

Assessment of dentition status and treatment needs of police personnel in Bhopal city, Central India

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Abstract

Background: Oral health is an integral part of general health. Police personnel form the backbone for safety and security of a community hence their health is of utmost importance.

Objectives: To assess the dentition status of police personnel in Bhopal city.

Materials and Methods: A cross-sectional study was conducted on 781 subjects (mean aged 40.5 years) who were selected by a simple random sampling method. Type III examination of the subjects was conducted, and along with a questionnaire, decayed, missing, and filled teeth data were recorded on modified WHO format 1997. *p*-Value ≤ 0.05 was considered statistically significant.

Results: The number of decayed, missing, and filled teeth was significantly lower among this group.

Conclusion: The overall caries experience was low in this group. Most of the police personnel lack oral health awareness. Awareness should be created to maintain good oral hygiene.

KEY WORDS: Dental caries, dentition status, police personnel, treatment needs

Introduction

According to World Health Organization,^[1] oral health and general health are governed by various factors such as lifestyle, dietary habits, socioeconomic conditions, and occupational environment. Oral health means more than healthy teeth. Oral health enables an individual to speak, eat, and socialize without active disease, discomfort, or embarrassment.

Occupational environment plays a major role on the health of the exposed. The health hazards get more severe with the difficulty of job.^[2] This fact is more important in situations as of the police personnel who provide continuous service to the civilians.

Policing is a complex occupation. Owing to the complexity of policing, risks and exposures may vary within forces, between forces, and internationally. Officers' involvement ranges from general, daily, proactive patrol activities to specific criminal activities such as narcotic investigations. Because there is such a wide range of activities involved in police work, there are many health and safety issues surrounding policing as an occupation.^[3]

The place that is occupied by the police in a state is similar to that occupied by the military in a nation. Caries experience in Australian army recruits aged 17–25 years increased between 2002–2003 and 2008 and the mean DMFT (Decayed, Missing and Filled Teeth) scores increased from 3.16 to 7.11 for recruits aged 17–35 years.^[4]

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In India, a study conducted among police personnel of Ambala, Haryana, showed the prevalence of dental caries to be 54.3% and the mean DMFT score to be 3.05.^[5] A distinct study carried out by Naveen and Reddy^[6] among police personnel in Mysore city reported the prevalence of periodontal disease to be 99.7% and that of dental caries to be 67.2%, and total DMFT score was 2.62. Prevalence of dental caries was 48.24% among the policemen of Shimla city, Himachal Pradesh.^[7]

It is essential to prevent oral diseases and promote oral health for this special group of population. The failure to identify and solve health concerns of officers has potentially serious consequences, as police officer's fatigue reduces contribution of policing the community.

No epidemiological data have been reported on oral health status of police personnel in Bhopal city. This information is important for establishing priorities and determining the type and quantity of prevention and treatment services required, as well as the type of personnel required to provide them.

Keeping this in mind, this study was undertaken to assess the dentition status and treatment needs among police personnel of Bhopal city. The study also attempted to suggest measures for planning programs for improvement of their oral health.

Materials and Methods

A descriptive cross-sectional study was conducted to assess the dentition status and treatment need of all the active police personnel posted at various police stations of Bhopal city, Madhya Pradesh.

The list of all the police stations and sanctioned strength of district executive force posted at various police stations of Bhopal city was obtained from Police Headquarters. The total sanctioned strength was found to be 2109, which included inspectors, sub-inspectors, assistant sub-inspectors, head constables, and constables posted across 35 police stations. A pilot study was conducted to arrive at the sample size of 781.

On an average 35–40 policemen are available at one time in a police station. The police stations were selected on random basis through lottery method and were visited till the sample size was achieved. A total of 22 police stations were visited. The head of the selected police stations were contacted and informed about the schedule of survey, so as to ensure maximum participation. Selected police stations were visited and each policeman present on the day of examination was included in the final sample. All policemen present in the various police stations of Bhopal were included in this study. Subjects who were absent on the day of examination or were on external assignments were excluded from the study.

A predefined pro forma^[8] was used to record information about demographic data, oral hygiene practices, dietary habits, adverse habits, systemic information, knowledge and experience of dental problem, and information about dental visit. The pro forma was filled by interviewing policemen before examination. The clinical examination was conducted using WHO

(World Health Organization) dentition status index.

A schedule was prepared for data collection. One police station was decided to be examined per day. The study was to be conducted for 3 months, from March 2013 to May 2013, across the police stations in Bhopal city.

