

Research Paper

Linking Personality Traits to Sleep: The Mediating Effect of Anxiety

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ABSTRACT

The increasing prevalence of sleep problems, especially following the COVID-19 pandemic, highlights the need to explore the underlying contributing factors. This study investigates the mediating role of anxiety in the relationship between personality traits and sleep quality. By examining how personality characteristics influence anxiety and, in turn, impact sleep, this research aims to shed light on a crucial pathway often overlooked in addressing sleep disturbances. A sample of 150 participants completed the Big Five Personality Inventory, Sleep Quality Scale, and the Beck Anxiety Inventory through an online survey platform. The results revealed that openness, conscientiousness, and neuroticism are indirectly related to sleep quality through anxiety. Additionally, while there were no direct effects of personality traits on sleep quality, the total effect was significant for both openness and neuroticism. These findings underscore the importance of considering anxiety as a mediator in the relationship between personality and sleep quality, offering a potential pathway for interventions aimed at improving sleep.

Keywords: *Big Five Personality Traits, Personality, Anxiety, Sleep Quality, Mediation Analysis*

Personality, anxiety, and sleep quality are three interrelated psychological constructs that significantly influence an individual's overall well-being. Research suggests that personality traits play a crucial role in determining emotional responses, behavioral patterns, and stress management strategies, all of which contribute to mental and physical health outcomes (Hampson, 2017). Among these outcomes, sleep quality has garnered increasing attention due to its implications for cognitive functioning, emotional regulation, and physical health (Kallestad et al., 2014). Sleep disturbances are commonly reported among individuals experiencing heightened anxiety levels, indicating a potential mediating role of anxiety in the relationship between personality and sleep quality (Gupta et al., 2020). The current study aims to examine this mediation effect, exploring how anxiety serves as a bridge between personality traits and sleep disturbances.

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Personality is a fundamental construct in psychology that encompasses the unique set of traits, characteristics, and behavioral patterns that define an individual; It is a stable pattern of behavior, cognition, and emotional tendencies that influence how an individual interacts with their environment (APA). Several theoretical models explain personality and its structure. The Big Five Personality Model (McCrae & Costa, 1999) is one of the most widely accepted frameworks, categorizing personality traits into openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each of these traits influences individual differences in cognition, emotion, and behavior, shaping how people respond to stress and anxiety, which can have significant implications for mental health (Ayoub & Roberts, 2020). Research findings offer empirical support for both the theoretical link between personality traits, as defined by models like the Big Five and important aspects of an individual's life, such as their sleep patterns and susceptibility to anxiety. They demonstrate how these stable personality characteristics can indeed shape how individuals interact with their environment and their overall mental well-being. For instance, research demonstrated a significant positive correlation between neuroticism and impaired sleep quality, indicating that individuals with higher neuroticism scores reported poorer sleep. Conversely, conscientiousness did not exhibit a significant association with sleep quality (Sharma, 2020). Middle-aged and older adults exhibiting higher levels of extraversion reported better overall sleep quality (Wang and Zeng, 2023). A significant positive correlation was observed between anxiety and sleep disorders, as well as between neuroticism and sleep disorders (Yu et al., 2024).

