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Testing the Moderating Effect of Burnout on the Relationship Between Anxiety and Sleep Quality

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Abstract

Several studies strongly indicate a connection between the quality of sleep and students' learning abilities and academic success. Thus, understanding the factors that disrupt one's sleep quality is important. One potent factor that can disrupt sleep is mental health, particularly anxiety. Although anxiety is a natural process that tries to keep a person safe by alerting them to potential dangers, this has a downside by increasing psychological and physiological arousal that can disrupt how well one sleeps. Previous research has found strong correlations between sleep quality and anxiety; however, some people may be more vulnerable than others to the negative association of anxiety and sleep. Notably, those experiencing burnout may be psychologically depleted from their workplaces and have fewer resources to cope with anxious states. Therefore, this study will investigate how anxiety predicts sleep quality (Research Question 1), and how anxiety and burnout both relate to each other in their relationship to affect sleep quality (Research Question 2). Online surveys were completed by non-faculty employees (n = 140) from the University of California, Merced participants. These measures included the Generalized Anxiety Disorder-7 Scale, the Pittsburgh Sleep Quality Index, and the Bergen Burnout Inventory. The results show a significant increase in poorer sleep quality as anxiety levels increased while the impact of burnout on this relationship was not significant enough. However, the results also indicated that a trend of sleep quality decreased as burnout increased, in the population with medium and high anxiety.

Keywords: anxiety, sleep quality, burnout

Testing the Moderating Effect of Burnout on the Relationship Between Anxiety and Sleep Quality

Sleep quality is defined as one's overall satisfaction with their sleep experience (Parmar et al., 2023). While a person sleeps, their brain processes and stores thoughts and memories. Not getting enough sleep can affect how well the brain remembers positive and happy experiences (Walker, M. P. & van der Helm, E., 2009). Like nutrition and exercise, sleep is essential for maintaining good health (Rezaei et al., 2017). It plays a vital role in cognitive functions such as reasoning, behavior, and creativity (Flo et al., 2014). Adequate sleep strengthens the immune system and helps regulate metabolism, while poor sleep is linked to serious health issues including heart disease, hypertension, and obesity (Kripke et al., 2002; van Cauter & Knutson, 2008). The factors influencing sleep quality are interconnected and multifaceted, indicating that improving sleep may require a comprehensive approach that considers various aspects of life, including mental health, lifestyle choices, and work-related habits (Badri et al., 2023). For instance, work-related factors, such as long hours and the balance between work and personal life, significantly impact sleep quality. Research indicates that longer working hours are associated with decreased sleep duration and increased stress levels, which can exacerbate sleep issues (Basner et al., 2007; Dahlgren et al., 2006). Thus, it is important to examine the factors in working adults that predict poor sleep quality.

Anxiety and Sleep

Research has established a direct and bidirectional relationship between sleep quality and mental health (Parmar et al., 2023). One key mental health factor that appears to influence sleep quality is anxiety. Anxiety is defined as “[an] unpleasant emotional state or condition which is characterized by subjective feelings of tension, apprehension, and worry, and by activation or

arousal of the autonomic nervous system" (Spielberger, 1972). Anxiety is a natural way to keep one safe by alerting us to potential dangers. However, this protective mechanism has a downside that can make people feel constantly worried and unhappy. An anxious person often expects bad things to happen all the time, making it hard for them to enjoy calm moments. The problem lies in the basic instinct's inability to regulate itself perfectly (Kim & Gorman, 2005). This is why it may be especially difficult for those struggling with anxiety to get a good night's sleep, as a result of being constantly uneasy. Empirical support has been found for the relationship between anxiety and sleep. For example, a study in the United States found that adults of all ages who reported worse insomnia symptoms had higher levels of anxiety (Bigalke et al., 2020). Similarly, in a study conducted by Salihoglu et al. (2023), their findings revealed a strong correlation between poorer sleep quality and mild anxiety.

Burnout and Sleep

Another important factor to consider when evaluating an individual's quality of sleep is burnout. Burnout is characterized by chronic work-related stress, leading to elevated cortisol levels. Cortisol disrupts the sleep-wake cycle, making it difficult to fall asleep and stay asleep (Melamed et al., 1999). This may leave individuals feeling exhausted and further perpetuating the cycle of anxiety and burnout. Moreover, feelings of exhaustion, cynicism, and reduced accomplishment associated with burnout can amplify the effect of anxiety and rumination, further hindering sleep quality (Gossmann et al., 2023). This can create a negative feedback loop where worries about work intrude on sleep, potentially leading to greater exhaustion, cynicism, or inadequacy the next day.