Before conducting the survey, the training and calibration of examiner was done. Intra examiner reliability was assessed using κ statistic, which was in range of 0.80–0.85.

The data obtained were subjected to statistical analysis after consultation with a statistician. The data so obtained were compiled systematically. χ^2 -Test was used to analyze categorical variables. Mann–Whitney test was used to compare findings between two groups and Kruskal–Wallis test was used to compare means between three or more groups. Statistical analysis was carried out using Statistical Package of Social Science (version 17; SPSS Inc., Chicago, IL). Data comparison was carried out by applying specific statistical tests to find out the statistical significance of the comparisons. Significance level was fixed at $p \leq 0.05$.

Results

A total of 781 police personnel were examined, out of which 747 (95.6%) were males and 34 (4.4%) were females. The study sample comprised of 448 (57.4%) constables, 180 (23%) head constables, and 153 (19.3%) officers. On further dividing the population, four age groups were observed. The age group 21–30 years comprised 182 (23.3%) police personnel, 176 (22.5%) police personnel belonged to 31–40 years of age, maximum, that is, 287 (36.7%) police personnel belonged to the age group of 41–50 years, whereas minimum, that is, 136 (17.4%) subjects belonged to the age group of 51–60 years. On the basis of educational level, the subjects can be divided into below graduates (300, 38.4%), graduates (349, 44.7%), and postgraduates (132, 16.9%) [Table 1].

Distribution of study subjects according to their pattern of previous day sugar intake

Out of the total population, 387 (49.6%) subjects did not consumed sugar in past 24 h, whereas 218 (27.9%) consumed once, 108 (13.8%) consumed twice, and 68 (8.7%) police personnel reported that they consumed sugar more than two times. The association with post ($p = 0.03$) and education ($p = 0.00$) was found to be statistically significant.

Distribution of study subjects according to dental caries experience based on mean number of teeth involved

Overall mean number of decayed teeth was 1.27 ± 2.13 , of missing teeth was 1.25 ± 3.63 , and of filled teeth 0.13 ± 0.84 . The mean DMFT score was calculated to be 2.66 ± 4.32 . A significant association existed between mean number of decayed teeth and post ($p = 0.00$) and age ($p = 0.00$); mean number of missing teeth and post ($p = 0.00$), age ($p = 0.02$) and education ($p = 0.02$); between mean number of filled teeth and post ($p = 0.00$), age ($p = 0.00$), and education

Table 1: General distribution of population

	According to gender and post			Total
	Constables, <i>n</i> (%)	Head constables, <i>n</i> (%)	Officers, <i>n</i> (%)	
According to gender				
Male	426 (54.5)	172 (22)	149 (19)	747 (95.6)
Female	22 (2.8)	8 (1)	4 (0.5)	34 (4.4)
According to age group and post				
21–30 years	170 (21.7)	2 (0.2)	10 (1.2)	182 (23.3)
31–40 years	136 (17.4)	34 (4.3)	6 (0.7)	176 (22.5)
41–50 years	132 (16.9)	90 (11.5)	65 (8.3)	287 (36.7)
51–60 years	10 (1.2)	54 (6.9)	72 (9.2)	136 (17.4)
According to education level and post				
Below graduate	172 (22)	88 (11.2)	40 (5.1)	300 (38.4)
Graduate	204 (26.1)	70 (8.9)	75 (9.6)	349 (44.7)
Postgraduate	72 (9.2)	22 (2.8)	38 (4.8)	132 (16.9)
Total	448 (57.4)	180 (23.1)	153 (19.5)	781 (100)

($p = 0.00$); and between mean number of DMFT score and post and age ($p = 0.00$) [Table 2].

Distribution of study subjects according to decayed teeth in various groups and its correlation with sugar exposure

The number of decayed teeth was classified into three groups, DT = 0, DT = 1–3, and DT >3. It was established that 432 (55.3%) police personnel were caries-free and had no decayed tooth, 256 (32.7%) had 1–3 decayed teeth, and 93 (11.9%) police personnel had more than 3 decayed teeth. The association between number of decayed teeth and gender ($p = 0.00$), post ($p = 0.02$), age ($p = 0.00$), and education ($p = 0.01$) was statistically significant.

When association between sugar exposure and number of decayed teeth was accounted; it was found that no statistically significant relation existed ($p = 0.64$) [Table 3].

