



## **Pattern of symptoms associated with insomnia among health personnel in a tertiary health facility Nigeria**

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### **Abstract**

**Background:** Insomnia is a common complaint, occurring when someone has difficulty falling asleep or staying asleep, when the need arises. Insomnia has pronounced effect on physical and mental as well as the work productivity and health of an individual. The aim of the study was to determine the pattern of symptoms associated with insomnia among health personnel at the Jos University Teaching Hospital (JUTH), Plateau State, Nigeria.

**Methods:** This cross-sectional study was conducted among 60 health personnel in a tertiary hospital in Nigeria. Stratified random sampling method was used and the study population was divided into four strata based upon their parent department. Socioeconomic details, work profile and standard tool– Manifestation of Insomnia Check List (MAICL) were used.

**Results:** Of the 60 health workers, (53.3%) were females. Most had work experience of > 5 years (77.6%). More females (100%) than males (78%) experienced different sleeping time and waking time every night as a result of work schedule;  $p < 0.05$ . Daytime tiredness and headaches following inadequate night sleep were more prevalent among females (92%) than males (62.5%),  $p < 0.05$ . Proportionally also, daytime depression or anxiety was more common in females (20.0%) than in males (18.8%),  $p < 0.05$ . Additionally, more females (92.0%) than males (43.8%) exhibit ongoing worries about sleep,  $p < 0.00$ . Among workers in the pharmacy department, insomnia was significantly associated with daytime sleepiness  $p < 0.05$ , increased errors or accidents  $p < 0.05$ , with attendant significant ongoing worries about sleep  $p < 0.05$ .

**Conclusion:** Periodic screening and medical check-ups, as well as health education on practising good sleep hygiene will help address work related insomnia disorders among health workers

**Keywords:** Insomnia, health personnel, insomnia symptoms, shift work disorder

### **Introduction**

Insomnia is defined as difficulties initiating or maintaining sleep, or early morning awakening, associated with impaired daytime functioning, for example, reduced cognitive performance, fatigue or mood disturbances [1]. It is an important public health problem that requires accurate diagnosis for effective treatment [2]. Sleep is an essential physiological function, necessary for neural development, learning and memory, emotional regulation, cardiovascular and metabolic function [2, 3]. Quality sleep is necessary for good health and overall quality of life. Studies report that sleep deprivation and circadian rhythm disruption may orchestrate altered immune function as well as an increased risk for cardiovascular disease and metabolic disorders such as weight gain, insulin resistance and diabetes [2-4].

The true prevalence of insomnia is unknown because it is inconsistently reported in the scientific literature, due to different perceptions of insomnia and its treatment amongst patients and clinicians.5 Nevertheless, insomnia is a widely prevalent condition that can affect anyone, including children, adults and the elderly.6,7 Insomnia is primarily a clinical diagnosis and is most frequently diagnosed using data obtained from patient histories and sleep diaries.8,9

Patients generally describe insomnia in terms of its daytime impairments extending the experience beyond night-time sleep difficulties. On the contrary, clinicians tend to place emphasis on the quantitative descriptors of insomnia, standard diagnostic criteria, rather than on the patient's qualitative description and subjective experience of insomnia [5, 8, 10]. It is estimated that approximately one-third of the adult population occasionally report sleep problems and 6–10% report symptoms that meet the diagnostic criteria for insomnia disorder [8, 11]. The high prevalence of insomnia and other sleep disorders, which are often underdiagnosed and undertreated is a cause for a global concern [8].

