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Original Article

Prevalence of insomnia and daytime sleepiness among healthcare professionals: A Cross-sectional Study

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ABSTRACT

Objectives: To analyse the prevalence of insomnia and daytime sleepiness among healthcare professionals working at a tertiary-level hospital in Barcelona.
Methods: An observational, descriptive, cross-sectional study was conducted using an anonymous survey administered to healthcare professionals at Hospital Clínic of Barcelona between January and April 2025. The Insomnia Severity Index (ISI; range 0–28) and the Epworth Sleepiness Scale (ESS; range 0–24) were applied, together with sociodemographic variables (age, sex, work shift, and professional category). Frequencies were calculated and comparisons between groups were performed.
Results: A total of 154 complete questionnaires were analysed. The sample was predominantly female (81.8%), with the most frequent age group being 41–50 years (33.8%). The overall prevalence of insomnia was 83.8% (45.5% mild, 33.8% moderate, and 4.5% severe). Insomnia prevalence was higher among men than women (89.3% vs 82.5%), although this difference was not statistically significant (p=0.381). Insomnia was more frequent in participants aged <50 years compared with those aged ≥50 years (88.6% vs 77.3%;p=0.058), with no significant differences according to work shift. Pathological daytime sleepiness was observed in 41.6% of participants and was slightly more frequent in women (42.9% vs 35.7%;p=0.488). Daytime sleepiness was more prevalent among participants aged ≥50 years (45.5% vs 38.6%), with significantly higher mean ESS scores (10.23 ± 4.24 vs 8.76 ± 4.94;p=0.025).
Conclusions: This study reveals a high prevalence of insomnia and daytime sleepiness among healthcare professionals, reinforcing the need to implement specific strategies for the detection, prevention, and promotion of sleep health within the hospital setting.

Keywords: Health Personnel; Occupational Health; Sleep Hygiene; Sleep Initiation and Maintenance Disorders; Surveillance of the Workers Health

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Introduction

Sleep is an essential biological process for physical, mental, and social health (1–4). Adequate sleep quality acts as a protective factor against multiple chronic diseases and contributes to optimal occupational and cognitive performance (5–7). However, sleep quality is a complex construct comprising both quantitative dimensions (duration, latency, awakenings, and efficiency) and qualitative dimensions (subjective perception of restfulness and satisfaction) (8–9).

According to the International Classification of Diseases, 11th Revision (ICD-11) of the World Health Organization, insomnia is defined as a persistent difficulty in initiating or maintaining sleep, or early morning awakening, occurring at least three times per week and accompanied by significant distress or functional impairment in personal, social, educational, or occupational domains (10–12). Excessive daytime sleepiness, in turn, is described as an abnormal tendency to fall asleep in inappropriate situations or an overwhelming need to sleep during the daytime. It represents a core symptom of several sleep disorders and has direct implications for personal and occupational safety (13).

In the healthcare setting, exposure to prolonged and irregular work schedules hinders circadian adaptation and leads to sleep deprivation, chronic fatigue, and reduced sleep quality. These disturbances increase the risk of insomnia and daytime sleepiness, negatively affecting patient safety and the quality of care delivery (8,14). Furthermore, they have been associated with physical consequences (metabolic, cardiovascular, and digestive disorders), psychological outcomes (anxiety, depression, and burnout), and social repercussions (social isolation and difficulties in work–life balance) (14–17). International organizations such as the World Health Organization (WHO), the International Labour Organization (ILO), and the National Institute for Safety and Health at Work (INSST) have recognized night and shift work as emerging occupational hazards linked to an increased risk of chronic diseases (6,37).

International studies estimate that between 20% and 30% of healthcare professionals exposed to prolonged, irregular, or night work schedules meet the criteria for shift work sleep disorder (SWSD) (7,35), with prevalence rates exceeding 50% in Spanish studies (24–25,34). This substantial impact positions sleep problems as a major challenge for occupational health and healthcare safety, with increasing costs related to clinical errors, absenteeism, and sickness leave (18–21).

In this context, it is essential to generate local evidence to quantify the magnitude of this problem in tertiary-level hospitals, using validated instruments such as the Insomnia Severity Index

(ISI) (22) and the Epworth Sleepiness Scale (ESS) (23). Therefore, the aim of this study was to analyse the prevalence of insomnia and daytime sleepiness among healthcare professionals working in a tertiary-level hospital in Barcelona.

