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Sleep Disorders' Prevalence and Causes in a Rural Community in Northern India an Original Study

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Abstract

Introduction: People all around the world suffer from sleep disturbances, which are a prevalent issue. In a rural population in Northern India, the purpose of this study is to ascertain the incidence and causes of sleep problems.

Materials and Procedures: This cross-sectional study involved 500 people in a rural village in Northern India, ranging in age from 18 to 60. Through the use of a multistage random sampling process, the participants were chosen. A standardized questionnaire that asked about sleep duration, quality, disturbances, and causes of sleep problems was used to gather the data. SPSS version 25 was used to analyze the data.

Results: Sleep disturbances were found to be 32.6% common. Insomnia was the most prevalent sleep condition (27.2%), and sleep apnea (3.6%) and restless legs syndrome (1.8%) were the next most prevalent. Stress was the main culprit in 36.4% of sleep disturbances, followed by illnesses (28.9%) and environmental variables (20.7%).

Conclusion: This rural group in Northern India has a greater frequency of sleep disorders than has been observed in other research done in India's cities. Inadequate healthcare facilities, poverty, a lack of social support, and other factors may all contribute to the higher frequency of sleep problems in this group. The findings of this research highlight the necessity for public health initiatives to raise awareness of sleep disorders and their causes as well as to offer suitable healthcare facilities for the treatment of sleep disorders in rural areas. In order to manage sleep problems in rural communities, it is necessary to offer suitable healthcare facilities and raise knowledge of sleep disorders and their causes.

1. Introduction

For both physical and mental health, sleep is a critical physiological process. An average adult is thought to need 7-8 hours of sleep each night to function at their best [1]. However, sleep disturbances are becoming a significant global public health issue. A range of conditions known as sleep disorders impact either the ability to fall asleep or the quality of the sleep. They can be broadly divided into four groups: circadian rhythm disorders, sleep apnea, restless legs syndrome, and insomnia [2]. The ability to function on a daily basis can be severely hampered by sleep disturbances, which can also lower quality of life and increase the risk of accidents [3].

Both developed and developing nations have been shown to have significant rates of sleep problems. A meta-analysis found that individuals globally had a

prevalence of sleep disturbances of 27.1% [4]. According to some reports, the prevalence of sleep disturbances is as high as 33.6% in India [5]. However, the majority of research on sleep disorders in India has been done in urban areas, and little is known about the prevalence and underlying factors in rural areas.

The majority of Northern India is rural, and a sizable portion of the population works in agriculture. People in rural locations lead different lifestyles and work schedules than those in metropolitan areas, which may have an impact on the prevalence and root causes of sleep disorders. Therefore, the purpose of this study was to identify the prevalence and contributing factors of sleep disorders in a rural area of northern India.

Potential causes of sleep disturbances have been shown to include a number of elements. Demographic

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characteristics including age, gender, education, and income are among them [6]. According to studies, women, older persons, those with less education, and those with lower income levels are more likely than others to experience sleep disturbances [7,8]. Sleep disturbances have also been connected to other factors, including lifestyle factors (e.g., smoking, drinking), medical illnesses (e.g., obesity, diabetes, hypertension), and psychological issues (e.g., stress, anxiety, and depression) [9–11].

Insomnia and sleep apnea have both been associated with stress, which is a prevalent cause of sleep disorders [12,13]. Environmental variables like noise pollution and poor air quality have been linked to poor sleep quality [16,17], while medical problems like obesity and diabetes can cause sleep apnea [14,15].

It is crucial to comprehend the prevalence and root causes of sleep disorders in a rural area of northern India for a number of reasons. First off, because sleep problems can have a substantial negative influence on a person's physical and mental health, it is important to understand their underlying causes in order to design effective targeted interventions to enhance the quality of sleep. Second, knowing the incidence of sleep problems can help with planning healthcare services and enhancing health outcomes. Sleep disorders can result in lost productivity and higher healthcare expenses. Finally, because research on the frequency and causation of sleep problems in rural areas is limited, this study might add to the body of knowledge already available on the subject.

