

Association Between Occupational Stress, Nicotine Dependence, and Oral Health Status Among Night Security Guards in Pune City- A Cross Sectional Study

¹Ronak A. Varyani, Department of Oral Medicine and Radiology, D Y Patil University School of Dentistry, Navi Mumbai.

²Dr. Nishad Gawali, Associate Professor, Department of Public health Dentistry, Hazaribag College of Dental Sciences and Hospital, Hazaribag, Jharkhand

Corresponding Author: Ronak A.Varyani, Department of Oral Medicine and Radiology, D Y Patil University School of Dentistry, Navi Mumbai.

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Abstract

Introduction: Health is dynamic and multifactorial in nature. It is influenced by factors like genetics, lifestyle, environment, socio economic status and many others. In this modern ever-changing world, all of us are affected at one time or another by work related stress.

Methodology: This cross sectional study was conducted in Pune city for one year among Night Security Guards In Pune City. Sample size has been scientifically estimated using G Power V 3.1 Software which yielded a minimum sample size of 450. The questionnaire consisted of demographic characteristic, which included questions concerning age, gender, education, marital status and nature of work. A significant relationship was assumed to exist if the *P* value was found to be <0.05. Chi-square test was used to check the association of periodontal disease and oral mucosal lesion according to

sociodemographic details, occupational stress and nicotine dependence.

Results: The mean age was 38.48 ranging from 20 to 60 years, the age distribution was found to be discrete. Among 450 participants, 390 (86.7%) were males and 60 (13.3%) were females. Maximum participants, i.e., 126 (28%) had completed PUC and only 22 (4.9%) of them had completed diploma course. Among 450 study participants, 393 (87.3) were married and 57 (12.7%) were unmarried. Presence or absence of tobacco habit, 192 (42.7%) were smokers, 116 (25.8%) had a habit of chewing tobacco and 31 (6.8%) participants had a habit of both.

Conclusion: In the present study poor oral health status is associated with occupational stress and nicotine dependence. As these factors have individual as well as synergistic effect on oral health.

Keywords: Night Security Guards, oral mucosal lesion, Stress, Nicotine, Smokers

Introduction

Health is dynamic and multifactorial in nature. It is influenced by factors like genetics, lifestyle, environment, socio economic status and many others. In this modern ever-changing world, all of us are affected at one time or another by work related stress.²

Stress is a fact of life and can affect individuals in variety of physical and psychological ways. Various factors can lead to stress in humans and one such factor is occupation.¹ Long working hours, salary, organizational climate, the risk of being fired are some of the aspects that generate stress to workers. It is difficult to consider any occupation that does not generate stress; one of them is to be the Night security guards.¹

Pune is a metropolitan city in state Maharashtra. There are various security agencies functioning in city. These agencies provide security to all sectors of the city including private and government institutions, societies, banks, ATMs, houses, malls, shopping complexes, etc.² Occupational stress has an adverse effect on individuals as well as on organizations. It is well known that stress causes systemic and oral health diseases like cardiac diseases, periodontitis, many studies have shown association between occurrence of necrotizing ulcerative gingivitis and negative life events and stress form day to day life situations.

Stress in night security works leads to various forms of substance abuse, in which use of tobacco is most common. Tobacco can either be used in the smoking form or the smokeless form. It is widely seen and believe that use of tobacco among night security guards is very high, as they have to stay awake all the night.¹

Tobacco use is second cause of number of mortality worldwide and first cause of preventable morbidity and mortality. The most severe effects of tobacco in oral cavity are oral cancers, potentially malignant lesions, severe periodontal disease, as well as poor wound healing.¹

The security guards play a vital role in providing security to our neighbourhoods, so their health should be ours concern. Till date, no research has been done to know the relationship between occupational stress, nicotine dependence, and its effect on oral health status among night security guards. Hence, the aim of this study will be to assess the association between occupational stress, nicotine dependence, and oral health status among night security guards in Pune city.

Methodology

This cross sectional study was conducted in Pune city for one year (November 2022 – November 2023) among Night Security Guards In Pune City. Sample size has been scientifically estimated using G Power V 3.1 Software which yielded a minimum sample size of 450. Subjects who are willing to give their consent, Individuals with minimum 1 year experience and those who were able to cooperate for the study were included in the study while who have cognitive impairment, with reported psychological problems, workers with systemic illness or disability and those who were on leave during the period of this study were excluded.

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 450 night security guards. under the available natural light. The ADA type III examination¹¹

(inspection using mouth mirror, explorer and adequate illumination) was used.

