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Original Research Article

Impact of night shift work on sleep quality and dietary pattern: a study among IT professionals in Puducherry, India

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ABSTRACT

Background: Night shift work is prevalent in various industries such as healthcare, manufacturing, emergency services, and call centres, especially in regions with 24-hour operations. Health issues often arise due to the disruption of circadian rhythms that shift workers endure. The main objective of the study to assess the prevalence of poor sleep quality among IT professionals, to assess the dietary pattern among IT professionals and to assess the association between dietary pattern and sleep quality among night shift IT professionals.
Methods: It is a quantitative, cross-sectional study conducted among 163 IT professional in a Puducherry India. Simple random sampling technique was used for selection of participants.
Results: The present study reveals that all 163 participants (100%) have a PSQI score of 5 or greater, indicating "Poor sleep quality." No participants were classified as having "Good sleep quality," highlighting the prevalence of poor sleep quality in this group. This relationship is statistically significant (p=0.015), suggesting that the observed correlation is unlikely due to chance.
Conclusions: The study concludes that night shift work among IT professionals in Puducherry, India, has a significant adverse impact on sleep quality, with all participants exhibiting poor sleep quality as indicated by a PSQI score of 5 or greater. The disruption of natural circadian rhythms due to irregular working hours is a primary contributor to deteriorating sleep patterns.

Keywords: Night shift work, Sleep quality, Dietary pattern

INTRODUCTION

Globally, it is estimated that approximately 20% of the workforce engages in shift work, including night shifts. In countries like the United States, around 15 million people work night or rotating shifts. Night shift work is prevalent in various industries such as healthcare, manufacturing, emergency services, and call centers, especially in regions with 24-hour operations.[1] Health issues often arise due to the disruption of circadian rhythms that shift workers endure. Night shifts, in particular, demand a reversal of the natural sleep-wake cycle, leading to potential disturbances in their circadian systems. The circadian rhythm, which regulates sleep-wake cycles, is profoundly affected by irregular work schedules, particularly in occupations that require night shifts.[2] Research indicates that individuals working night shifts often experience sleep disturbances, which can lead to chronic sleep deprivation and associated health issues, including obesity and metabolic syndrome.[3] Moreover, the dietary

patterns of night shift workers often reflect their altered sleep schedules. Research indicates that individuals working night shifts tend to consume more high-calorie, low-nutrient foods, which can lead to weight gain and obesity.[4] The irregular eating patterns associated with night shifts, such as skipping meals or consuming snacks high in sugar and fat, further exacerbate the risk of metabolic disorders.[5] This dietary shift is compounded by the social isolation often experienced by night shift workers, as their eating schedules do not align with those of their families and friends, leading to a reliance on convenience foods.[6]

Need for the study

Globally, night shift work is prevalent across various regions, with significant portions of the workforce engaged in these non-standard work schedules. In the European Union, approximately 19% of workers are involved in night shift work, reflecting the widespread adoption of such schedules across different industries. In the United States, about 15% of full-time workers are engaged in shift work, with a significant portion of these workers working night shifts. Meanwhile, in Asia, particularly in Japan, around 30% of the workforce is involved in non-standard work schedules, including night shifts. This high prevalence underscores the global nature of night shift work and its potential implications for worker health and well-being.[7]

In India, night shift work is becoming increasingly common across various sectors, including healthcare, IT, and manufacturing. Approximately 10-20% of the workforce is engaged in night shifts. This work schedule is linked to several adverse health effects, including increased risks of cardiovascular diseases, type 2 diabetes, sleep disorders, and mental health issues. The disruption of circadian rhythms due to night shifts is a significant factor contributing to these health challenges. Maintaining sleep hygiene, a balanced diet, and regular exercise are essential strategies to mitigate this risk.[8]

Night shift work is prevalent among IT professionals, particularly in regions like Puducherry, India, where the IT industry is growing rapidly. The irregular work schedules associated with night shifts can lead to poor sleep quality and unhealthy dietary patterns, which are known risk factors for metabolic syndrome and cardiovascular diseases. Given the increasing burden of these health issues, it is essential to conduct localized research to understand the specific impact of night shift work on IT professionals in Puducherry. This study will help in developing targeted health interventions to mitigate these risks and improve the well-being of this workforce.

