

## The oral health status among army personnel in Patna Bihar – A descriptive cross sectional study

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### Abstract

**Background:** To study the association between oral health status and army personnel in Patna (Bihar).

**Aims & Objective:** To assess the oral health status among army personnel in Patna, Bihar.

**Materials and Methods:** A total of 700 army personnel's were evaluated and oral examination was done by using CPI probe. WHO oral health assessment form (2013)<sup>9</sup> was used to assess the Dentition status, periodontal status, presence or absence of oral mucosal lesion.

**Result:** A total of 700 army personnel's were selected from the Patna, Bihar of which 99.7% were males and 0.3% were females. 65.6% were in the age group of 21-≤ 35 years and 46.4% were in the age group of >35-55 years.

**Keywords:** Oral health, Periodontal status, Oral mucosal condition, Dental caries and dental fluorosis.

*"An extra ordinary life, a life full of adventure, honour and glory. Where army are one among a million, and one in a million"*

### Introduction

Oral health is an integral part of general health. World Health Organization has defined Health as 'a state of complete physical, mental and social well being and not merely an absence of a disease or infirmity'. In recent years, this statement has been amplified to include the ability to lead a "socially and economically productive life."<sup>1</sup> Health is not something that one possesses as commodity, but connotes rather way of functioning within one's environment.<sup>2</sup> The work environment constitutes an important part of mans environment, so health to a large extent is affected by work condition.<sup>3</sup> Oral health is mainly determined by the prevalence of dental caries and periodontal diseases, the former being one of the most widespread chronic disease in the world. Dental caries can aptly be termed as a scourge of modern civilization and no nation, continent or race has escaped the ill effects.<sup>4</sup> The health and economic costs of tobacco use in military and veteran populations are high. In the short term, tobacco use impairs military readiness by reducing physical fitness, impairing visual acuity, and contributing to hearing loss. Over the long term, it causes health problems, including lung cancer and chronic obstructive pulmonary disease (COPD), and contributes to numerous other health problems, including cardiovascular disease, infections, and delayed wound – healing, use of smokeless tobacco also causes oral pancreatic cancer and periodontal diseases.<sup>5</sup> Oral health has two dimensions firstly, there is the physical oral health status in terms of number of teeth, periodontal status, and mouth opening and secondly, how the individual perceives his or her oral health is equally important, both dimensions are needed to characterize oral health comprehensively. Key characteristics of physical oral health are the number of teeth and denture status and such findings are standard components of oral health surveys.<sup>6</sup>

Army officers are expected to be combat - ready at all times facing a continual sense of danger from an unknown enemy. Army officers alternate between the violence of the street (e.g., shootings, witnessing death and mutilation, and dealing with abused children) and the normalcy of civilian life on a daily basis. Army officers face a number of occupational health and safety risks in the jobs. Risks are probably increasing over times because demands on officers, endemic shift work and stress, higher prevalence of communicable disease, widespread illicit drug manufacture and use, and greater willingness amongst offenders to attack officers. Reduction of vulnerability depends on recognition of these risk factors and implementation of effective prevention strategies.<sup>7</sup> The central reserve police force (CRPF) is the premier central police force of the union of India for internal security. Originally constituted as the crown representative police in 1939, its one of the oldest central Para military force (now termed as central reserve police force).CRPF was raised as a sequel to the political unrest and the agitations in the princely states of India following the Madras Resolution of the All-India Congress Committee in 1936 and the ever-growing desire of the Crown Representative to help the vast majority of the native States to preserve law and order as a part of the imperial policy. After Independence, the force was renamed as Central Reserve Police Force by an Act of Parliament on December 28, 1949. This Act constituted CRPF as an armed force of the Union. Sardar Vallabhbai Patel, then the Home Minister, visualized a multi-dimensional role for it in tune with the changing needs of a newly independent nation.<sup>8</sup>

The mission of army personnel of a state is to help the common man, to provide him security and to create a peaceful and law abiding community with his co-operation. The place that is occupied by the police in a state is similar to the place occupied by the military in a nation. Army

personnel are government employees who have access for free medical care at government hospitals and privileges for leave on medical grounds. This warrants good general as well as oral health. But on the other hand, Army personnel are a group of professionals who have all together a different working environment with 24 hours duty and often being exposed to highest physical strain and mental stress. Because of their odd working pattern, they often miss timely food, sleep, rest, and recreation and family contacts. This complicates their life and pulls down their level of living.<sup>8</sup>

### **Aim and Objectives**

To assess the oral health status among Army Personnel in Patna, Bihar.

To assess the prevalence of Dental Caries, Periodontal Status, Dental Fluorosis and Oral Mucosal Lesions/Conditions among army personnel in Patna, Bihar and to find the association if any between the variables considered under the study.

### **Study design**

It is a descriptive cross- Sectional study.