The questionnaire consisted of four sections. (i) Section I consisted of demographic characteristic, which included questions concerning age, gender, education, marital status and nature of work. Age was categorized into four groups (20–30 years, 30–40 years, 40–50 years, and 50–60 years), the groups are selected to facilitate the inclusion of all the staffs working in the transportation, the level of education was categorized as primary school, secondary school, PUC, diploma, ITI, graduation or any other. (ii) Section II consisted of occupational stress questions, there were total 20 questions with options following a 5-point Likert scale (strongly agree = 5, agree = 4, disagree = 3, strongly disagree = 2 and unsure = 1). (iii) Section III consisted of Modified Fagerstrom scale for smoking and smokeless tobacco, each scale consisted of 6 questions and each question carried some point/score based on the answer. The subjects were asked to answer the questions as per their experience of tobacco consumption. The overall score was the summation of scores of all questions. Minimum score was 0 and the maximum score was 10. The interpretation of scoring was: 7–10: person is highly dependent; 4–6: person has low to moderate dependence; below 4: person has low addiction; and (iv) section IV included recording of CPI index and oral mucosal lesion using WHO pro forma 1997 with the help of clinical examination.

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 check the association of periodontal disease and oral mucosal lesion according to sociodemographic details, occupational stress and nicotine dependence. Binomial regression analyses were

performed to assess the effect of various independent variables on the dependent variable (periodontal disease and oral mucosal lesion).

Results

The mean age was 38.48 ranging from 20 to 60 years, the age distribution was found to be discrete. Among 450 participants, 390 (86.7%) were males and 60 (13.3%) were females. Maximum participants, i.e., 126 (28%) had completed PUC and only 22 (4.9%) of them had completed diploma course. Among 450 study participants, 393 (87.3) were married and 57 (12.7%) were unmarried.

According to presence or absence of tobacco habit, 192 (42.7%) were smokers, 116 (25.8%) had a habit of chewing tobacco and 31 (6.8%) participants had a habit of both. Among 450 participants, 111 (24.7%) had reported absence of these habits. 265 (58.9%) study participants reported high work place stress and 185 (41.1%) participants, reported low occupational stress [Table 1].

There was no statistically significant association between periodontal disease and any of the age groups selected ($P = 0.106$), marital status ($P = 0.298$) and education ($P = 0.057$); however, statistically significant association was seen between periodontal disease and the gender ($P < 0.001$), nature of work ($P < 0.001$), occupational stress ($P < 0.001$) and modified Fagerstrom scale for smoking ($P = 0.001$) and smokeless tobacco ($P = 0.001$). Similarly, there was no statistically significant association between oral mucosal lesion and age ($P = 0.244$), marital status ($P = 0.228$), education ($P = 0.074$), and occupational stress ($P = 0.085$); however, a statistically significant association between oral mucosal lesion and gender ($P = 0.034$), nature of work ($P = 0.042$) and nicotine addiction for smoking

($P < 0.001$) and smokeless tobacco ($P < 0.001$) [Table 2], [Table 3], [Table 4].

Table 1: Distribution of study population according to adverse habits practiced and occupational stress.

Adverse habit	n (%)
Cigarettes	192 (42.7)
Chewing tobacco	116 (25.8)
Cigarettes/chewing tobacco	31 (6.8)
None	111 (24.7)
High stress	265 (58.9)
Low stress	185 (41.1)

Table 2: Prevalence of periodontal disease and oral mucosal lesion by demographic characteristic

Periodontal disease			P Value	Oral mucosal lesion		P Value
	Present, n (%)	Absent, n (%)		Present, n (%)	Absent, n (%)	
Age group						
20-30	66 (64.1)	37 (35.9)	0.106	10 (9.70)	93 (90.3)	0.244
30-40	123 (68.3)	57 (31.7)		31 (17.2)	149 (82.8)	
40-50	66 (67.3)	32 (32.7)		19 (19.4)	79 (80.6)	
50-60	56 (81.2)	13 (18.8)		12 (17.4)	57 (82.6)	
Gender						
Male	284 (72.8)	106 (27.2)	<0.00*	68 (17.4)	322 (82.6)	0.034*
Female	27 (45.0)	33 (55.0)		4 (6.7)	56 (93.3)	
Education						
Primary	24 (96)	1 (4.0)	0.057	9 (36)	16 (64)	0.075
Secondary	77 (71.3)	31 (28.7)		14 (14.3)	84 (85.7)	
PUC	86 (68.3)	40 (31.7)		21 (16.7)	105 (83.3)	
Diploma	13 (59.1)	9 (40.9)		2 (9.1)	20 (90.9)	
ITI	64 (65.3)	34 (34.7)		13 (12)	95 (88.0)	
Graduation	47 (66.2)	24 (33.8)		13 (18.3)	58 (81.7)	
Marital status						
Married	275 (70.0)	118 (30.0)	0.298	66 (16.8)	327 (83.2)	0.228
Unmarried	36 (63.2)	21 (36.8)		6 (10.5)	51 (89.5)	
Nature of work						
Driver	83 (69.2)	37 (30.8)	<0.001*	24 (20)	96 (80)	0.042*
Conductor	40 (65.5)	21 (34.4)		13 (21.3)	48 (78.7)	
Both	69 (88.5)	9 (11.5)		17 (21.8)	61 (78.2)	
Mechanics	87 (61.3)	55 (38.7)		15 (10.6)	127 (89.4)	
Admin section	12 (50.0)	12 (50.0)		2 (8.3)	22 (91.7)	
Others	20 (80.0)	5 (20.0)		1 (4)	24 (96)	