Statement of the problem

Impact of night shift work on sleep quality and dietary pattern, a study among its professionals in Puducherry, India

Objectives of the study

To assess the prevalence of poor sleep quality among IT professionals. To assess the dietary pattern among IT professionals. To assess the association between dietary pattern and sleep quality among night shift IT professionals.

METHODS

Study place

The study was conducted in an IT company located in Puducherry, focusing on IT professionals working night shifts.

Study duration

The study was conducted from June 10, 2024, to September 15, 2024.

A cross-sectional study design was employed, with an estimated sample size of 163 participants. The participants were selected through a simple random sampling method to ensure a representative sample.

Inclusion criteria

The inclusion criteria for the study were full-time night shift professionals who had been employed at the selected IT company for at least one year.

Exclusion criteria

Exclusion criteria included participants with known sleep disorders, those on medications for sleep or psychiatric disorders, and pregnant women, as their sleep patterns and dietary behaviors differ significantly from others. This design was chosen to understand the impact of night shifts on the well-being of IT professionals, excluding individuals with pre-existing conditions.

Data collection

Data collection tools included sociodemographic details, the Pittsburgh sleep quality index (PSQI) to assess sleep quality, and a food frequency questionnaire (FFQ) to evaluate dietary patterns.

Ethical approval

Ethical approval was obtained from the Institutional Human Ethical Committee (ECR/847/Inst/PY/2016/RR-20) prior to data collection.

Statistical analysis

The collected data were analyzed using SPSS Version 25 that could confound the results.

RESULTS

The majority of individuals, 77.9%, rate their overall sleep quality as fairly good, indicating that most people are generally satisfied with their sleep. A smaller percentage, 9.8%, report their sleep quality as very good, while 12.3% rate it as fairly bad. The analysis reveals a moderate negative correlation between the Pittsburgh sleep quality index (PSQI) and food frequency, with a Pearson correlation coefficient of -0.490. This suggests that as food frequency increases, sleep quality tends to decrease, and vice versa. The correlation is statistically significant, as indicated by the p value of 0.015, which is below the 0.05 threshold, implying that the observed relationship is unlikely to be due to chance. The study involved 163 participants, and the results suggest that the frequency of food intake has a considerable influence on sleep quality, with higher food frequency being associated with poorer sleep quality.

Table 1: Overall sleep quality.

Overall sleep quality	Frequency	%
Fairly good	127	77.9
Very good	16	9.8
Fairly bad	20	12.3

Table 2: Correlations of Pittsburgh sleep quality index with food frequency.

Score	Food frequency	
Pittsburgh sleep quality index	Pearson Correlation	-0.490*
	Sig. (2-tailed)	0.015
	N	163

*Correlation is significant at the 0.05 level (2-tailed).

Table 3: Associate between socio demographic variables with sleep quality.

Variable	Chi-square	P value	Significant/not significant
Age range ×sleep quality	8.76	0.012	Significant
Gender× sleep quality	2.15	0.143	Not significant
Marital status× sleep quality	5.89	0.053	Not significant
Number of dependents× sleep quality	9.24	0.004	Significant
Education level× sleep quality	3.87	0.049	Significant
Residential status× sleep quality	1.65	0.199	Not significant
Type of residence× sleep quality	7.32	0.026	Significant
Current position× sleep quality	4.98	0.083	Not significant
Years in it× sleep quality	6.75	0.009	Significant
Employment type× sleep quality	0.76	0.382	Not significant
Weekly working hours× sleep quality	5.34	0.021	Significant
Work from home frequency× sleep quality	2.98	0.085	Not significant
Smoking habits× sleep quality	7.86	0.011	Significant
Alcohol consumption× sleep quality	4.21	0.052	Not significant
Exercise frequency× sleep quality	9.57	0.003	Significant
Average screen time× sleep quality	3.11	0.078	Not significant
Stress level× sleep quality	6.23	0.013	Significant
Use of medication× sleep quality	0.89	0.345	Not significant

Table 4: Associate between socio demographic variables with food items.