Anxiety is a psychological state marked by anticipatory apprehension and physiological arousal, wherein individuals perceive potential threats or adverse outcomes. This emotional response often triggers somatic manifestations such as increased muscular tension, accelerated respiration, and elevated heart rate, reflecting the body's preparatory mobilization to confront perceived danger (APA, 2018). It can manifest in both adaptive and maladaptive ways. While mild anxiety serves as a protective mechanism that enhances alertness and decision-making, excessive or chronic anxiety can impair cognitive and emotional functioning, leading to generalized anxiety disorder (GAD), panic disorder, obsessive-compulsive disorder (OCD), post-traumatic stress disorder (PTSD), and social anxiety disorder (Verma & Mishra, 2020). Research has demonstrated that personality plays a significant role in shaping anxiety levels. Notably, neuroticism is a strong predictor of chronic anxiety due to its association with negative affect and stress sensitivity (Paulus, 2016). Individuals with high neuroticism tend to engage in excessive worry, maladaptive coping mechanisms, and catastrophic thinking, all of which exacerbate anxiety symptoms. Conversely, conscientious individuals are more likely to employ effective coping strategies, reducing the severity of anxiety (Stephan et al., 2018). Other factors influencing anxiety levels include genetic predisposition, neurotransmitter imbalances, cognitive distortions, environmental stressors, and cultural influences (Wu et al., 2024). Anxiety has far-reaching implications beyond mental health, affecting physical well-being, cognitive performance, social relationships, and overall life satisfaction. Chronic anxiety is known to contribute to cardiovascular problems, weakened immune response, and increased susceptibility to chronic illnesses (Beaudreau & O'Hara, 2009). Moreover, anxiety significantly disrupts sleep patterns, reinforcing a cyclical relationship in which poor sleep exacerbates anxiety, and heightened anxiety impairs sleep quality (Gupta et al., 2020). People who are diagnosed with anxiety or depression tend to have a lower overall quality of life than those who are not. (Thiel et al., 2024; IsHak et al., 2011; Olatunji et al., 2007; Saarijärvi et al., 2002). They consistently report a lower quality of life (QOL) compared to those without anxiety, regardless of the type of anxiety they experience. Research shows that anxiety, stress, and

depression are linked to a lower health-related quality of life (HRQoL) in people with long-term illnesses. Anxiety is linked to behaviours that harms health, including decreased physical activity, sleep disturbances, smoking, and obesity, all of which contribute to poorer health-related quality of life (Hwang et al., 2024). Globally, anxiety and depression are the most common mental health issues affecting one in five individuals particularly during adolescence and early adulthood. (WHO), W.H.O. 2024; Solmi, 2021). (Gonsalves et al., 2023). The presence of anxiety disorders alongside eating disorders in female adolescents and young adults correlates with more severe eating disorder symptoms. In particular, social anxiety that exists alongside other conditions makes recovery harder because the tendency to avoid people and fear criticism disrupts treatment participation and the formation of a positive therapeutic alliance (Sander et al., 2021). Research highlights the intricate interplay of psychological and physical factors affecting sleep quality, particularly during stressful periods like the COVID-19 pandemic, where anxiety significantly mediated the link between loneliness and poor sleep (Grey et al., 2023). Beyond anxiety, other significant predictors of poor sleep include depression, low calcium intake, and multisite pain (Alkhatatbeh et al., 2020), illustrating that both mental and physical well-being are crucial for healthy sleep. Moreover, a cyclical relationship exists, as poor sleep can itself lead to increased anxiety the following day (Chan et al., 2022). Given the central role of anxiety and these interconnected factors, preventing the worsening of sleep problems is essential for individual health and to mitigate potential burdens on healthcare systems (Grey et al., 2023).

Sleep quality refers to the overall effectiveness of sleep in restoring cognitive, emotional, and physiological balance. Unlike sleep quantity, which measures the total duration of sleep, sleep quality evaluates various dimensions, including sleep efficiency, depth, continuity, and satisfaction. Research suggests that good sleep quality is essential for cognitive functioning, emotional regulation, and overall physical health (Kallestad et al., 2014). Several factors influence sleep quality, including sleep hygiene, environmental conditions, physical health, stress levels, and individual variability. Poor sleep hygiene – such as inconsistent sleep schedules, excessive screen time before bed, and consumption of stimulants – can negatively impact sleep quality. Similarly, chronic stress, anxiety, and underlying medical conditions such as insomnia or restless leg syndrome can disrupt sleep patterns (Lahlouh & Mustafa, 2020). Studies have shown that anxiety is one of the strongest predictors of poor sleep quality, emphasizing the need to explore the underlying mechanisms connecting these constructs (Noohu et al., 2019). Furthermore, the impact of anxiety on sleep quality is not uniform across individuals; rather, it varies depending on personality traits (Seow et al., 2020). For instance, individuals with high neuroticism may exhibit heightened sensitivity to stressors, making them more susceptible to anxiety-induced sleep disturbances. In contrast, conscientious individuals, who tend to adopt structured routines and effective stress management strategies, may experience fewer anxiety-related sleep disruptions (Stephan et al., 2018). This variation underscores the need to examine anxiety as a potential mediator between personality traits and sleep quality.