Chi-square test, *Statistically significant

Table 3: Prevalence of periodontal disease and oral mucosal lesion by occupational stress

Occupational stress	Periodontal Disease		P Value	Oral mucosal lesion		P Value
	Present, n (%)	Absent,n (%)		Present, n (%)	Absent,n (%)	
Low stress	106 (57.3)	79 (42.7)	<0.001*	23 (12.4)	162 (87.6)	0.085
High stress	205 (77.4)	60 (22.6)		49 (18.5)	216 (81.5)	

Table 4: Prevalence of periodontal disease and oral mucosal lesion by nicotine dependence to smoking and smokeless tobacco

Periodontal disease			P Value	Oral mucosal lesion		P Value
	Present, n (%)	Absent, n (%)		Present,n(%)	Absent, n (%)	
Smoking tobacco†						
Low to moderate addiction	107 (34.4)	36 (25.9)	0.001*	36 (25.2)	107 (74.8)	<0.001*
Moderate addiction	50 (16.1)	10 (7.2)		13 (21.7)	47 (78.3)	
High addiction	18 (5.8)	5 (3.6)		7 (30.4)	16 (69.6)	
No habit	88 (63.3)	88 (63.3)		16 (7.1)	208 (92.9)	
Smokeless tobacco†						
Low to moderate addiction	67 (21.5)	17 (12.2)	0.001*	24 (28.6)	60 (71.4)	<0.001*
Medium addiction	34 (10.9)	5 (3.6)		11 (28.2)	28 (71.8)	
High addiction	18 (5.8)	4 (2.9)		3 (13.6)	19 (86.4)	
No habit	192 (61.7)	113 (81.3)		34 (11.1)	271 (88.9)	

Discussion

This cross sectional study was unique in assessing the association of demographic characteristic, occupational stress, nicotine dependence to smoking and smokeless tobacco with oral health status among night securityguards. Our study revealed high percentage of males with tobacco use and high prevalence of periodontal disease and oral mucosal lesions among them. Similar findings were reported by Radi *et al.* who reported high job strain was related to smoking in males.¹² Our study results reported high prevalence of periodontal disease with level of nicotine dependence which was in agreement with the findings of Shizukuishi *et al.*, who reported significant association between tobacco use and periodontitis among Japanese

security guards.¹³ These changes can be explained due to alteration in microflora and negative effect on the host immune response. A high statistically significant association between oral mucosal lesions and level of nicotine dependence was also observed in our study. Tobacco use is one of the most important risk factors for the development of oral mucosal lesions including potentially malignant lesion and cancer. Various studies have reported that smoking and chewing of tobacco and betel quid act synergistically in oral carcinogenesis and that person with mixed habits forms substantially high-risk populations.¹⁵

In the present study high occupational stress was associated with high prevalence of periodontal disease which was in agreement with the findings of Linden *et*

al. who reported a significant relationship between work stress and periodontal health status.¹⁶ These findings give support to the theory that stress has a relatively nonspecific effect since it is associated with a variety of diseases including periodontal disease.^{17,18} On contrary, Marcenes and Sheiham reported lack of association between work stress and periodontal health status which they explains due to presence of confounding factors which may interact with stress and can leads to spurious association.¹⁹

The present study has limitations typical of a cross-sectional research that cannot ascertain causality. Longitudinal studies provide valuable information compared to the cross-sectional studies but longitudinal studies are difficult to organize and more time consuming than cross sectional studies. Further, because data were collected in face-to-face interviews, the presence of another individual at these interviews may have been enough to distort the results. Because “social desirability bias” involves the systematic distortion of responses in a certain direction, contorted marginal distributions in the participants' responses must be considered when looking at the results. In our study, we have not taken the habit of alcohol in consideration which can act as a potential confounder. The oral mucosal lesions were not differentiated into the potentially malignant lesion and conditions in our study due to limitations and shortage of diagnostic equipment. These differentiations can be considered in further studies to correlate different conditions with level of nicotine dependence and other factors. Despite these shortcomings, even though the study was conducted among public transit workers of one city, the sample size is fairly adequate and represents the overall pattern of adverse addictive tobacco habits and occupational stress among public transit workers. These results can be

applied to Indian population as a whole. The study found some important and often neglected correlates of ill effects of tobacco and oral health. Antitobacco advocacy offers an approach in improving both general and oral health. Banning tobacco usage shifts the responsibility for health from the formal healthcare system to individuals. Successful and effective implementation of anti-tobacco acts and rules lies within communities and decision-makers at all levels of society. A crucial need for strict implementation of antitobacco act is clearly evident in the present era.

Conclusion

In the present study poor oral health status is associated with occupational stress and nicotine dependence. As these factors have individual as well as synergistic effect on oral health. A multirisk approach and work place interventions to reduce job stress, psychotherapy sessions, and counselling for already established nicotine dependence and motivational oral health education programs and strategies to promote oral health are the need for status quo.

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