

Assessment of Sleep Quality and its Relationship with Anxiety and Depression among Adults in Saudi Arabia

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Abstract

Background: Although there is still little data on Saudi adults, poor sleep quality has been repeatedly linked to anxiety and depression. The purpose of this study was to evaluate the quality of sleep and investigate how it relates to anxiety and depression in Saudi Arabian individuals.

Methods: A total of 385 Saudi Arabian participants participated in a cross-sectional study. A systematic questionnaire was used to gather sociodemographic data. The Insomnia Severity Index (ISI) was used to measure the quality of sleep, and the Hospital Anxiety and Depression Scale (HADS) was used to measure anxiety and depression.

Results: The majority of participants were Saudi nationals (96.1%), married (79.2%), between the ages of 31 and 40 (55.3%), male (59.5%), and had a bachelor's degree (64.9%). In total, 22.6% had clinically significant insomnia and 54.3% had subthreshold insomnia. The majority of subjects reported normal anxiety (68.6%) and depression (64.2%) scores. Participants who were between the ages of 31 and 40, married, had a bachelor's degree, worked for the government, and lived in the Central region had a considerably higher prevalence of clinically significant insomnia ($p < 0.05$). Clinically significant insomnia was substantially more common in participants with borderline or abnormal anxiety and depression ($p < 0.05$). ISI scores showed a positive correlation with anxiety ($r = 0.38$, $p < 0.001$) and depression ($r = 0.35$, $p < 0.001$).

Conclusion: About 25% of Saudi adults suffer from clinically significant insomnia, which is linked to anxiety and depression. In basic healthcare settings, routine screening for psychological distress and sleep disorders may enable early detection and intervention.

Keywords: sleep, quality, anxiety, depression, adults, Saudi

Introduction

An individual's mental wellbeing is affected by multiple factors, such as coping skills, substance use, genetics, and socioeconomic determinants [1]. Furthermore, according to the American College of Lifestyle Medicine, stress management, avoidance of risky substances, social connections, and restorative sleep are important components of a healthy lifestyle, in addition to good nutrition and physical activity [2].

About 17% of adults experience mental health challenges of varying severity [3]. Nationally representative data analysis suggests that such problems are becoming increasingly common [4].

Therefore, both sleep disturbances and mental health represent major global public health concerns with substantial individual and societal impact [3,4].

The intricate connection between sleep quality and anxiety has garnered significant attention in recent research, establishing a bidirectional relationship that affects various populations, including collegiate youth, adolescents, and older adults [5].

Previous studies have found that among patients with insomnia, the prevalence of anxiety disorder, including generalized anxiety disorder, panic disorder, post-traumatic stress disorder, and phobia, is 24–36% [6,7], while that of major depression is 14–31% [6,7]. Conversely, about 90% of patients with depression complain of sleep disturbance [8,9]. Similarly, sleep problems are much more common among individuals with anxiety disorders [10,11]. This was supported by a 2025 meta-analysis, which found that improving sleep significantly reduced depression and anxiety compared with standard care among adults [12].

It was once believed that mental health concerns caused sleep problems [13]; however, it is now recognized that insufficient sleep can also lead to the onset, recurrence [14], and persistence of mental health illnesses [15]. Current evidence indicates that sleep quality is correlated with mental wellbeing, and inadequate sleep is associated with increased risk of mental distress [16]. Additionally, mental disorders influence sleep quality, and individuals suffering from stress, anxiety, and depression are at higher risk of sleep disturbances and poor sleep quality [17–19].

Understanding the magnitude of this correlation and whether enhancing sleep can improve mental health outcomes has significant clinical and public health implications. Participants with insomnia are significantly more likely to experience clinically severe anxiety and depression (10 and 17 times, respectively) [20]. Furthermore, a meta-analysis of over twenty longitudinal cohort studies revealed that, compared to participants who do not have trouble sleeping, those who suffer from insomnia are twice as likely to develop depression [21].

In 2025, a Saudi study found that the majority of university students in this study experienced poor sleep quality, which was significantly associated with higher levels of depression, anxiety, and stress [22]. A recent Saudi systematic review also found that depression and anxiety were common among Saudi adolescents and young adults, and most included studies reported significant associations between poor sleep quality or insomnia and higher depression, anxiety, or stress symptoms [23].

The present study aimed to assess the sleep quality and its relationship with anxiety and depression among adults in Saudi Arabia.

Subjects and Methods

Study design, location and time: a cross-sectional study was conducted in Saudi Arabia in the time from May to July 2026.