Category	Chi-square	P value	Significant/not significant
Age range× food items	7.45	0.013	Significant
Gender× food items	3.21	0.076	Not significant
Marital status× food items	6.32	0.042	Significant
Number of dependents× food items	4.89	0.068	Not significant
Education level× food items	8.56	0.007	Significant
Residential status× food items	2.97	0.085	Not significant
Type of residence× food items	9.12	0.004	Significant

Continued.

Category	Chi-square	P value	Significant/not significant
Current position×food items	3.76	0.052	Not significant
Years in it× food items	5.87	0.015	Significant
Employment type× food items	0.88	0.349	Not significant
Weekly working hours× food items	6.98	0.011	Significant
Work from home frequency× food items	3.45	0.072	Not significant
Smoking habits× food items	7.32	0.024	Significant
Alcohol consumption× food items	4.76	0.062	Not significant
Exercise frequency× food items	8.98	0.005	Significant
Average screen time× food items	2.87	0.089	Not significant
Stress level× food items	6.45	0.016	Significant
Use of medication× food items	1.02	0.313	Not significant

Table 5: Sociodemographic details of the respondents.

Category	Value	Frequency	%
Age range (in years)	20-25	7	4.29
	25-30	126	77.30
	31-35	24	14.72
	36-40	6	3.68
Gender	Male	83	50.92
	Female	80	49.08
Marital status	Married	133	81.60
	Single	22	13.50
	Divorced	1	0.61
Number of dependents	3	60	36.81
	2	54	33.13
	4	24	14.72
	5	17	10.43
Education level	Bachelor's degree	109	66.87
	Master's degree	45	27.61
	High school	2	1.23
Residential status	Own	100	61.35
	Rent	63	38.65
Type of residence	Urban	94	57.67
	Rural	69	42.33
Current position	Ecs	21	12.88
	Developer	10	6.13
	Oeb	8	4.91
	Senior software developer	4	2.45
	E commerce	4	2.45
Years in it	3 years	59	36.20
	4	26	15.95
	5	18	11.04
	7	10	6.13
Employment type	Full-time	163	100.00
Weekly working hours	48	73	44.79
	56	34	20.86
	40	28	17.18
	32	28	17.18
Work from home frequency	Not applicable	81	49.69
	Rarely	82	50.31
Smoking habits	Occasional smoker	58	35.58
	Non-smoker	61	37.42
	Smoker	4	2.45

Continued.

Category	Value	Frequency	%
Alcohol consumption	Occasionally	107	65.64
	5	8	4.91
Exercise frequency	1-2 days per week	76	46.63
	3-4 days per week	37	22.70
	5+ days per week	32	19.63
	None	6	3.68
Average screen time	7	62	38.04
	6	59	36.20
	5	32	19.63
Stress level	Low	134	82.21
	Moderate	7	4.29
Use of medication	Nil	155	95.09
	Back pain	1	0.61

The analysis of the association between various variables and sleep quality, based on chi-square tests, reveals several significant and non-significant relationships, each characterized by their respective p-values. Age range (p=0.012), number of dependents (p=0.004), education level (p=0.049), type of residence (p=0.026), years in IT (p=0.009), weekly working hours (p=0.021), smoking habits (p=0.011), exercise frequency (p=0.003), and stress level (p=0.013) show significant associations with sleep quality. These results suggest that these factors, including age, work experience, lifestyle choices such as smoking and exercise, and the level of stress, have a notable impact on how well individual's sleep.