According to research, the widespread nature of poor sleep quality globally has detrimental effects on both mental and physical health (Tanaka & Shirakawa, 2004; Weaver et al., 2018; Barnes & Watson, 2019). Frequent poor sleep is associated with negative affect and increases the risk of affective disorders (Nicassio et al., 2012; Kao et al., 2016; Weinberg et al., 2016). An individual's sleep quality significantly impacts their overall sense of well-being (Tighe et al., 2016), with poor sleep leading to lower life satisfaction and a shift towards fewer positive and more negative feelings (Berger et al., 2012; Palmer & Alfano, 2017; Kim, 2018). Conversely, higher sleep quality is associated with greater subjective

well-being and acts as a partial mediator between stress and subjective well-being (Weinberg et al., 2016).

In conclusion, the evidence strongly suggests that sleep quality is not merely a matter of nightly rest but rather a critical foundation intricately linked with various facets of overall well-being and effective work performance. For instance, studies have shown that insomnia symptoms are associated with lower psychological and subjective well-being (Hamilton et al., 2007), increased negative emotions such as anger, and decreased positive emotions like happiness and focus, as well as reduced job satisfaction (Scott & Judge, 2006). Furthermore, sleep quality significantly impacts job satisfaction and the likelihood of job turnover (Lai et al., 2008), and influences employees' job satisfaction and helpfulness at work (Barnes et al., 2013). Lastly, poor sleep can also contribute to workplace issues such as disagreements between leaders and employees (Guarana & Barnes, 2017) and heightened feelings of anxiety, depression, anger, and hostility (Granö et al., 2008; Weaver et al., 2018; Peng et al., 2023).

Rationale for the Present Study

Despite the well-established links between personality, anxiety, and sleep, a comprehensive understanding of the mediation effect remains limited. The COVID-19 pandemic has exacerbated anxiety and sleep disturbances, particularly among young adults, highlighting the need for further research in this domain (Gupta et al., 2020). While previous studies have explored the direct relationships between these variables, few have employed mediation models to investigate the underlying mechanisms driving these associations.

The present study seeks to fill this gap by examining the extent to which anxiety mediates the relationship between personality traits and sleep quality. By doing so, this research aims to contribute to the growing body of literature on personality psychology, mental health, and sleep science. Understanding these mechanisms may have significant implications for developing targeted interventions for individuals experiencing anxiety-related sleep disturbances.

Given the critical role of personality in shaping emotional responses and behavioral patterns, identifying anxiety as a mediator could provide valuable insights into the development of personalized therapeutic strategies. Interventions aimed at reducing anxiety, such as cognitive-behavioral therapy (CBT) and mindfulness-based stress reduction (MBSR), may prove effective in mitigating sleep disturbances among individuals with certain personality profiles (Asquith et al., 2022).

Therefore, keeping the aforementioned review in mind, the present study aims to explore the intricate relationships between personality traits, anxiety, and sleep quality through a mediation framework. By investigating these connections, this research seeks to advance the understanding of psychological well-being and inform evidence-based approaches for improving sleep health, based on the following objectives and hypotheses:

1. To study the indirect effect of anxiety on personality and sleep quality.
 2. To study the direct effect of personality on sleep quality.
 3. To study the overall effect of relationship between personality and sleep quality through anxiety.
- **Hypothesis 1 (H1).** There will be a significant indirect effect of anxiety on personality and sleep quality.

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- **Hypothesis 2 (H2).** There will be a significant direct effect of personality on sleep quality.
- **Hypothesis 3 (H3).** There will be a significant overall effect of relationship between personality and sleep quality through anxiety.

METHOD

Participants

A sample of 150 young adults, aged 18 to 25 years, of both sexes, was selected through purposive sampling. Participants were required to have a minimum of a high school education and reside either in hostels or at home. Individuals undergoing medical treatment, as well as those identifying as asexual or pansexual, were excluded to avoid bias and ensure a balanced comparison.