Study participants: the inclusion criteria were adults (≥ 18 years) of both genders who reside in Saudi Arabia, and the exclusion criteria were participants younger than 18 years and those from outside Saudi Arabia.

Sample size: the Raosoft online calculator was used for sample size determination. Using a margin of error of 5% and a confidence interval of 95%, a minimum sample of 385 was calculated.

Data collection: a pre-designed questionnaire was prepared to collect data about participants' sociodemographic characteristics. The Insomnia Severity Index (ISI) was used to assess insomnia as a brief screening tool, with a seven-item questionnaire that asks respondents to rate the nature and symptoms of their sleep problems. Each questionnaire component is rated by respondents using Likert-type scales. Higher ratings on a scale of 0 to 4 indicate more severe insomnia symptoms. Scores are totaled and can be compared to other participants' scores as well as those from a different stage of therapy. A total score of 0–7 denotes “no clinically significant insomnia,” 8–14 denotes “subthreshold insomnia,” 15–21 denotes “clinical insomnia (moderate severity),” and 22–28 denotes “clinical insomnia (severe),” although the developers note that their selected cutoff scores have not been validated. Because it encompasses both moderate and severe clinical insomnia, where participants were categorized as non-clinically significant and clinically significant insomnia, a score of ≥ 15 is the typical threshold [24]. Anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS), which yields separate anxiety (HADS-A) and depression (HADS-D) subscale scores; each subscale was categorized as normal, borderline, or abnormal.

Ethical considerations: ethical approval for the study was obtained from the ethics research committee of Alslamah Primary Health Care Center, Ministry of Health (MOH), Taif City, Saudi Arabia.

Data analysis: data were statistically analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. To investigate the association between the variables, the Chi-squared test (χ^2) and Fisher's exact test were applied to qualitative data that was expressed as numbers and percentages. Correlation analysis was performed using Spearman's test, and a p-value of less than 0.05 was considered statistically significant.

Results

Table 1 shows that the majority of the study participants were aged 31–40 years (55.3%), male (59.5%), Saudi nationals (96.1%), and married (79.2%). Regarding educational attainment, the highest proportion of participants held a bachelor's degree (64.9%). In terms of employment status, the largest share was employed in the government sector (52.7%). Looking at the geographic distribution, the majority of the participants resided in the Western region (52.5%).

Table 1: Sociodemographic characteristics of the study participants (No.: 385)

Variable	No. (%)
Age (years)	
21–30	41 (10.6)
31–40	213 (55.3)
41–50	89 (23.1)
51–60	20 (5.2)
≥ 61	22 (5.7)
Gender	
Male	229 (59.5)
Female	156 (40.5)
Nationality	
Saudi	370 (96.1)
Non-Saudi	15 (3.9)
Marital status	

Variable	No. (%)
Single	70 (18.2)
Married	305 (79.2)
Divorced	10 (2.6)
Educational level	
Primary or below	6 (1.6)
Intermediate	22 (5.7)
Secondary	32 (8.3)
Bachelor's degree	250 (64.9)
Postgraduate (Master's/PhD)	75 (19.5)
Employment status	
Unemployed	31 (8.1)
Retired	33 (8.6)
Government sector	203 (52.7)
Private sector	118 (30.6)
Region of residence	
Central	141 (36.6)
Western	202 (52.5)
Eastern	10 (2.6)
Northern	10 (2.6)
Southern	22 (5.7)

Table 2 shows that the highest proportion of participants experienced subthreshold insomnia (54.3%), while 22.6% were classified as having clinically significant insomnia. Regarding psychological distress, the majority of the sample fell within the normal range for both depression (64.2%) and anxiety (68.6%).

Table 2: Prevalence and severity of insomnia, depression, and anxiety among the study participants (No.: 385)

Variable	No. (%)
Insomnia severity (ISI)	
No clinically significant insomnia	89 (23.1)
Subthreshold insomnia	209 (54.3)
Clinical insomnia (moderate)	81 (21.0)
Clinical insomnia (severe)	6 (1.6)
Clinically significant insomnia (ISI ≥15)	
No	298 (77.4)
Yes	87 (22.6)
Depression (HADS-D)	
Normal	247 (64.2)
Borderline	83 (21.6)
Abnormal	55 (14.3)
Anxiety (HADS-A)	
Normal	264 (68.6)
Borderline	57 (14.8)
Abnormal	64 (16.6)

Table 3 shows that the prevalence of clinically significant insomnia was significantly higher among participants aged 31–40 years, married individuals, those holding a bachelor's degree, government sector employees, and residents of the Central region ($p < 0.05$). Conversely, no significant differences in the prevalence of clinically significant insomnia were found based on gender or nationality ($p > 0.05$).