### **Method of collection of data**

The data will be obtained from the selected subjects from Army Personnel in Patna, Bihar. A total of 700 army personnel's working in Patna represent the study population. All the subjects available who fulfill the inclusion and exclusion criteria will be selected by simple random sampling method.

### **Inclusion criteria**

1. Participants who were able to respond to the questions are enrolled.
2. Participants who wish to give the consent are included in the study.

### **Exclusion criteria**

1. Medically compromised individuals
2. Participants who were not willing to give the consent.
3. Participants who were uncooperative.

### **Duration of study**

The duration of the study was six months.

### **Method of obtaining data**

After ethical committee review oral examination was done by CPI/WHO periodontal probe. The recorder was made to sit close to the examiner so that instructions and codes could be easily heard and the examiner could see that findings were being recorded correctly. The natural daylight was assisted by the torch light in cases where paper illuminations of the oral cavity could not be achieved with natural light. A specially prepared and pre tested Proforma, designed for collecting all the required and relevant general information and clinical findings were used for recording data.

WHO oral health assessment form (2013)<sup>9</sup> was used to assess the Dentition status, periodontal status, presence or absence of oral mucosal lesion.

Following were the Indices used in the present study:

1. DMFT (Total coronal caries experience)
2. Community Periodontal Index(CPI) and loss of attachment (LOA)
3. Oral Mucosal Lesions and
4. Dental Fluorosis

A set of instruments, viz mouth mirror, explorer, and WHO CPI probe were used for each individual patient separately. Clinical examination of the study subjects included assessment of the caries prevalence, periodontal status, presence or absence of oral mucosal lesion, dental fluorosis and dental trauma. Community Periodontal Index (CPI) modified Two indicators of periodontal status are used for this assessment: gingival bleeding and periodontal pockets. A specially designed, lightweight CPI metallic probe with a 0.5-mm ball tip is used, with a black band between 3.5 and 5.5 mm, and rings at 8.5 and 11.5 mm from the ball tip (19). All teeth present in the mouth are examined for absence or presence of gingival bleeding and absence or presence of periodontal pockets; pocket depth is measured with the WHO CPI periodontal probe.

### **Results**

The data obtained from the study was compiled, tabulated and subjected to statistical analysis. The present study was conducted to assess the oral health status among army personnel in Patna, Bihar-A descriptive cross-sectional study. The results are presented under various parameters considered under the study.

The distribution of study subjects according to gender is as follows. Of the total 700 subjects selected, 99.7% were males and the rest 0.3% were females.

The distribution of study subjects according to age groups. They were broadly grouped into 2 categories, those belonging to 21-≤35 years and >35-55 years age group. Of the total 700 army personnel's selected, 65.6% belonged to 21-≤35 years age group and the rest 34.4% belonged to >35-55 years age group.

The distribution of study subjects according to educational qualification. An overall majority of the subjects (37.9%) had Profession or Honours qualification, followed by Graduate or Post Graduate (27.7%); Intermediate or Post High School Diploma (21%); High School certificate (11.9%) and the rest 1.5% had either Middle or Primary School certificates. Among the age group 21-≤35 years, a majority of 22.3% had Profession or Honours qualification, followed by Graduate or Post Graduate (18.4%); Intermediate or Post High School Diploma (15.1%); High School certificate (9.2%) and the rest 0.5% had either Middle or Primary School certificates. Among the age group <35 -55 years, a majority of 15.5% had Profession or Honours qualification, followed by Graduate or Post Graduate (9.3%); Intermediate or Post High School Diploma (5.8%); High School certificate

(2.7%) and the rest 1% had either Middle or Primary School certificates.

#### **The distribution of study subjects according to occupation**

An overall majority of the subjects (38.5%) were Profession, followed by semi profession (27.2%); clerical, shop owner were (18.5%); skilled worker were (14.3%) and the rest 1.5% were semi-skilled and unskilled. Among the age group 21-≤35 years, majority of (23.9%) were Profession, followed by semi profession (16.9%); clerical, shop owner were (13.5%); skilled worker were (10.7%) and the rest (0.5%) were semi-skilled and unskilled. Among the age group <35-55 years, a majority of (14.6%) were Profession, followed by semi profession (10.3%); clerical, shop owner were (5%); skilled worker were (3.6%) and the rest (1%) were semi-skilled and unskilled.

#### **The distribution of study subjects according to income per month**

An overall majority of the subjects (40.7%) had an income of >36997 per month, followed by the income 36996-18498 (24.9%); (20%) had an income of 18497-13874; (12.8%) had an income of 13873-9249 and the rest (1.6%) had an income of 9248-5547 and 5546-1866. Among the age group 21-≤35 years, majority of (24.8%) had an income of >36997 per month, followed by the income 36996-18498 (15.9%); (14.6%) had an income of 18497-13874; (9.7%) had an income of 13873-9249 and the rest (0.59%) had an income of 9248-5547 and 5546-1866. Among the age group <35-55 years, majority of (15.6%) had an income of >36997 per month, followed by the income 36996-18498 (9%); (5.4%) had an income of 18497-13874; (3.1%) had an income of 13873-9249 and the rest (1%) had an income of 9248-5547 and 5546-1866.

