

## **Knowledge and Awareness of Sleep Disorders among Healthcare Professionals in KSA: A Protocol for Systematic Review**

Suhail Abdulhameed Khan

Amal Abdullah Alharbi

Hoda Jehad Abousada

Faisal Ayidh Alanazi

Abdullah Mohammad Alsufi

Oqalaa Ali Alshammari

Sabah Turayhib Alharbi

Saad Aqeel Alshammari

Hayat Abdulrazaq ALenezi

Maha Homoud Alanazi

Nadiyah Abdulrahman Albreet

Nourah Shaleh Alharbi

Budur Ashwi Alanazi

Gamyalh Saad Alrasheede

Abdulmajed Abdulrahman Albader

## Abstract

**Background:** Sleep disorders pose significant health challenges, yet their recognition and management among healthcare professionals are often inadequate. This systematic review aimed to assess the level of knowledge and awareness regarding sleep disorders among healthcare professionals in Saudi Arabia.

**Methods:** Following PRISMA guidelines, a comprehensive search was conducted across PubMed, Embase, Cochrane Library, and CINAHL databases. Search terms included variations of "sleep disorders," "healthcare professionals," and "Saudi Arabia." Inclusion criteria comprised studies examining knowledge and awareness levels among healthcare professionals in Saudi Arabia. Six eligible studies, spanning medical students, primary care physicians (PCPs), and primary healthcare physicians, were selected for analysis.

**Results:** The review identified a substantial gap between interest and actual knowledge levels among medical students, indicating insufficient education on sleep medicine within medical schools. Similarly, PCPs and primary healthcare physicians exhibited poor awareness and knowledge of sleep disorders, despite recognizing their clinical importance. Variations in attitudes and knowledge levels were observed across different regions and institutions in Saudi Arabia.

**Conclusion:** The findings underscore the urgent need for enhanced education and awareness programs targeting medical students and healthcare professionals to improve the recognition, diagnosis, and management of sleep disorders in Saudi Arabia. Addressing these deficiencies is crucial for optimizing patient care and outcomes in the field of sleep medicine within the region.

**Keywords:** Sleep disorders - medical students - healthcare professionals - level of knowledge - awareness programs

## Introduction

Adolescents' physical and mental health are impacted by sleep because of the significant control it has on biological and psychological processes [1]. In addition to affecting maturation in terms of the body and mind, sleep also has an effect on learning and cognitive performance [2, 3]. Sleep disorders are underrecognized, according to many studies [3,4], despite their prevalence and clinical significance.

Although there is a dearth of research on the frequency of sleep disorders in the Kingdom of Saudi Arabia (KSA), the first certification exam for sleep medicine as a distinct specialty was authorized in 2009 [5] and the field was officially recognized as a specialty in 2012 [6]. But there seems to be a high prevalence of sleep problems among Saudis, according to statistics and waitlists for sleep examinations [7]. Three out of ten Saudi men and four out of ten Saudi women are at a high risk of obstructive sleep apnea (OSA) [8, 9], according to a study that used the Berlin questionnaire to evaluate the prevalence of OSA risk and symptoms among middle-aged Saudi men and women in their primary care setting. The discipline of sleep medicine is still in its early stages in the Kingdom of Saudi Arabia, according to a recent national study that objectively evaluated the service [7]. Sleep laboratories that offer diagnostic and therapeutic services limited to sleep-related breathing disorders like OSA, and seven sleep disorder centers that provide clinical diagnostics and therapeutic services for patients with various sleep disorders were identified in the survey [7], [10].

Both patients and medical professionals tend to overlook sleep problems and the field of sleep medicine. People in the KSA have formed their own beliefs and misconceptions about sleep because they readily accept information regarding sleep problems from any source, regardless of its validity. Some members of the general population dismiss sleep disorders as unimportant and untreatable because they assume they are natural [11]. Because they believe that only mental health therapists, especially psychiatrists, can treat sleep disorders, the majority of patients who enter the sleep disorders clinic have already visited many physicians. Patients in the KSA are less likely to comply with CPAP treatment than those in industrialized nations because the severity of conditions like OSA is not widely acknowledged [12].