Although the causes, symptoms and severity of insomnia are well documented in the general population [12], not much is known about work-related insomnia (distorted circadian cycle) among people who run calls and shift duties, especially health personnel who are involved in caring for the sick and the unwell. This study aimed to identify and determine the pattern of symptoms associated with insomnia among health personnel at the Jos University Teaching Hospital (JUTH), Plateau State, Nigeria. The specific objectives were (1) to establish the difference in the

distribution of gender-based insomnia symptoms manifestation among health personnel in JUTH and <sup>[2]</sup>. To identify the difference in the distribution of insomnia symptoms manifestation among the various departments-based health personnel in JUTH. In order to achieve the aim and objectives, the research questions sought to answer <sup>[1]</sup> what was the difference in the distribution of insomnia symptoms manifestation among health personnel according to gender in JUTH and, <sup>[2]</sup> what was the difference in the distribution of insomnia symptoms manifestation among the various departments-based health personnel in JUTH. The hypotheses were, <sup>[1]</sup> there was no significant difference in the distribution of insomnia symptoms manifestation among health personnel in JUTH according to gender and, <sup>[2]</sup> there was no significant difference in the distribution of insomnia symptoms manifestation among health personnel in various departments in JUTH.

### Methodology

This was a cross-sectional study conducted at the Jos University Teaching Hospital, located in the Middle-belt region of Nigeria. The studied population consisted of health personnel in the Hospital, drawn from Doctors, Nurses, Medical laboratory scientists/technicians and Pharmacists, who exhibited symptoms of insomnia. The inclusion criteria comprised health personnel who had insomnia, run duty shifts or calls, and who willingly gave informed consent to participate in the study. Health personnel who had insomnia but never run shifts or call duty, or who were on any medication for neurological and sleep disorders, or refusal to give informed consent, were excluded from the study.

The sample size was calculated to be 60, using the formula:  $S.F. = n/N$ , where  $n$  = the sample size,  $N$  = the size of the population from which the sample was drawn (= 200 health personnel: 70 Surgical Residents doctors + 55 Nurses + 48 Medical Laboratory scientists/technicians + 27 Pharmacists.). Thus, the  $S.F. = 60/200$ , or 0.3, or 30%; so that each of the four strata contributed 0.3 (30%) of its size to the sample size,  $n = 60$ .

**Methods:** Ethical clearance was obtained from the Institution Ethical Committee. A pilot study was conducted among 35 hospital staff to ascertain the feasibility and ease of administering the questionnaire, the availability and cooperation from the hospital staff and to determine the method of statistical analysis. Stratified random sampling method was used to recruit the study participants. The study population was divided into four strata based upon their parent department; a list of all workers in these four departments was obtained from the administration office of the hospital. Computer generated random numbers were used to recruit the study subjects; thereafter, participants were sampled by simple random sampling technique. Informed consent was obtained and structured interview schedule and standardized questionnaires were used, which are described below.

**Structured interview schedule:** The interview schedule consisted of two parts. The first part included the socio-demographic details such as age, gender, place of residence, marital status and type of family, area of work, years of experience, working hours, and frequency of night shifts per month among other details.

The second part of the interview schedule consisted of questions to assess the presence of symptoms of shift/call duty-related insomnia, using standardized (pre-tested and validated) tool, namely Manifestation of Insomnia Check List (MAICL), an Insomnia Questionnaire\*, which contained 18 preset symptoms <sup>[1, 12]</sup> to which the participants were required to respond as a checklist (data collection instrument).

**Data Analysis:** The data were analyzed using Chi-Square, with significance level set at 95% ( $p.05$  was considered statistically significant).

### Results

Of the 60 participants, 32 (53.3%) males and 28 (46.7%) females. Their ages ranged between 21 and 65 years, with the majority 12 (20.0%) aged between 51-55 years. The socio-demographic characteristics of the study population are shown in Table-I. About 60% (36) of the study population were married, majority (34 or 56.7%) of whom had more than five family members. A sizeable proportion (46.7%) of the workers resided >6 km radius of the hospital, and with private car as the most common mode of transport to work (38.3%).

Table-II describes the nature of their work. Majority (46.7%) of the study subjects worked in general wards, commonly in 8-hour shifts duty (70.0%), and had night duties at least twice a month (73.3%). Twelve hours continuous work without rest was rampant (85.0%); over half (63.3%) of them had a work experience of more than or equal to 5 years.