Measures

The following tools were selected for the study:

1. **Big Five Inventory:** Developed by John and Srivastava (1999), the Big Five Inventory consists of 44 items that assess personality across five dimensions: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. The scale demonstrates strong internal consistency with Cronbach's alpha ranging from 0.76 to 0.90.
2. **Sleep Quality Scale:** Created by Yi Hyeryeon, Kyungrim Shin, and Col Shin (2006), the Sleep Quality Scale includes 28 items assessing sleep quality across six domains: daytime symptoms, restoration after sleep, difficulty initiating and maintaining sleep, difficulty waking, and sleep satisfaction. The scale exhibits high reliability, with an internal consistency of 0.92 and test-retest reliability of 0.81. Validity is supported by a strong correlation with the Pittsburgh Sleep Quality Index (PSQI).
3. **Beck Anxiety Inventory:** Developed by Aaron T. Beck and colleagues (1988), the Beck Anxiety Inventory comprises 21 items that measure the severity of anxiety symptoms. The scale has demonstrated high reliability with a Cronbach's alpha of 0.92. The validity of the scale is supported by a moderate correlation of 0.51.

Research Design

The present study is empirical in nature, employing a correlational research design to investigate the mediating role of anxiety between personality traits and sleep quality. The research focuses on examining associations between these variables without manipulating them, as they naturally occur in the population. Participants, aged 18 to 25 years, were invited to complete a questionnaire. Informed consent was obtained from all participants, ensuring confidentiality and voluntary participation. Upon reaching the desired sample size of 150, the collected data was analyzed using Jamovi software for mediation analysis.

Statistical Analyses

Using Jamovi software, mediation analysis was conducted to assess the mediating role of anxiety in the relationship between personality traits (independent variable) and sleep quality (dependent variable). Mediation analysis helps determine if the association between the independent and dependent variables is partially or fully explained by the mediator (anxiety). The analysis included the calculation of the following effects:

- **Direct Effect:** The effect of the independent variable on the dependent variable while holding the mediator constant.

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- Indirect Effect: The effect of the independent variable on the dependent variable mediated by anxiety.
- Total Effect: The combined effect of the independent variable on the dependent variable, calculated by summing the direct and indirect effects.

RESULTS

Table 1. Mediation Estimates of Personality Trait of Openness

Effect	Label	Estimate	SE	95% Confidence Interval		Z	p	% Mediation
				Lower	Upper			
Indirect	a × b	0.327	0.133	0.095	0.610	2.454	0.014	64.7
Direct	c	0.178	0.193	-0.204	0.558	0.922	0.356	35.3
Total	c + a × b	0.505	0.222	0.061	0.949	2.271	0.023	100.

- **Indirect Effect:** The estimate is 0.327, and this is statistically significant ($p = 0.014 < 0.05$), suggesting that the indirect path from Openness to Sleep Quality via Anxiety is significant.
- **Direct Effect:** The estimate is 0.178, but this is not statistically significant ($p = 0.356 > 0.05$), suggesting that the direct path from Openness to Sleep Quality is not significant.
- **Total Effect:** The estimate is 0.505, and this is statistically significant ($p = 0.023 < 0.05$), suggesting a significant total effect of Openness on Sleep Quality.

Table 2. Path Estimates for Personality Trait of Openness

					95% Confidence Interval		Z	p
		Label	Estimate	SE	Lower	Upper		
Openness	→	Anxiety	a	0.733	0.2641	0.226	1.252	0.005
Anxiety	→	Sleep Quality	b	0.445	0.0692	0.310	0.590	<.001
Openness	→	Sleep Quality	c	0.178	0.1932	-0.204	0.558	0.356

- **Path a (Openness → Anxiety):** This is the effect of Openness on Anxiety. The estimate is 0.733, and this is statistically significant ($p = 0.005 < 0.05$), suggesting a significant positive relationship between Openness and Anxiety.
- **Path b (Anxiety → Sleep Quality):** This is the effect of Anxiety on Sleep Quality. The estimate is 0.445, and this is statistically significant ($p < 0.001$), suggesting a significant positive relationship between Anxiety and Sleep Quality.
- **Path c (Openness → Sleep Quality):** This is the direct effect of Openness on Sleep Quality, bypassing Anxiety. The estimate is 0.178, but this is not statistically significant ($p = 0.356 > 0.05$).

