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Original Research Article

Determinants and prevalence of insomnia among security personnel of a tertiary care hospital in Bengaluru city: a cross-sectional study

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ABSTRACT

Background: Insomnia is an important public health concern and may be particularly relevant among security personnel because of irregular work schedules, occupational demands, sustained vigilance, and inadequate rest. This study was conducted to determine the prevalence of insomnia and its association with selected sociodemographic and health-related factors among security personnel in a tertiary care government hospital in south India.
Methods: A cross-sectional study was conducted among 100 security personnel. Sociodemographic characteristics, including age, gender, income, education, and marital status, and health-related characteristics, including body mass index, diabetes, and hypertension, were assessed using a structured questionnaire. Insomnia was assessed using the Insomnia Severity Index (ISI). Associations between insomnia and selected variables were examined using the chi-square test.
Results: Sub-threshold insomnia was present in 32% of participants, while no cases of moderate or severe insomnia were identified. Significant associations were observed between insomnia and gender (p=0.019) and income level (p=0.020). No significant associations were observed with age, education, marital status, or metabolic health status. Self-reported Diabetes and Hypertension were present in 10% and 4% of participants, respectively, while 74% were classified as obese.
Conclusions: Although moderate or severe insomnia was not observed, nearly one-third of security personnel had sub-threshold insomnia. Workplace-based sleep hygiene interventions may be beneficial, particularly among women and lower-income employees. Further studies incorporating objective sleep assessments and detailed evaluation of shift schedules are warranted.

Keywords: Insomnia, Insomnia severity index, Occupational health, Security personnel, Sleep quality

INTRODUCTION

Insomnia is a significant public health concern, characterised by difficulty in initiating or maintaining sleep, leading to daytime fatigue and impaired functioning.[1] While it affects various population groups, security personnel are especially vulnerable due to the nature of their work, which often includes irregular shifts, high alertness demands, and limited recovery time. In hospital settings, where security 'personnel are integral to round-the-clock operations, sleep disturbances can have critical implications on both individual well-being and institutional safety. This study aims to assess the prevalence and determinants of insomnia among security personnel in a tertiary care hospital in Bengaluru,

providing a much-needed perspective on occupational sleep health in a high-stress, shift-based workforce.

Shift work, especially involving night duties, disrupts circadian rhythms and increases vulnerability to sleep disorders. Healthcare settings are known for demanding work schedules, and evidence from a tertiary care hospital in Bengaluru has shown significant associations between shift work and sleep disturbances among healthcare workers.[1] Similar findings from international cohort studies indicate that both rotating and permanent night shifts are linked with fatigue and reductions in total sleep duration.[2] For security personnel, who often face unpredictable work patterns and limited rest between shifts, these disruptions are even more pronounced. A cross-sectional study at AIIMS Raipur revealed a high prevalence of shift work sleep disorder among security staff, underscoring the direct impact of erratic work hours on sleep quality.[3]

Apart from work schedules, mental health plays a central role in the development and persistence of insomnia. Anxiety, emotional stress, and isolation during night duties are known to impair sleep initiation and maintenance. A recent study during the COVID-19 pandemic highlighted how increased anxiety among hospital security officers was significantly correlated with sleepiness and cognitive issues such as memory lapses.[4] In a broader context, insomnia among security guards in the Delhi-NCR region has also been associated with lower sleep quality and greater sleep fragmentation, especially among night-shift workers.[5] These findings suggest that occupational stress, especially when coupled with psychological strain, can severely compromise sleep health.

The COVID-19 pandemic further exacerbated sleep-related problems across healthcare settings. Fatigue, burnout, and sleep disturbances were widely reported among frontline workers, including security personnel, who were tasked with enforcing safety protocols and managing access control during peak outbreak periods.[6] Studies from both India and neighbouring countries have shown that healthcare workers exposed to high job stressors during the pandemic had increased rates of insomnia and reduced quality of life.[7] These stressors were not limited to clinical staff but extended to medical support personnel, including security workers, who experienced significant psychosocial stress and insufficient sleep recovery.[8]

Besides occupational and psychological factors, lifestyle elements such as obesity, physical inactivity, and poor sleep hygiene are also associated with insomnia. In military populations with similar occupational demands, obesity and low sleep quality were found to be interrelated, further increasing insomnia prevalence.[9] These findings suggest a need to examine physical health parameters in addition to job-related stress in hospital security staff. The long-term consequences of chronic insomnia include not only impaired work performance but also elevated risk of metabolic, cardiovascular, and mental health disorders, as widely discussed in authoritative sleep medicine literature.[10]

The aim of this study was to assess the severity and impact of insomnia among security personnel in the hospital setting. The findings from this project are expected to inform targeted occupational health interventions, promote better shift management, and support the mental and physical well-being of hospital security staff.

