

# Assessment of oral health status amongst postal employees of Bhubaneswar city: A cross-sectional study

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## ABSTRACT

**Introduction:** Upholding good dental health has wider effects on productivity and performance at work in addition to being crucial for individual well-being. Because it can affect both their personal well-being and productivity at work, post office workers' oral health is therefore a critical issue of concern. Hence, evaluating Bhubaneswar city post office workers' dental health is the study's aim. **Materials and Methodology:** With the aid of the WHO 2013 oral health assessment form, a cross-sectional study involving 171 regular post office workers was undertaken. Using the Chi-square test and an ANOVA for pertinent variables, the data were analysed using SPSS statistical software version 27.0. Potential confounding variables were adjusted using multiple logistic regression analysis. **Results:** The survey included a total of 171 post office personnel, of which 76.6% were men and 23.4% were women. The participants' periodontal health revealed that 67.7% had deep periodontal pockets, 18.7% had shallow ones, and 95.3% had bleeding gums. The mean DMFT of the study participants was  $4.10 \pm 3.149$ . **Conclusion:** Among post office workers, tobacco use and oral health conditions represent a crucial junction of variables that call for caution and preventative action.

**Keywords:** Occupational groups, oral health, periodontal diseases, tobacco, WHO oral health survey

## Introduction

Oral health plays a crucial role in one's ability to carry out daily activities, communicate effectively, and maintain good overall health.<sup>[1]</sup> Maintaining optimal oral health is not only essential for personal well-being but also has broader implications for workplace efficiency and performance. Occupational stress

among white-collar workers, who typically work in professional, managerial, administrative, or office-based roles, can result from various job-related factors and work environments. White-collar workers often have demanding workloads, tight deadlines, and high expectations to meet. They are expected to work long hours, including overtime and irregular schedules. This can interfere with work-life balance, contributing to stress and strained personal relationships.

Occupational stress can have a significant impact on an individual's overall health, including their oral health. Although the relationship between stress and oral health is complex and

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multifactorial, there are several ways in which occupational stress can affect the oral health of white-collar workers. Post office employees, such as individuals in any profession, are susceptible to various oral health issues that can affect their productivity and overall health. They often lead busy and demanding lives, which can sometimes lead to neglecting their oral health. Irregular eating patterns, stress, and limited access to dental care facilities during work hours might contribute to poor oral health habits among this group.

Common oral health issues faced by post office employees might include dental caries (cavities), gum diseases, and oral discomfort. These issues can result from a combination of factors, such as improper oral hygiene practices, inadequate nutrition, and infrequent dental check-ups. The physical demands of the job, which might involve long hours of standing or repetitive tasks, could also indirectly affect oral health because of increased stress levels or habits such as tobacco consumption.<sup>[2]</sup>

Addressing the oral health status of post office employees requires a comprehensive approach that combines awareness, education, and access to preventive and treatment services. Workplace initiatives that promote oral hygiene education, offer regular dental check-ups, and encourage healthy eating habits can significantly contribute to improving the oral health of post office employees. Moreover, fostering a supportive environment where employees feel comfortable discussing their oral health concerns can lead to early detection and timely management of oral health issues.

Several studies on oral health status of tribals, transgenders, school children and adult population have been conducted in Odisha.<sup>[2-10]</sup> To the best of our knowledge, no study has been conducted on this particular group of employees. Hence, the oral health status of post office employees is an important area of concern that can impact both their personal well-being and workplace performance. Recognizing the challenges they may face and implementing strategies to promote good oral hygiene practices can result in healthier and more productive employees. By emphasizing the significance of oral health within the workplace, we can strive towards a workforce that not only delivers efficient services but also enjoys improved overall health and quality of life. This study aims to shed light on the oral health status of post office employees, highlighting the potential challenges they may face and the importance of promoting good oral hygiene practices within this demographic.

## Methods

### Study design and population

It is a cross-sectional epidemiological study that was performed to investigate the oral health status, oral hygiene practice, tobacco intake, and periodontal status of post office employees living in Bhubaneswar city. It has been strategically scheduled to occur during a three-month period.

Ethical clearance was obtained from the Institutional Review Board (KIIT/KIMS/IEC/1375/2023). The permission to conduct the study was obtained from the office of the Chief Postmaster General, Bhubaneswar. Participants who were willing to participate gave their informed consent.