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Table 3. Mediation Estimates for Personality trait of Conscientiousness

Effect	Label	Estimate	SE	95% Confidence Interval		Z	p	% Mediation
				Lower	Upper			
Indirect	$a \times b$	-0.359	0.115	-0.607	-0.149	-3.122	0.002	68.9
Direct	c	0.162	0.195	-0.233	0.609	0.831	0.406	31.1
Total	$c + a \times b$	-0.197	0.210	-0.628	0.254	-0.938	0.348	100.0

- **Indirect Effect:** The indirect effect is statistically significant ($p = 0.002$), suggesting that the mediator variable plays a significant role in the relationship between the independent and dependent variables. The negative estimate (-0.359) indicates a negative relationship, meaning as the independent variable increases, the mediator decreases, which then decreases the dependent variable.
- **Direct Effect:** The direct effect is not statistically significant ($p = 0.406$), suggesting that the independent variable does not have a significant effect on the dependent variable when the mediator is controlled.
- **Total Effect:** The total effect is not statistically significant ($p = 0.348$), suggesting that the independent variable does not have a significant total effect on the dependent variable.

Table 4. Path Estimates for Personality Trait of Conscientiousness

					95% Confidence Interval				
			Label	Estimate	SE	Lower	Upper	Z	p
Conscientiousness	→	Anxiety	a	-0.761	0.2122	-1.178	-0.282	-3.585	<.001
Anxiety	→	Sleep Quality	b	0.472	0.0681	0.325	0.602	6.932	<.001
Conscientiousness	→	Sleep Quality	c	0.162	0.1949	-0.233	0.609	0.831	0.406

- **Conscientiousness → Anxiety (a):** There is a significant negative relationship between conscientiousness and anxiety ($p < 0.001$). As conscientiousness increases, anxiety decreases.
- **Anxiety → Sleep Quality (b):** There is a significant positive relationship between anxiety and sleep quality ($p < 0.001$). As anxiety increases, sleep quality improves.
- **Conscientiousness → Sleep Quality:** There is no significant relationship between conscientiousness and sleep quality ($p = 0.406$).

Table 5. Mediation Estimates for Personality Trait of Extraversion

Effect	Label	Estimate	SE	95% Confidence Interval		Z	p	% Mediation
				Lower	Upper			
Indirect	$a \times b$	-0.1387	0.124	-0.3888	0.103	-1.117	0.264	39.9
Direct	c	0.2088	0.150	-0.0922	0.531	1.389	0.165	60.1
Total	$c + a \times b$	0.0700	0.218	-0.3455	0.507	0.322	0.748	100.0

- **Indirect Effect:** The estimate is -0.1387, but this is not statistically significant ($p = 0.264 > 0.05$), suggesting that the indirect path from Extraversion to Sleep Quality via Anxiety is not significant.
- **Direct Effect:** The estimate is 0.2088, but this is also not statistically significant ($p = 0.165 > 0.05$), suggesting that the direct path from Extraversion to Sleep Quality is not significant.
- **Total Effect.** The estimate is 0.0700, but this is not statistically significant ($p = 0.748 > 0.05$).

Table 6. Path Estimates for Personality Trait of Extraversion

					95% Confidence Interval				
					Lower	Upper	Z	p	
Extraversion	→	Anxiety	a	-0.298	0.2519	-0.7568	0.199	-1.18	0.237
Anxiety	→	Sleep Quality	b	0.465	0.0809	0.2869	0.610	5.75	<.001
Extraversion	→	Sleep Quality	c	0.209	0.1504	-0.0922	0.531	1.39	0.165

- **Path a (Extraversion → Anxiety):** This is the effect of Extraversion on Anxiety. The estimate is -0.298, but this is not statistically significant ($p = 0.237 > 0.05$).
- **Path b (Anxiety → Sleep Quality):** This is the effect of Anxiety on Sleep Quality. The estimate is 0.465, and this is statistically significant ($p < 0.001$), suggesting a significant positive relationship between Anxiety and Sleep Quality.
- **Path c (Extraversion → Sleep Quality):** This is the direct effect of Extraversion on Sleep Quality. The estimate is 0.209, but this is not statistically significant ($p = 0.165 > 0.05$).