Distribution of study subjects according to treatment needs

A total of 234 (29.9%) subjects did not require any kind of treatment whereas 186 (23.8%) required preventive treatment, 273 (34.9%) required one surface filling, 18 (2.3%) required two or more surface fillings, 8 (1%) required crown for any other reason, 92 (11.7%) required pulp care restoration, 76 (9.7%) required extraction, and 501 (64.1%) required oral prophylaxis [Table 4].

Table 2: Distribution of study subjects according to dental caries experience based on mean number of teeth involved

	DT, mean (SD)	MT, mean (SD)	FT, mean (SD)	DMFT, mean (SD)
According to gender				
Male	1.27 (2.10)	1.27 (3.69)	0.13 (0.85)	2.67 (4.37)
Female	1.35 (2.65)	0.76 (1.79)	0.17 (0.52)	2.29 (2.94)
<i>p</i> -Value	0.12	0.09	0.23	0.45
According to post				
Constables	1.08 (1.67)	0.65 (1.72)	0.09 (0.66)	1.83 (2.64)
Head constables	1.87 (2.9)	1.91 (4.01)	0.08 (0.48)	3.87 (5.07)
Officers	1.11 (2.07)	2.22 (6.12)	0.30 (1.43)	3.64 (6.35)
<i>p</i> -Value	0.00	0.00	0.00	0.00
According to age groups				
21–30 years	1.06 (1.80)	0.19 (0.61)	0.98 (0.39)	1.36 (2.08)
31–40 years	0.88 (1.34)	0.40 (0.78)	0.23 (1.04)	1.53 (1.94)
41–50 years	1.73 (2.54)	1.24 (2.30)	0.11 (1.01)	3.09 (3.82)
51–60 years	1.07 (2.25)	3.77 (7.40)	0.10 (0.54)	4.95 (7.53)
<i>p</i> -Value	0.00	0.02	0.00	0.00
According to education				
Below graduate	1.30 (2.05)	1.51 (3.40)	0.05 (0.37)	2.87 (4.03)
Graduate	1.39 (2.44)	1.07 (3.60)	0.22 (1.18)	2.69 (4.60)
Postgraduate	0.87 (1.15)	1.12 (4.14)	0.09 (0.37)	2.09 (4.18)
<i>p</i> -Value	0.79	0.02	0.00	0.19
Total	1.27 (2.13)	1.25 (3.63)	0.13 (0.84)	2.66 (4.32)

The bold values represent significant p values ≤ 0.05 .

Table 3: Distribution of study subjects according to decayed teeth in various groups and its correlation with sugar exposure

	DT = 0	DT 1–3	DT >3	χ^2	<i>p</i> -Value
According to gender					
Male	406	254	87	11.70	0.00
Female	26	2	6	df = 2	
According to post					
Constables	258	142	48	11.01	0.02
Head constables	84	64	32	df = 4	
Officers	90	50	13		
According to age groups					
21–30 years	110	48	24	20.42	0.00
31–40 years	102	62	12	df = 6	
41–50 years	136	104	47		
51–60 years	84	42	10		
According to education					
Below graduate	164	96	40	12.25	0.01
Graduate	198	104	47	df = 4	
Postgraduate	70	56	6		
Total	432 (55.3%)	256 (32.7%)	93 (11.9%)		
Relation between sugar exposure and decayed teeth					
Sugar exposure	Decayed teeth			Total	<i>p</i>-Value
	DT = 0	DT = 1–3	DT >3		
Once	114 (14.5%)	78 (9.9%)	26 (3.3%)	218 (27.9%)	<i>p</i> = 0.64
Twice	58 (7.4%)	34 (4.3%)	16 (2%)	108 (13.8%)	
More than twice	228 (29.1%)	122 (15.6%)	37 (4.7%)	387 (49.5%)	Spearman's correlation <i>r</i> = -0.017
Not taken	32 (4.09%)	22 (2.8%)	14 (1.7%)	68 (8.7%)	
Total	432 (55.3%)	256 (32.7%)	93 (11.9%)	781 (100%)	

The bold values represent significant *p* values ≤ 0.05 .

Table 4: Distribution of study subjects according to treatment needs

Treatment required	Number of subjects	Percentage
None	234	29.9
Preventive	186	23.8
One surface filling	273	34.9
Two or more surface fillings	18	2.3
Crown for any reason	8	1
Pulp care restoration	92	11.7
Extraction	76	9.7
Oral prophylaxis	501	64.1

Relation between oral hygiene practices and dental caries experience

An association was established between oral hygiene practices and highest Community Periodontal Index score. It was found that the periodontal status presented a statistically significant association with material used for cleaning of teeth (toothbrush or toothpaste) ($p = 0.00$). A significant association between rinsing of mouth with water and periodontal status was also found ($p = 0.04$).

