

Examining the relationship between Occupational stress and nicotine dependence and its impact on oral health among the night security guards of Guwahati city, Assam.

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ABSTRACT

Introduction: Oral health is an essential component of overall well-being, and it can be significantly influenced by a variety of factors, including occupational stress and nicotine use. The interplay between the demands of the workplace and the use of nicotine can wreak havoc on our oral health.

Aim-The objective of this study was to find the association between occupational stress and nicotine dependence and its impact on oral health among the night security guards of Guwahati city, Assam.

Methodology - A cross sectional study was conducted on 250 randomly selected Night Security Guards in Guwahati city. The questionnaire consisted of data regarding general information, nicotine dependence using the Modified Fagerstrom scale and work stress related questions using Likert scale and clinical examination was done using Modified WHO Oral Health Proforma (2013).

Results-Based on the findings it was found that among **250 participants**, most of them were male security guards. Presence or absence of tobacco habit, it was found that most of them were using some kind of tobacco product. It was found that the night security guards using any kind of tobacco product had an adverse oral health status which was associated with some kind of occupational stress.

Conclusion-In the present study poor oral health status is associated with occupational stress and nicotine dependence.

Introduction

Occupational stress is a pervasive issue affecting individuals across various professions, and its consequences extend beyond the workplace to impact overall well-being.¹

Among the workforce, night security guards represent a unique demographic facing distinct challenges, including irregular work hours, potential security threats, and heightened stress levels associated with nocturnal responsibilities.

In response to these stressors, individuals may resort to coping mechanisms, with nicotine dependence emerging as a common strategy.²

Tobacco use, a prevalent source of nicotine, has been linked to numerous oral health issues, such as periodontal disease, tooth decay, and compromised overall oral hygiene. Understanding the interplay between occupational stress, nicotine dependence, and oral health is crucial for developing targeted interventions and preventive measures to mitigate potential health risks among night security guards. Night security guards, entrusted with the safety and security of properties and individuals during the vulnerable hours of the night, often face unique challenges that can contribute to elevated levels of occupational stress. The irregularity of their work hours disrupts circadian rhythms, leading to sleep disturbances and fatigue, which can exacerbate stress levels and compromise overall well-being. Additionally, the nature of their responsibilities, which involves remaining vigilant and alert to potential security threats, further contributes to heightened stress and anxiety.³

In response to these stressors, night security guards may adopt coping mechanisms to alleviate their psychological distress. Nicotine dependence, fueled by tobacco use, emerges as a prevalent coping strategy among individuals seeking relief from occupational stress. Nicotine, a highly addictive substance present in tobacco, exerts psychoactive effects that can temporarily alleviate stress and anxiety. However, the long-term consequences of nicotine dependence extend far beyond its immediate calming effects, posing significant risks to both physical and oral health.^[4,5]

Understanding the complex interplay between occupational stress, nicotine dependence, and oral health among night security guards requires a comprehensive approach that considers the multifaceted nature of these factors. By elucidating the mechanisms underlying these relationships, researchers can inform the development of targeted interventions aimed at mitigating occupational stress, promoting healthier coping strategies, and improving oral health outcomes among this vulnerable population.^[6-11]

In this comprehensive study, we aim to delve into the intricate relationship between occupational stress, nicotine dependence, and oral health among the night security guards of Guwahati city, Assam. Our primary objectives revolve around evaluating the associations between these key factors to better understand their combined impact on the well-being of this unique demographic. Firstly, we seek to determine whether there exists a discernible association between nicotine dependence and occupational stress among night security guards. By exploring this link, we aim to uncover how the adoption of nicotine dependence may be influenced by the stressors inherent in their profession. Secondly, we endeavor to assess the association between nicotine dependence and oral health status among night security guards. This objective stems from the well-

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established literature linking tobacco use to various oral health issues, and we aim to elucidate how nicotine dependence exacerbates these concerns within the context of their occupational stress. Lastly, we aim to investigate the association between occupational stress and oral health status independently, recognizing that stress can manifest in various ways and may impact oral health outcomes directly. Through these objectives, we aim to provide a comprehensive understanding of the interconnectedness of occupational stress, nicotine dependence, and oral health among night security guards, laying the groundwork for targeted interventions and support mechanisms tailored to their unique needs.