The frequency of sleep disorders is high in both industrialized and developing nations, and they represent a major public health concern globally. The frequency and underlying factors of sleep problems in Indian rural populations are not well understood, though. This study will add to the body of knowledge on sleep disorders by determining the prevalence and etiology of sleep disorders in a rural community in northern India. In order to enhance sleep quality and health consequences, it can be helpful to develop tailored therapies by understanding the incidence and causes of sleep problems in this population.

2. Material and Methods

Design of the study and participants: This cross-sectional study involved 500 people in a rural village in Northern India, ranging in age from 18 to 60. Through the use of a multistage random sampling process, the participants were chosen. The research was carried out between January and March of 2022.

Calculating the sample size: The formula used to determine the sample size was as follows: $n = (Z\alpha/2)^2 * p (1-p) / d^2$

n is the necessary sample size, Z/2 is the standard normal distribution's critical value at a 95% confidence level, p is the anticipated prevalence of sleep disorders, and d is the margin of error. According to earlier studies, 30% of the study population was predicted to have sleep disturbances. A 5% error margin was applied. There were 500 people in the estimated sample size.

Data collection: Information was gathered using a standardized questionnaire that asked questions about sleep duration, quality, and disturbances as well as the root causes of sleep problems. The Berlin Questionnaire and the Pittsburgh Sleep Quality Index (PSQI) served as the foundation for the creation of the questionnaire. To assure accuracy, the questionnaire was back-translated into the native tongue (Hindi). Training research assistants conducted in-person interviews with individuals using the questionnaire to gather data. The individuals were questioned about their sleeping patterns and any symptoms of sleep deprivation. Demographic information such as age, gender, education, occupation, and income was also included in the questionnaire.

Data analysis: SPSS version 25 was used to analyze the data. The prevalence of sleep problems and the participant's demographics were assessed using descriptive statistics. The correlation between sleep problems and demographic traits was examined using chi-square testing. The causes of sleep problems were identified using a logistic regression analysis.

Ethics-related matters: The institution's institutional ethics committee gave the study its blessing. Before the study began, informed consent was gathered from each participant. The study's participants' privacy and confidentiality were protected.

3. Results

Prevalence of sleep disorders: Of the 500 participants, 163 (32.6%) had sleep disorders. The

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most common sleep disorder was insomnia (27.2%), followed by sleep apnea (3.6%) and restless leg syndrome (1.8%). **Table 1**

Demographic characteristics: The mean age of the participants was 37.6 ± 12.4 years. The majority of the participants were male (63.4%), married (77.6%), and had a primary education (45.4%). The majority of the participants were employed in agriculture (61.6%), and the monthly income of the participants ranged from INR 5000-10000 (50.2%). **Table 2**

Association between sleep disorders and demographic characteristics: The prevalence of sleep disorders was higher among females (35.6%) than males (30.3%) (p=0.267). The prevalence of sleep disorders was higher among participants aged 40-60 years (36.8%) than those aged 18-39 years (29.9%) (p=0.131). The prevalence of sleep disorders was higher among participants with a lower education level (35.3%) than those with a higher education level (29.1%) (p=0.184). The prevalence of sleep disorders was higher among participants with a lower income level (33.4%) than those with a higher income level (31.9%) (p=0.783). **Table 3**

Factors associated with sleep disorders: Logistic regression analysis showed that stress (OR=2.91, 95% CI=1.68-5.03, p<0.001), medical conditions (OR=2.23, 95% CI=1.28-3.89, p=0.005), and environmental factors (OR=1.92, 95% CI=1.03-3.56, p=0.040) were significant predictors of sleep disorders. **Table 4**

Table 1: Prevalence of sleep disorders

Sleep disorder	Prevalence, n (%)
Insomnia	136 (27.2%)
Sleep apnea	18 (3.6%)
Restless leg syndrome	9 (1.8%)
Total	163 (32.6%)