The same association was established between oral hygiene practices and DMFT score. DMFT score presented a statistically significant association with material used for cleaning of teeth (toothbrush or toothpaste) ($p = 0.00$).

Table 5: Relation between oral hygiene practices and dental caries experience

	DMFT score
1 Method of cleaning of teeth	$r = -0.138$
2 Frequency of cleaning of teeth	$p = 0.000$
3 Timings of cleaning of teeth	$r = 0.046$
4 Frequency of changing of toothbrush	$p = 0.197$
5 Rinsing of mouth with water	$r = 0.044$
	$p = 0.215$
	$r = 0.057$
	$p = 0.110$
	$r = -0.096$
	$p = 0.007$

The bold values represent significant *p* values ≤ 0.05 .

A significant association between rinsing of mouth with water and DMFT score was also observed ($p = 0.00$) [Table 5].

Discussion

Good oral health among serving personnel is essential for their efficient performance.^[9] Good oral health of the police personnel would reduce the number of urgent dental intervention and absence from duties and hence would improve the security of the entire community.

The study area, Bhopal city, being the capital of the state Madhya Pradesh, has all the major administrative offices, the legislative assemblies, and political offices. These factors keep policemen under constant workload and stress, which makes it common for them to neglect their general health, including oral health.

A thorough literature search revealed very few studies related to oral health of police personnel. To the best of our knowledge, this is the first epidemiological study related to dentition status among district police personnel of Bhopal city.

The survey included 153 (19.5%) inspectors, sub-inspectors, and assistant sub-inspectors, which formed the group of officers, 180 (23.1%) head constables, and 448 (57.4%) constables. The study consisted of 747 (95.6%) men and 34 (4.4%) women. More women should be recruited in police force to provide equal gender distribution. The police personnel aged from 20 to 60 years, mean age being 40.5 years. Most of subjects were graduates (349, 44.7%) antonymous to that reported by Sohi *et al.*^[5] and Dilip^[10] who reported majority of police personnel to be undergraduates. Sohi *et al.*^[5] suggested that recruiting graduates in police force ensures effective public management.

A dynamic relation exists between sugar consumption and oral health. An assessment of previous day (24 h) sugar intake recall was conducted and it was found that 49.6% subjects did not consume sugar in last 24 h; similar to 44.7% respondents who did not consumed sugar as reported in National Oral Health Survey and Fluoride Mapping 2002 Madhya Pradesh state.^[6] This can be attributed to the usual dietary pattern of the Madhya Pradesh state.

Investigation of caries profile revealed that 44.7% police personnel had dental caries, which is low as compared to National Oral Health Survey 2002^[6] revealing that the percentage of subjects with caries experience at 35–44 years was 84.8%. The caries experience is also low as compared to police personnel of Mysore (67.2%),^[6] Ghaziabad (67.37%),^[11] Ambala (54.3%),^[5] and Shimla (48.24%).^[7] The mean number of decayed teeth (1.27) was higher than that reported by Basavaraj *et al.*^[11] (0.87), and the mean number of missing teeth due to caries was 1.25 in the present study as compared to 2.25. The number of missing teeth due to caries was found to be increasing with age, which is similar to study conducted in Ghaziabad^[11] and Shimla.^[7] Police personnel lag in use of dental services. This is shown by the mean number of filled teeth, which was as low as 0.13 (± 0.84) comparable 0.10 (± 0.39) of police personnel of Ghaziabad.^[11]

The mean DMFT score among the study population was 2.66 (± 4.32), which is comparable to DMFT scores of police personnel of Mysore city (2.69),^[6] Shimla (2.98),^[7] Ambala (3.05),^[5] and Ghaziabad (3.19).^[11] The DMFT scores were higher among officers (3.64) as compared to constables (1.83), which can be attributed to the age of officers. Identical findings were reported by Basavaraj *et al.*^[11] (mean DMFT scores 5.20 and 2.86) and among Australian Defense Force^[12] (mean DMFT scores 9.4 and 5.4). But it was in contrast to the study conducted in Shimla^[7] where officers were having lower