Similarly, primary care physicians and other practicing doctors have a lack of understanding when it comes to sleep problems [13]. Only 33.6% of the primary care doctors evaluated by Salem et al. were familiar with sleep medicine [14]. Primary care doctors in Riyadh did not fully appreciate the significance and effects of obstructive sleep apnea (OSA) and other sleep disorders, according to a poll of PHC physicians conducted in all primary care centers in the city [13]. Among the participants, 43% were unaware that sleep medicine is a distinct field of medicine; 40% believed that sleep problems are

uncommon; and 38% were unsure of where to send their patients for treatment [13]. The majority of Saudi medical schools do not provide their students with any kind of sleep medicine curriculum.

Similarly, there seems to be a lack of postgraduate instruction on sleep problems throughout residency programs [12]. Due to a dearth of sleep medicine education and training, many doctors aren't well-versed in sleep disorders and may fail to properly identify or treat their patients who suffer from them [12]. While administering the Assessment of Sleep Knowledge in Medical Education (ASKME) assessment, researchers in Riyadh, KSA found that only 27.7% of medical students demonstrated knowledge of sleep medicine [15].

Patients in the KSA often initially interact with a primary care physician (PCP), who does an evaluation and determines the best course of treatment, as part of the country's referral-based healthcare system. Therefore, primary health care providers' awareness and expertise play a significant role in the early diagnosis and treatment of patients suffering from sleep problems. Primary health care doctors may not know much about sleep disorders, therefore their patients may not have their conditions properly identified. As a result, they run the risk of receiving the wrong diagnosis and treatment [16]. People with OSA often visit primary health care clinics, according to studies conducted in the Kingdom of Saudi Arabia and Western nations [8, 9, 17]. It is unrealistic to expect the small number of sleep medicine professionals in the KSA to handle the majority of patients' treatment for sleep problems. Consequently, it is crucial to have a team of general practitioners, experts in sleep medicine, PHC doctors, and specialists in internal medicine and pediatrics. The rates of OSA recognition among PHC doctors may be increased by educational initiatives [18].

## **Methods**

### **Review Question**

This systematic review aims to investigate the level of knowledge and awareness regarding sleep disorders among healthcare professionals in Saudi Arabia (KSA). The primary research question guiding this review is: What is the level of knowledge and awareness of sleep disorders among healthcare professionals in Saudi Arabia?

### **Search Strategy**

The search strategy adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Electronic searches were conducted in databases such as PubMed, Embase, Scopus, and Web of Science. Medical Subject Headings (MeSH) terms and relevant keywords pertaining

to "sleep disorders," "healthcare professionals," and "Saudi Arabia" were utilized. The search was restricted to studies published in English or Arabic.

### **Types of Studies to be Included**

This systematic review encompassed studies examining the level of knowledge and awareness of sleep disorders among healthcare professionals in Saudi Arabia. All study designs, including cross-sectional, cohort, and qualitative studies, were considered. Only studies providing primary data on knowledge and awareness levels were included, while reviews, editorials, and commentaries are excluded.

### **Participants**

The systematic review involved studies focusing on healthcare professionals in Saudi Arabia, including those working in hospitals, clinics, and other healthcare settings. There are no restrictions based on age, gender, or specific healthcare profession.

### **Search Keywords**

Searches employed a combination of keywords and phrases pertinent to the review question, including "sleep disorders," "healthcare professionals," "Saudi Arabia," and related terms. The search strategy was tailored to each database and encompassed both controlled vocabulary (MeSH terms) and free-text terms.

### **Study Selection Process**

Two independent reviewers screened titles, abstracts, and full texts of retrieved articles for eligibility. Any discrepancies were resolved through discussion or consultation with a third reviewer. Eligible studies were chosen based on predefined inclusion and exclusion criteria, prioritizing studies examining the level of knowledge and awareness of sleep disorders among healthcare professionals in Saudi Arabia.

### **Outcomes**

The primary outcome of interest is the level of knowledge and awareness of sleep disorders among healthcare professionals in Saudi Arabia. Secondary outcomes may include factors influencing knowledge and awareness levels, such as demographic characteristics and professional experience.

### **Data Extraction and Coding**

Data extraction was conducted using a standardized form to capture relevant study characteristics, participant demographics, and data on knowledge and awareness levels. Two reviewers independently

extracted data from included studies, with any disparities resolved through discussion or consultation with a third reviewer.

