

# INDIAN ARMY SOLDIERS AND ORAL HYGIENE. THE COGNIZANCE FACTOR

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*Abstract : The aim of this study was to evaluate the oral hygiene awareness and practices among serving soldiers as well as their dependents of Mathura cantonment. Specific tailored questionnaires about oral hygiene maintenance techniques were distributed to 700 patients divided into 3 groups based on age. The results were tabulated and intergroup comparison was done using Pearson Chi-square Test. Oral hygiene awareness even though better than other studies, the techniques used for oral health maintenance were not ideal. The intergroup comparisons of different methods were highly significant. More specific tailor made oral hygiene awareness programs than the ones already instigated must be undertaken at different echelons to make everybody 'Biting Fit'*

*IndexTerms - Oral Health, Tooth Brush, Dental Caries, Periodontal Diseases*

## I. INTRODUCTION

India army which is the second largest army in the world is deployed in every nook and corner of India. Army Dental Corps has been looking after the oral health of not only the soldiers but also their family and dependents. The dental surgeons of Indian army work with the motto of making the soldiers "Biting Fit". Oral health is considered as the mirror of health status of the body and thus a healthy oral cavity is a primary requirement for keeping the ever fighting soldier fit.

Diversified oral diseases like dental caries, gingivitis and periodontitis are highly prevalent among Indian population in comparison to other developed countries. Not to forget that the domineering incidence of oral carcinoma is found in Indian population (Almas K et al, 2000). It has already been ascertained beyond doubt the effect of these oral diseases on certain systemic conditions like diabetes mellitus, cardiovascular diseases, preterm low birth weight and certain hematologic diseases to name a few (Ame Adriana et al, 2008). So it becomes momentous to possess an oral cavity unimpeded of diseases. Transitioning living conditions, improved knowledge, interest and inculcating oral self-care practices and preventive oral care have been ascertained as an effective measure for sustenance of sterling oral health. It is an obligation of dental surgeons that amelioration is sought about in these factors concerning the individual after analyzing the level of oral hygiene awareness in them.

There are manifold studies that decree an association between knowledge, oral hygiene practice and better oral health which are mostly concentrated to the urban population (AGuile E et al, 1996, Al-Otaibi M et al, 2008). But fewer studies are available with a mixture of both urban and rural population (Dilip CL, 2005, Jiang H et al, 2006). Soldiers and their families located at Mathura cantonment are a very good representative of such mixed population. Keeping the above-mentioned facts in mind the following study was under taken to assess the level of oral hygiene awareness through the knowledge of their oral health practice among the population of Mathura Cantonment and thus provide insight into additional educational programs that have to be organized for the improvement of oral health.

## II. MATERIAL AND METHODS

This observational study was transacted in 1 CDU Mathura. A total of 700 patients aged between 15 to 60 years of age, who visited the outpatient department of Dental Unit were embodied in the study. The study population was then cleaved randomly into three groups based on age grouping wherein Group A constituted 254 patients (15-30 years) Group B consisted of 219 patients (30-45 years) and Group C constituted 227 patients (45-60 years).

All subjects were verbally informed and consent was obtained for their participation in the study. A self constructed questionnaire form (in English and Hindi languages) [Fig 1] was distributed to all selected patients to be filled by them. In case of illiterate persons, the accompanying persons or the dental staff at the unit helped to fill them. The questionnaire included questions cognated to the patient's demographic background, oral health hygiene habits, oral health knowledge and attitudes, usage of other oral hygiene aids and effective utilization of dental services.

The overall data obtained was tabulated and statistical analysis carried out using Pearson Chi-Square test.

## III. RESULTS

The statistical analysis was done through SPSS for Windows Version 14.0 Evaluation version (SPSS, 2005. SPSS Inc, New York). 'P' value was set at 0.05 for the statistical significance. Of the 700 patients, 404 were males and 296 were females. Group A had 158 male and 96 females (n=254). Group B had 111 males and 108 females (n=219). Group C consisted of 135 males and 92

females (n=227). Of the total sample 607 were literate and 93 were illiterate and thus required help to fill the forms. All the 700 patients cleaned their teeth daily.

