

# Quality of sleep among hypertensive patients attending a rural health training centre

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## ABSTRACT

**Introduction:** Sleep is a vital biological, reparative, and restorative phenomenon, and poor sleep has a serious detrimental effect on health. Poor sleep quality is a serious problem as it adversely affects a person's ability to function physically and socially, as well as their potential for profession and quality of life. The degree of hypertension directly affects sleep quality, and poor sleep can exacerbate hypertensive symptoms. This study assesses hypertension patients' sleep quality in a rural health training centre in Chennai. **Objectives:** 1. To study the prevalence of poor sleep quality among hypertensive patients. 2. To determine the association between selected socio-demographic factors and sleep quality among these patients. **Materials and Methods:** Hypertensives attending the outpatient department of a rural health and training centre were selected in a systematic manner and administered a semi-structured interview schedule and the Pittsburgh Sleep Quality Index (PSQI) questionnaire followed by a basic clinical examination. Using the PSQI, they were categorised as having either poor or good sleep quality and the association between selected socio-demographic factors and sleep quality was assessed. **Results:** Out of the 179 study participants, there were almost equal numbers of male and female participants. The mean age of participants was 57.80 years (standard deviation (SD) = 9.8 yrs.). Among the study participants, 44.13% had completed secondary level of school as an education qualification and 6.70% were illiterate. By the modified BG Prasad classification 2022, most of the study participants (34.08%) came under the class II socioeconomic classification. A large proportion (78.8%) of study participants had poor sleep quality. The difference in sleep quality was observed with respect to gender, socio-economic class, alcohol consumption and body mass index (BMI). **Conclusion:** This observational study shows that individuals with hypertension suffer significantly from poor sleep. A poor quality of sleep was reported by 78.77% of the patients in this study. Statistically significant factors that influenced sleep quality were gender, alcohol consumption and BMI.

**Keywords:** Hypertension, poor sleep, PSQI, sleep index, sleep quality

## Introduction

Sleep is a fundamental human need that is necessary for good health, a high quality of life, and effective daytime performance.<sup>[1]</sup> Sleep issues, which affect both quantity and quality of sleep, are

very common; they are referred to as sleep interruptions when they interfere with a person's ability to sleep continuously. Sleep disruption is caused by a variety of circumstances, including environmental and lifestyle variables, sleep disorders, and other medical diseases. Sleep disturbances have negative short- and long-term health effects.<sup>[2]</sup>

The recommended amount of sleep for adults is 7–8 hours every night, while for children it is 10 hours. In India, sleep disorders are very common. A survey estimated that up to 33% of people in India suffer from insomnia.<sup>[3]</sup>

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Sleep deprivation has long been linked to neurocognitive impairment, decreased physical ability and skill, and impaired judgement. However, getting too much sleep can be harmful to health. Numerous studies have found a link between chronic diseases like type 2 diabetes, obesity, atherosclerosis, hypertension and sleep duration.<sup>[4]</sup>

Worldwide, hypertension rates are rising as a result of population ageing, poor lifestyle choices, and other factors. Hypertension is the primary preventable risk factor for cardiovascular disease (CVD) and all-cause mortality. Along with the primary dietary and exercise-related factors, a significant amount of research has been done on the association between sleep and high blood pressure.

Studies have demonstrated a link between hypertension and sleep duration. Short sleep duration—generally defined as less than seven hours, six hours, or five hours per night—was associated to a higher chance of developing a hypertension condition. Association of Usual Sleep Duration with Hypertension: The Sleep Heart Health Study, Gottlieb *et al.* found that the prevalence of hypertension was increased by sleep durations of less than seven hours or more than eight hours per night.<sup>[5]</sup> In a study by Svedmyr *et al.*,<sup>[6]</sup> poor control of blood pressure was common among patients with obstructive sleep apnoea. This study aimed to identify sleep quality among hypertensives and also find the association between selected socio-demographic variables and sleep quality.

## Materials and Methods

The study was a cross-sectional study conducted among the patients attending the outpatient department at the rural health training centre of a private medical college. Assuming a prevalence of poor sleep quality of 36.5% based on the study in Ethiopia and a 95% confidence interval and a desired relative precision of 20%, the minimum sample size was calculated as 179. These patients were systematically selected from the outpatient register of the non-communicable disease (NCD) clinic. Only adult participants who had hypertension for at least six months were included in the study. Participants with comorbid conditions like patients with a history of congestive heart disease, night shift workers, and known cases of mental and psychiatric illness, pregnant and lactating women were excluded from the study.