The gender-based distribution of insomnia symptoms is shown in Table III. Although the insomnia symptoms were fairly distributed in similar proportions between the male and female sexes, a few differences were observed. More females (100%) than males (78%) experienced different sleeping time and waking time every night as a result of work schedule;  $p= 0.012$ ; OR (95% CI) = 0.00 (0.00-0.703). Daytime tiredness and headaches following inadequate night sleep was more prevalent among females (92%) than males (62.5%),  $p=0.006$ ; OR (95% CI) = 0.13 (0.01 – 0.70). Also, proportionally, daytime depression or anxiety was more common in females (20.0%) than in males (18.8%),  $p=0.010$ ; OR (95% CI) = 0.23 (0.06 – 0.83). Additionally, more females (92.0%) than males (43.8%) exhibit ongoing worries about sleep,  $p < 0.001$ ; OR (95% CI) = 0.06 (0.01 – 0.32).

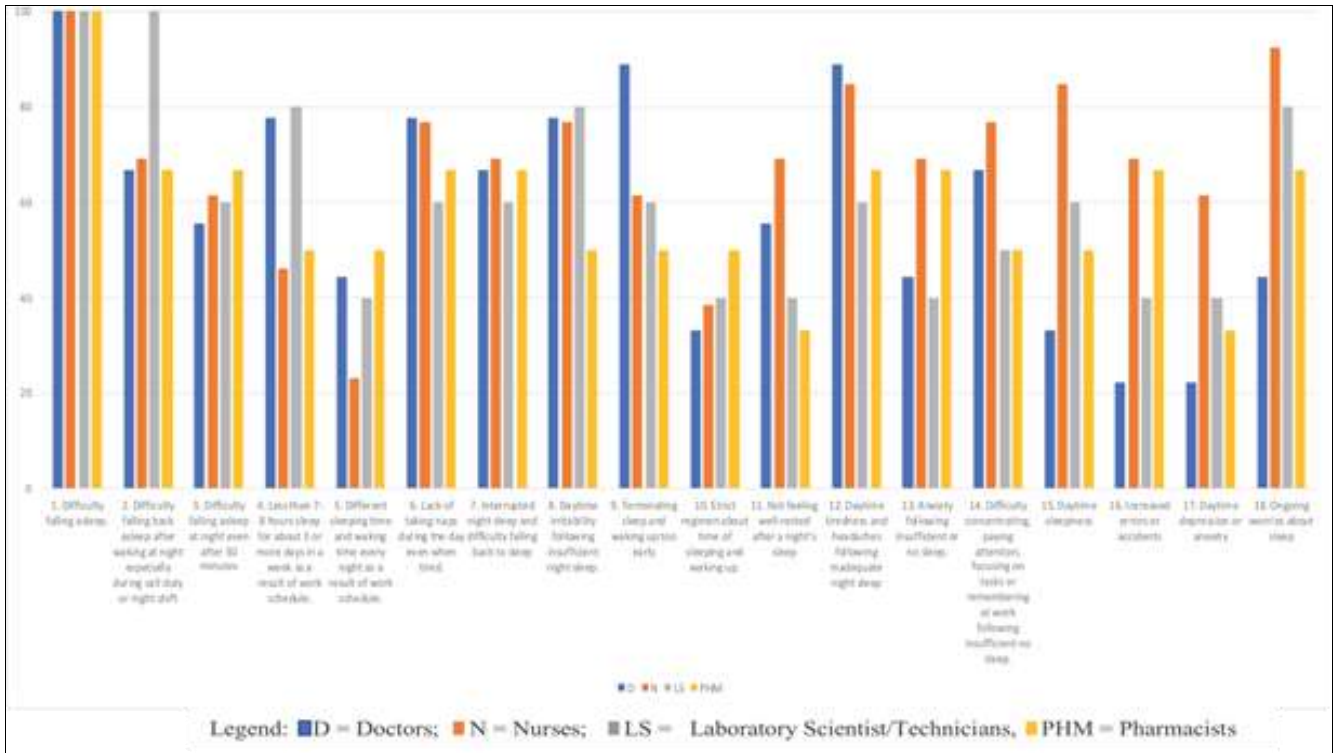


Fig 1: Shows the distribution of insomnia symptoms among department-based health workers

Analysis of insomnia according to departments of work (Table IV) shows that among workers in the pharmacy department, insomnia was significantly associated with daytime sleepiness ( $p=0.005$ ), increased errors or accidents ( $p=0.012$ ), with attendant significant ongoing worries about sleep ( $p=0.004$ ).