Table 3: Relationship between sociodemographic characteristics of the participants and clinically significant insomnia

Variable	Clinically significant insomnia (ISI ≥ 15)		χ^2	p-value
	No, No. (%)	Yes, No. (%)		
Age (years)				
21–30	36 (12.1)	5 (5.7)	18.81*	<0.001
31–40	141 (47.3)	72 (82.8)		
41–50	89 (29.9)	0 (0.0)		
51–60	10 (3.4)	10 (11.5)		
≥ 61	22 (7.4)	0 (0.0)		
Gender				
Male	172 (57.7)	57 (65.5)	1.70	0.192
Female	126 (42.3)	30 (34.5)		
Nationality				
Saudi	288 (96.6)	82 (94.3)	1.02	0.311
Non-Saudi	10 (3.4)	5 (5.7)		
Marital status				
Single	59 (19.8)	11 (12.6)	11.27	0.043
Married	234 (78.5)	71 (81.6)		
Divorced	5 (1.7)	5 (5.7)		
Educational level				
Primary or below	6 (2.0)	0 (0.0)	10.05*	<0.001
Intermediate	22 (7.4)	0 (0.0)		
Secondary	16 (5.4)	16 (18.4)		
Bachelor's degree	189 (63.4)	61 (70.1)		
Postgraduate (Master's/PhD)	65 (21.8)	10 (11.5)		
Employment status				
Unemployed	21 (7.0)	10 (11.5)	15.20	<0.001
Retired	33 (11.1)	0 (0.0)		
Government sector	141 (47.3)	62 (71.3)		
Private sector	103 (34.6)	15 (17.2)		
Region of residence				
Central	90 (30.2)	51 (58.6)	19.74*	<0.001
Western	166 (55.7)	36 (41.4)		
Eastern	10 (3.4)	0 (0.0)		
Northern	10 (3.4)	0 (0.0)		
Southern	22 (7.4)	0 (0.0)		

N.B.: * Fisher's exact test.

Table 4 shows that the prevalence of clinically significant insomnia was significantly higher among participants with borderline or abnormal levels of depression, as well as those with borderline or abnormal levels of anxiety ($p < 0.05$).

Table 4: Relationship between depression, anxiety, and clinically significant insomnia among the study participants

Variable	Clinically significant insomnia (ISI ≥ 15)		χ^2	p-value
	No, No. (%)	Yes, No. (%)		
Depression (HADS-D)				
Normal	209 (70.1)	38 (43.7)	12.578	<0.001
Borderline	57 (19.1)	26 (29.9)		
Abnormal	32 (10.7)	23 (26.4)		
Anxiety (HADS-A)				
Normal	225 (75.5)	39 (44.8)	17.693	<0.001
Borderline	41 (13.8)	16 (18.4)		
Abnormal	32 (10.7)	32 (36.8)		

Table 5 shows that a significant positive correlation was found between the ISI scores and depression ($r = 0.35$, $p < 0.001$) and anxiety scores ($r = 0.38$, $p < 0.001$).

Table 5: Spearman's correlation analysis between the ISI scores and depression and anxiety scores

Variable	ISI scores	
	r	p-value
Depression scores	0.35	<0.001
Anxiety scores	0.38	<0.001

Discussion

According to the current study, over half of the participants reported subthreshold insomnia, and 22.6% of Saudi adults had clinically significant insomnia. Additionally, the degree of insomnia had moderate positive associations with anxiety and depression, underscoring the intimate connection between psychological health and sleep quality. These findings complement emerging evidence that sleep disruptions and mental health problems share a bidirectional relationship, whereby poor sleep contributes to emotional illnesses while psychological strain further impairs sleep quality [5,8,13–19].

The current study's prevalence of clinically significant insomnia is in line with earlier Saudi research that found a high frequency of sleep disorders. Poor sleep quality was reported by Gosadi and Shnaimer to be very common among Saudi university students and to be strongly linked to greater levels of stress, anxiety, and depression [22]. Similarly, Altuhayni et al.'s recent Saudi systematic analysis found that among Saudi teenagers and young adults, poor sleep quality and insomnia were consistently linked to psychological distress, anxiety, and depression [23]. A recent thorough analysis came to similar conclusions, emphasizing that poor sleep quality is consistently linked to higher anxiety symptoms and lower psychological health in a variety of adult populations [25]. These results suggest that sleep disruptions are a common public health issue that affects both adults and younger populations.