Objectives

The objectives of the study were to determine the prevalence and determinants of insomnia among the security personnel of a tertiary care hospital in Bengaluru.

METHODS

This cross-sectional study was done among security personnel employed in a government-run tertiary care hospital in South India from 1st August 2025 to 15th August 2025.

Inclusion and exclusion criteria

Universal sampling was adopted for selection of the participants. Security personnel aged ≥18 years who were employed at the study hospital, willing to participate, and provided written informed consent were included in the study, while those with a previously diagnosed psychiatric illness were excluded.

Of the 132 security personnel, 115 were available during the study period, of which one hundred security personnel consented to participate in the study. The questionnaire consisted of three parts, part A includes the socio-demographic details like age, gender, education, income and marital status, self-reported co-morbidities and working hours, number of night shifts per month. Part B included the Insomnia Severity Index (ISI) questionnaire. It is a widely validated self-report tool designed to assess the nature, severity, and impact of insomnia. It comprises seven questions, each targeting a different dimension of sleep disturbance, including difficulty falling asleep, staying asleep, and waking too early, as well as satisfaction with sleep, interference with daily functioning, noticeable impairment, and level of distress caused by sleep problems. Responses were rated on a five-point Likert scale ranging from 0 (no problem) to 4 (very severe problem), producing a total score between 0 and 28. The ISI has demonstrated excellent internal consistency, with a Cronbach's alpha of 0.84-0.91 in previous studies, indicating strong reliability for both clinical and research applications.[11-13]

Beyond symptom evaluation, the ISI enables categorization of insomnia severity: 0-7 (no clinically

significant insomnia), 8-14 (sub-threshold insomnia), 15-21 (moderate insomnia), and 22-28 (severe insomnia). Its brevity, ease of scoring, and strong psychometric properties make it suitable for use in diverse populations, including shift-based workers and occupational groups under high stress. The five-point Likert scaling allows for nuanced measurement of symptom changes, making it valuable for both cross-sectional assessment and longitudinal monitoring. Studies in India have confirmed the ISI's validity and reliability, establishing it as a practical instrument for field-based epidemiological surveys among working adults.[11]

However, scholars have noted some limitations, including subjective interpretation and lack of contextual sensitivity, especially in high-stress job settings.14 Despite these limitations, ISI remains a practical tool when combined with contextual assessments for vulnerable occupational groups.

For this study, the ISI was administered as a self-completed questionnaire among security personnel working in a tertiary care hospital in Bengaluru. Prior to data collection, participants were gathered in small groups, and the purpose of the study was explained in simple language. Instructions on how to interpret and mark responses on the Likert scale were clearly provided to ensure uniform understanding. Respondents completed the ISI independently, without interviewer influence, to reduce social desirability bias and encourage honest reporting. This method was chosen for its efficiency in reaching a large workforce while maintaining confidentiality, thereby improving the accuracy and authenticity of the responses obtained.

Height measurement (using measuring tape)

Participants were asked to stand barefoot on a flat surface, with heels together, back straight, and head in the Frankfort horizontal plane. Height was measured using a non-stretchable measuring tape fixed vertically against a wall, recorded to the nearest 0.1 cm.

Weight measurement (using digital weighing scale)

Body weight was measured using a calibrated digital weighing scale placed on a firm, level surface. Participants wore light clothing and no footwear during measurement, and readings were recorded to the nearest 0.1 kg.

Blood pressure measurement (using digital sphygmomanometer)

BP was assessed using an automated digital sphygmomanometer with an appropriately sized cuff. Participants were seated comfortably with back supported, feet flat on the ground, and arm at heart level, after a rest period of at least 5 minutes.