Participants who were present during the examination and those who granted informed consent were involved in the survey. Subjects who were unwilling to undergo the clinical examination during the study or refused to give consent were excluded from the survey.

### Sample size and sampling method

Universal sampling method was used. A total of 171 study participants were enrolled in the study.

### Data collection

Employee demographic information, oral hygiene habits, including frequency, techniques, and materials used for tooth brushing, smoking and chewing tobacco usage during the course of their lifetimes, including the use of paan and gutkha, was obtained. Each participant sat on a portable dental chair while receiving an oral examination. The standard WHO Oral Health Assessment Tool (WHO, 2013) for adults was used to document oral health status. A Type III clinical examination was performed as per ADA specifications. To be more precise, we used this as a benchmark to assess the degree of dentition, periodontal health, oral mucosal diseases, dental fluorosis, dental erosion, and dental trauma. The form also provided us with instructions on how to offer potential treatments to staff members.

All the examinations were performed by a single examiner, assisted by a trained recording dentist at the Department of Public Health Dentistry, Kalinga Institute of Dental Sciences in Bhubaneswar. The Kappa value was 0.8, which was considered to be a strong agreement between the measurements of the same examiner. For the goal of imitating a regular dentist office set-up for oral health examination, a team of support workers also comprised nurses, health attendants, and housekeeping attendants.

### Statistical analysis

The obtained data were entered into an Excel sheet after coding. Data were analyzed by SPSS Statistical software version 27.0. Chi-square test, ANOVA were used for relevant variables. Multiple logistic regression analysis was used to adjust potential confounding variables. Confidence interval was taken as 95%. The significance level was fixed at 5%.

## Results

The survey included a total of 171 post office personnel, of which 76.6% were men and 23.4% were women. Participants in the study were 42.80 years on average. The majority of participants (97.7%) stated that they only brush their teeth once a day, as opposed to the advised twice daily. Herbal toothpaste and brushes were the

most often used cleaning tools (60.2% and 80.1%, respectively). Participants also mentioned their lifetime usage of alcohol (8%) and their habits of smoking cigarettes (10.5%), using smokeless tobacco (43.9%), and using gutkha (17%) [Table 1].

The participants' periodontal health revealed that 67.7% had deep periodontal pockets, 18.7% had shallow ones, and 95.3% had bleeding gums. Only 22.9% of the participants had dental erosion, whereas dental trauma was observed in 2.4% of the subjects.

**Table 1: Sociodemographic details, oral hygiene practices, deleterious habits, caries experience**

Variables	Levels	Mean	SD
Age		42.8070	12.04810
		Frequency (n)	Percentage
Age	20-30	66	38.6
	31-40	30	17.5
	41-50	51	29.8
	51-60	21	12.3
	61 and above	3	1.8
Gender	Male	131	76.6
	Female	40	23.4
Smoking (cigarette)	Absent	153	89.5
	Present	18	10.5
Smokeless tobacco (paan)	Absent	96	56.1
	Present	75	43.9
Smokeless tobacco (gutkha)	Absent	142	83.0
	Present	29	17.0
Alcohol	Absent	160	93.6
	Present	11	6.4
Type of cleaning	Sal twig	6	3.5
	Neem twig	28	16.4
	Toothbrush	137	80.1
Materials	Fluoridated toothpaste	50	29.2
	Herbal toothpaste	103	60.2
	Gudakhu	18	10.5
Method of brushing	Horizontal	92	53.8
	Vertical	78	45.6
	Circular	1	0.6
Frequency of brushing	Once	167	97.7
	Twice	4	2.3
Caries experience	Absent	38	22.2
	Present	133	77.8
Bleeding (highest score)	Absent	8	4.7
	Present	163	95.3
Pocket (highest score)	0-3mm	25	14.6
	4-5 mm	32	18.7
	6 mm or more	114	66.7
Loss of attachment (highest score)	0-3 mm	33	19.3
	4-5 mm	8	4.7
	6-8 mm	42	24.6
	9-11 mm	40	23.4
	12 mm or more	48	28.1
Oral mucosal lesions	No lesions	144	84.2
	Leukoplakia	2	1.2
	Oral submucous fibrosis	2	1.2
	Tobacco pouch keratosis	23	13.5
Dental trauma	No trauma	167	97.7
	Treated injury	3	1.8
	Enamel fracture	1	0.6
Dental erosion	No erosion	132	77.2
	Enamel erosion	16	9.4
	Dentinal Erosion	23	13.5
Total		171	100.0

Only 1.2% of the individuals had leukoplakia and oral submucous fibrosis, whereas the tobacco pouch keratosis prevalence was the highest (13.5%) among the employees [Table 1].