**Table 1 Overall data obtained from all the 700 patients**

Question No	15-30 yrs (n=354)	30-45 yrs (n=219)	45-60 yrs (n=227)
<b>2. How do you brush</b>			
a. Neem	3	11	18
b. Charcoal	0	0	0
c. Finger & toothpaste	1	18	27
d. Finger & Salt	0	1	4
e. Toothbrush & Toothpaste	313	143	137
f. Toothbrush & Toothpowder	37	46	41
<b>3. How often do you brush</b>			
a. Occasionaly	0	3	6
b. Once a day	110	115	198
c. Twice a day	132	93	22
d. Thrice a day	12	8	1
<b>4. How do you brush</b>			
a. Horizontal	39	52	54
b. Vertical	63	77	59
c. Circular	27	17	21
d. Combined	125	73	93
<b>7. Do you use Dental floss</b>			
a. Yes	7	4	0
b. No	247	215	227
<b>8. Do you use Interdental Brush</b>			
a. Yes	2	8	14
b. No	252	211	213
<b>9. Do You use Mouth Wash</b>			
a. Yes	94	53	37
b. No	160	166	190
<b>10. Do you clean your tongue</b>			
a. No	3	17	16
b. Yes	251	202	211
<b>11. Do you rinse your after food</b>			
a. No	11	8	10
b. Yes	243	211	217
<b>12. Do you have bleeding gums</b>			
a. Yes	99	176	132
b. No	155	43	95
<b>13. Do you have bad breath</b>			
a. Yes	46	113	53
b. No	208	106	174
<b>14. How often you visit a dentist</b>			
a. When having tooth pain	121	138	176
b. Once in 3 months	29	21	11
c. Once in 6 months	37	28	23
d. Once in a year	67	32	17

Out of 700 patients, 493 (70.4%) of the patients used toothbrush and toothpaste to brush, and of which 213 (30.4%) were in Group A, 143 (20.4%) and 137 (19.6%) were in Group B and C respectively. Nobody used charcoal and 46 (6.5%) used finger and toothpaste to clean [Table 1]. Table 2 shows that 617 (88.1%) patients used toothbrush for cleaning the teeth out of which 224, 193 and 200 patients were of Group A, B and C respectively [Table 2]. Only 9 (1.2%) patients brushed occasionally and 21 (3%) of patients brushed thrice a day. Four hundred and twenty three (60.4%) of patients brushed just once a day [Table 1] [Fig 1A]. While cleaning their teeth 145 (20.7%) brushed horizontally and 291 (41.5%) brushed in a combined manner [Table 1] [Fig 1B].

**QUESTIONNAIRE**

Name: \_\_\_\_\_ Age: \_\_\_\_\_ Sex:  Male  Female

Rank/Service No: \_\_\_\_\_ Relation: \_\_\_\_\_

Socioeconomic Status:  Upper Class  Upper Middle Class  Lower Middleclass  Lower Class

1. Do you clean your teeth?  Yes  No

2. What do you use to brush your teeth?  Neem  Charcoal  Finger & toothpaste  
 Finger & Salt  Toothbrush & Toothpaste  
 Toothbrush & Toothpowder