## Data Management

Descriptive statistics were utilized to summarize the extracted data, including levels of knowledge and awareness of sleep disorders among healthcare professionals in Saudi Arabia. Additionally, a narrative synthesis is provided to summarize findings across the included studies.

## Results

The initial search identified a total of 40 studies from PubMed, Embase, Cochrane Library, and CINAHL. There were no duplicates and all the 40 studies were screened based on their titles and abstracts. Of these, 17 full-text articles were reviewed, and only six studies were eligible for inclusion in this systematic review (Figure 1).

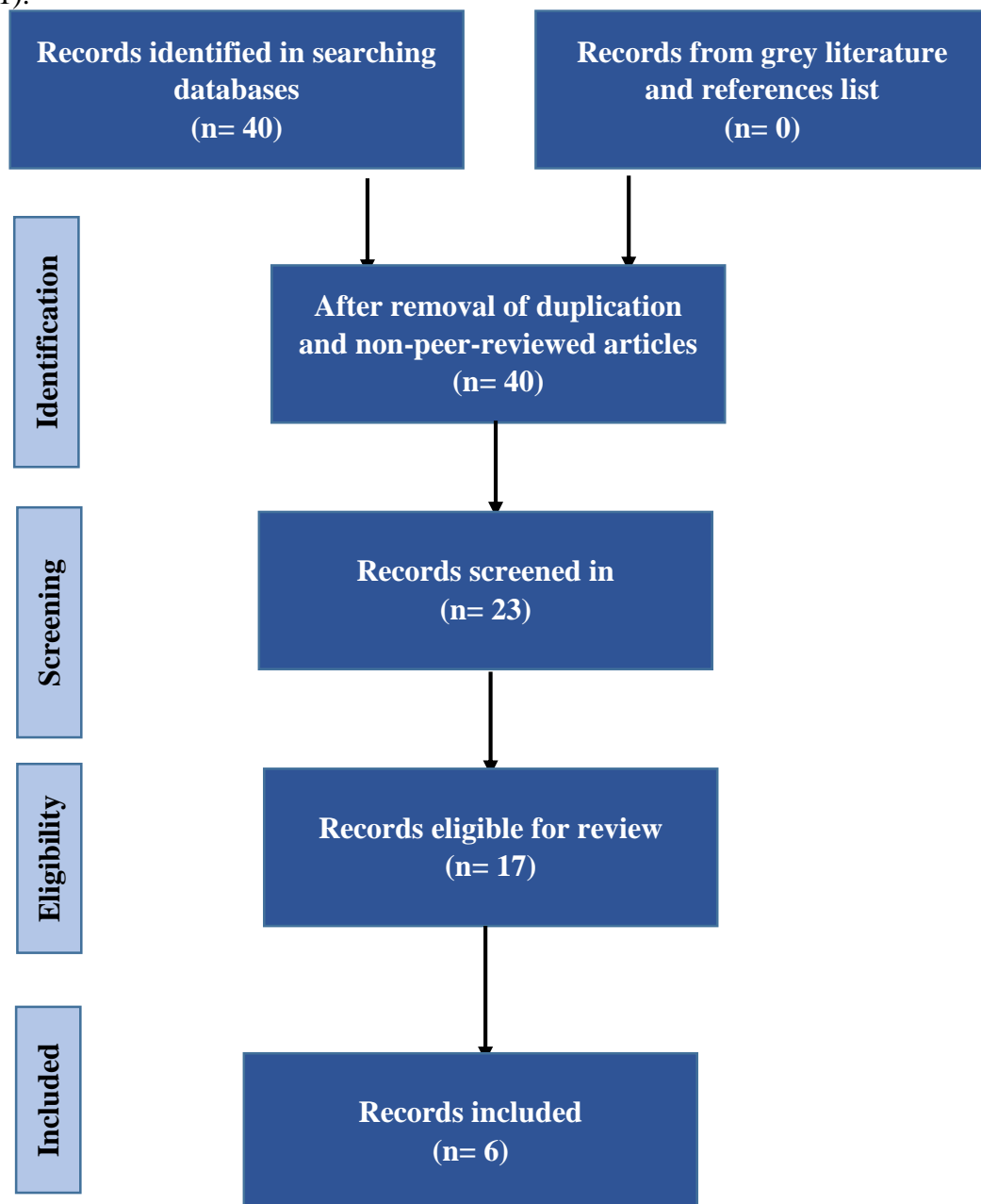


Figure 1: Flow chart of selection process

The table summarizes six studies conducted in Saudi Arabia, aiming to assess knowledge, attitudes, and education regarding sleep disorders among medical students, primary care physicians (PCPs), and primary healthcare physicians [19-24].