Exhaustion signifies the depletion of emotional resources, resulting in chronic fatigue and emotional drain. Cynicism reflects the development of a distant and negative attitude toward

one's job. Reduced professional efficacy, also known as inadequacy, conveys the perception that one is no longer capable of effectively fulfilling their job responsibilities. Feldt et al. (2014) highlight the importance of differentiating these dimensions. They note that cynicism and inadequacy exhibit high co-occurrence, while exhaustion remains a more distinct element. Despite their strong correlation, the intensity of these interrelated dimensions may not always coincide. Burnout manifests in several ways, but feelings of inadequacy may be particularly disruptive to sleep. Inadequacy can exacerbate anxiety, fueling anxious-depressive symptoms that can prevent falling asleep. Furthermore, it can erode personal energy and resources, leading to a sense of frustration and possible loss of control over mood and self-esteem, further hindering sleep (Nonnis et al., 2024). While exhaustion and cynicism from burnout also play a role, inadequacy appears to be a key factor amplifying anxiety's negative influence on sleep quality.

Burnout as a Moderator between Anxiety and Sleep

Building upon prior research demonstrating the significant influence of anxiety and burnout on sleep quality, the current study aims to explore the moderating role of burnout. While burnout has often been examined as a mediator, less is known about how it alters the strength of relationships between variables such as anxiety and sleep. For instance, stressful working environments have been shown to influence burnout levels, providing rationale for investigating how burnout might change the anxiety-sleep relationship (Bhuvaneswari & Thirumoorthi, 2023). Specifically, burnout could amplify the detrimental effects of anxiety on sleep quality, particularly in individuals exposed to high-stress environments, making it a crucial moderator to study. Moreover, emotional exhaustion, one of burnout’s core components, has been shown to significantly affect quality of life, particularly in high-stress professions like critical care nursing (Cecere et al, 2023). Since emotional exhaustion directly impacts both physical and emotional

health, including sleep, burnout may intensify the negative link between anxiety and sleep quality. Those experiencing higher burnout may suffer from more severe anxiety-related sleep disturbances, whereas individuals with lower burnout may experience anxiety but still maintain relatively better sleep quality. This variability supports the idea that burnout could moderate the relationship between anxiety and sleep, making it an essential factor to examine in understanding sleep outcomes.

The Present Study

Therefore, this study aims to investigate the independent contributions of exhaustion, cynicism, and inadequacy to sleep quality. We hypothesize that one dimension may exert a significantly greater influence on anxiety's relationship with sleep disruption compared to the others. To investigate this, we will assess the connection between anxiety and sleep quality among university staff. Additionally, we will examine how each aspect of burnout influences this relationship, addressing a gap in the research regarding the moderating effects of burnout on the link between anxiety and sleep.

Methods

Participants

The study took place at a public university in Central California. Participants were required to be non-student and non-faculty employees of the university. Recruitment was conducted through university emails and flyers, inviting employees to participate in a study on the impact of mindfulness training on workplace stress. Data for the present study came from the baseline session. To determine eligibility, interested individuals completed an online screening survey. The inclusion criteria required participants to have daily access to a smartphone with internet, be fluent in English, be employed by the university, and be at least 18 years old.

Experienced meditators, defined as those engaging in a sitting meditation practice more than twice a week for at least 10 minutes over the past three months, were excluded to ensure uniform levels of dispositional mindfulness prior to the intervention (Gavrilova & Zawadzki, 2023).

This study included an eligible sample of 142 non-faculty staff (24.6% male, 74.6% female, 0.7% other) from the University of California, Merced. Participants' ages ranged from 21 to 65 years (M = 38.2 years).

Materials

Anxiety was assessed using the 7-item Generalized Anxiety Disorder Scale (GAD-7) (Spitzer et al., 2006). The GAD-7 measures the potential severity of generalized anxiety disorder (GAD) over the past two weeks. Participants rated how often they were bothered by problems like feeling nervous or having trouble relaxing, using a 0 (*not at all*) to 3 (*nearly every day*) scale. The GAD-7 had strong reliability in the present study (α = .90). Items were summed such that higher scores indicated greater anxiety (range: 0-21).