Table 1: Socio-demographic characteristics (n=60).

S. No.	Baseline variable	Frequency	Percentage (%)
<b>1. Age (in years)</b>			
	21-25	2	3.3
	26-30	5	8.3
	31-35	4	6.7
	36-40	9	15.0
	41-45	9	15.0
	46-50	10	16.7
	51-55	12	20.0
	56-60	6	10.0
	61-65	3	5.0
<b>2. Gender</b>			
	Male	32	53.3
	Female	28	46.7
<b>3. Marital status</b>			
	Single	16	26.7
	Married	36	60.0
	Widow(er)	8	13.3
<b>4. No. of family members</b>			
	0-2	8	13.3
	3-5	18	30.0
	>5	34	56.7
<b>5. Distance from workplace</b>			
	0-2km	5	8.3
	2-4km	11	18.3
	4-6km	16	26.7
	>6km	28	46.7

<b>6. Regular Mode of transport</b>		
Trekking	4	6.7
Private car	23	38.3
Public Bus	19	31.7
2-wheeler motorcycle	8	13.3
Tricycle	6	10.0

Table 2: Description of the nature of work (n=60).

S. No.	Variable	Frequency	Percentage (%)
<b>1. Designated Unit</b>			
	General wards	28	46.7
	Private wards	8	13.3
	High Dependence Units	6	10.0
	Intensive Care Units	10	16.7
	Laboratories	8	13.3
<b>2. Working hours</b>			
	6 hours	18	30.0
	8 hours	42	70.0
<b>3. Frequency of night duty per month</b>			
	Once	16	26.7
	Twice	44	73.3
<b>4. Duration of night duty per day</b>			
	12 hours without rest	51	85.0
	12 hours with 2 hours of	9	15.0
<b>5. Years of experience</b>			
	≤5 years	22	36.7
	>5 years	38	63.3

**Table 3:** Manifestations of Insomnia among 60 Health Personnel in JUTH

Symptoms	Frequency (%)		$\chi^2$ P OR (95% CI)
	M	F	
1. Difficulty falling asleep.	32 (100.0)	28 (100.0)	----
2. Difficulty falling back asleep after waking at night especially during call duty or night shift	26 (81.3)	24 (85.7)	- 0.737* 0.72 (0.13 – 3.50)
3. Difficulty falling asleep at night even after 30 minutes	30 (93.8)	26 (92.9)	- 1.000* 1.15 (0.08 – 16.92)
4. Less than 7-8 hours sleep for about 3 or more days in a week as a result of work schedule.	28 (87.5)	26 (92.9)	- 0.675* 0.54 (0.05 – 4.17)
5. Different sleeping time and waking time every night as a result of work schedule.	25 (78.1)	28 (100.0)	- 0.012* 0.00 (0.000 – 0.703)
6. Lack of taking naps during the day even when tired.	28 (87.5)	25 (89.3)	- 1.000* 0.84 (0.11 – 5.52)
7. Interrupted night sleep and difficulty falling back to sleep	22 (68.8)	18 (64.4)	0.134 0.714 1.22 (0.36 – 4.10)
8. Daytime irritability following insufficient night sleep.	26 (81.3)	24 (85.7)	- 0.737* 0.72 (0.13 – 3.50)
9. Terminating sleep and waking up too early	28 (100.0)	26 (92.0)	- 0.675* 0.54 (0.05 – 4.17)
10. Strict regimen about time of sleeping and waking up.	25 (78.1)	24 (85.7)	0.574 0.448 0.60 (0.11 – 2.73)
11. Not feeling well-rested after a night's sleep	25 (78.1)	22 (78.6)	0.002 0.967 0.97 (0.23 – 3.98)
12. Daytime tiredness and headaches following inadequate night sleep	20 (62.5)	26 (92.0)	7.693 0.006 0.13 (0.01 – 0.70)
13. Anxiety following insufficient or no sleep	18 (56.3)	22 (78.6)	3.348 0.067 0.35 (0.09 – 1.24)
14. Difficulty concentrating, paying attention, focusing on tasks or remembering at work following insufficient no sleep	24 (75.0)	26 (92.0)	- 0.088* 0.23 (0.02 – 1.35)
15. Daytime sleepiness	16 (60.0)	10 (53.7)	1.241 0.265 1.80 (0.57 – 5.80)
16. Increased errors or accidents	8 (25.0)	12 (742.9)	2.143 0.143 0.44 (0.13 – 1.55)
17. Daytime depression or anxiety	6 (18.8)	14 (20.0)	6.563 0.010 0.23 (0.06 – 0.83)
18. Ongoing worries about sleep	14 (43.8)	26 (92.0)	16.205 < 0.001 0.06 (0.01 – 0.32)