#### **The distribution of study subjects according to socio economic status**

An overall majority of the subjects (38.1%) belonged to upper class, followed by upper middle class (23.1%); middle class (18.6%); lower middle class (12.3%) and lower class (7.9%). Among the age group 21-≤35 years, majority of (23.4%) belonged to upper class, followed by upper middle class (14.8%); middle class (13.7%); lower middle class (8.8%) and lower class (4.7%). Among the age group >35-55 years, majority of (14.7%) belonged to upper class, followed by upper middle class (8.3%); middle class (4.9%); and the rest (6.5%) belonged to either lower middle class and lower class.

#### **The distribution of study subjects according to marital status**

An overall majority of the study subjects (86.7%) were married, followed by unmarried (10.6%) and widow/widower (2.7%). Among the age group 21-≤35 years, majority of (56.8%) were married, followed by unmarried (7.4%) and widow/widower (1.3%). Among the age group >35-55 years, majority of (29.6%) were married

and the rest (4.6%) were either unmarried or widow/widower.

#### **Oral Hygiene Practices**

##### **The distribution of study subjects according to cleaning aids used**

An overall majority of the study subjects used toothbrush (93.2%) and 6.8% used indigenous (neem stick). Among the age group 21-≤35 years, majority of 61.8% used toothbrush and 3.7% used indigenous (neem stick). Among the age group >35-55 years, a majority of 31.4% used toothbrush and 3% used indigenous (neem stick).

##### **The distribution of study subjects according to type of material used**

An overall majority of the study subjects (93.6%) used tooth paste and 6.4% used tooth powder. Among the age group 21-≤35 years, majority of (61.9%) used tooth paste and 3.75% used tooth powder. Among the age group >35-55 years, majority of (31.7%) used tooth paste and 2.7% used tooth powder.

##### **The distribution of study subjects according to frequency of tooth brushing**

An overall majority of the study subjects (67.2%) cleaned their teeth once a day, followed by twice a day (25.4%) and (7.4%) cleaned their teeth more than twice per day. Among the age group 21-≤35 years, majority of (44.6%) cleaned their teeth once a day, followed by twice a day (17.3%) and (3.7%) cleaned their teeth more than twice per day. Among the age group >35-55 years, majority of (22.5%) cleaned their teeth once a day, followed by twice a day (8.1%) and (3.7%) cleaned their teeth more than twice per day.

##### **The distribution of study subjects according to method of brushing**

An overall majority of the study subjects (35.6%) cleaned their teeth horizontal method, followed by vertical method (30.7%); 19.3% cleaned their teeth in circular method and 14.4% had a combination of all. Among the age group 21-≤35 years, majority of (22%) cleaned their teeth by horizontal method, followed by vertical method (19.1%); 14.1% cleaned their teeth in circular method and 10.2% had a combination of all. Among the age group >35-55 years, majority of (13.6%) cleaned their teeth by horizontal method, followed by vertical method (11.6%); 5.1% cleaned their teeth in circular motion and 4.1% had a combination of all.

##### **The distribution of study subjects according to oral hygiene aid used**

An overall majority of the study subjects (34%) used flossing, followed by interdental brushes (30.9%) and 20% used oral mouth rinse. Among the age group 21-≤35 years, majority of (19.1%) used flossing, followed by interdental brushes (20.6%) and 15.1% used oral mouth rinse. Among the age group >35-55 years, majority of (14.6%) used

flossing, followed by interdental brushes (10.3%) and 4.9% used oral mouth rinse.

#### **The distribution of study subjects according to diet**

An overall majority of the study subjects 65.7% were of mixed diet and the rest 34.3% were vegetarian. Among the age group 21-≤35 years, majority of (43%) had mixed diet and (22.6%) were vegetarian. Among the age group >35-55 years, majority of (22.7%) had mixed diet and (11.7%) were vegetarian.

### **Tobacco Consumption**

#### **The distribution of study subjects according to whether they consume tobacco or not**

An overall majority of the study subjects (62.9%) consumed tobacco and 37.1% did not consume. Among the age group 21-≤35 years, majority of (45.9%) consumed tobacco and among the age group >35-55 years, 17% consumed tobacco.

#### **The distribution of study subjects according to the form of tobacco consumed**

An overall majority of the study subjects (53.6%) consumed smokeless tobacco, followed by smoked tobacco (35.9%) and 10.5% consumed both forms of tobacco. Among the age group 21-≤35 years, majority of (42%) consumed smokeless tobacco, followed by smoked tobacco (22.5%) and 8.4% consumed both forms of tobacco. Among the age group >35-55 years, majority of (13.4%) consumed smoked tobacco, followed by smokeless tobacco (11.6%) and (2.1%) consumed both forms of tobacco.