3. How often do you brush?  Occasionally  Once daily  Twice daily  Thrice daily

4. How do you brush your teeth?  Horizontal  Vertical  Circular  Combined

5. What type of brush do you use?  Hard  Medium  Soft  Don't Know

6. When do you change your brush?  When Useless  In 3 months  In 6 months  In 1 year

7. Do you use Dental floss?  Yes  No

8. Do you use Interdental Brush?  Yes  No

9. Do you use Mouth Wash?  Yes  No

10. Do you clean your tongue?  Yes  No

11. Do you rinse your mouth after food?  Yes  No

12. Do you have bleeding from gums?  Yes  No

13. Do you have bad breath?  Yes  No

14. How often do you visit a dentist?  When having tooth pain  Once in 3 months  
 Once in 6 months  Once in a year

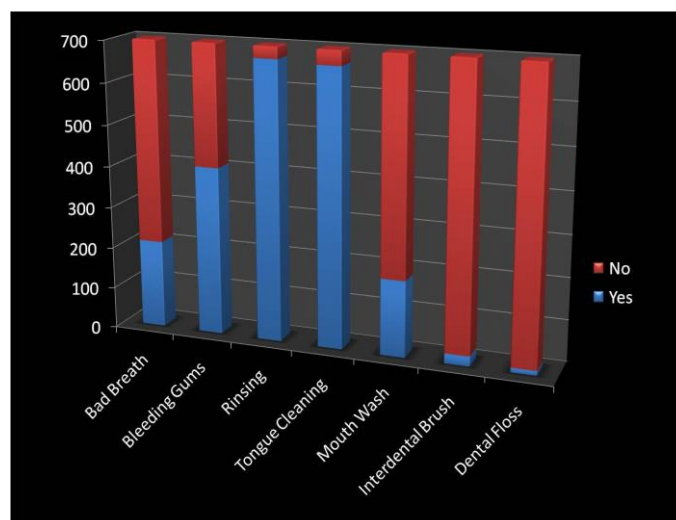


Figure 1: Questionnaire form distributed to the patients

Figure 2: Graph depicting data about hygiene status and practices

Figure 1C shows that, of the 617 patients using toothbrush, 15 (2.4%) did not know the consistency of the toothbrush used and 398 (64.5%) patients used medium consistency toothbrush [Fig 1C]. While 219 (35.4%) subjects changed their brush when it became useless, 293 (47.4%) patients changed them in 3 months [Table 2] [Fig 1D]. Table 1 shows that only 11 (1.57%) of patients used mouthwash out of which 7 of them belonged to group A and 516 (73.7%) of them never used a mouth wash [Table 1] [Fig 2]. Another highlighting feature was that 407 (58.1%) had bleeding gums out of which 176 (43.3%) were concentrated in Group B [Table 1] [Fig 2]. Even though 212 (30.2%) had bad breath only 61 (8.7%) visited the dental doctor once in 3 months and 435 (62.1%) of them visited the dentist only on having tooth pain [Table 1].

Table 3 Descriptive statistics calculated for data obtained

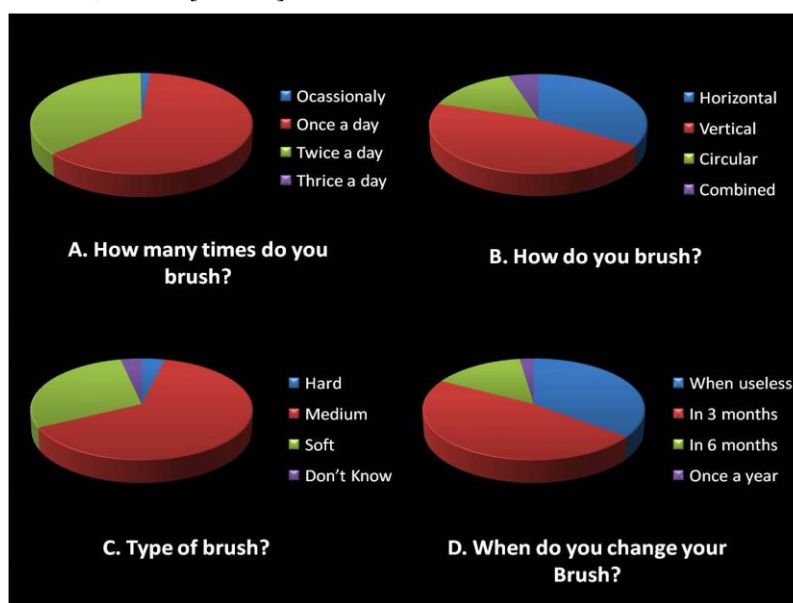
Question No	Min	Max	Range	Sum	Median	Mean	Std Dev	Variance
2a	3	18	15	32	11	10.66	7.50	56.33
2c	1	27	26	46	18	15.33	13.20	174.33
2d	0	4	4	5	1	1.66	2.08	4.33
2e	137	213	76	493	143	164.33	42.25	1785.3
2f	37	46	9	124	41	41.33	4.50	20.33
3a	0	6	6	9	3	3	3	9
3b	110	198	154	437	150	154	44.33	248
3c	22	132	110	247	93	82.33	55.77	3110.3
3d	1	12	11	21	8	7	5.56	31
4a	39	54	15	145	52	48.33	8.14	66.33
4b	59	77	18	199	63	66.33	9.45	89.33
4c	17	27	10	65	21	21.66	5.03	25.33
4d	73	125	52	291	93	97	26.23	688
5a	3	11	8	23	9	7.66	4.16	17.33
5b	124	143	19	398	131	132.66	9.60	92.33
5c	46	76	30	181	59	60.33	15.04	226.33
5d	2	8	6	15	5	5	3	9
Question No	Min	Max	Range	Sum	Median	Mean	Std Dev	Variance
6a	28	112	84	219	79	73	42.32	1791
6b	53	172	119	293	68	97.66	64.81	4200
6c	21	38	17	59	31	26.66	12.31	82.33
6d	3	8	5	11	5	5.33	3.61	11
7a	0	7	7	11	4	3.66	3.51	12.333
7b	215	247	32	689	227	229.66	16.16	261.33
8a	2	14	12	24	8	8	6	36
8b	211	252	41	676	213	225.33	23.11	534.33