Methods

Study design

An observational, descriptive, cross-sectional study was conducted based on an anonymous survey addressed to healthcare professionals at Hospital Clínic of Barcelona. The aim was to analyse the prevalence of insomnia and daytime sleepiness in this population during the first quarter of 2025.

Setting and study period

The study was carried out at Hospital Clínic of Barcelona, a tertiary-level hospital with an approximate workforce of 8,000 employees. Data collection took place between January and April 2025.

Study population. Sample.

The reference population included all active healthcare professionals with a valid employment contract at the hospital during the study period, regardless of professional category or type of work shift. No additional exclusion criteria were applied, except for incomplete or duplicate survey responses. Participation was voluntary and anonymous.

The first 154 complete questionnaires received during the study period were analysed.

Procedure and data collection

Information about the study and the importance of sleep health was disseminated through the hospital's corporate intranet, inviting all staff members to participate. Interested professionals accessed a self-administered online questionnaire that included all study variables. Data were collected automatically and exported to a protected spreadsheet for subsequent statistical analysis.

Variables

Sociodemographic variables included age, sex, work shift (morning, afternoon, night, rotating, or weekend shifts), and professional category.

Instruments

Sleep was assessed using two standardized and validated instruments:

- Insomnia Severity Index (ISI): a seven-item self-report scale with scores ranging from 0 to 28, assessing the severity of insomnia. Scores were classified as no insomnia (0–7), mild or subclinical insomnia (8–14), moderate insomnia (15–21), and severe insomnia (22–28). Clinically relevant insomnia was defined as an ISI score ≥8.
- Epworth Sleepiness Scale (ESS): an eight-item questionnaire with scores ranging from 0 to 24, used to assess daytime sleepiness in everyday situations. Pathological daytime sleepiness was defined as an ESS score >10.

Ethical considerations

This study was conducted using an anonymous online survey designed to avoid the collection of identifiable personal data and did not involve any intervention on participants. Therefore, in accordance with current Spanish legislation (Law 14/2007 on Biomedical Research and Royal Decree 1090/2015) (31–32), approval from a Research Ethics Committee was not required.

The study adhered to the fundamental ethical principles outlined in the Declaration of Helsinki (World Medical Association, 1964 and subsequent revisions), ensuring voluntary, informed, and safe participation. Prior to initiating the survey, participants were provided with clear and accessible information explaining the purpose of the study, the anonymous nature of data collection, the absence of direct risks or benefits, and compliance with data protection regulations (General Data Protection Regulation [GDPR] and Organic Law 3/2018).

Informed consent was obtained explicitly through digital acceptance, and participants were free to withdraw from the questionnaire at any time without consequences.

Statistical analysis

A descriptive analysis of all variables was performed. Categorical variables were expressed as absolute and relative frequencies (percentages), and continuous variables as means and standard deviations. Group comparisons were conducted using the chi-square (χ^2) test for categorical variables and Student's *t* test for continuous variables (ISI and ESS scores). Statistical significance was set at $p < 0.05$.

Results

Sample sociodemographic characteristics

A total of 154 complete questionnaires were analysed. The sample consisted predominantly of women (81.8%), with a smaller proportion of men (18.2%). The most frequent age group was 41–50 years (33.8%). Regarding work shifts, participants were distributed across day shifts (62.3%), rotating shifts (10.4%), night shifts (6.5%), and mixed shifts (22.1%), with no relevant differences in participation rates among groups (Table 1).

Table 1. Sociodemographic characteristics of the study sample (N = 154)

Variable	N (%)
Sex	
Female	126 (81.8)
Male	28 (18.2)
Age (Years)	
< 30	18 (11.7)
31 – 40	36 (23.4)
41 – 50	52 (33.8)
51 – 60	34 (22.1)
> 60	14 (9.1)
Work shift	
Day shift	96 (62.3)
Rotating shift	16 (10.4)
Night shift	10 (6.5)
Mixed shift	32 (22.1)

Insomnia Severity Index (ISI)

The overall prevalence of insomnia was 83.8%, distributed as 45.5% mild, 33.8% moderate, and 4.5% severe insomnia, while the remaining 16.2% of participants did not report insomnia symptoms.

The overall mean ISI score was 12.87 ± 4.73 with values ranging from 1 to 26 points (Table 2).

Table 2. Prevalence and severity of insomnia according to the Insomnia Severity Index (ISI) (N = 154).