### **Smokeless form of Tobacco**

#### **The distribution of study subjects according to the type of smokeless form of tobacco**

An overall majority of the study subjects (44%) used Gutkha, followed by pan masala (22%); (16%) Khaini and rest (18%) used Zarda and pan with tobacco. Among the age group 21-≤35 years, majority of (36.2%) used Gutkha, followed by pan masala (18.8%); Khaini (11%) and rest (12.7%) used Zarda and pan with tobacco. Among the age group >35-55 years, majority of (7.8%) used Gutkha, followed by Khaini (5%); and the rest (8.5%) used pan masala, Zarda and pan with tobacco.

#### **The distribution of study subjects according to the frequency of smokeless form of tobacco used**

An overall majority of the study subjects (62.4%) used ≤5 times/day, followed by 6-10 times/day (23%); 11-15 times/day (8.9%) and >15times/day (5.8%). Among the age group 21-≤35 years, a majority of 52.1% used ≤5 times/day, followed by 6-10 times/day (19.7%); and rest (7.9%) used 11-15 times/day and >15times/day. Among the age group >35-55 years, majority of 10.3% used ≤5 times/day, followed by 6-10 times/day (4.2%); and rest (6.8%) used 11-15 times/day and >15times/day.

#### **The distribution of study subjects according to the duration of habit (in years)**

An overall majority of the study subjects (38.7%) had a habit of smokeless tobacco more than 1 year to less than 5 years category, followed by >5 year to <10 years (30.1%); ≤ 1 year (20.6%) and 10.6% in more than 10 years category. Among the age group 21-≤35 years, majority of 34.8% had a habit of smokeless tobacco for more than 1 year to less than 5 years category, followed by 22% among >5 year-<10 years; 13.9% in ≤ 1 year category and 8.1% in more than 10 years category. Among the age group >35-55 years, majority of 8.1% had a habit of smokeless tobacco more than 5 year to less than 10 years category; followed by 6.7% in ≤ 1 year category and rest (6.4%) had a habit of smokeless tobacco in more than 1 year to less than 5 years and more than 10 year's category.

#### **The distribution of study subjects according to the site of placement of smokeless form of tobacco**

An overall majority of the study subjects (45.4%) kept in the labial mucosa, followed by buccal mucosa (31.2%) and 23.4% kept below the tongue. Among the age group 21-≤35 years, majority of (39.3%) kept in the labial mucosa, followed by below the tongue (20.6%) and 18.8% kept in buccal mucosa. Among the age group >35-55 years, majority of (12.4%) kept in buccal mucosa and rest of (8.8%) kept in labial mucosa and below the tongue.

#### **The distribution of study subjects according to the duration of smokeless form of tobacco placed in the mouth**

An overall majority of the study subjects (47.8%) kept smokeless tobacco for >15mins, followed by 10-15mins (22.3%); less than 5mins (16.3%) and 13.5% kept for 5-10mins duration. Among the age group 21-≤35 years, majority of (34.3%) kept smokeless tobacco for more than 15mins, followed by 10-15mins (20.9%); 5-10mins (13.1%) and 10.3% kept for less than 5mins. Among the age group >35-55 years, majority of (13.5%) kept for more than 15mins, and rest (7.8%) kept smokeless tobacco for < 5mins; 5-10mins and 10-15mins.

#### **The distribution of study subjects according to the time interval between subsequent uses of smokeless form of tobacco**

An overall majority of the study subjects (33.7%) had a time interval of 2-3hrs for subsequent use of smokeless form of tobacco, followed by 4- 5hrs time interval (23.8%); less than 1 hour time interval (22%) and 20.6% had a time interval of >5hr between subsequent uses. Among the age group 21-≤35 years, majority of (30.9%) had a time interval of 2-3hrs, followed by 19.5% who had time interval of 4-5hrs; less than 1 hour time interval (16.3%) and 12% had a time interval of >5hrs between subsequent uses. Among the age group >35-55 years, majority of (8.5%) had a time interval of >5hr and rest (12.7%) had a time interval of ≤ 1 hour; 2-3hrs and 4- 5hrs between subsequent uses.

### Smoked form of Tobacco

#### The distribution of study subjects according to the type of tobacco smoked

An overall majority of the study subjects (55.9%) smoked cigarette, followed by hukka (23.5%) and beedi (20.6%). Among the age group 21-≤35 years, majority of (38.2%) smoked cigarette, followed by beedi (15.2%) and hukka (13.2%). Among the age group >35-55 years, majority of (17.7%) smoked cigarette, followed by hukka (10.2%) and beedi (5.4%).