After obtaining written informed consent, the participants were administered a semi-structured interview schedule containing basic demographic and health information. Then each study participants were subjected to the Pittsburgh Sleep Quality Index (PSQI) questionnaire followed by a basic clinical examination. Based on a scoring system, the PSQI categorises a participant as having either poor or good sleep quality. The data were entered using Microsoft Excel and later analysed using SPSS software version 16. A basic descriptive analysis of the proportion of individuals with poor sleep quality was calculated.

The proportion of individuals with poor sleep quality within the sub-group was compared and statistically analysed using the Chi-squared test. A *P*-value of <0.05 was considered to be statistically significant. The study was initiated after obtaining permission from the Institutional Ethics Committee.

## Results

### Characteristics of study participants

A total of 179 study participants were selected as planned. There were almost equal numbers of male and female participants. The mean age of participants was 57.8 years (standard deviation (SD) = 9.8 yrs.). The age range between 51–60 years had the maximum number of participants at 34.4%, and 8.9% of participants were aged between 71 and 80 years.

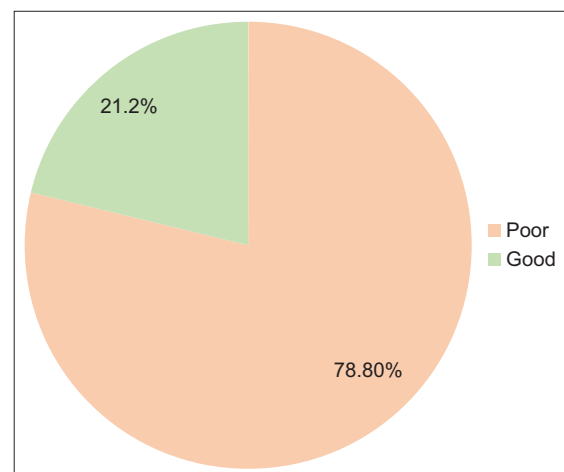
Among the study participants, 44.1% had completed secondary level of school as education qualification, 6.7% were illiterate, 41.34% were homemakers and 29.60% were self-employed. A large proportion of participants (69.3%) belonged to a nuclear family, and 83% of study participants belonged to socioeconomic class III or lower based on the modified BG Prasad classification (updated to 2022) [Table 1].

### Prevalence of good and poor sleep quality among hypertensive patients

The majority of the hypertensive study participants had poor sleep quality (78.8%) [Figure 1].

### Factors associated with sleep quality among hypertensive patients attending rural health training center

Poor sleep quality was more common among male participants (84.3%), those of lower socioeconomic status (80%), smokers (87.2%) and those with a higher body mass index (BMI) (88.9%). Diabetics (41%) had poorer sleep quality compared to non-diabetics (37.9%) and sleep quality was



**Figure 1:** Prevalence of good and poor sleep quality among hypertensive patients

poorer among the physically inactive (36.4%) compared to the physically active individuals (25.6%). Those with a habit of alcohol consumption reported poorer sleep quality. There was no difference in sleep quality in relation to age. The differences were statistically significant for gender, BMI and alcohol consumption [Table 2].

## Discussion

In this cross-sectional study, the sleep quality of hypertension patients visiting a rural health training institution was studied. According to studies, a lack of sleep may contribute to a variety of health issues. The current study seeks to investigate the quality of sleep among people who have hypertension and determine whether there is any association between inadequate sleep and specific factors. There were roughly 179 study participants, ranging in age from 31 to 80. Of these, 34.64% of those in the 51–60 age group and 8.94% of those in the 71–80 age group participated in the study. In a study done in Ethiopia,<sup>[7]</sup> the majority of study participants belonged to the age group of 45–64 years at 38% and the least was from 30–34 years at 7.8%. In the current study, 50.3% of participants were female. In the study done in Ethiopia 53.4% of participants were male.

In the current study, out of the study's participants, 44.13 percent have completed secondary school, while 6.7 percent were

illiterate. Moreover, 41.34% were homemakers and 29.60% were self-employed. In a similar study done in semi-urban Nigeria,<sup>[8]</sup> the participants who were unemployed were 33.3% and those who had post-secondary education were 45.5%.