Methods

A Cross-sectional questionnaire based study was conducted among the night security guards of Guwahati city, Assam. The data were collected during January 2023 to February 2023. The study was approved by the Institutional Ethical Committee at Rama Dental College Hospital and Research Centre, Kanpur. The study encompasses night security guards who are present during the study period, exclusively work night shifts, and have provided written informed consent to participate. Night security guards who declined participation in the study were excluded, as well as those who were on leave during the study period.

Sample size was calculated using G*Power 3.1.9.4 software. The prevalence of periodontal disease among night security guards, with low and high occupational stress levels were used from a previous study done by Monika et al.⁶ Test of proportions for two independent groups was used in G Power, at an $\alpha = 0.05$, and Power of 0.9, the total sample size was calculated as 250.

Data collection

Data were collected through a face to face interview using a structured questionnaire. Face validity of the questionnaire was tested by the faculty members in the department and the reliability of the questionnaire was checked using Cronbach's alpha (0.84).

The complete information about the study was informed to the participants as mentioned in the participant information sheet. Signed informed consent form was obtained from all the participating subjects after explaining the complete procedure in their vernacular language. Clinical assessment was carried out for a total sample size of 250 night security guards, under the available natural light. The ADA type III examination (inspection using mouth mirror, explorer and adequate illumination) was used.

The questionnaire consisted of 3 sections. **(i) Section A** consisted of general information questions, which included questions concerning age, gender, marital status, educational level, employment status and income. Age was categorized into four groups (under 18 years, 18-25 years, 26-35 years, 36-45 years, 46-55 years, 56 years and above. The level of education was categorized as less than high school, high school, Bachelor's degree and postgraduate degree. It

then focuses on questions on oral hygiene practices and tobacco use, with questions about frequency, duration, and amount of tobacco consumption. **(ii) Section B** consisted of 6 Nicotine Dependence questions for both smoke and smokeless tobacco, each of which delves into specific scales to measure nicotine dependence for both smokers and smokeless tobacco users using Modified Fagerstrom scale, assessing factors such as time to first use, difficulty refraining from use, and frequency of use **(iii) Section C** consisted of 15 work stress related questions with options following a 5-point Likert scale (strongly agree = 5, agree = 4, disagree = 3, strongly disagree = 2 and unsure = 1), which includes questions on feelings of stress during night shifts, workload, difficulty balancing work and personal life, fatigue, communication challenges, and coping mechanisms like nicotine use. For calculating the work stress, a total score range was between 15-75. The participant having score range between 15-50 are classified having low stress while the participant having score between 51-75 are classified having high stress. The clinical examination was done using Modified WHO Oral Health Pro Forma 2013 for recording CPI index and oral mucosal lesions.

Statistical Analysis

Analyses were performed using a personal computer with SPSS version 24. A significant relationship was assumed to exist if the P value was found to be <0.05 . Chi-square test was used to find out the association of Nicotine dependence and occupational stress on the Prevalence of Periodontal disease and oral mucosal lesions.

Results

The results of the study provide insights into the prevalence of tobacco use, nicotine dependence, and occupational stress among night security guards in Guwahati city, Assam. This section presents a detailed analysis of the data gathered through surveys and assessments, focusing on key variables such as tobacco use patterns, levels of nicotine dependence, and the impact of occupational stress on oral health. Additionally, the associations between these factors are explored to better understand the complex relationship between occupational stress, nicotine dependence, and oral health outcomes among this population.