Sleep quality was measured using the 19-item Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989). The PSQI assesses seven sleep components, including duration, disturbance, latency, daytime dysfunction, efficiency, overall quality, and medication use. Each component is scored from 0 (*no difficulty*) to 3 (*severe difficulty*), with a total score ranging from 0 to 21. Higher scores indicate poorer sleep quality.

Workplace burnout was assessed with the 8-item Bergen Burnout Inventory (Feldt et al., 2013). The scale consists of three subscales: exhaustion (emotional), cynicism (cognitive), and inadequacy (behavioral) at work. Participants rated their agreement with each statement on a scale from 1 (*completely disagree*) to 6 (*completely agree*). Items included statements such as, "I am snowed under with work. (EXH)" and "I feel dispirited at work and I think of leaving my job.

(CYN)" (Salmela-Aro et al., 2011). Exhaustion, cynicism, and inadequacy all displayed acceptable reliability (αs = .74, .78, .75, respectively). On average, the BBI displayed strong reliability (α = .86). As such, items for each subscale, and then overall, were averaged such that higher numbers indicated more burnout.

Procedure

This study recruited non-faculty staff from the University of California, Merced. Following a detailed explanation of the study procedures and their rights, participants provided written informed consent. They then completed scales online via Qualtrics.

Analytic Plan

To address the research questions, a two-step analytical approach was employed. First, a bivariate correlation analysis was conducted to investigate the correlation between anxiety and sleep quality. Second, PROCESS was utilized to perform regression analyses and explore whether burnout moderates the relationship between anxiety and sleep quality. The three subscales of burnout (exhaustion, cynicism, and inadequacy) were also analyzed in their moderation to anxiety and sleep quality using PROCESS.

Results

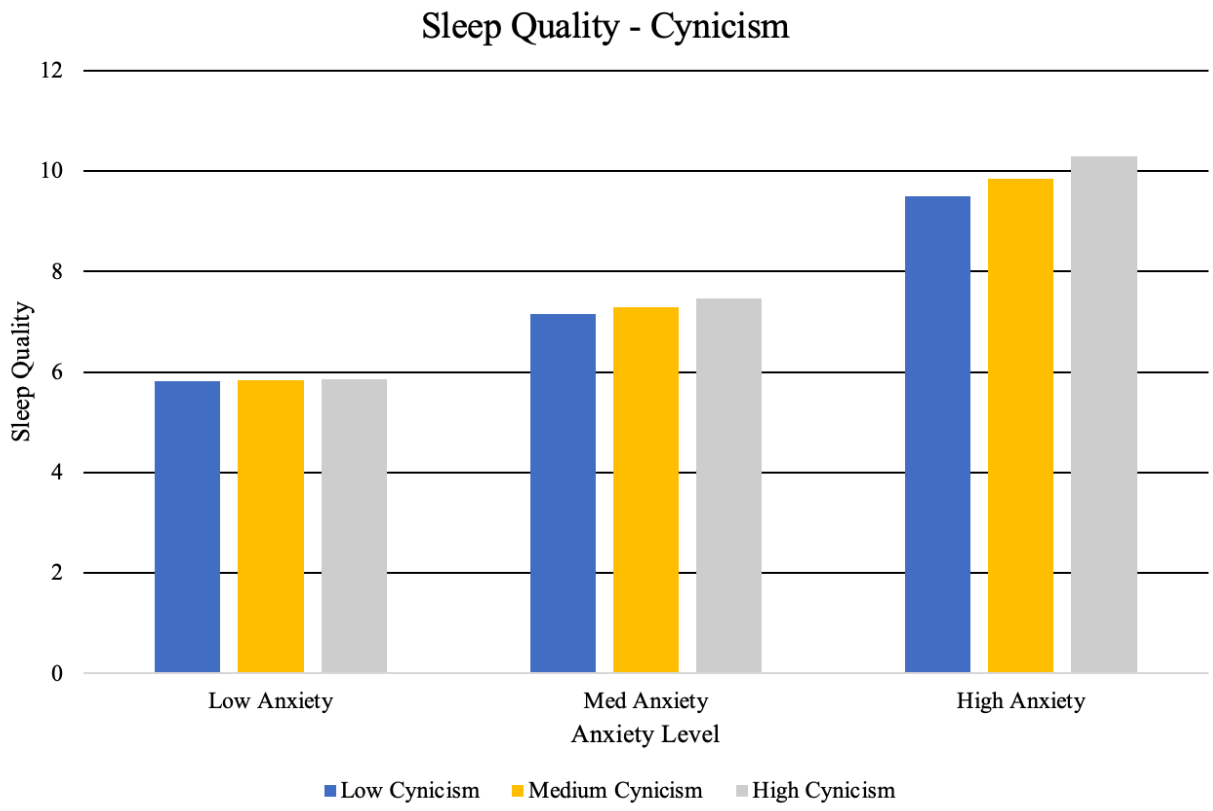
Our first research question investigated the relationship between anxiety on sleep quality. A bivariate correlation indicated a significant positive correlation, $r = .53$, $p < .001$, such that higher levels of anxiety are associated with higher levels of poorer sleep quality.