Among Saudi medical students surveyed in multiple studies, a significant portion expressed interest in sleep medicine, yet the overall knowledge level was found to be inadequate, with a majority rating their understanding as below average [19]. Education on sleep medicine in medical schools was limited, with few dedicated teaching hours and identified obstacles such as low priority in the curriculum and time constraints [19]. Similar findings were observed among PCPs, where a substantial proportion lacked awareness of sleep medicine as a distinct specialty and exhibited poor knowledge levels. Despite recognizing sleep disorders as important clinical problems, many PCPs reported low referral rates to specialized centers for further management [20].

Furthermore, the studies highlighted variations in attitudes and knowledge levels among healthcare professionals across different regions and institutions within Saudi Arabia [21]. While some physicians demonstrated positive attitudes towards sleep medicine and obstructive sleep apnea (OSA), others showed deficiencies in recognizing the significance of these disorders and lacked confidence in screening practices [22]. These findings underscore the need for enhanced education and awareness programs targeting medical students and healthcare providers to improve the recognition, diagnosis, and management of sleep disorders in Saudi Arabia [23-24].

**Table 1: Summary of included studies in this review**

Study	Year	Objective	Region	Participants	Key Findings
Almohaya et al. [19]	2013	Assess knowledge of sleep disorders among Saudi medical students and prevalence of sleep medicine education in medical schools	Medical schools	348 fourth- and fifth-year medical students	27.7% interested in sleep medicine; >80% rated knowledge as below average; only 4.6% scored $\geq 60\%$ on sleep knowledge survey; mean teaching hours on sleep medicine: $2.6 \pm 2.6$ hours; obstacles: low priority in curriculum (53%), time constraints (47%)
Saleem et al.	2017	Evaluate PCPs'	Riyadh	223 PCPs	19.9% didn't know sleep

[20]		knowledge and attitudes towards sleep disorders in Riyadh, Saudi Arabia			medicine is a specialty; 10.9% thought sleep disorders are uncommon; mean ASKME score: $14.4 \pm 4$ (out of 30); 39% referred patients to specialized centers
BaHammam [21]	2000	Assess PHC physicians' knowledge and attitude towards sleep disorders in Riyadh, Saudi Arabia	Riyadh	209 PHC physicians	57% agreed sleep disorders are a specialty; 40% felt sleep disorders are common; poor recognition of consequences of sleep disorders; only 15% attended lectures on sleep disorders; those who attended referred more patients ( $P=0.003$ )
Alrebdi et al. [22]	2019	Evaluate knowledge and attitude towards sleep medicine among medical students at Qassim University, Saudi Arabia	Qassim University	Medical students at Qassim University	23.3% had interest in sleep medicine; 94.8% had poor knowledge; 59.5% had positive attitude; attitude correlated with interest and knowledge
Al-Rasheedi et al. [23]	2022	Assess knowledge and attitude towards OSA among PCPs in northern Saudi Arabia	Northern region	264 PCPs	43.9% had low knowledge; 45.1% had low attitude scores; 78% recognized overnight sleep study as gold standard; referral: ENT (39.4%), sleep clinics (21%), pulmonologists



					(18.2%); positive correlation between knowledge and attitude
Alghamdi et al. [24]	2024	Evaluate knowledge, awareness, and attitude of primary healthcare physicians regarding OSA in Al-Baha region, Saudi Arabia	Al-Baha region	174 primary healthcare physicians	Majority male (58%); mean age: 32.73 years; 92.5% considered OSA as clinical disease; 63.8% disagreed on screening all patients; 62.6% had low knowledge; gender, nationality, specialty training associated with knowledge and awareness

## Discussion

Primary care doctors and other medical professionals must be involved in the treatment of sleep disorders because of the condition's significant clinical relevance [25]. Finding out how healthcare professionals in Saudi Arabia feel about sleep disorders and how much they know about it was the driving force for this review. The results provide light on the participants' perspectives, OSA awareness, and knowledge levels, as well as the correlation between these factors and a range of demographic characteristics [24].