#### The distribution of study subjects according to the frequency of smoked tobacco

An overall majority of the study subjects (55.9%) had a frequency of smoked tobacco ≤5 times/day, followed by 6-10 times/day (21.6%); 11-15 times/day (14.2%) and (8.3%) had a frequency of > 15 times/day of smoked tobacco. Among the age group 21-≤35 years, majority of (39.7%) had a frequency of smoked tobacco less than 5 times/day, followed by 6-10 times/day (12.8%); 11-15 times/day (8.8%) and 5.4% had a frequency of > 15 times/day of smoked tobacco. Among the age group >35-55 years, majority of (16.2%) had a frequency of smoked tobacco ≤5 times/day, followed by 6-10 times/day (8.8%); 11-15 times/day (5.4%) and 2.9% had a frequency of > 15 times/day of smoked tobacco.

#### The distribution of study subjects according to the duration of habit (smoked tobacco)

An overall majority of the study subjects (38.7%) had duration of habit from 2-5 years, followed by less than 1 year duration (23.5%); 6-10 years (21.6%) and 16.1% in more than 10 years category. Among the age group 21-≤35 years, majority of (28.4%) had duration of habit from 2-5 years, followed by less than 1 year duration (15.7%); 6-10years (12.8%) and 9.8% in more than 10 years duration category. Among the age group >35-55 years, majority of (10.3%) had duration of habit from 2-5 years, followed by 6-10years duration category (8.8%); less than 1 year duration (7.8%) and 6.3% in more than 10 years duration category.

#### The distribution of study subjects according to the time interval between subsequent uses of smoked form of tobacco

An overall majority of the study subjects (41.2%) had a time interval of 2-3hrs for subsequent use, followed by time interval of 4-5hrs (25.4%); time interval of ≤ 1 hour (21.6%) and 11.7% had a time interval of >5hr between subsequent uses. Among the age group 21-≤35 years, majority of (25.5%) had a time interval of 2-3hrs, followed by time interval of 4- 5hrs (19.5%); time interval of ≤ 1 hour (13.7%) and 7.8% had a time interval of >5hr between subsequent uses. Among the age group >35-55 years, majority of (15.78%) had a time interval of 2-3hrs; time interval of ≤ 1 hour (7.9%) and 3.9% had a time interval of >5hr between subsequent uses.

### The prevalence of dental caries among the study subjects

An overall prevalence of dental caries was 12.9%. Among the age group 21-≤35 years, it affected 6.7% of the subjects and in >35-55 age group category it affected 6.2% of the subjects. When compared between two age groups, the results were statistically significant with value < 0.001.

#### The dental caries experience (mean DMFT) among the study subjects

An overall dental caries experience (mean DMFT) was 5.8±0.06. Among the age group 21-≤35 and <35-55 years, it was 5.1±0.8 and 6.5±0.4 respectively. When individual components were considered, for Decayed Teeth (DT) component, an overall mean was 1.1±0.02 and for age group 21-≤35 and <35-55 years, it was 0.9±0.01 and 1.3±0.03 respectively. For Missing Teeth (MT) component, an overall mean was 2.8±0.05 and for age group 21-≤35 and <35-55 years, it was 2.5±0.4 and 3.1±0.6 respectively. For Filled Teeth (FT) component, an overall mean was 4.8±0.04 and for age group 21-≤35 and <35-55 years, it was 4.6±0.3 and 5.1±0.4 respectively. The results were statistically significant (p < 0.05) for all parameters considered in this section.

#### The presence of bleeding on probing among the study subjects

An overall prevalence of gingival bleeding was seen among 10.6% of the study population. Among the age group 21-≤35 years, it affected 5.4% of the subjects and in >35-55 age group category it affected 5.2% of the subjects. When compared between two age groups, the results were statistically significant with value < 0.001.

#### The presence of periodontal pocket among the study subjects

An overall prevalence of periodontal pocket was 17.3% among the study population. For Score 1 (pocket depth 4-5 mm) and Score 2 (pocket depth > 6 mm) it was 11.6% and 5.7% respectively. Among the age group 21-≤35 years, for score 1 (Pocket depth 4-5mm) it affected 6% of the subjects and for score 2 (Pocket > 6 mm) it affected 3.6% of the subjects. Among the age group >35-55 years, for score 1 (Pocket depth 4-5mm) it affected 5.6% of the subjects and for score 2 (Pocket > 6 mm) it affected 1.1% of the subjects. When compared between two age groups, the results were statistically significant with value < 0.001.