Our second research question investigated whether burnout moderated the effect between anxiety and sleep quality. There was a trending effect for the moderation, $b = 0.01$, $SE = 0.01$, $p = .080$. As can be seen in Figure 1, although for all participants as anxiety levels increase sleep quality decreases, the strength of this relationship depends on level of burnout. For individuals

with low anxiety, sleep quality is relatively stable across different levels of burnout. However, for those with medium and high anxiety, higher burnout levels are associated with worse sleep quality. Specifically, individuals with high anxiety and high burnout experience the poorest sleep quality, as indicated by the highest sleep quality values.

Figure 1

Moderating Effect of Overall Burnout on Anxiety and Sleep Quality

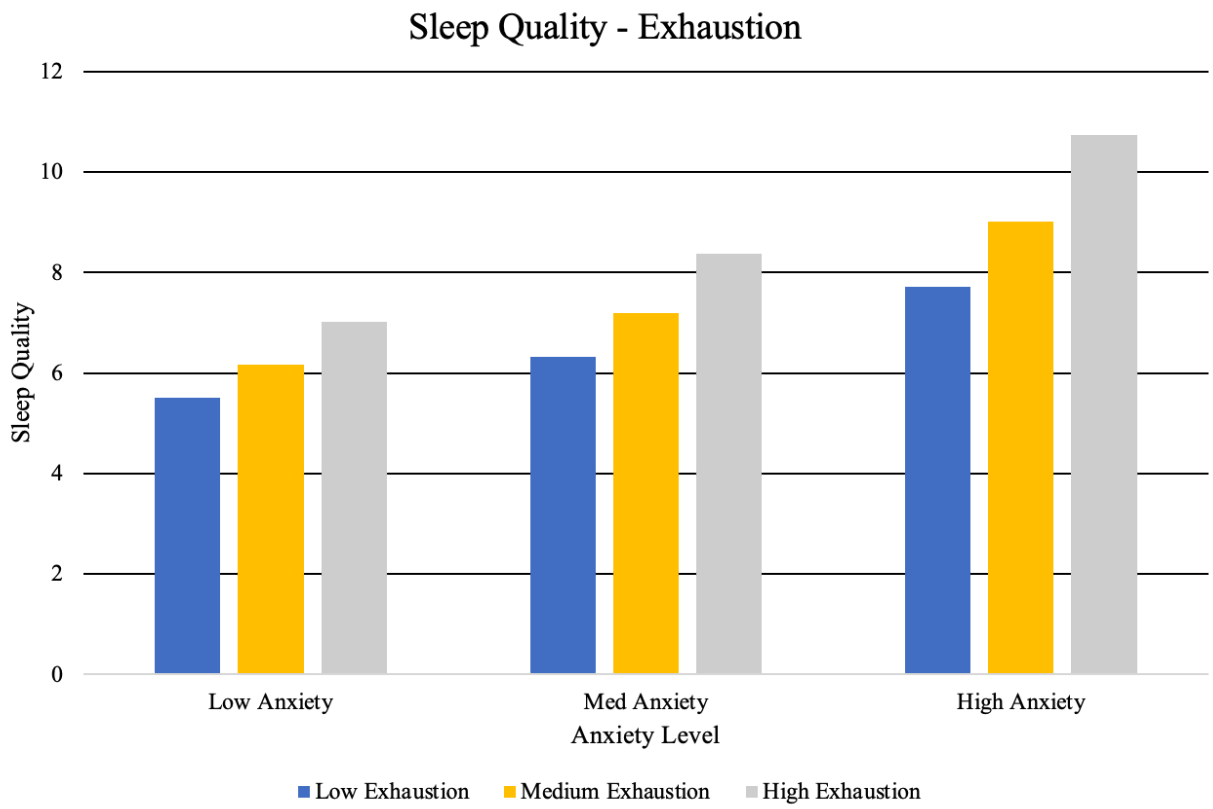


We then conducted follow-up analyses looking at each subscale of burnout. Neither the interaction between inadequacy and anxiety, $b = .02$, $SE = .01$, $p = .16$, nor cynicism and anxiety, $b = .01$, $SE = .01$, $p = .51$, were statistically significant. Exhaustion showed a trend towards a significant moderation of the relationship between anxiety and sleep quality, $b = .02$, $SE = .01$, $p = .100$. As depicted in Figure 2, participants reporting high exhaustion exhibited the most

substantial decline in sleep quality across all levels of anxiety compared to those reporting medium or low exhaustion.

Figure 2

Moderating Effect of Exhaustion on Anxiety and Sleep Quality



Discussion

The key finding of this study is that higher levels of anxiety are strongly associated with poorer sleep quality in this workplace sample. These findings are consistent with other studies that found that anxiety and sleep quality are associated (Teker & Luleci, 2018; Kara, 2016). This is important because it highlights the potential impact of workplace mental health on overall employee well-being and productivity. This relationship can inform organizational policies and interventions aimed at reducing workplace anxiety and improving sleep health. Additionally, by

addressing the factors contributing to anxiety and poor sleep, employers can enhance employee well-being, productivity, and job satisfaction.

We were also interested in the role of burnout as a moderator of the relationship between anxiety and sleep quality. Contrary to expectations, we found that work-related burnout did not consistently influence this relationship. However, there is potential for burnout to play a role in sleep quality, as a non-significant trend was observed, particularly in individuals with moderate to high anxiety. Specifically, sleep quality appeared to decline as burnout increased, suggesting that we may be on the right track but that a larger sample size might be needed to detect a smaller effect. It is important to note that other research found that burnout, specifically emotional exhaustion, is related to both physical and emotional aspects of life quality (Cecere et al, 2023). This supports the notion that the observed trend indicates a potential link worth further investigation, enhancing the hypothesis that burnout may influence both anxiety and sleep quality. Differences in sample demographics (age, profession, baseline mental health) could have impacted the strength of associations between burnout, anxiety, and sleep. Since Cecere et al. (2023) used a high-burnout group like critical care nurses, the relationship between burnout and sleep might be more pronounced than in a general university staff population sample.