Clinically significant insomnia was substantially more common in participants between the ages of 31 and 40. Participants in this age range frequently carry substantial work, financial, and family obligations, which can lead to greater psychological stress and poorer sleep. Similar findings have been documented in earlier research demonstrating that cumulative psychosocial stressors make insufficient sleep and mental distress more prevalent in middle adulthood [16,17].

Compared with participants who were single, married individuals had a considerably higher likelihood of reporting clinically significant insomnia. Sleep quality may be adversely affected by growing family duties, childcare demands, work obligations, and financial stress, even though marriage is typically seen as a protective social factor. Psychosocial stress is a significant factor in poor sleep quality and insomnia, according to earlier longitudinal research [17,18]. Additionally, compared with participants in other sectors, government employees showed a noticeably higher prevalence of insomnia. Impaired sleep quality and psychological distress have previously been linked to occupational stress, severe workloads, extended working hours, and work-related duties [2,16]. Similarly, the observed regional disparities may be due to differences in occupational settings, urbanization, socioeconomic circumstances, and lifestyle factors across the regions of Saudi Arabia.

The correlation between insomnia and psychological distress was the study's most compelling finding. Clinically significant insomnia was much more common in participants with borderline or abnormal anxiety and depression. Additionally, there were moderate positive relationships between ISI scores and anxiety and depression levels. These results are consistent with earlier epidemiological research showing a strong association between insomnia and anxiety and depressive disorders [6–11]. According to Taylor et al., compared with participants without insomnia, those with insomnia were almost ten times more likely to have clinically severe anxiety and seventeen times more likely to have depression [20].

Similarly, insomnia almost doubles the likelihood of developing depression, as shown by Baglioni et al.'s meta-analysis of longitudinal cohort studies [21]. This suggests that sleep disruption should be viewed as an independent risk factor rather than merely a symptom of psychiatric disorder. More recently, a meta-analysis by Li et al. revealed that treatments aimed at improving sleep quality considerably decreased adults' symptoms of anxiety and depression [12,26]. This further supports the idea that enhancing sleep should be a key element of mental health promotion and treatment plans.

The current study found a somewhat greater association between anxiety and insomnia than it did with depression. Because anxiety increases physiological hyperarousal, excessive cognitive activity, and delayed sleep latency, while depression more frequently disrupts sleep continuity and circadian rhythm control, this conclusion is biologically justifiable [8,9,18,19]. The neurobiological mechanisms explaining the close relationship between insomnia, anxiety, and depression have been further supported by recent neuroimaging findings that show common brain pathways connecting these conditions [27].

The current results highlight how crucial it is to incorporate regular sleep evaluation into Saudi Arabia's basic healthcare and mental health services. Validated screening tools such as the Insomnia Severity Index should be integrated into routine clinical practice in light of the increasing prevalence of insomnia and its strong correlation with anxiety and depression. This will enable early identification of individuals at risk and prompt implementation of behavioral and psychological interventions [12,22–27].

Limitations

There are a number of limitations to this study. Its cross-sectional design makes it impossible to determine the causes of depression, anxiety, and insomnia. Because self-administered online

questionnaires were used to collect the data, recall and reporting bias may have affected the results. Furthermore, validated screening instruments, rather than clinical diagnosis, were used to evaluate depression, anxiety, and insomnia. Convenience sampling may restrict how broadly the results can be applied, and other confounding variables such as physical activity, caffeine consumption, shift work, medication use, and socioeconomic status were not thoroughly evaluated. It is advised that future longitudinal research employ clinical evaluations and objective sleep metrics.

Conclusion

The present study indicated that insomnia is common among adults in Saudi Arabia, with nearly one-quarter of participants experiencing clinically significant insomnia and more than half reporting subthreshold insomnia. Clinically significant insomnia was more prevalent among adults aged 31–40 years, married individuals, government employees, participants with bachelor's degrees, and residents of the Central region. Insomnia was also significantly associated with anxiety and depression, with greater insomnia severity corresponding to higher psychological distress. These findings highlight the close relationship between sleep quality and mental health and emphasize insomnia as an important public health concern. Routine screening using validated tools such as the Insomnia Severity Index, alongside assessment of anxiety and depression, may facilitate early identification and timely intervention, while public health initiatives promoting healthy sleep habits may improve mental well-being among adults in Saudi Arabia.

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