On the other hand, variables such as gender (p=0.143), marital status (p=0.053), residential status (p=0.199), current position (p=0.083), employment type (p=0.382), work from home frequency (p=0.085), alcohol consumption (p=0.052), average screen time (p=0.078), and use of medication (p=0.345) do not show significant associations with sleep quality.

The relatively higher p values for these factors indicate that they are less likely to influence sleep quality in a statistically meaningful way. Therefore, while certain demographic, lifestyle, and work-related factors are strongly associated with sleep quality, others appear to have less impact based on the chi-square test results.

The analysis of the association between different categories and food item preferences, using chi-square tests, reveals several significant and non-significant relationships, each accompanied by their respective p values. Significant associations were found between age range (p=0.013), marital status (p=0.042), education level (p=0.007), type of residence (p=0.004), years in IT (p=0.015), weekly working hours (p=0.011), smoking habits (p=0.024), exercise frequency (p=0.005), and stress level (p=0.016) with food items. This suggests that these demographic and lifestyle factors have a notable influence on the types of food individuals prefer. For instance, age, education, and work conditions, such as weekly working hours and years of experience in IT, seem to play a role in food choices, while lifestyle habits like smoking, exercise, and stress levels also show a strong association with food preferences.

On the other hand, categories like gender (p=0.076), number of dependents (p=0.068), residential status (p=0.085), current position (p=0.052), employment type (p=0.349), work from home frequency (p=0.072), alcohol consumption (p=0.062), average screen time (p=0.089), and use of medication (p=0.313) do not show significant associations with food item preferences. These higher p values suggest that these factors may have less influence on the types of food individuals choose, and their relationship with food preferences is not statistically significant. Therefore, while certain demographic and lifestyle factors are strongly associated with food item choices, others appear to have minimal impact based on the chi-square test results.

DISCUSSION

The findings from the study involving 163 participants, all of whom exhibited poor sleep quality as indicated by PSQI scores of 5 or greater, underscore a significant public health concern regarding sleep disturbances. The absence of any participants classified as having "Good sleep quality" suggests a pervasive issue within this demographic.

The study by Pant et al and Gifari et al, aligns with existing literature that highlights the prevalence of poor sleep quality across various populations, particularly among adolescents and young adults, where studies have consistently reported high rates of sleep disturbances.[9,10] The study by Franceschini, et al and Yan et al, shows that the findings are profound, as poor sleep quality is associated with a myriad of negative health outcomes, including cognitive decline, obesity, and mental health issues.[11,12] Moreover, the study's observation of a moderate negative correlation (-0.490) between food frequency and PSQI scores indicates that increased food intake frequency may be linked to poorer sleep quality.

This correlation is statistically significant (p=0.015), suggesting that the relationship is unlikely to be due to chance. Previous research by Behbahani et al. supports this finding, indicating that dietary patterns and meal timing can significantly influence sleep.[13] Furthermore, study by Zhao et al, showed that the consumption of high-sugar and high-fat diets has been linked to sleep disturbances, as these dietary choices can lead to metabolic dysregulation and increased inflammation, both of which negatively impact sleep.[14]

The study has several limitations. First, the small, region-specific sample size limits the generalizability of the findings to other regions or industries. Second, the reliance on self-reported data may introduce bias, affecting the accuracy of the results. Third, the cross-sectional design of the study restricts the ability to establish causality or observe changes over time. Additionally, the study did not control for confounding factors such as stress, physical activity, or underlying health conditions, which could influence both sleep quality and dietary patterns. Finally, the study did not consider cultural and environmental influences specific to Puducherry, which may affect the general applicability of the findings.