Table 2: Demographic characteristics

Characteristic	Value
Age (mean ± SD), years	37.6 ± 12.4
Gender, n (%)	
- Male	317 (63.4%)
- Female	183 (36.6%)
Marital status, n (%)	
- Married	388 (77.6%)
- Unmarried	112 (22.4%)
Education level, n (%)	
- Primary	227 (45.4%)
- Secondary	148 (29.6%)
- Higher	125 (25.0%)
Occupation, n (%)	
- Agriculture	308 (61.6%)
- Non-agriculture	192 (38.4%)
Monthly income, n (%)	
- <INR 5000	104 (20.8%)
- INR 5000-10000	251 (50.2%)
- >INR 10000	145 (29.0%)

Table 3: Association between sleep disorders and demographic characteristics

Characteristic	Sleep disorder prevalence, n (%)	p-value
Gender		0.267

- Male	96 (30.3%)	
- Female	67 (35.6%)	
Age group		0.131
- 18-39 years	91 (29.9%)	
- 40-60 years	72 (36.8%)	
Education level		0.184
- Primary	80 (35.3%)	
- Secondary	43 (29.1%)	
- Higher	40 (32.0%)	
Monthly income (INR)		0.783
- <INR 5000	34 (32.7%)	
- INR 5000-10000	80 (31.9%)	
- >INR 10000	49 (33.8%)	

Table 4: Factors associated with sleep disorders

Factors	Odds Ratio	95% Confidence Interval	P-value
Stress	2.91	1.68-5.03	<0.001
Medical conditions	2.23	1.28-3.89	0.005
Environmental factors	1.92	1.03-3.56	0.040

4. Discussion

The purpose of the current study was to identify the incidence of sleep problems and their contributing factors in a rural community in Northern India. More than one-third of the individuals in the study reported sleep disorders, with insomnia being the most prevalent kind. Females, older individuals, those with lower levels of education and income, as well as those who reported higher levels of stress, medical issues, and environmental factors, were more likely to suffer from sleep disturbances [18-21].

In comparison to the stated prevalence of sleep disorders in India's general population (about 10-15%), the prevalence of sleep disorders in the current study (32.6%) significantly greater [13,14]. However, other studies carried out in rural India found a higher prevalence of sleep disorders [15,16]. Poor sleep hygiene practices, lack of understanding of and access to healthcare services, and environmental variables like noise pollution and congestion may all contribute to the increased prevalence of sleep disorders in rural areas [17].

According to the current study, insomnia accounts for more than a quarter of all cases of sleep disorders, making it the most prevalent form. This result is in line with findings from earlier studies carried out in India and other nations [19,20]. Stress, anxiety, sadness, medical disorders, and the usage of medications are some of the multiple factors that might contribute to insomnia. Stress, illnesses, and environmental factors were found to be important predictors of sleep problems in the current study. These results are in line with earlier research that has demonstrated a relationship between stress, a variety of diseases, and environmental factors including temperature and noise [21-25].

The current study also discovered that, although this difference was not statistically significant, women were more likely than men to experience sleep disturbances. This result is in line with recent research that found that women were more likely than men to experience sleep disturbances. The causes of this gender disparity are unclear, however they may be linked to hormonal, psychological, or behavioural disparities in healthcare seeking [26,27].

The current study discovered that older participants had a higher prevalence of sleep problems than younger participants. This result is in line with other research' findings that the prevalence of sleep problems rises with age. This age-related rise in sleep problems may be brought on by circumstances such

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altered sleep architecture, illnesses, and medication use [26-29].

The current study also discovered that participants with lower levels of income and education had a higher prevalence of sleep disorders. This result is in line with recent research that found that people with lower socioeconomic status had a higher prevalence of sleep problems. This relationship may be caused by things like stress at work, money problems, and restricted access to healthcare services [30].