**Table 4:** Manifestations of Insomnia among 60 Health Personnel According to Departments in JUTH

Symptoms	Frequency (%)		$\chi^2$ P OR (95% CI)
	M	F	
1. Difficulty falling asleep.	32 (100.0)	28 (100.0)	----
2. Difficulty falling back asleep after waking at night especially during call duty or night shift	26 (81.3)	24 (85.7)	- 0.737* 0.72 (0.13 – 3.50)
3. Difficulty falling asleep at night even after 30 minutes	30 (93.8)	26 (92.9)	- 1.000* 1.15 (0.08 – 16.92)
4. Less than 7-8 hours sleep for about 3 or more days in a week as a result of work schedule.	28 (87.5)	26 (92.9)	- 0.675* 0.54 (0.05 – 4.17)
5. Different sleeping time and waking time every night as a result of work schedule.	25 (78.1)	28 (100.0)	- 0.012* 0.00 (0.000 – 0.703)
6. Lack of taking naps during the day even when tired.	28 (87.5)	25 (89.3)	- 1.000* 0.84 (0.11 – 5.52)
7. Interrupted night sleep and difficulty falling back to sleep	22 (68.8)	18 (64.4)	0.134 0.714 1.22 (0.36 – 4.10)
8. Daytime irritability following insufficient night sleep.	26 (81.3)	24 (85.7)	- 0.737* 0.72 (0.13 – 3.50)
9. Terminating sleep and waking up too early	28 (100.0)	26 (92.0)	- 0.675* 0.54 (0.05 – 4.17)
10. Strict regimen about time of sleeping and waking up	25 (78.1)	24 (85.7)	0.574 0.448 0.60 (0.11 – 2.73)
11. Not feeling well-rested after a night's sleep	25 (78.1)	22 (78.6)	0.002 0.967 0.97 (0.23 – 3.98)
12. Daytime tiredness and headaches following inadequate night sleep	20 (62.5)	26 (92.0)	7.693 0.006 0.13 (0.01 – 0.70)
13. Anxiety following insufficient or no sleep.	18 (56.3)	22 (78.6)	3.348 0.067 0.35 (0.09 – 1.24)
14. Difficulty concentrating, paying attention, focusing on tasks or remembering at work following insufficient no sleep	24 (75.0)	26 (92.0)	- 0.088* 0.23 (0.02 – 1.35)
15. Daytime sleepiness	16 (60.0)	10 (53.7)	1.241 0.265 1.80 (0.57 – 5.80)
16. Increased errors or accidents	8 (25.0)	12 (742.9)	2.143 0.143 0.44 (0.13 – 1.55)
17. Daytime depression or anxiety	6 (18.8)	14 (20.0)	6.563 0.010 0.23 (0.06 – 0.83)
18. Ongoing worries about sleep	14 (43.8)	26 (92.0)	16.205 < 0.001 0.06 (0.01 – 0.32)