Considering additional factors that may have a stronger impact on sleep could yield clearer insights. While burnout is a crucial factor for overall well-being, it primarily occurs within the work environment. As a result, there may be intervening factors between workplace stress and the time individuals go home and prepare for sleep, which could buffer the effects of burnout on sleep quality. Sleep may be less directly influenced by burnout because the transition from work to home allows for detachment from work-related stressors. More research could explore this idea further by investigating potential variables that mediate the relationship

between burnout and sleep. These could include factors like evening routines, time spent unwinding after work, or personal coping strategies that help mitigate burnout's influence on sleep. Previous research suggests that smartphone use and physical exercise play a role in sleep quality (Xu et al., 2023). Factors as such could be potentially mediating the relationship between burnout and sleep quality. Identifying these mediating factors could help clarify why burnout's impact on sleep appears limited and highlight potential strategies for improving sleep quality in those experiencing high levels of burnout.

Moreover, future research can refine how burnout is measured, examining it more precisely, especially by isolating the core dimensions, such as exhaustion and feelings of inadequacy. Research suggests a repeated link between emotional exhaustion and overall quality of life, indicating that early intervention in these areas could help prevent burnout and sleep problems (Pagnin et al., 2014; Cecere et al, 2023). Investigating exhaustion more can contribute to a comprehensive understanding of mental health in high-stress professions. This understanding can inform policies and practices that prioritize employee well-being. Employing more precise measurements of various aspects of sleep and anxiety could uncover more nuanced relationships. For instance, investigating the interplay between burnout, anxiety, and sleep disturbances using different assessment scales or examining diverse populations, similar to the approach taken by Pagnin et al. (2014) with medical students, could yield valuable insights.

Ultimately, identifying anxiety as a key factor impacting sleep quality highlights the importance of addressing both anxiety and sleep disturbances in interventions aimed at improving overall well-being. Improving sleep quality has the potential to significantly enhance quality of life by mitigating the adverse effects of anxiety.

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