The mean DMFT of the study participants was  $4.10 \pm 3.149$ . In the middle age groups of 31-40 and 41-50 years, the scores were  $4.63 \pm 3.01$  and  $4.90 \pm 3.11$ , respectively. Statistical significance of decayed teeth, missing teeth and DMFT was found with age [Table 2].

Table 3 depicts the model fitting information, and it was statically significant. Multinomial logistic regression was performed with highest score of loss of attachment with both forms of tobacco and pocket with smokeless form of tobacco [Tables 4 and 5]. The reference group was absence of smoking or smokeless tobacco. Multinomial logistic regression between intervention urgency and caries experience was performed. Statically significance was observed between participants requiring prompt treatment and age [Table 6].

## Discussion

This study assessed the oral health status of postal workers. Participants reported lower-than-normal rates of alcohol, cigarette, and smokeless tobacco (paan and gutkha) use (TISS, Mumbai). Similar to the findings of the current survey, just 6.3% of law enforcement professionals in India reported using tobacco.<sup>[11]</sup>

In this study, the majority of the employees cleaned their teeth with a toothbrush. The majority of them (80.1%) used

toothpaste. Of the study participants, 75.8% (995) brushed their teeth once every day. This was similar to the findings of the study by Chandra *et al.*<sup>[12]</sup>

In this study, the prevalence of dental caries was found to be high. This was similar to findings from a study among teaching ( $2.18 \pm 1.99$ ) and nonteaching personnel ( $2.62 \pm 2.35$ ) at a university in India, and the current study population's caries experience was found to be high.<sup>[13]</sup> Compared with the current study, a study of information technology (IT) employees in South India revealed a greater caries experience of  $4.23 \pm 3.47$ .<sup>[14]</sup> Similar findings were also found among administration workers of Vishakhapatnam.<sup>[15]</sup>

The majority of subjects showed signs of gum bleeding, and more than half of them developed periodontitis. These results are comparable with Shimla, India's state government personnel, who had a high prevalence (60%) of gingival disease. Around 2.5% of participants experienced dental erosion, compared with 49% of industrial employees in Himachal Pradesh who had the condition.<sup>[16]</sup> These variations may be brought on by the nature of industrial job and occupational chemical exposure.

An additional concern is the correlation between tobacco consumption and oral health. Tobacco use, including smoking and smokeless tobacco, is a well-established risk factor for a range of oral health problems. These include but are not limited to stained teeth, bad breath, gum diseases, and even more severe conditions such as oral cancers. For post office employees who already face challenges in maintaining good oral hygiene, tobacco consumption further exacerbates their vulnerability to these health issues. Tobacco pouch keratosis predominated in the current study, followed by leukoplakia and oral submucous fibrosis. Steel factory workers showed similar oral mucosal lesions.<sup>[17]</sup> The most likely explanation of this was working in an atmosphere where exposure to substances such as tar develops carcinomas over time, or it could have been because of how frequently workers developed bad dental habits as a result of the stress and demanding workload related to their jobs. The prevalence of oral premalignant and malignant lesions was also higher among municipal employees of Mysore city.<sup>[18]</sup>

Efforts to address these challenges require a multifaceted approach. Workplace initiatives should focus not only on

**Table 2: Comparisons of decayed, missing, filled teeth (DMFT) with age among study participants**

Age group	DT		MT because of caries		FT		DMFT	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
20-30	2.61	2.430	0.32	0.705	0.20	0.588	3.12	2.599
31-40	4.13	3.048	0.50	0.900	0.00	0.000	4.63	3.011
41-50	3.45	2.484	1.22	1.770	0.24	0.885	4.90	3.151
51-60	2.90	2.528	0.81	1.327	0.00	0.000	3.71	3.289
61 and above	5.33	2.887	4.00	3.464	0.00	0.000	9.33	6.351
Total	3.21	2.628	0.74	1.390	0.15	0.610	4.10	3.149
F	2.554		8.706		1.165		5.268	
P	0.041		0.0001		0.328		0.001	