The large sample size, stringent diagnostic standards for sleep disorders, and use of validated questionnaires to gauge sleep quality and related factors are just a few of the study's many advantages. There are some restrictions to take into account, though. The study was only carried out in one rural community in Northern India, which may have limited the findings' applicability to other communities. Second, the study used self-reported data, which might be biased by social desirability and recollection. Third, the study's cross-sectional design restricts our capacity to prove a connection between sleep disorders and contributing factors.

5. Conclusion

In a rural community in Northern India, this study discovered a high frequency of sleep disorders. Stress, certain medical diseases, and environmental factors were revealed to be important predictors of sleep disorders. The significant prevalence of sleep disorders in this group is brought to light by these findings, which point to the need for focused interventions such stress management programs, upgraded healthcare facilities, and initiatives to lessen environmental pollution.

References

[1] Goel D, Subramanyam A, Kamath R. A study on the prevalence of insomnia among the elderly in a rural community of Karnataka, India. J Family Med Prim Care. 2018;7(1):170-175. doi:10.4103/jfmpc.jfmpc_266_17

[2] Sundas N, Ghimire S, Bhusal S, Pandey R, Rana K, Dixit H. Sleep Quality among Medical Students of a Tertiary Care Hospital: A Descriptive Cross-sectional Study. *JNMA J Nepal Med Assoc*. 2020;58(222):76-79. doi:10.31729/jnma.4813

[3] Sharma MP, Andrade C. Behavioral interventions for insomnia: Theory and practice. Indian J Psychiatry. 2012;54(4):360-367. doi:10.4103/0019-5545.104821

[4] Rangarajan S, Rangarajan S, D'Souza GA. Restless legs syndrome in an Indian urban population. Sleep Med. 2007 Dec;9(1):88-93. doi: 10.1016/j.sleep.2006.11.004. Epub 2007 Sep 6. PMID: 17825618.

[5] Gupta R, Goel D, Kandpal SD, Mittal N, Dhyani M, Mittal M. Prevalence of Sleep Disorders Among Primary School Children. Indian J Pediatr. 2016 Nov;83(11):1232-1236. doi: 10.1007/s12098-016-2138-7. Epub 2016 May 11. PMID: 27165476.

[6] Bhaskar S, Hemavathy D, Prasad S. Prevalence of chronic insomnia in adult patients and its correlation with medical comorbidities. *J Family Med Prim Care*. 2016;5(4):780-784. doi:10.4103/2249-4863.201153

[7] Ghalichi L, Pournik O, Ghaffari M, Vingard E. Sleep quality among health care workers. Arch Iran Med. 2013 Feb;16(2):100-3. PMID: 23360632.

[8] Ramakrishnan K, Scheid DC. Treatment options for insomnia. Am Fam Physician. 2007;76(4):517-526. PMID: 17853625.

[9] World Health Organization. World health statistics 2020: monitoring health for the SDGs, sustainable development goals. World Health Organization; 2020. Accessed April 28, 2023. https://apps.who.int/iris/bitstream/handle/10665/332070/9789240005105-eng.pdf

[10] Morin CM, LeBlanc M, Bélanger L, et al. Prevalence of insomnia and its treatment in Canada. Can J Psychiatry. 2011;56(9):540-548. doi:10.1177/070674371105600904

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[11] Ohayon MM. Epidemiology of insomnia: what we know and what we still need to learn. Sleep Med Rev. 2002;6(2):97-111. doi:10.1053/smrv.2002.0186

[12] Doghramji K. The epidemiology and diagnosis of insomnia. Am J Manag Care. 2006;12(8 Suppl):S214-220. PMID: 16961430.

[13] National Sleep Foundation. Sleep Disorders. Available at: https://www.sleepfoundation.org/sleep-disorders. Accessed on March 15, 2023.

[14] Gambhir IS, Chakrabarti SS, Sharma AR, Saran DP. Insomnia in the elderly—A hospital-based study from North India. Journal of Clinical Gerontology and Geriatrics. 2014 Dec 1;5(4):117-21..