Table 7. Mediation Estimates for Personality Trait of Agreeableness

Effect	Label	Estimate	SE	95% Confidence Interval		Z	p	% Mediation
				Lower	Upper			
Indirect	$a \times b$	-0.0413	0.126	-0.267	0.252	-0.327	0.744	26.1
Direct	c	-0.1168	0.227	-0.582	0.367	-0.514	0.607	73.9
Total	$c + a \times b$	-0.1580	0.246	-0.734	0.304	-0.643	0.520	100.0

- **Indirect Effect:** The estimate is -0.0413, but this is not statistically significant ($p = 0.744 > 0.05$), suggesting that the indirect path from Agreeableness to Sleep Quality via Anxiety is not significant.
- **Direct Effect:** The estimate is -0.1168, but this is also not statistically significant ($p = 0.607 > 0.05$), suggesting that the direct path from Agreeableness to Sleep Quality is not significant.
- **Total Effect:** The estimate is -0.1580, but this is not statistically significant ($p = 0.520 > 0.05$).

Table 8. Path Estimates for Personality Trait of Agreeableness

					95% Confidence Interval				
					Lower	Upper	Z	p	
Agreeableness	→	Anxiety	a	-0.0904	0.2742	-0.569	0.524	-0.330	0.742
Anxiety	→	Sleep Quality	b	0.4567	0.0649	0.314	0.560	7.032	<.001
Agreeableness	→	Sleep Quality	c	-0.1168	0.2271	-0.582	0.367	-0.514	0.607

- **Path a (Agreeableness → Anxiety):** This is the effect of Agreeableness on Anxiety. The estimate is -0.0904, but this is not statistically significant ($p = 0.742 > 0.05$).
- **Path b (Anxiety → Sleep Quality):** This is the effect of Anxiety on Sleep Quality. The estimate is 0.4567, and this is statistically significant ($p < 0.001$), suggesting a significant positive relationship between Anxiety and Sleep Quality.
- **Path c (Agreeableness → Sleep Quality):** This is the direct effect of Agreeableness on Sleep Quality, bypassing Anxiety. The estimate is -0.1168, but this is not statistically significant ($p = 0.607 > 0.05$).

Table 9. Mediation Estimates for Personality trait of Neuroticism

Effect	Label	Estimate	SE	95% Confidence Interval		Z	p	% Mediation
				Lower	Upper			
Indirect	$a \times b$	0.500	0.129	0.2613	0.778	3.87	<.001	59.7
Direct	c	0.337	0.197	0.0113	0.753	1.71	0.087	40.3
Total	$c + a \times b$	0.837	0.181	0.5034	1.271	4.61	<.001	100.0

- **Indirect Effect:** The estimate is 0.500, and this is statistically significant ($p < 0.001$), suggesting that the indirect path from Neuroticism to Sleep Quality via Anxiety is significant.
- **Direct Effect:** The estimate is 0.337, but this is not statistically significant ($p = 0.087 > 0.05$), suggesting that the direct path from Neuroticism to Sleep Quality is not significant.
- **Total Effect:** The estimate is 0.837, and this is statistically significant ($p < 0.001$), suggesting a significant total effect of Neuroticism on Sleep Quality.

Table 10. Path Estimates for Personality Trait of Neuroticism

						95% Confidence Interval			
			Label	Estimate	SE	Lower	Upper	Z	p
Neuroticism	→	Anxiety	a	1.288	0.1750	0.9927	1.642	7.36	< .001
Anxiety	→	Sleep Quality	b	0.388	0.0902	0.1987	0.560	4.30	< .001
Neuroticism	→	Sleep Quality	c	0.337	0.1966	0.0113	0.753	1.71	0.087

- **Path a (Neuroticism → Anxiety):** This is the effect of Neuroticism on Anxiety. The estimate is 1.288, and this is statistically significant ($p < 0.001$), suggesting a significant positive relationship between Neuroticism and Anxiety.
- **Path b (Anxiety → Sleep Quality):** This is the effect of Anxiety on Sleep Quality. The estimate is 0.388, and this is statistically significant ($p < 0.001$), suggesting a significant positive relationship between Anxiety and Sleep Quality.
- **Path c (Neuroticism → Sleep Quality):** This is the direct effect of Neuroticism on Sleep Quality, bypassing Anxiety. The estimate is 0.337, but this is not statistically significant ($p = 0.087 > 0.05$).