\* Likelihood ratio chi Square test

**Discussion**

The findings in this study agrees with other studies that the most common symptoms of insomnia are fatigue, irritability, social dysfunction, problems with concentration or memory, reduced motivation, anxiety and worry about sleep leading to impaired daytime functioning and possibly accidents or errors [1, 10]. It was established that in this study as in other reports that complaints of insomnia symptoms may often result in poor work ability and social isolation, 13 as well as a sense of reduced alertness and a desire to sleep, but inability to sleep and achieve the relief they seek [10, 14,

15]. To meet the diagnostic criteria for chronic insomnia disorder, the patient should have symptoms at least three times per week over a duration of three or more months [1, 8, 16]. The International Classification of Sleep Disorders (ICSD-3) [1, 12], identifies three distinct types of insomnia namely short-term insomnia, chronic insomnia, and other insomnia (when the patient has insomnia symptoms but does not meet the criteria for the other two types of insomnia [1, 17, 18]. A diagnosis of short-term insomnia must meet the same criteria as chronic insomnia except that the symptoms have been present for less than three months [5].



Short-term insomnia is often aggravated by stressful situations and is therefore usually resolved when the underlying cause is resolved or when the patient develops coping mechanisms<sup>[19]</sup>.

Health-care workers with >5 years' work experience had greater insomnia symptoms as compared to the others. This finding contrasts with other studies where increase in years of practice was associated with lower symptoms of sleep disorder<sup>[20]</sup>. It appears that the adaptation to insomnia during shift duty (especially night shift work) expected of prolonged exposure and experience rarely occurs. In this study, longer duration of duty was associated with decreased insomnia symptoms. This is probably so because in the shorter shift duration the work is more intense and stressful, with less time to complete the same task, no privilege of napping in between work hours and, therefore, more exhaustive unlike the longer period where the worker enjoys some leisure.

Day time somnolence was observed more among the female workers when compared to the males. Similar findings have been observed in other studies<sup>[13, 21]</sup> where marital commitment and household responsibilities, including child care, have been blamed for sleep deprivation and adduced for contributing to excessive day time sleepiness in women.

The preponderance of female in this study could be attributed to their greater number among the predominantly female dominant profession, which in turn constitutes the largest proportion among the healthcare workers in the hospital. Additionally, studies have shown greater prevalence of insomnia in women due to their hormonal profile. Insomnia is more prevalent among women, middle-aged and older adults<sup>[8, 10, 13]</sup>. Approximately 50% of women experience insomnia as a result of hot flushes and night sweats due to menopause<sup>[6]</sup>. There is also a higher prevalence of insomnia among those who are unemployed, disabled, divorced, widowed, separated, or persons of lower socioeconomic status and those working irregular shifts<sup>[6, 22]</sup>. It is common knowledge that insomnia from long working hours may also lead to fatigue (tiredness) and anxiety. Thus, the significantly high rates of excessive daytime sleepiness and anxiety in this study were worrisome given the sensitive nature of the work in the hospital, where errors and accidents due to somnolence involving health-care workers not only can directly impact their own lives (e.g. needle stick injuries) but also expose the lives of patients to great jeopardy. There is also the concern for burnout, job dissatisfaction and absenteeism. It is for these reasons that earlier studies also recommended to restricting the duration of work hours to 8 hours rather than 12 hours<sup>[23]</sup>.

### Conclusion

Based on the forgoing, it is obvious that unregulated shift work/duty significantly affects both the professional and personal lives of health-care workers. It is therefore recommended that behavioral and certain changes such as practicing good sleep hygiene, scheduled napping during shifts are necessary to improve quality of life. Also, periodic screening for shift work disorder during routine annual medical check-ups and reinforcement and education of the staff for practicing good sleep hygiene are recommended because of their potential beneficial long-term result. Also,

minimizing shift work and reducing the duration of shift duty duration could be key preventive strategies of insomnia symptoms. Giving all health care workers few days to rest after long hours of shifts and calls is recommended to help them recover from the effects of insomnia.

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