#### The distribution of the study subjects according to the Loss of attachment

An overall 43% of the subjects had some form of loss of attachment. Of which score 1(4-5mm) had 16.6%, followed by score 2 (6-8mm) (12.6%); score 3 (9-11mm) (8.1%) and the least of 5.7% was seen with score 4 (>12mm). Among the age group 21-≤35 years, score 1(4-5mm) had 9.6%, followed by score 2 (6-8mm) (7.3%); score 3 (9-11mm) (5.5%) and the least of 3% was seen with score 4 (>12mm). Among the age group >35-55 years, score 1(4-5mm) had 7%, followed by score 2 (6-8mm) (5.3%); score 3 (9-11mm)

(2.6%) and the least of 2.7% was seen with score 4 (>12mm). When compared between two age groups, the results were statistically significant with value < 0.00.

#### **The distribution of study subjects according to the Enamel Fluorosis**

An overall 55.6% of the subjects had some form of enamel fluorosis. Questionable was seen in 16.6% of the subjects, followed by very mild form (12.1%); mild form (10.3%); severe form (8.6%) and a least of 8% was seen with moderate form. Among the age group 21-≤35 years, Questionable was seen in 9.5% of the subjects, followed by very mild form (7.3%); mild form (6.6%); moderate form (5.3%) and a least of 5.2% was seen with severe form. Among the age group >35-55 years, Questionable was seen in 7% of the subjects, followed by very mild form (4.8%); mild form (3.7%); severe form (3.4%) and a least of 2.7% was seen with moderate form. When compared between two age groups, the results were statistically significant with value < 0.00.

#### **The distribution of the study subjects according to the oral mucosal lesions/conditions**

An overall 5.1% of the subjects had ulceration as the only finding. Among the age group 21-≤35 years, it was 3.4% and among the age group >35-55 years, it was 1.7%. When compared between two age groups, the results were statistically significant with value < 0.05.

The distribution of the study subjects according to the location of oral mucosal lesions/conditions are shown in (Table 33). An overall majority of 66.7% was seen in buccal mucosa and 33.3% were seen in sulci. Among the age group 21-≤35 years, majority of 38.1% was seen in buccal mucosa and 23.8% was seen in sulci and among the age group >35-55 years, majority of 28.6% was seen in buccal mucosa and 9.5% was seen in sulci. When compared between two age groups, the results were statistically significant with value < 0.001.

#### **Associations between Various Parameters Considered under the Study: Dental caries**

##### **The association between dental caries experience and socio-economic status**

The mean dental caries experience was seen more with middle class and it was statistically significant with p value 0.05. When individual components were considered, the mean decayed teeth component was seen maximum with upper middle class and it was statistically significant. While for filled teeth component, it was maximum with middle class and it was statistically significant. And with missing teeth there was no association found and it was not statistically significant.

The association between dental caries and diet was found to be significant with p value (p -0.001). Dental caries was seen more among the vegetarians. And lastly with tobacco consumption, it was significantly associated more with tobacco consumers with p value 0.001.)

#### **Periodontal Status**

##### **Gingival bleeding**

Gingival bleeding was compared with many variables like socio-economic status, diet and tobacco consumption. It was found that the results were statistically significant with all the above considered parameters in the study. Periodontal Pockets:

When compared with socio-economic status, for shallow pockets (4-5mm) and deep pockets (> 6mm), it was seen more with lower middle class and lower class respectively and the results were statistically significant p value <0.05. When compared with diet and tobacco consumption, periodontal pockets (Score 1 and Score 2 both) were significantly associated with p value < 0.05. Loss of attachment:

When compared with method of tooth brushing, loss of attachment was significantly associated with tooth brushes (p value <0.05) and similar association existed with tobacco consumption.

##### **Dental Fluorosis**

When compared with the diet, the results were statistically significant with p value < 0.05.

##### **Oral Mucosal Lesions/Conditions**

Oral mucosal lesions/conditions were compared with socio-economic status. Ulcerations were seen more with lower class and it was statistically significant with p value < 0.05. Similar results were seen with diet and tobacco consumption and labial mucosa was the most common site for such ulcerations with results being significant.

#### **Discussion**

Oral diseases are ranked among the most significant diseases affecting human race. Their high frequency has resulted in public health concern in the growing population. Many epidemiological data show that oral health problems is one of the most commonly observed diseases around the world. These diseases may never be eradicated because of complex interplay of social, behavioral, dietary, abuse of tobacco and tobacco related products and biological factors that are found to be associated with their initiation and progression. Tobacco use imposes a huge and growing burden for public health globally. Approximately 5 million people are killed annually by tobacco use. By the year 2030, according to current trends it is assumed that these numbers will increase to 10 million with 70% of deaths occurring in low and middle countries. Oral diseases among individuals consuming tobacco in some form have been known to cause irreversible damage to oral periodontium. The change in oral micro flora adds to the complex interplay of etiological factors thus, making the situation more difficult to understand and provide necessary care to individuals who are in need. Army personnels are no different as they form the same population strata. For this purpose it was necessary to know the prevalence of oral health problems and dental health practices followed among army personnels in Patna,

Bihar. This data will assist the concerned authorities understand the prevailing situation and plan any preventive programmes deemed necessary to implement either education wise or physical intervention. Thus the study aimed to assess and compare the oral health status among army personnel in Patna, Bihar. This study was descriptive cross-sectional survey.