Category	N (%)
No insomnia (0-7)	25 (16.2)
Subclinical insomnia (8-14)	70 (45.5)
Moderate clinical insomnia (15-21)	52 (33.8)
Severe clinical insomnia (22-28)	7 (4.5)
Total insomnia (≥ 8)	**129 (83.8)**

In the sex-based analysis, men showed a higher prevalence of insomnia than women (89.3% vs. 82.5%), although this difference was not statistically significant ($\chi^2 = 0.767$; $p = 0.381$). Mean ISI scores were 13.71 ± 4.63 in men and 12.68 ± 4.76 in women ($p = 0.299$).

According to age, insomnia was more frequent in participants younger than 50 years (88.6%) compared with those aged 50 years or older (77.3%), without reaching statistical significance ($\chi^2 = 3.58$; $p = 0.058$). Mean ISI scores were 13.39 ± 4.36 in the <50 years group and 12.18 ± 5.15 in the ≥50 years group ($p = 0.064$). No significant differences were observed according to work shift ($\chi^2 = 0.76$; $p = 0.860$) (Table 3).

Table 3. Prevalence of insomnia and Insomnia Severity Index (ISI) scores according to sex, age, and work shift

VARIABLE	CATEGORY	INSOMNIA (%)	ISI SCORE (MEAN ± SD)	P VALUE
SEX	Women	82.5	12.68 ± 4.76	0.381
	Men	89.3	13.71 ± 4.63	
AGE (YEARS)	<50	88.6	13.39 ± 4.36	0.058
	≥ 50	77.3	12.18 ± 5.15	
WORK SHIFT	Day shift	83.3	-	0.860
	Rotating shift	87.5	-	
	Night shift	80.0	-	
	Mixed shift	81.3	-	

ISI: Insomnia Severity Index; SD: standard deviation; (–) indicates that mean comparison was not performed.

Epworth Sleepiness Scale (ESS)

Pathological daytime sleepiness was observed in 41.6% of participants. The overall mean ESS score was 9.39 ± 4.70, with values ranging from 0 to 22 (Table 4).

Table 4. Prevalence and severity of daytime sleepiness according to the Epworth Sleepiness Scale (ESS) (N = 154).

Category	N (%)
No sleepiness (0-9)	90 (58.4)
Mild sleepiness (10-12)	26 (16.9)
Moderate sleepiness (13-15)	23 (14.9)
Severe sleepiness (> 16)	15 (9.7)
Total sleepiness ≥ 10	**64 (41.6)**

By sex, daytime sleepiness affected 42.9% of women and 35.7% of men, with no statistically significant differences ($\chi^2 = 0.48$; $p = 0.488$). Mean ESS scores were 9.48 ± 4.65 in women and 8.96 ± 4.97 in men ($p = 0.299$). Regarding age, daytime sleepiness was more frequent among professionals aged ≥50 years (45.5%) than among those younger than 50 years (38.6%), although this difference was not statistically significant ($\chi^2 = 0.72$; $p = 0.396$). However, mean ESS scores were significantly higher in the older age group (10.23 ± 4.24 vs 8.76 ± 4.94; $p = 0.025$). No significant differences were observed according to work shift ($\chi^2 = 6.09$; $p = 0.107$) (Table 5).

Combined analysis

No statistically significant associations were found between sex and the presence of insomnia or daytime sleepiness. Age showed opposite trends for both conditions, with a higher prevalence of insomnia among participants younger than 50 years and a higher prevalence of daytime sleepiness among those aged 50 years or older. Statistical significance was observed only for mean ESS scores ($p = 0.025$). Work shift did not significantly influence the results of either questionnaire.

Table 5. Prevalence of daytime sleepiness and Epworth Sleepiness Scale (ESS) scores according to sex, age, and work shift

Variable	Category	Sleepiness (%)	ESS score (mean ± SD)	p-value
Sex	Women	42.9	9.48 ± 4.65	0.488
	Men	35.7	8.96 ± 4.97	
Age (Years)	<50	38.6	8.76 ± 4.94	0.396
	≥ 50	45.5	10.23 ± 4.24	
Work shift	Day shift	41.7	-	0.107
	Rotating shift	37.5	-	
	Night shift	60.0	-	
	Mixed shift	37.5	-	

ESS: Epworth Sleepiness Scale; SD: standard deviation; (–) indicates that mean comparison was not performed.