9a	37	94	57	184	53	61.33	29.40	864.33
9b	160	190	30	516	166	172	15.87	252
10a	3	17	14	36	16	12	7.81	61
10b	202	251	49	664	211	221.33	26.08	680.33
11a	8	11	3	29	10	9.66	1.52	2.33
11b	211	243	32	671	217	223.66	17.01	289.33
12a	99	176	77	407	132	135.66	38.63	1492.3
12b	43	155	112	293	95	97.66	56.04	3141.3
13a	46	113	67	212	53	70.66	36.82	1356.3
13b	106	208	102	488	174	162.66	51.93	2697.3
14a	121	176	55	435	138	145	28.16	793
14b	11	29	18	61	21	20.33	9.018	81.33
14c	23	37	14	60	28	29.33	7.09	50.33
14d	17	67	50	116	32	38.66	25.65	658.33

**Table 4 Pearson Chi-Square analysis for intergroup comparison**

Question	Value	df	P Value
How do you brush	56.404	8	<0.0001
How often do you brush	121.258	6	<0.0001
How do you brush	18.872	6	0.004
Do you use Dental floss	6.020	2	0.049
Do you use Interdental Brush	10.527	2	0.005
Do You use Mouth Wash	27.245	2	<0.0001
Do you clean your tongue	12.943	2	0.002
Do you rinse your after food	0.194	2	0.907
Do you have bleeding gums	82.779	2	<0.0001
Do you have bad breath	70.123	2	<0.0001
How often you visit a dentist	51.933	6	<0.0001
Type of brush do you use	14.140	6	0.028
How often do you change your brush	135.974	6	<0.0001

The answers provided by the subjects were correlated into descriptive statistics which revealed that on average 164.33 +/- 42.25 patients brushed using toothbrush and toothpaste, 154 +/- 44.33 brushed once a day, 132.66 +/- 9.60 use medium consistency brush, 97.66 +/- 64.81 patients change their brush once in 3 months [Table 3] [Fig 3]. A mean of 229.66 +/- 16.16 did not use dental floss, 225.33 +/- 23.11 and 172 +/- 15.87 did not use interdental brush and mouthwash respectively [Table 3]. The statistical analysis in the form of Pearson Chi-Square test revealed that the level of significance in between groups were statistically significant for all the questions with maximum significance seen in questions number 2,3,7,10,11 and 12 (<0.0001). The least significance was seen in question number 13 with a P value of 0.028 [Table 4].



**Figure 3: Graph depicting the brushing methods and techniques used**



#### IV. DISCUSSION

Mouth is the gateway to our body and copious things entering our body have to pass through the oral cavity. Hence maintenance of its hygiene is of utmost importance and has plenary remained as an ignored and unrealized major social problem. Majority of the people are unaware of the fact that presence of various oral diseases can be a risk factor to distinct systemic diseases or disorders. Two such oral diseases which are primordial in influencing systemic homeostasis are the periodontitis and dental caries. Hence prevention of these diseases by having proper awareness of the oral hygiene measures becomes mandatory. Keeping these facts in mind this study was formulated to evaluate the level of oral hygiene awareness among the military population in Mathura cantonment so that attempts can be made to instigate additional programs to improve their oral hygiene practices.

In the present study 700 subjects attending the OPD of 1 CDU were divided into 3 groups based on age. The dental patients of Mathura which consist not only serving personnel but also their dependents thus reflecting an ideal mixed urban and rural population for study of this kind. In this study we have the well-educated officer cadre soldiers and their families who belong mostly to upper class and the JCOs and ORs and their families who belong to upper middle or middle class giving us participants belonging to a wide range of socioeconomic status and educational background. Out of 700 participants 94 were officers/families, 241 were JCOs/families and 365 belonged to ORs/families.

The data was collected by means of interview administered questionnaires and due to the consecutive participation approach, the response rate was high. All the 700 patients revealed that they clean their teeth at least once a day. But this does not mean that they are having a healthy oral cavity because merely cleaning their teeth without using ideal techniques does not suffice and some age old techniques used can have deleterious effect on teeth otherwise.