In the present study a total of 700 subjects participated in the study, of which 99.7% were males and the rest 0.3% were females. The results were in accordance with the study conducted by Bhalla M et al,<sup>2</sup> (99.6%- males and 0.4%-females) and Sohi RK et al,<sup>10</sup> (98.9% males and 1.1% females). It can be justified by the fact that in a country like India the recruitment of army mainly dominates by men and only recently it is been open to female category. So, this reasons the high prevalence of men in the study.

### Oral Hygiene Practices

Regarding oral hygiene practices, majority of the army personnel used tooth brush (93.2%) and tooth paste (93.6%) for cleaning their teeth. Affordability and increased awareness has been justified reasons for increase in prevalence of use of oral hygiene aids. Similar findings were seen in studies of Naveen N et al.<sup>11</sup> and Bhardwaj V k et al.<sup>12</sup>

Majority of the subjects 67.2% brush their teeth once a day. Similar findings were seen in studies of Borhan Jasmin et al<sup>13</sup> and Vinay Kumar et al.<sup>12</sup> lack of time availability and routine habit of practice of one time brushing justifies the reason. The frequency of brushing twice daily was seen among 25.4% of study subjects. Similar findings were seen in studies of Borhan Jasmin et al<sup>13</sup> and Vinay kumar et al.<sup>12</sup> it can be reasoned that increase awareness and better access to improve oral care have lead to better oral hygiene practices. Use of other oral hygiene aids was moderate in the present study population.

### Tobacco Consumption

In the present study 62.9% subjects consumed tobacco which in accordance to the study conducted by Gili R, et al.<sup>14</sup> and Vinay Kumar, et al.<sup>12</sup> easy availability of tobacco products, peer influence, habits developed overtime, better socioeconomic of the individuals, poor awareness about the harmful tobacco and tobacco related products, lack of knowledge on oral health effects are possible reasons for increase consumption of tobacco products in the present study. (Park K, Hiremath S.S and Peter Soben. Textbooks in community dentistry)

Among the tobacco consumers 53.6% consumed smokeless form of tobacco. Easy availability work stress, inexpensive nature of these products and lack of awareness, psychological factors of thrills and fills have influenced the subjects who use more, it was found to be in accordance to the study conducted by Singh A, Bhambal A, et al.<sup>15</sup> 35.4% consumed smoked form it can be reasoned that better socio economic status as many belong to upper and upper middle class, ease of availability, family history of smoking are some of the few reasons for consuming smoked form of

tobacco. Over 1.1 billion adults are current smokers of cigarettes worldwide. (Sajid Vellappally et al)<sup>16</sup>

### Smokeless form of Tobacco

Gutkha (44%) was the most commonly used smokeless form of tobacco. The reason for high prevalence was the ease in availability of the products in this region and it was the most popular product among tobacco users (Dr. D N Sinha, Patna). This was found to be in contrast to the study conducted by Vinay Kumar et al<sup>12</sup> where only 2.96% of the study consumed Gutkha.

Among frequency of consumption of smokeless form of tobacco, a majority of 62.4% of the subjects consumed less than 5 times/day. It is in accordance to the study conducted by Singh A, Bhambal A, et al.<sup>15</sup> Physical dependence of tobacco, higher socio economic status, increased stress and peer influence clearly influences the individual to use it more frequently.

Labial mucosa (45.4%) and buccal mucosa (31.2%) was the most common site preferred for placement of smokeless form of tobacco in oral cavity (Bhambal A, et al).<sup>15</sup> The traditional of these smokeless forms in labial or buccal mucosa has been practiced for many centuries and it is the most preferred site in this part of the country.

The duration of smokeless form of tobacco kept in the oral cavity for more than 15 minutes was 47.8% of the subjects followed by 10-15 minutes seen among 22.3% of the subjects. There were no studies available to compare the above results.

### Smoked form of Tobacco

Regarding smoked form of tobacco used, cigarettes and hukka were the most commonly used smoked form with 55.9% and 23.5% respectively. Beedi was consumed by 20.6% of the study subjects. Regarding the frequency, a majority of 55.9% of the subjects consumed less than 5 times /day, followed by 21.6% who consumed 6-10 times/day. The study was in accordance to the study conducted by (Bhambal A, et al).<sup>15</sup> Stress, higher socioeconomic status, physical dependent or addiction and peer influence can result in such higher prevalence; a majority of 38.7% of the subjects developed this habit in the last 2-5 years whereas 23.5% developed in the last one year. There were no studies available to compare the results.