The majority of the study participants, or 69.27% of them, are part of nuclear families. In a study done in Ethiopia, families with less than four members had good quality sleep than families with more than four members.<sup>[7]</sup> According to the modified BG Prasad classification, 34.08% of belong to class II the class II socioeconomic class. In a similar study done in China, they used income for categorization as less than 1000 RMB, 1000–3000 RMB and more than 3000 RMB, where duration of sleep was less among participants who had less than 1000 RMB.<sup>[9]</sup>

The majority of the hypertensive study participants had a poor sleep quality of 78.77%. In a study done by the National Health and Nutrition Examination Survey, 2005–2008 (NHANES), poor quality sleep was present in 52.4% of hypertensive patients.

Out of the 179 study participants gender, and BMI impacted on quality of sleep. Poor quality of sleep was higher among males 84.3% compare to that in females, 72.2%  $p=0.05$ . Higher BMI was also associated with poor sleep quality ( $P < 0.001$ ). In a similar study done in China,<sup>[10]</sup> statistical association was observed between

**Table 1: Characteristics of study participants**

Characteristics	Number	Percentage (%)
Age group		
31–40	12	6.7
41–50	36	20.1
51–60	62	34.6
61–70	53	29.6
71–80	16	8.9
Sex		
Male	89	49.7
Female	90	50.3
Education		
Illiterate	12	6.7
Primary	40	22.3
Secondary	79	44.1
Higher secondary	19	10.6
Diploma/graduate	29	16.2
Occupation		
Government employee	20	11.2
Non-government employee	29	16.2
Self-employed	53	29.6
Homemaker	74	41.3
Retired	3	1.7
Family		
Nuclear	124	69.3
Joint	55	30.7
Socioeconomic class		
Class I	43	24.0
Class II	61	34.1
Class III	45	25.1
Class IV	28	15.7
Class V	2	1.1

**Table 2: Factors associated with sleep quality among hypertensive patients**

Characteristics	Good sleep quality	Poor sleep quality	Total	P
Age				0.99
<60 years	24 (21.8%)	86 (78.2%)	110 (100%)	
≥60 years	15 (21.7%)	54 (78.3%)	69 (100%)	
Gender				0.05
Male	14 (15.7%)	75 (84.3%)	89 (100%)	
Female	25 (27.8%)	65 (72.2%)	90 (100%)	
Socioeconomic status				0.62
Classes I and II	24 (23.1%)	80 (76.9%)	104 (100%)	
Class III and class IV	15 (20%)	60 (80%)	75 (100%)	
Smoking				0.17
Yes	5 (12.8%)	34 (87.2%)	39 (100%)	
No	32 (22.9%)	108 (77.1%)	140 (100%)	
Alcohol consumption				<0.001
Yes	1 (2.5%)	38 (97.5%)	39 (100%)	
No	46 (32.9%)	94 (67.1%)	140 (100%)	
Physical activity				0.21
Yes	29 (74.4%)	10 (25.6%)	39 (100%)	
No	89 (63.6%)	51 (36.4%)	140 (100%)	
BMI				0.0005
Underweight and normal	29 (32.6%)	60 (67.4%)	89 (100%)	
Overweight and obesity	10 (11.1%)	80 (88.9%)	90 (100%)	
Diabetes				
Yes	23 (59%)	16 (41%)	39 (100%)	
No	87 (62.1%)	53 (37.9%)	140 (100%)	

sleep quality and the variables gender and BMI with *P*-value less than 0.001, and in another study done in China, sleep duration and income of the family statistical significance was found.<sup>[9]</sup> In the current study, participants who consumed alcohol, had poor sleep quality with a statistical significance *P*-value < 0.001. In a similar study done in China,<sup>[9]</sup> there were less than seven hours of sleep duration for participants who consumed alcohol with *P*-value statistical significance less than 0.001.

## Conclusion

This observational study shows that individuals with hypertension suffer from poor sleep quality. A poor quality of sleep was reported by 78.77% of the patients in this study. Statistically significant factors that influenced sleep quality were gender, alcohol consumption and high BMI.

## Acknowledgement

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## Conflicts of interest

There are no conflicts of interest.

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