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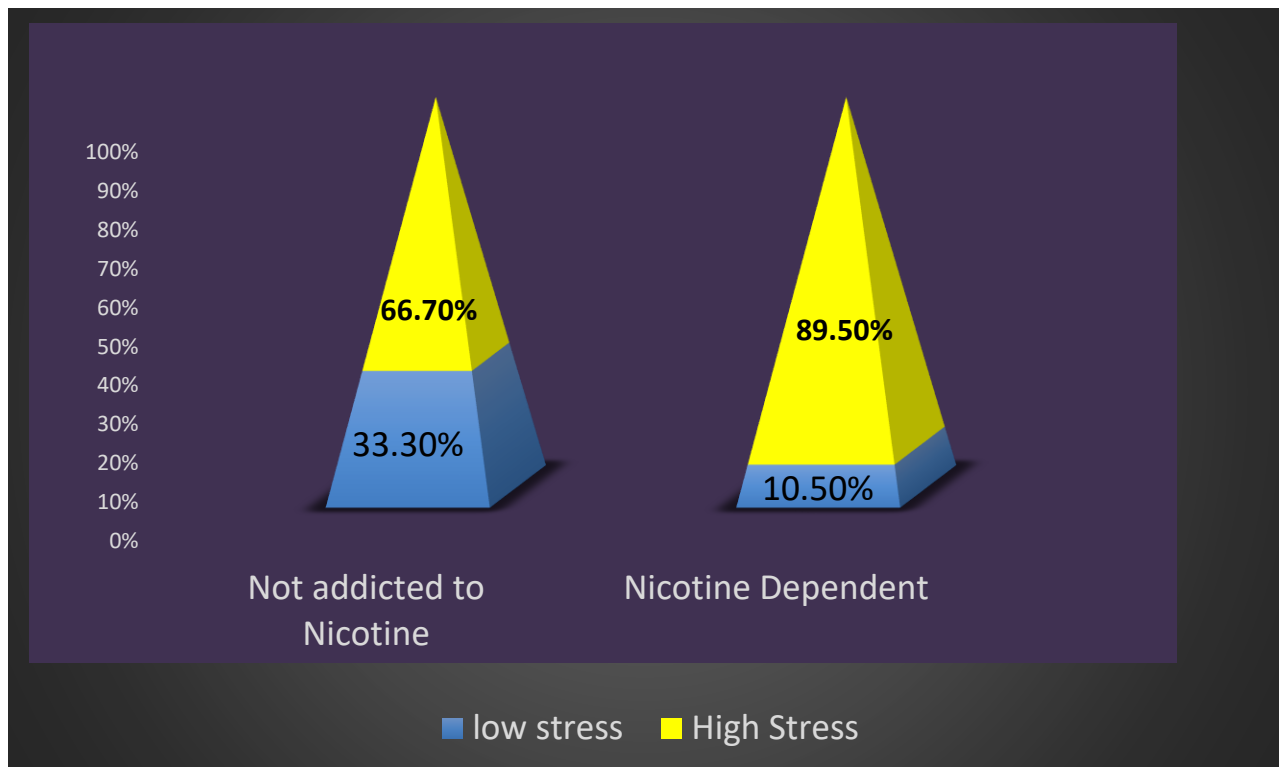
Use of Tobacco	Not used	21	8.4
	Yes	229	91.6
Form of Tobacco use	Not used	21	8.4
	Smoke	52	20.8
	Smokeless	62	24.8
	Both	95	38.0
Dependence to Smoking addiction	No habit	83	33.2
	Low to moderate	44	17.6
	High	107	42.8
	Significant	16	6.4
Dependence to Smokeless Tobacco addiction	No habit	73	29.2
	Low to moderate	32	12.8
	High	104	41.6
	Significant	41	16.4
Stress level	Low stress	31	12.4
	High Stress	219	87.6

Table no. 1 focuses on distribution of study population according to tobacco use, nicotine dependence and occupational stress, with 91.6% of the night security guards using tobacco in some form. The most common forms of tobacco use are both smoking and smokeless (38%), followed by smokeless (24.8%), and smoking (20.8%). The population has varying levels of dependence on smoking addiction and smokeless tobacco addiction, with the majority having a high level of dependence. 87.6% of the population experiences high levels of occupational stress.

Table no 1: Distribution of study population according to tobacco use, nicotine dependence and occupational stress

Graph 1 showed that 66.7% (N=14) not addicted to nicotine have high stress while 89.5% (N=205) participants had high stress among participants addicted to nicotine. The result showed significant association between nicotine dependence and stress with chi square value 9.24 and P value 0.008.

Graph1 :Association between Nicotine Dependence and Occupational stress



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Table no. 2 presents the prevalence of periodontal disease and oral mucosal lesions based on nicotine dependence to smoking and smokeless tobacco. The table shows that there is significant association between dependence to smoking addiction and the presence of periodontal disease (with a p-value of 0.073) and oral mucosal lesion (with a p-value of 0.025*). Similarly, there is a significant association between dependence to smokeless tobacco addiction and the presence of periodontal disease (with a p-value of 0.048*) but not with oral mucosal lesions (with a p-value of 0.44).

Table 2 Distribution of periodontal disease and mucosal lesions by nicotine dependence to smoking and smokeless tobacco.