**Table 3: Model fitting information of loss of attachment, tobacco, intervention urgency, dental caries and age among study participants**

	Model	Model fitting criteria -2 Log likelihood	Likelihood ratio tests		
			Chi-Square	df	Sig.
Loss of attachment and tobacco	Intercept only	94.454	51.600	12	0.000
	Final	42.854			
Intervention urgency, caries experience, and age	Intercept only	40.181	15.895	4	0.003
	Final	24.286			
Pocket and smokeless tobacco	Intercept only	48.766	23.559	4	0.000
	Final	25.207			

**Table 4: Multinomial Logistic regression between Loss of attachment (highest score) and tobacco**

Parameter estimates								
HIGHESTLOA <sup>a</sup>	B	Std. error	Wald	df	Sig.	Exp (B)	95% Confidence interval for exp (B)	
							Lower bound	Upper bound
4-5 mm								
Intercept	-15.817	2871.504	0.000	1	0.996			
No smoking	16.035	1.264	161.031	1	0.000	9205213.028	773435.812	109557827.033
Smoking	0 <sup>b</sup>	.	.	0	.	.	.	.
No paan	-16.650	0.000	.	1	.	5.873E-8	5.873E-8	5.873E-8
Paan	0 <sup>b</sup>	.	.	0	.	.		
No gutkha	15.019	2871.504	0.000	1	0.996	3330246.416	0.000	<sup>c</sup>
Gutkha	0 <sup>b</sup>	.	.	0	.	.		
6-8 mm								
Intercept	1.809	1.118	2.619	1	0.106			
No smoking	31.486	2767.117	0.000	1	0.991	47220120343419.984	0.000	<sup>c</sup>
Smoking	0 <sup>b</sup>	.	.	0	.	.	.	.
No paan	-33.166	2767.117	0.000	1	0.990	3.948E-15	0.000	<sup>c</sup>
Paan	0 <sup>b</sup>	.	.	0	.	.	.	.
No gutkha	-0.280	1.260	0.049	1	0.824	0.755	0.064	8.935
Gutkha	0 <sup>b</sup>	.	.	0	.	.	.	.
9-11 mm								
Intercept	2.156	1.094	3.886	1	0.049			
No smoking	15.369	2281.589	0.000	1	0.995	4725693.267	0.000	<sup>c</sup>
Smoking	0 <sup>b</sup>	.	.	0	.	.	.	.
No paan	-17.275	2281.589	0.000	1	0.994	3.145E-8	0.000	<sup>c</sup>
Paan	0 <sup>b</sup>	.	.	0	.	.	.	.
No gutkha	-0.531	1.237	0.185	1	0.667	0.588	0.052	6.637
Gutkha	0 <sup>b</sup>	.	.	0	.	.	.	.
12 mm or more								
Intercept	3.010	1.061	8.044	1	0.005			
No smoking	31.372	2767.117	0.000	1	0.991	42131161859831.040	0.000	<sup>c</sup>
Smoking	0 <sup>b</sup>	.	.	0	.	.	.	.
No paan	-34.315	2767.117	0.000	1	0.990	1.251E-15	0.000	<sup>c</sup>
Paan	0 <sup>b</sup>	.	.	0	.	.	.	.
No gutkha	-0.961	1.201	0.640	1	0.424	0.382	0.036	4.030
Gutkha	0 <sup>b</sup>	.	.	0	.	.	.	.