Statistical analysis

For this project, data from 100 security personnel were first collected using manual self-administered questionnaires and physical measurements, then entered into Epicollect5 for digitization. The collected data-including variables such as age, gender, BMI, diabetic status, and hypertension treatment status- were exported into Microsoft Excel for initial organization and cleaning, followed by statistical analysis using SPSS version 25.0. Descriptive statistics, such as proportions, means, and standard deviations, were used to summarize the data. Associations between categorical variables were examined using the Chi-square test. A p value <0.05 was considered statistically significant. This approach ensured systematic, accurate, and reproducible analysis of both demographic and health-related determinants of insomnia.

Data interpretation

After entering the data of each security personnel from the manual self-administered questionnaire and physical measurements into Epicollect5, the information was exported to a standardized and validated Excel sheet for analysis. The insomnia severity index (ISI) score was automatically calculated in Excel using a pre-set formula based on the 7-item questionnaire scoring system. Each participant's score was categorized into standard severity levels: no clinically significant insomnia, sub-threshold insomnia, moderate insomnia, and severe insomnia.

The same dataset, containing demographic variables, lifestyle factors, and health parameters, was analysed using SPSS version 25.0 to assess associations with insomnia prevalence, applying Chi-square tests for categorical data with a significance threshold of $p<0.05$.

RESULTS

Table 1 presents the socio-demographic and health characteristics of the 100 security personnel included in the study. Nearly half of the participants (46%) belonged to the 41-50 years age group, followed by 28% in the 51-60 years age group. Males constituted 66% of the study population, and the majority (69%) had completed secondary school education. Most participants (57%) reported a monthly income of ₹30,000-39,999, while 94% were married.

With respect to occupational characteristics, 57% had 5–10 years of work experience and 40% had less than 5 years of experience. Self-reported diabetes and hypertension were present among 10% and 4% of participants, respectively. Based on BMI classification, 74% of participants were obese, while 14% were overweight. According to the Insomnia Severity Index (ISI), 32% of participants had sub-threshold insomnia, whereas 68% reported no insomnia.

Table 1: Socio-demographic characteristics of the study participants (n=100).

Variables	Frequency/percentage
Age group (years)	
21-30	2
31-40	24
41-50	46
51-60	28
Gender	
Male	66
Female	34
Educational status	
Middle school	2
Secondary school	69
Higher secondary school	27
Graduate	2
Monthly income	
20,000-29,999	39
30,000-39,999	57
40,000-49,999	2
≥50,000	2
Marital status	
Married	94
Separated/divorced	6
Work experience	
<5 years	40
5-10 years	57
>10 years	13
Diabetic status	
Non-diabetic	90
Diabetic	10
Hypertensive status	
Normotensive	96
Hypertension	4
BMI	
Normal	10
Under-weight	2
Over-weight	14
Obese	74
Insomnia status as per ISI	
No insomnia	68
Sub-threshold insomnia	32

BMI: Body Mass Index; ISI: Insomnia Severity Index

Table 2 shows the association between insomnia and selected socio-demographic and health-related characteristics of the study participants. A statistically significant association was observed between insomnia and gender (p=0.019), with a higher proportion of females (47.1%) reporting insomnia compared to males (24.2%). Monthly income was also significantly associated with insomnia (p=0.020), with participants in the lower income group (₹20,000-29,999) reporting a higher prevalence of insomnia than those in higher income categories.

No statistically significant association was found between insomnia and age category (p=0.924), educational status (p=0.360), marital status (p=0.628), work experience (p=0.228), diabetic status (p=0.403), hypertensive status (p=0.383), or BMI status (p=0.469).

Table 2: Association of insomnia with socio-demographic characteristics (n=100).