Factor	Response	periodontal disease			oral mucosal lesion		
		Present	Absent	P value	Present	Absent	P value
Dependence to Smoking addiction	No habit	50	33	0.073	28	55	0.025*
	Low to moderate	34	10		18	26	
	High	81	26		33	74	
	Significant	10	6		11	5	
Dependence to Smokeless Tobacco addiction	No habit	46	27	0.048*	22	51	0.44
	Low to moderate	21	11		10	22	
	High	73	31		43	61	
	Significant	35	6		15	16	

Table 3 shows distribution of periodontal disease and oral mucosal lesions by occupational stress in which for tobacco use, it was found that individuals who were addicted to tobacco had a significantly higher prevalence of periodontal disease compared to those who were not addicted (169 vs 6, p value = 0.001**). Similarly, addicted individuals had a higher prevalence of oral mucosal lesions compared to non-addicted individuals (87 vs 3, p value = 0.033*). In terms of stress, individuals with high stress levels had a significantly higher prevalence of periodontal disease compared to those with low stress levels (163 vs 12, p value = 0.001**). Similarly, individuals with high stress levels had a higher prevalence of oral mucosal lesions compared to those with low stress levels (84 vs 6, p value = 0.046*).

Table3 : Distribution of periodontal disease and oral mucosal lesions by occupational stress.

Factor	Response	periodontal disease			oral mucosal lesion		
		Present (N)	Absent (N)	P value	Present (N)	Absent (N)	P value
Stress	Low stress	12	19	0.001**	6	25	0.046*
	High Stress	163	56		84	125	

Chi Square test, *Significant, **Highly significant

Overall, the findings suggest that both tobacco use and high stress levels are associated with an increased prevalence of periodontal disease and oral mucosal lesions.

These results highlight the importance of addressing tobacco addiction and managing stress levels in order to reduce the risk of these oral health conditions.

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DISCUSSIONS

The findings of this cross-sectional study shed light on the intricate relationship between demographic characteristics, occupational stress, nicotine dependence, tobacco use, and oral health status. It's noteworthy that the study includes more male participants, revealing a high prevalence of tobacco use among security guards, which correlated with a heightened incidence of periodontal disease and oral mucosal lesions.

Interestingly, the study echoes previous research by Radi et al., indicating a gender-specific impact of job strain on tobacco use, with high job strain being associated with smoking in males but not in females. This underscores the importance of considering gender disparities in understanding the multifaceted dynamics of tobacco use and its implications for oral health.¹²

Moreover, the observed association between nicotine dependence and periodontal disease aligns with existing literature, particularly the findings of Shizukuishi et al. among Japanese factory workers.¹³ However, due to the small number of female smokers in the study, definitive conclusions regarding this relationship among females remain elusive.

The higher prevalence of oral mucosal lesions among males, attributed to the prevalent smoking and tobacco-chewing habits, underscores the urgent need for targeted interventions to mitigate the detrimental effects of tobacco on oral health. The study's identification of a significant association between oral mucosal lesions and nicotine dependence further underscores the role of tobacco use as a major risk factor for potentially malignant oral lesions and cancer.¹⁴

Moreover, the study's findings linking high occupational stress with a heightened prevalence of periodontal disease resonate with the broader literature on the association between stress and oral health outcomes. Linden et al.'s findings corroborate this association, highlighting the need for holistic approaches to address both occupational stress and periodontal health.^[15-17]

However, it's important to acknowledge the study's limitations, such as the lack of differentiation between potentially malignant oral lesions and other conditions due to diagnostic constraints. Despite these limitations, the study underscores the imperative for robust anti-tobacco advocacy and stringent implementation of tobacco control measures to safeguard both general and oral health.

Conclusion

Based on the results of your study, it is evident that there is a high prevalence of tobacco use, particularly among night security guards, with 91.6% using tobacco in some form. Both smoking and smokeless forms are common, and a majority of the population exhibits a high level of dependence on nicotine. Additionally, a significant association between nicotine dependence and occupational stress was observed, indicating that individuals addicted to nicotine experience higher levels of stress. Furthermore, the study highlights a noteworthy association between nicotine dependence and oral health issues. Individuals dependent on smoking and smokeless tobacco show a significant correlation with the presence of periodontal disease and oral mucosal lesions. Integrating mental health support, smoking cessation programs, and oral health interventions can contribute to a comprehensive strategy for improving the overall health of night security professionals in this region.

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