Discussion

The present study demonstrated a high prevalence of insomnia (83.8%) and pathological daytime sleepiness (41.6%) among healthcare professionals working at a tertiary-level hospital. These figures are higher than those reported in both national and international literature, where insomnia prevalence ranges between 20% and 55%, and daytime sleepiness affects approximately one third of healthcare workers (7,14,24–25,34). This finding confirms that sleep disturbances represent a major occupational health problem, with a potential impact on patient safety and professionals' quality of life (26–28,31).

Our results partially coincide with those reported in previous studies (25), which described sleep disturbances in 60% of healthcare workers in hospitals in Madrid, although the prevalence observed in the present study was notably higher. Similarly, other studies have reported comparable findings among nurses working within the Spanish National Health System, highlighting the widespread nature of this problem in the healthcare setting in Spain (25,37–38).

Regarding age, a higher prevalence of insomnia was observed among professionals younger than 50 years, whereas daytime sleepiness was more frequent in older professionals. This pattern may be explained by an interaction between biological and occupational factors, as previously described in the literature. Younger professionals are often more exposed to rotating and night

shifts, have less experience managing rest and recovery, and face higher workload demands. In contrast, older professionals may accumulate circadian rhythm alterations and comorbidities that impair sleep recovery (13–14,16,18). These findings are consistent with previous studies identifying age and chronotype as key determinants of sleep quality among nursing staff (39–40).

Although no statistically significant differences were found by sex, several authors have reported greater vulnerability to sleep disturbances among women, attributed to hormonal factors and the double burden of professional and family responsibilities (15,17). The lack of statistical significance in this study may be explained by the marked predominance of women in the sample (81.8%), which limits the statistical power to detect differences between sexes.

No significant differences were observed according to work shift, in contrast with existing evidence linking night and rotating shifts to poorer sleep quality (5,14,21,34). This discrepancy may be related to the small size of certain subgroups and the heterogeneity of rest patterns. Nevertheless, international organizations such as the International Labour Organization and the International Agency for Research on Cancer recognize night work as an emerging occupational risk, potentially associated with metabolic disturbances and an increased risk of chronic disease (5–6).

Chronic sleep deprivation has been associated with an increased risk of clinical errors, absenteeism, occupational accidents, and impaired professional performance (26–28,31). Recent studies have confirmed that sleep disorders among nurses increase the risk of medication errors and reduce perceived quality of care (7,27-28). In this context, insufficient sleep not only affects workers' well-being but also constitutes a relevant risk factor for patient safety.

From the perspective of occupational health nursing, these results reinforce the need to incorporate systematic screening for sleep disturbances into health surveillance programmes, using validated instruments such as the ISI and the ESS (22-23). In addition, preventive interventions focusing on sleep hygiene education, rational shift scheduling, and the promotion of restorative sleep are recommended, as these strategies have been shown to improve sleep quality and healthcare safety (5,17,21,31).

Overall, the findings of this study reveal a high prevalence of insomnia and daytime sleepiness among healthcare professionals working at a tertiary-level hospital, underscoring the magnitude of this problem in this population and its relevance in terms of occupational health. These results highlight the need to implement specific strategies for the detection, prevention, and promotion of sleep health in the workplace, integrated into occupational health surveillance programmes and led by occupational health services and occupational health nursing. However, participation was limited in relation to the target population of the hospital (~8,000 workers),

suggesting that alternative recruitment strategies should be considered in future studies. Moreover, it cannot be ruled out that individual perception of sleep disturbances influenced the decision to participate, potentially introducing response bias.

Limitations of the study

This study has several limitations. Its cross-sectional design precludes the establishment of causal relationships between the variables analysed. The participation rate was low relative to the total workforce (~8,000 workers), which may have resulted in self-selection bias, as individuals more concerned about sleep problems may have been more likely to participate. In addition, no clinical variables such as depression, anxiety, or obstructive sleep apnea were collected, which could act as potential confounding factors. Finally, the use of self-reported questionnaires may introduce perception or recall bias.

Strengths

The main strengths of this study include the use of validated instruments (ISI and ESS), the inclusion of different professional groups, and the analysis by sociodemographic subgroups. Furthermore, this study represents one of the first systematic approaches to sleep health among healthcare professionals in a tertiary-level hospital in Spain, providing local evidence with direct applicability to occupational health practice and to the design of nurse-led preventive interventions.

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Conflict of interest

The authors declare no conflicts of interest.

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