Variables	Insomnia			
	Present	Absent	χ^2	P value
Age group (years)				
21-30	1	1	0.476	0.924
31-40	8	16		
41-50	15	31		
51-60	8	20		
Gender				
Male	16	50	5.369	0.019*
Female	16	18		
Educational status				
Middle school	1	1	2.993	0.360
Secondary school	25	44		
Higher secondary school	6	21		
Graduate	0	2		
Monthly income				
20,000-29,999	17	22	5.136	0.020*
30,000-39,999	15	42		
>40,000	0	4		
Marital status				
Married	30	64	0.005	0.628
Separated/ divorced	2	4		
Work experience				
<5 years	9	31	3.182	0.228
5-10 years	19	28		
>10 years	4	9		
DM status				
Diabetic	4	6	0.327	0.403
Non-diabetic	28	62		
Hypertensive status				
Normotensive	2	2	0.620	0.383
Hypertensive	30	66		
BMI status				
Underweight	1	1	2.534	0.469
Normal	5	5		
Overweight	3	11		
Obese	23	51		

DM: Diabetes Mellitus; BMI: Body Mass Index; *Statistically significant.

DISCUSSION

This study assessed the determinants and prevalence of insomnia among 100 hospital security personnel. The cohort was largely middle-aged, male, married, lower-middle income, and mid-tenure, with very high obesity but relatively low diabetes and hypertension prevalence. Such patterns appear shaped by rotating shifts, modest physical activity, and disciplined lifestyle practices typical of uniformed services. Similar socio-demographic profiles have been reported among university security staff in Seoul, Korea, where occupational stress and night duties were concentrated in comparable groups.[15]

Most participants were aged 41-60 years, with males forming two-thirds of the workforce. The majority had secondary education and fell into the lower-middle income bracket, while nearly all were married. Mid-level job experience (5-10 years) dominated, reflecting retention of dependable staff for night duties. Despite obesity affecting nearly three-quarters of participants, only 10% had diabetes and 4% hypertension- figures lower than those reported in other shift-working populations, possibly due to controlled diets, periodic medical screening, and regulated workplace routines.

The prevalence of insomnia was 32%, all of which was sub-threshold, with no moderate or severe clinical cases identified. This aligns with findings from studies in Delhi-NCR and AIIMS Raipur, which reported around one-third of security staff experiencing sleep disturbances.[3,5] Variations across studies likely stem from differences in diagnostic tools, night shift schedules, and workplace contexts. The relatively low burden of metabolic comorbidities and adherence to healthy dietary practices in this cohort may have contributed to better sleep outcomes despite high obesity rates.

Associations between insomnia and socio-demographic factors revealed significant links with gender and income, while no associations were found with age, education, marital status, experience, diabetes, hypertension, or BMI. Female staff and those earning in the lower income bracket reported more insomnia, consistent with global evidence highlighting the role of psychosocial stressors. The findings suggest that while shift work predisposes staff to sleep problems, protective factors such as stable routines, dietary discipline, and health monitoring may mitigate their severity. Future studies should explore coping strategies that could be applied to broader shift-working populations.

The study has few limitations. First, reliance on self-reported data through the Insomnia Severity Index (ISI) may have introduced recall bias and subjective interpretation of symptoms, and underreporting due to fear of stigma cannot be ruled out. Second, shift work variables such as shift timing and rotation patterns were not accounted for, as the number of night duties was fixed. Although Diabetes and Hypertension status were recorded, details regarding glycemic control and medication use were not assessed, which could have led to underestimation of the magnitude of their association with insomnia. Finally, the absence of objective sleep measures such as actigraphy or polysomnography may have resulted in the inclusion of sub-threshold cases whose sleep disturbances could have been related to transient stress rather than clinical insomnia. Further research should address these gaps by incorporating objective sleep assessments, detailed evaluation of shift-work patterns and relevant clinical and treatment-related factors to better understand the determinants of insomnia among security personnel.

CONCLUSION

The findings suggest that while sub-threshold insomnia is present among security personnel, moderate or severe clinical insomnia was not observed, indicating relatively favourable sleep health in this occupational group. Their structured work routines, disciplined lifestyle and physical activity may contribute to regular sleep patterns, while the low prevalence of metabolic disorders may reflect potentially protective health practices. Female workers and those with lower incomes had higher rates of insomnia, highlighting the possible influence of psychosocial and socioeconomic factors, whereas no significant association was observed with age, education or marital status. These findings emphasise the need for workplace policies promoting sleep health, particularly among vulnerable groups. Future research should explore the coping mechanisms and work-life balance strategies of security personnel to better understand the factors contributing to their favourable sleep outcomes compared with other high-stress occupations.

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