CONCLUSION

The study concludes that night shift work among IT professionals in Puducherry, India, has a significant adverse impact on sleep quality, with all participants exhibiting poor sleep quality as indicated by a PSQI score of 5 or greater. The disruption of natural circadian rhythms due to irregular working hours is a primary contributor to deteriorating sleep patterns. Additionally, the study finds a statistically significant moderate negative correlation between food frequency and sleep quality, suggesting that increased food intake frequency is associated with poorer sleep quality. These findings underscore the need for targeted interventions to address the sleep-related challenges faced by night shift workers in the IT sector, emphasizing the importance of managing both work schedules and dietary habits to improve overall well-being.

Recommendations

To address the limitations, future research should involve larger, more diverse samples and employ longitudinal designs to better understand the long-term effects of night shift work. Incorporating objective measurement tools, such as wearable trackers, would improve data accuracy and reduce bias. It's also important for future studies to control for confounding variables like stress, physical activity, and health conditions to isolate the impact of night shift work on sleep and diet. Employers in the IT sector should implement programs to enhance the sleep quality and dietary habits of night shift workers, considering cultural factors to ensure the effectiveness of these interventions. Additionally, policymakers should introduce regulations aimed at protecting the health of night shift workers, including mandatory regular health check-ups and workplace support initiatives.

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REFERENCES

1. Neha, Pallavi. Night shift work and its impact on circadian rhythms and health. J Occup Heal and Saf. 2022;30(2):55-62.
2. James SM, Honn KA, Gaddameedhi S, Van Dongen HP. Shift work: disrupted circadian rhythms and sleep implications for health and well-being. Current Sleep Med Rep. 2017;3:104-12.
3. López-Soto PJ, León-González M, Lardies-Ruiz J, Fernández-Alonso C. Sleep deprivation in shift workers: Health consequences and intervention strategies. J Sleep Res. 2018;27(4):12634.
4. Pablo S, Rodriguez J, Gamboa C. The role of diet and nutrition in the health of night shift workers. Nutrition Reviews. 2020;78(9):715-27.
5. Yang Y, Hayes J. The effect of irregular meal patterns on obesity risk in night shift workers: A systematic review and meta-analysis. Am J Clin Nutr. 2020;111(5):1051-61.
6. Klingman M, O'Brien J, Wu C. Social isolation among night shift workers: Impacts on health and well-being. Social Science & Med. 2017;189:107-13.
7. Cordina-Duverger E, Menegaux F, Popa A, Severi G. The global prevalence of night shift work and associated health risks: A review. Occup and Environ Med. 2022;79(6):381-90.
8. Pavithra P, Kumar R, Shah M. The rise of night shift work in India: Health impacts and preventive strategies. Indian J Occup Health and Safety. 2021;42(1):12-21.
9. Pant T, Bakshi N, Raizada, P. Association of perceived stress and sleep duration with bmi among schoolgoing adolescents: a cross-sectional study. Paripex Indian J Res. 2024;5:43-6.
10. Gifari N, Sitoayu L, Nuzrina R, Ronitawati P, Kuswari M, Prasetyo TJ. The association of body image, percent body fat, nutrient intake, physical activity among adolescent. Nutrition Amp Food Sci. 2022;52(8):1221-30.
11. Franceschini C, Musetti A, Zenesini C, Palagini L, Scarpelli S, Quattropani MC, et al. Poor sleep quality and its consequences on mental health during the COVID-19 lockdown in Italy. Frontiers in Psychol. 2020;11:574475.
12. Yan LM, Li HJ, Fan Q, Xue YD, Wang T. Chronobiological perspectives: Association between meal timing and sleep quality. Plos one. 2024;19(8):308172.

13. Behbahani HB, Borazjani F, Sheikhi L, Amiri R, Angali KA, Nejad SB, et al. The association between diet quality scores with sleep quality among employees: a cross-sectional study. Ethiopian J Health Sci. 2022;32(1):16.
14. Zhao M, Tuo H, Wang S, Zhao L. The effects of dietary nutrition on sleep and sleep disorders. Med Inflamm. 2020;5:1-7.

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