Many healthcare professionals stressed the need of doctors being familiar with sleep disorders as a medical disorder. Previous research has shown that obstructive sleep apnea (OSA) significantly affects people's health and quality of life [26]. However, when asked about screening all patients for possible OSA, the vast majority of people were either against it or strongly opposed. Since early discovery is crucial for the management of OSA, the aforementioned study raises concerns about insufficient diagnosis and treatment of the condition [27]. In light of this, it is possible that further educational efforts and campaigns are needed to emphasize the need of screening for OSA in primary care settings.

All doctors, including primary care physicians, need to have a healthy dose of self-assurance, according to a plethora of current literature [28-29]. The participants' opinions were rather evenly distributed about their level of trust in using OSA screening approaches [24]. The lack of standardized and well accepted screening tools for OSA in primary care settings may explain this outcome [30].

Chang et al. [31] also found that primary care doctors in three different areas of Africa had poor confidence

when it came to treating patients with OSA, which is consistent with the results of the current research. Because of this, primary care settings must place a premium on the creation and validation of trustworthy, easily-used screening tools [24].

In terms of knowledge and consciousness, this review revealed a range of correct answer rates for several aspects of sleep disorders. While the participants' level of awareness was typically high, there were a few items where it was somewhat lower. Some examples of the participants' lack of understanding include the following: the frequency of obstructive sleep apnea (OSA) in Saudi Arabia; the gender gap in OSA prevalence; and the link between OSA, bruxism, and orofacial discomfort [19-24]. Previous studies have shown that healthcare providers do not have enough knowledge about the many aspects of OSA, which is consistent with the aforementioned information gaps [32].

The results of our study align with those of Embarak et al. [25] and Corso et al. [33] in that they also found that the knowledge questionnaire questions varied substantially, with a range of 35.6% to 87.9%. Understanding OSA is not enough, according to this conclusion, and students need to be taught in a way that is suitable for their curriculum. This review shows that primary care doctors were more accurate when answering the question about snoring. Findings from a research done in Egypt in 2020 corroborate this finding [25]. One hundred fifty people (86.2% of the total) agreed that most people with obstructive sleep apnea snore [24].

Only a small percentage of healthcare professionals showed very high levels of knowledge and awareness; the majority showed only moderate to low levels. Studies done recently in Ecuador and Saudi Arabia came to similar conclusions, showing that respondents there averaged a score of around 10 out of 18 [30, 34]. Several counter-studies, however, found that participants had considerably greater average knowledge scores [33, 35].

Based on these results, it is clear that primary care providers need further training to better understand OSA. Educational programs and treatments have the potential to increase healthcare providers' awareness and comprehension of OSA, according to previous studies [36]. Accordingly, providing continuing professional development opportunities for working doctors and incorporating OSA education into medical school curriculum may help fill the information gap [24].

The relationship between OSA awareness and knowledge and demographic variables may be better understood with the help of our research. Knowledge and awareness were significantly correlated with gender, country, present job title, specialty training, and length of experience [20-24]. Specialists and consultants, those with less than ten years of experience, females, non-Saudi participants, and those

specializing in internal medicine, pediatrics, and otolaryngology had the highest levels of knowledge and awareness [24].

This review findings are in line with other studies that have shown differences in OSA awareness and knowledge based on demographic characteristics [30, 37]. This review stresses the significance of tailoring training interventions to the unique needs of different groups of healthcare professionals by considering these factors.

## **Conclusion**

The systematic review of six studies conducted in Saudi Arabia highlights concerning deficiencies in knowledge, attitudes, and education regarding sleep disorders among medical students and healthcare professionals. Despite expressing interest in sleep medicine, medical students exhibited inadequate knowledge levels, indicative of shortcomings in sleep medicine education within medical schools. Similarly, primary care physicians (PCPs) and primary healthcare physicians demonstrated limited awareness of sleep disorders, with many failing to recognize their significance and exhibiting low referral rates to specialized centers for further management. These findings underscore the urgent need for comprehensive educational initiatives targeting medical students and healthcare providers across different regions and institutions in Saudi Arabia. By addressing these gaps and enhancing awareness, education, and training in sleep medicine, healthcare professionals can significantly improve the recognition, diagnosis, and management of sleep disorders, ultimately leading to better patient outcomes and quality of care in this critical area of healthcare.

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