### Dental Caries

An overall prevalence of dental caries among the study subject was (12.9%). The mean DMFT was 5.8±0.06 and with individual components considered (DT) decayed teeth, missing teeth (MT and filled teeth FT was 1.1±0.02, 2.8±0.05 and 4.8±0.04, which is in accordance to the study conducted by R. Sohi, et al,<sup>17</sup> the increase in mean DMFT is because of missing tooth and filled component. During the recruitment procedure it is desired to undergo a complete oral health care before joining the services. Thus overall dental caries experience is high in this study when the two age groups considered under the study where compared, the results were statistically significant.

## Periodontal Status

### Gingival bleeding on probing

Only 10.6% of the subjects had gingival bleeding on probing. Maintenance of good oral hygiene as mandated in their training regimen, increased awareness, increased availability of oral hygiene products all have resulted in causing less bleeding in the gingiva. This was similar to the study conducted by Lt Col. Ahuja AS, et al.<sup>3</sup> When compared between different age groups, the results were statistically significant. Periodontal disease is an age related entity in which there is a gradual deterioration of periodontal supporting structures so even minimal risk causative factors can influence the health of the periodontal structures which justifies why bleeding was seen more among older age groups.

### Periodontal pockets

Periodontal pockets was seen in 17.3% of the study subjects shallow pockets (4-5mm) was seen in 11.6% and deep pockets (more than 6mm) was seen in more than 5.7% of the subjects. This was similar to the study conducted by Lt Col. Ahuja A, et al.<sup>3</sup> When different age group was compared the results were statistically significant. The periodontal destruction is accumulative effect overtime and older age group is bound to show increased prevalence in periodontal disease.

### Enamel Fluorosis

Dental fluorosis was seen effecting 55.6% of the study subjects and the rest 44.4% had some form of dental fluorosis affecting them. Environmental factors like the presence of fluoride in the drinking water, early childhood consumption of the same before 8 years, diet rich in fluoride, easy availability of fluoridated tooth paste have contribute a lot for the occurrence of dental fluorosis. In contrast, the study conducted by Sohi R.K et al.<sup>17</sup> and Bhalla M et al.<sup>2</sup> reported that 95.38% and 24% of the study subjects had dental fluorosis.

### Oral mucosal lesions/conditions

5.1% had ulceration as the only oral mucosal lesions observed among the study population. Stress ease one of the major contributing factor, followed by dietary deficiency may be acts as a contributing factor for this observation. Buccal mucosa and sulci were the most common affected locations for these ulcers. It can be justified that the clinical manifestations are site specific thus it affects commonly the above said areas. The study was in accordance to the study conducted by (Bhambal A, et al).<sup>15</sup>

### Associations between various parameters considered under the study: Dental caries:

Dental caries was compared with various parameters like socio economic status, diet and tobacco consumption. With diet, the dental caries was seen more among vegetarians and the results were statistically significant. Increased sweet consumption among vegetarians as seen in this part of the

region can be one the major contributing factor for dental caries occurrence while the fibrous nature of food in the missed diet can act as a self cleansing mechanism foe decrease in dental caries.

## Periodontal Status

### Gingival bleeding

Gingival bleeding was compared with socio economic status, diet and tobacco consumption. It was statistically associated. With different classes that is higher to lower, gingival bleeding increased it can be reasoned that poor awareness, poor socioeconomic status, carelessness have lead to increased gingival bleeding.

There was a significant association between gingival bleeding and tobacco consumption. It was found statistically significant in the study conducted by (Bhambal A, et al).<sup>15</sup> Traditionally, the reduce bleeding in smokers have been attributed to gingival vaso constriction induced by the actions of nicotine stimulated adrenalin and nor adrenalin on alpha-1 adrenergic receptors. There is some evidence to support this theory in animal models, however, the available evidence supporting this hypothesis in humans is not concluding as smoking can cause vaso dilation in some tissues causing increased bleeding.

Periodontal pocket was compared with socioeconomic status, diet and tobacco consumption. There was an association existing with all the above parameters. Poor oral hygiene ignorance and less affordability increases the chances of developing pockets with decrease in socio economic class and with diet there were very less reports available to justify while tobacco is a known risk factor in the etiology of periodontal disease, thus more pockets associated with periodontal pockets. (Yousaf A, Manzoor A, et al).<sup>17</sup>

## Conclusion

This descriptive cross sectional survey was carried out among army personnel in Patna in order to evaluate the oral health status and its relationship with sociodemographic variables. A total of 700 army personnel's were selected from the Patna, Bihar, of which 99.7% were males and 0.3% were females. 65.6% were in the age group of 21-≤ 35 years and 46.4% were in the age group of >35-55 years. The data obtained from the study has shown that the overall prevalence of the dental caries was 12.9%, the presence of bleeding gum was 10.6%, enamel fluorosis is 55.6% and oral mus/cosal lesion/conditions was 5.1% This being the first-ever data from the army personnel of Patna, Bihar, more such studies are recommended.

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None.

### Conflict of Interest

None.



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