<sup>a</sup>The reference category is 0.00. <sup>b</sup>This parameter is set to zero because it is redundant**Table 5: Multinomial logistic regression between pocket (highest score) and smokeless tobacco**

Parameter estimates								
Highestpocket <sup>a</sup>	<i>B</i>	Std. Error	Wald	df	Sig.	Exp ( <i>B</i> )	95% Confidence interval for exp ( <i>B</i> )	
							Lower bound	Upper bound
4-5 mm								
Intercept	0.670	1.227	0.298	1	0.585			
No paan	0.226	0.741	0.093	1	0.761	1.253	0.293	5.357
Paan	0 <sup>b</sup>			0				
No gutkha	-0.638	1.370	0.216	1	0.642	0.529	0.036	7.755
Gutkha	0 <sup>b</sup>			0				
6 mm or more								
Intercept	3.329	1.023	10.599	1	0.001			
No paan	-1.339	0.576	5.395	1	0.020	0.262	0.085	0.811
Paan	0 <sup>b</sup>			0				
No gutkha	-1.083	1.125	0.927	1	0.336	0.339	0.037	3.070
Gutkha	0 <sup>b</sup>			0				

<sup>a</sup>The reference category is 0.00. <sup>b</sup>This parameter is set to zero because it is redundant

promoting oral hygiene practices but also on raising awareness about the detrimental effects of tobacco on oral health. Providing

access to educational resources, counseling, and cessation programs can aid post office employees in making informed



**Table 6: Multinomial Logistic regression between intervention urgency and caries experience and age**

Intervention urgency <sup>a</sup>	Parameter Estimates					95% Confidence interval for exp (B)		
	B	Std. Error	Wald	df	Sig.	Exp (B)	Lower bound	Upper bound
Prompt treatment								
Intercept	4.721	3520.525	0.000	1	0.999			
AGE	15.452	0.275	3166.498	1	0.000	5138811.134	2999995.640	8802472.752
No caries experience	-18.749	3520.526	0.000	1	0.996	7.204E-9	0.000	. <sup>b</sup>
Caries experience	0 <sup>c</sup>			0				
Immediate treatment								
Intercept	1.742	3520.525	0.000	1	1.000			
Age	15.491	0.000	.	1	.	5343796.116	5343796.116	5343796.116
No caries experience	-17.904	3520.526	0.000	1	0.996	1.676E-8	0.000	. <sup>b</sup>
Caries experience	0 <sup>c</sup>			0				

<sup>a</sup>The reference category is 0.00. <sup>b</sup>Floating point overflow occurred while computing this statistic. Its value is therefore set to system missing. <sup>c</sup>This parameter is set to zero because it is redundant

decisions to quit or reduce tobacco use. Moreover, collaboration between employers, healthcare professionals, and relevant authorities can lead to the implementation of policies that create a supportive environment for employees to prioritize their oral health. Regular dental check-ups, early detection of oral health problems, and appropriate treatment can significantly improve the well-being of post office employees.

To lessen the incidence of oral diseases among employees, a routine oral health check-up should be scheduled at the workplace. It has been discovered that providing tooth brushing advice in addition to the typical dental exam is an efficient way to improve plaque control. Similar to this, the current study's oral health education programme gave specific instructions on how to clean their teeth to each participant, which may have helped them maintain their oral hygiene better.

The results of this study suggest that the burden of oral disease among post office employees serves as a reminder of the intricate connection between personal health and workplace effectiveness. The toll of oral diseases can lead to absenteeism, reduced productivity, and even financial strain because of healthcare costs. Recognizing the significance of oral health in the context of post office employment, it becomes imperative to address this burden through comprehensive initiatives. By raising awareness about oral hygiene practices, facilitating access to dental care, and promoting tobacco cessation, workplaces can actively contribute to improving the oral health of their employees.<sup>[19]</sup> Flexible work arrangements for dental appointments and the creation of an environment that supports open discussions about oral health challenges can further empower employees to take charge of their well-being.

The burden of oral disease extends beyond the individual level because healthier employees lead to a more productive and vibrant workforce. Implementing these measures not only enhances workplace efficiency but also showcases an organization's commitment to the holistic health of its employees. By acknowledging the burden of oral disease and taking proactive steps, post office workplaces can become advocates for oral

health, fostering an environment where employees thrive both professionally and personally.

## Conclusion

In conclusion, the oral health status and tobacco consumption among post office employees form a critical intersection of factors that warrant attention and proactive measures. The oral health status of post office employees, such as any group of workers, depends on several factors, including individual behaviors, access to dental care, workplace stress, and overall health habits. Primary care physicians can take an initiative to enhance awareness towards oral health care by providing education and counseling to the postal employees residing in Bhubaneswar. It is therefore essential to consider that oral health is a component of general health and well-being of those particular profession.

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## Conflicts of interest

There are no conflicts of interest.

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