DISCUSSION

The present research aimed to examine the mediating role of anxiety in the relationship between personality traits and sleep quality. Anxiety, as a natural response to stress, is posited to influence sleep quality, while personality traits represent stable patterns of cognition, affect, and behavior. The findings support the alternative hypothesis (H1) that

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personality indirectly affects sleep quality through anxiety for three dimensions of the Big Five—Openness, Conscientiousness, and Neuroticism.

Openness and Sleep Quality

For the personality dimension of Openness, a statistically significant indirect effect was observed via anxiety ($P = 0.014$). Individuals scoring high on Openness—characterized by intellectual curiosity, creativity, and a preference for novelty—tended to exhibit elevated anxiety levels, which in turn adversely affected their sleep quality (estimate = 0.327). This result is consistent with earlier findings suggesting that higher openness may predispose individuals to heightened emotional reactivity and anxiety, thereby impairing sleep (Zawadzki, Graham-Engeland, & Gerin, 2013). Moreover, research on personality and stress has demonstrated that openness is often associated with greater sensitivity to environmental stressors, which can exacerbate anxiety symptoms and lead to sleep disturbances.

Conscientiousness and Sleep Quality

The analysis further revealed a statistically significant indirect effect between Conscientiousness and sleep quality via anxiety ($P = 0.002$). The negative estimate (-0.359) indicates that individuals with higher levels of Conscientiousness tend to experience lower anxiety, which in turn contributes to improved sleep quality. This inverse relationship is supported by literature that links conscientiousness with better self-regulation and structured routines—factors known to mitigate anxiety and promote restorative sleep (Juskiene et al., 2018). Such findings underscore the protective role of conscientiousness against anxiety-related sleep disruptions.

Neuroticism and Sleep Quality

In the case of Neuroticism, the data demonstrated a statistically significant indirect effect with anxiety acting as a mediator ($P < 0.01$). Individuals with higher neuroticism scores—marked by emotional instability, anxiety, and moodiness—exhibited greater anxiety, which negatively impacted their sleep quality (estimate = 0.500). This observation aligns with previous research linking high neuroticism to increased susceptibility to anxiety and stress, factors that disrupt sleep (Merikanto et al., 2017). The complete mediation observed in this relationship suggests that the detrimental effects of neuroticism on sleep are fully conveyed through its impact on anxiety. Similarly, this relationship has been observed in other contexts like, King et al., 2024 indicated that neuroticism was associated with poorer sleep quality, prolonged sleep latency, increased sleep disturbances, daytime dysfunction, and shorter sleep duration. Overall, the findings suggest a significant correlation between sleep quality and fear of COVID-19, anxiety, and specific personality traits in this population.

Extraversion, Agreeableness, and Sleep Quality

Conversely, the traits of Extraversion and Agreeableness did not exhibit statistically significant indirect effects on sleep quality through anxiety ($P = 0.237$ and $P = 0.607$, respectively). This lack of significance suggests that these personality dimensions do not substantially influence sleep quality via anxiety. The non-significant findings could be attributed to the possibility that extraversion and agreeableness are less directly involved in the mechanisms that elevate anxiety, or that other unmeasured variables might moderate their effects.