It is very consequential the material used for cleaning teeth and 6.5% of the population did not still use tooth brush and 124 out of 700 subjects used tooth powder. Both these are not ideal because if tooth brush is not used effective cleaning is not possible and tooth powder usage can lead to wasting diseases of teeth (Fleming T, 2003). These observations are higher than the studies by Dilip (2005) and Jiang et al (2005). However the positive factor was that more of younger age groups were using toothbrush ( $P < 0.001$ ) and paste to clean their teeth. Another surprising factor was that about 9 subjects of older age group brushed occasionally and on the other hand 21 subjects brushed thrice a day which can be harmful to the teeth and gums. Brushing has to be ideally twice a day and was done by about 35% of the patients which is very less as compared to 62% in a study by Al Shammary et al (1999) and 58% in a study by Dilip (2005).

It is noteworthy that only 20.5% of the subjects brushed their teeth using traditional horizontal method, which will jeopardize the tooth structure (Fleming T, 2003). This is attributable to the dental education programs of Army Dental Corps being conducted at the unit level. This finding is not in agreement with that of the study done by Zhu et al (2005) wherein 60% of the sample did the same. Maximum patient's especially younger age groups used the recommended combined technique and the inter technique comparison was highly significant. About 51% of the subjects used medium consistency brush, which is more than observed in study by Al-Beirut (1997) where 27% of the sample used the same. Almost 35% of the population more significantly Group 3 changed their brush when it became useless which can be traumatic to the gums while brushing and ideally it should be changed in 3 months which was done by 47.5% of subjects and this can be again attributable to the education programs instituted to them by the army.

Only 11, 24 and 184 subjects used cleaning aids like dental floss, interdental brush and dental floss respectively and their intergroup comparisons were highly significant ( $P < 0.001$ ) which are similar to studies conducted by Jamjoom (2001) and Hamilton et al (1991). Making them to use these hygiene aids can further substantiate a better oral care. Fifty eight percent of the total subjects reported bleeding gums which is in agreement with studies of Gilbert et al (1999) and Buhlin et al (2008) who showed that bleeding gums was high in percentage but contrast with the studies of Nagarajan et al (2008), Tervonen et al (1998) and Kallio et al (1994). About 30% of the patients had bad breath and both bleeding gums and bad breath are classical features of periodontal diseases which mandate them to visit the dental surgeon frequently (WHO, 2000).

But this was not the case seen in our study where 8.7% of patients visited a dentist ideally once in 3 months. About 62% of the patients visited the dentist only on having tooth pain. Despite the availability of free dental care, not visiting the dentist once in 3 months clearly shows the least importance given by the patients to oral health care. In general, oral health awareness seemed to be slightly precinct in our study population. However, dental attendance habits might be influenced by educational and cultural factors. Oral hygiene routines should be established much earlier and awareness of oral health needs greater promotion. It would be appropriate to preserve established oral hygiene traditions and complement these with a modern approach tooth brushing with fluoride toothpaste. However, in this context it should be acknowledged that the elderly are usually very bound by tradition and unwilling to change their established behavior. Further more extensive studies are needed in order to establish a reliable database on oral health status. Data for target groups in the population should be analyzed thoroughly, in order to provide a basis for planning appropriately tailored preventive measures for each group.

#### V. CONCLUSION

The study conducted betoken towards the task to spread more awareness among the armed forces population about the importance of oral hygiene. It becomes mandatory that the dental surgeons of Indian army will have to keep reinforcing the importance of correcting all aspects related with brushing and flossing along with the importance of regular checkups. They are also duty bound to dentally educate each and every individual at all echelons of the army. The task of spreading this awareness extends not only within us but well beyond us and will have to be achieved by various outreach programs and relevant public health

awareness measures through various mediums, such as Print/Press Media, Audio/Radio/Television, Internet, and Organizing Social Activities. We can proudly state here that Army Dental Corps has already instituted various such programs which are carried out regularly. It is this very reason that the oral hygiene awareness among the study sample is comparatively better than other studies. However, there are certain limitations to the study like during the data collection the participants may have given socially desirable responses even though not following them. The study population even though random cannot be extrapolated to the whole Indian army population. Further time to time studies with larger sample sizes will surely help us in devising specific dental health related program for achieving a good oral health in maximum population.

## VI. CONFLICT OF INTREST

None declared

## VII. ACKNOWLEDGEMENT

The authors would like to acknowledge the immense help and guidance provided by Colonel Manish Mukherjee in making this study successful.

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