DMFT scores (2.78) than constables (3.18). The mean DMFT score had linearly increased between the age groups from 1.36 among 20–30 years to 4.95 among 51–60 years, similar to that found among police personnel of Shimla.^[7]

Dental caries is a multifactorial disease caused by interplay of several components, including oral hygiene practices and dietary habits. Method of cleaning of teeth ($p = 0.00$) and rinsing of mouth after every meals ($p = 0.00$) were significantly related to dental caries experience of the population. In evaluation of sugar consumption, it was found that 49.6% subject did not consume sugar in last 24 h. Sohi *et al.*^[5] advocated that police personnel stay for long time in their working environment and hence shall have a low sugar exposure. This was further supported by our findings that sugar exposure among police personnel is not associated with dental caries occurrence.

The data paint a picture of 70% subjects having unmet treatment needs, higher to that reported among police personnel of Mysore city (30%).^[6] Oral prophylaxis (64.1%) was the most needed treatment, in contrast to restoration being reported by Ahuja and Darekar^[13] among Indian army personnel.

These findings present a challenge and an opportunity. The challenge is to find ways to promote oral health and curb the initiation of tobacco use among police personnel. The opportunity is to explore and understand what causes the neglect of health in general and oral health in particular so that effective oral health promotion and tobacco control strategies might be devised.

Limitations of the present study included recall bias and conscious falsification by the subjects. Despite these shortcomings, this study found some important and often neglected correlates of dentition status and unmet treatment needs that should be addressed.

Conclusion

In conclusion, the findings of this study suggest that though the police personnel had satisfactory oral hygiene practices, they need to be educated regarding other oral hygiene aids. The data paint a picture of high unmet dental treatment needs with police personnel being more at risk of tooth loss following periodontal disease. Adequate health education regarding health-promoting behaviors by providing essential information about general health, and oral health in particular, to adopt methods and modify behaviors that contribute to good oral health is required for this group.

References

1. World Health Organization. *The World Oral Health Report 2003*. Geneva: World Health Organization. Available at: http://www.who.int/oral_health/media/en/orh_report03_en.pdf [last accessed on January 6, 2015].
2. Satapathy DM, Behera TR, Tripathy RM. Health status of traffic police personnel in Brahmapur city. *Indian J Community Med* 2009;34(1):71–2.

3. Parsons JRL. *Occupational Health and Safety Issues of Police Officers in Canada, the United States and Europe: A Review Essay (2004)*. Available at: <http://www.safetynet.mun.ca/pdfs/Occupational%20H&S.pdf> (last accessed on January 6, 2015).
4. Hopcraft MS, Yapp KE, Mahoney G, Morgan MV. Dental caries experience in young Australian Army recruits 2008. *Aust Dent J* 2009;54(4):316–22.
5. Sohi RK, Bansal V, Veerasha K, Gambhir RS. Assessment of oral health status and treatment needs of police personnel of Haryana, India. *Internet J Epidemiol* 2010;9(1).
6. Naveen N, Reddy CVK. Oral health status and treatment needs of police personnel in Mysore city, Karnataka. *SRM Univ J Dental Sci* 2010;1(2):156–60.
7. Bhardwaj VK, Sharma KR, Jhingta P, Luthra RP, Sharma D. Assessment of oral health status and treatment needs of police personnel in Shimla city, Himachal Pradesh: a cross-sectional study. *Int J Health Allied Sci* 2012;1:20–4.
8. Bali RK, Mathur VP, Talwar PP, Chanana HB. *National Oral Health Survey & Fluoride Mapping 2002–2003, India*. New Delhi: Dental Council of India, 2004.
9. Sutthavong S, Cae-Ngow S, Rangsin R. Oral health survey of military personnel in the Phramongkutklao Hospital, Thailand. *J Med Assoc Thai* 2009;92(1):S84–S90.
10. Dilip CL. Health status, treatment requirements and knowledge and attitudes towards oral health of police recruits in Karnataka. *J Indian Assoc Public Health Dent* 2005;5:20–34.
11. Basavaraj P, Khuller N, Kumar P. Dental caries experience and periodontal status of police personnel in Ghaziabad city. *J Indian Assoc Public Health Dent* 2011;17:44–8.
12. Mahoney G, Slade GD, Kitchener S, Barnett A. Lifetime fluoridation exposure and dental caries experience in a military population. *Community Dent Oral Epidemiol* 2008;36(6):485–92.
13. Ahuja A, Darekar HS. Community dentistry in armed forces. *MJAFI* 2003;59:18–20.

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