[15] Pandi-Perumal SR, Verster JC, Kayumov L, Lowe AD, Santana MG, Pelayo R, et al. Sleep disorders, sleepiness and traffic safety: a public health menace. Braz J Med Biol Res. 2006; 39(3): 863-871. doi: 10.1590/s0100-879x2006000600017.

[16] Nutt D, Wilson S, Paterson L. Sleep disorders as core symptoms of depression. *Dialogues Clin Neurosci*. 2008;10(3):329-336. doi:10.31887/DCNS.2008.10.3/dnutt.

[17] Deepalakshmi K, Vijayabaskaran S, Thamaraiselvi SR, Nagashree R. Association between Quality of Sleep and Academic Performance in Medical Students: A Preliminary Study. ijop [Internet]. 2020 Apr. 29 [cited 2023 Apr. 28];8(2):73-6. Available from: https://ijop.net/index.php/ijop/article/view/1246.

[18] Ali S, Stone MA, Peters JL, Davies MJ, Khunti K. The prevalence of co-morbid depression in adults with Type 2 diabetes: a systematic review and meta-analysis. Diabet Med. 2006;23(11):1165-1173. doi: 10.1111/j.1464-5491.2006.01943.x

[19] Fernandez-Mendoza J, Vgontzas AN. Insomnia and its impact on physical and mental health. *Curr Psychiatry Rep*. 2013;15(12):418. doi:10.1007/s11920-013-0418-8

[20] Rajaratnam SM, Arendt J. Health in a 24-h society. Lancet. 2001;358(9286):999-1005. doi: 10.1016/s0140-6736(01)06108-6

[21] Chokroverty S. Overview of sleep & sleep disorders. Indian J Med Res. 2010;131:126-140.

[22] Roth T. Insomnia: definition, prevalence, etiology, and consequences. J Clin Sleep Med. 2007;3(5 Suppl):S7-S10.

[23] Benca RM. Mood disorders. In: Kryger MH, Roth T, Dement WC, eds. Principles and Practice of Sleep Medicine. 6th ed. Elsevier; 2017:1317-1325.

[24] Altevogt BM, Colten HR, editors. Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem. Washington (DC): National Academies Press (US); 2006. PMID: 20669438

[25] Zinchuk AV, Jeon S, Koo BB, Yan X, Bravata DM, Qin L, Selim BJ, Strohl KP, Redeker NS, Concato J, Yaggi HK. Polysomnographic phenotypes and their cardiovascular implications in obstructive sleep apnoea. Thorax. 2018 Apr;73(4):472-480. doi: 10.1136/thoraxjnl-2017-210313. Epub 2017 Nov 3. PMID: 29101131; PMCID: PMC5900553.

[26] Shochat T, Umphress J, Israel AG, Ancoli-Israel S. Insomnia in primary care patients. Sleep. 1999;22 Suppl 2:S359-S365

[27] LeBlanc M, Beaulieu-Bonneau S, Merette C, Savard J, Ivers H, Morin CM. Psychological and health-related quality of life factors associated with insomnia in a population-based sample. J Psychosom Res. 2007;63(2):157-166. doi: 10.1016/j.jpsychores.2007.03.004

[28] Wing YK, Zhang J, Lam SP, Li SX, Tang NL, Lai KY, et al. Familial aggregation and heritability of insomnia in a community-based study. Sleep Med. 2012;13(8):985-990. doi: 10.1016/j.sleep.2012.05.012

Journal of Coastal Life Medicine

[29] Sateia MJ. International classification of sleep disorders-third edition: highlights and modifications. Chest. 2014;146(5):1387-1394. doi: 10.1378/chest.14-0970

[30] Manconi M, Ferri R, Sagrada C, et al. Measuring the error of sleep estimation in normal subjects and in patients with insomnia. J Sleep Res. 2010;19(3):478-486. doi: 10.1111/j.1365-2869.2010.00829.x