Direct Effects of Personality on Sleep Quality

In contrast to Hypothesis (H2), which posited a direct effect of personality traits on sleep quality, the analysis revealed no significant direct relationship between the independent

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variable (personality) and the dependent variable (sleep quality). The P-values for all personality dimensions were not statistically significant (Openness: $P = 0.356$, Conscientiousness: $P = 0.40$, Extraversion: $P = 0.237$, Agreeableness: $P = 0.607$, Neuroticism: $P = 0.087$). This suggests that, in the absence of anxiety, personality traits do not directly influence sleep quality. Several unexplored factors, such as individual coping mechanisms, socioeconomic status, or environmental stressors, may account for the absence of a direct correlation. These findings highlight the complex nature of the relationship between personality and sleep, indicating that psychological mechanisms such as anxiety play a crucial mediating role. This absence of a direct correlation underscores the importance of psychological mediators – such as anxiety – in elucidating the relationship between personality and sleep. Supporting this notion, studies have consistently reported that anxiety and depressive symptoms are critical mediators in the link between personality and sleep disturbances (Baglioni, Spiegelhalder, Lombardo, & Riemann, 2010). The influence of personality on sleep quality is a consistently observed phenomenon like in a study by Keskin et al., 2024, poorer sleep strongly links to the severity of personality disorders, similar to other mental health conditions, from adolescence to young adulthood. Improving personality disorder symptoms associates with better sleep and explains sleep benefits from recovering from anxiety/depression. Recurring mental illness worsens sleep. However, worsening personality disorder alone does not significantly predict sleep changes when considering other factors.

Total Effect of Personality on Sleep Quality through Anxiety

Further, the overall model (H3) indicated a significant total effect of personality on sleep quality through anxiety for the traits of Openness and Neuroticism. Specifically, the total effect for Openness was statistically significant ($P = 0.023$) with a 100% mediation by anxiety, and a similar pattern was observed for Neuroticism ($P < 0.001$). These findings highlight the crucial role of anxiety in fully mediating the relationship between certain personality traits and sleep quality. These findings suggest that anxiety plays a crucial role in mediating the impact of specific personality traits, such as Openness and Neuroticism, on sleep quality. Openness, associated with novelty-seeking and creativity, can lead to heightened anxiety, which negatively affects sleep. Similarly, Neuroticism, characterized by emotional instability and stress susceptibility, influences sleep quality through its impact on anxiety. These results underscore the importance of considering anxiety as a psychological factor in understanding the relationship between personality traits and sleep quality.

In conclusion, the current study highlights the significant mediating role of anxiety in the relationship between certain personality traits (Openness, Conscientiousness, and Neuroticism) and sleep quality. These findings contribute to a more nuanced understanding of how psychological mechanisms influence sleep and emphasize the need for targeted interventions aimed at reducing anxiety to improve sleep quality, particularly among individuals with high Openness and Neuroticism.

Limitations and Future Recommendations

The present study, while contributing to the understanding of the relationships between personality traits, anxiety, and sleep quality, is subject to several limitations that must be taken into account. Firstly, the sample size may limit the generalizability of the findings. A larger and more diverse sample would enhance the applicability of the results to a broader population. Additionally, the recruitment process posed challenges, particularly in reaching a wider array of participants from different sexual and gender identities, which constrained

the scope of the data. Future studies should aim to include participants from a more diverse range of identities, allowing for more conclusive and comprehensive findings.

Moreover, the research relied on self-reported questionnaires for measuring both personality traits and sleep quality, which are prone to bias, such as social desirability and response inaccuracies. To mitigate these issues, future research could benefit from using objective measures, such as actigraphy or polysomnography, to assess sleep quality. Furthermore, this study focused solely on the Big Five personality traits, and while these traits are well-established in personality research, other dimensions of personality, such as locus of control or self-efficacy, may also play a significant role in anxiety and sleep quality. Future studies could incorporate these additional personality traits to provide a more holistic understanding. Lastly, this study did not consider the dynamic nature of personality, anxiety, and sleep quality over time. A longitudinal or mixed-methods approach, combining both quantitative and qualitative data, could yield a deeper insight into how these variables evolve and interact across different stages of life. Furthermore, investigating the cultural context in which personality traits are expressed could reveal how cultural norms and societal attitudes influence the relationship between personality, anxiety, and sleep quality. Future research could explore these dynamics across various age groups and cultural settings to enhance the generalizability of the findings and improve our understanding of the complex interactions involved.

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Conflict of Interest

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