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ORIGINAL ARTICLE

Oral Health Status and Anxiety Level Amongst the Borderline Security Force Personnel and Their Family Members

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Abstract
The primary role of border security personnel is to safeguard borders against illegal trans-border activities during peacetime and provide military support during wartime. Medical facilities are available to residents, offering direct oral care for minor procedures, with comprehensive dental treatments managed through empanelled clinics under a government insurance system. This study aimed to evaluate the oral health status, treatment needs, and prevalence of oral pre-malignant conditions among security forces personnel and their families at training centres in Delhi NCR. A multi-centric cross-sectional study was conducted at three training centres. Permission was obtained from BSF headquarters for the oral health screening program. Oral health education topics included oral cancer screening, early detection, oral diseases, their prevention, and tobacco cessation. Brief explanations of dental procedures, such as pit and fissure sealants, dental caries restoration, and root canal treatments, were provided. Demonstrations of proper brushing techniques and oral hygiene maintenance measures were conducted. Participants were encouraged to discuss experiences and challenges, which were addressed by attending clinicians. Following the sessions, oral screenings identified oral diseases and pre-malignant lesions. Affected participants were informed about their condition and referred for treatment. Those using tobacco were counselled, provided with educational materials, and motivated to quit. The study concluded that the oral health status of BSF personnel was comparable to the general population, possibly due to the rigorous physical and medical fitness criteria required during recruitment.

Keywords: Oral Health, Anxiety, Military Oral Health, Army Oral Health, Tobacco

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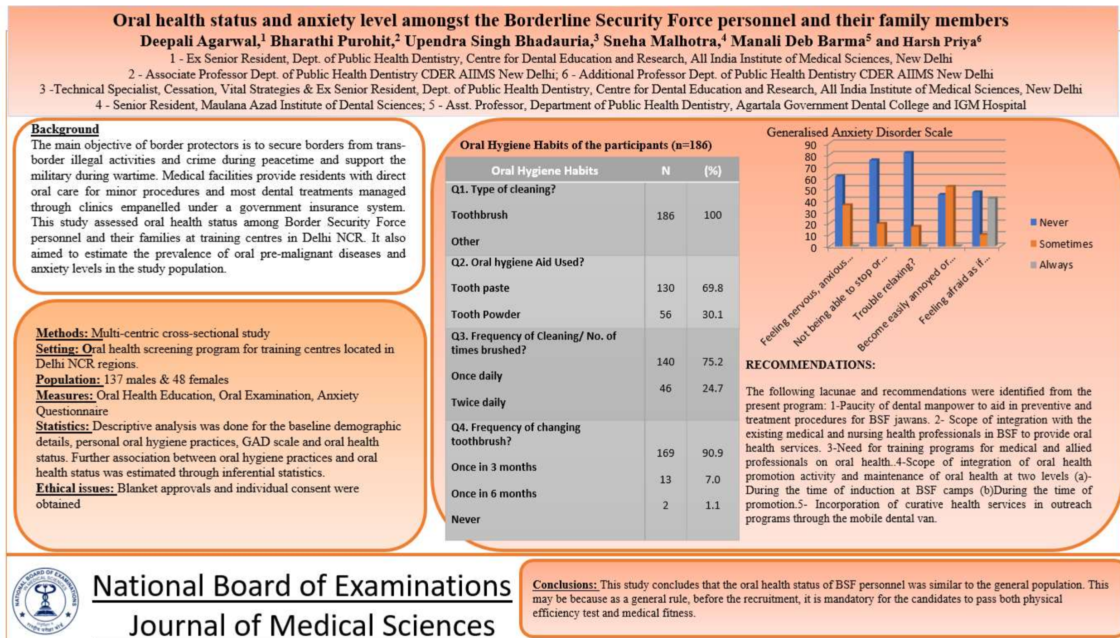
Graphical Abstract



Introduction

Borderline Security Force (BSF) in India is one of the segments of Central Armed Police Forces (CAPF) under Ministry of Home Affairs. Its headquarters is at New Delhi and is headed by Director General [1]. Its main objective is to secure the borders from any trans-border illegal activities and crime in regular time and to hold the grounds and guide the military force in the war times [1]. Borderline Security Force personnel are usually deployed at remote areas where the access to the basic health facilities is a challenge, let alone the oral diseases treatment [2].

Majority of the security forces are deprived of efficient oral health facilities due to an existing acute disparity between the burden of oral diseases and treatment facilities in India [3]. Common oral diseases like dental caries, gingivitis, periodontitis, recurrent ulcers and oro-dental trauma may compromise the working potential of any individual. It leads to loss of working hours [4]. A soldier is expected to stay ready and fit for any emergency situation and maintenance of oral health is essential part of overall fitness. The cost of conservative treatment of dental diseases increases with the progression of disease. Untreated oral diseases have untoward effects not only on their duties but also increases government financial burden by increasing the cost of treatment of progressive oral diseases [5]. The nature of soldiers work may create a constant environment of anxiety and pressure to perform well which may further lead to poor oral hygiene practices or poor diet aggravating the oral diseases [6,7]. Working under harsh conditions away from the families may plunge them to deleterious habits like that of tobacco use resulting in oral premalignant diseases [8]. Their stringent regimen on one hand may prove to be beneficial for oral health by restricting in

between snacking but at the same time it may be deleterious if not provided with a balanced or adequate diet.

BSF training centres

These training centres spread over huge land areas and harbour the BSF personnel along with their families estimating to around 5000 to 6000 people at each centre. Basic and emergency medical facilities are provided to all the residents. Direct oral health care delivery is provided for the minor procedure while majority of the dental treatments are catered through dental clinics near the vicinity of the campus empanelled under a closed panel insurance system by the government. However, there are a few limitations regarding the type of dental treatments available under this scheme. So, it becomes imperative to imbibe preventive oral care in their daily routine in order to avoid culmination of initial and less severe diseases to a more severe forms. Early diagnosis and prompt treatment could prove highly beneficial under such circumstances. So, the aim of this study was to assess the oral health status amongst the Borderline Security Force personnel and their family members at their training centres in Delhi NCR region. The other objectives were to estimate the prevalence of oral pre-malignant diseases and anxiety level amongst the study population.

Material and Methods

Study design and setting

A multi-centric cross sectional study was designed to assess the oral health status and treatment needs amongst the Borderline Security Force personnel and their family members. The headquarters of BSF was approached by the study investigators and consent was taken for the same. Permission was given for conducting oral health screening program for three BSF training centres located at Bhondsi, Chhawla and Tigri in Delhi NCR regions.

Participants

Participants included both BSF personnel and their families. There were no exclusion criteria for oral health examination. However, a separate counter was set up for the soldier’s family members.

Oral Health Education and Oral Examination

Topics for oral health education included:

a) Oral cancer screening and early detection: Here participants were made aware of the prevalence of oral cancer in India. They were shown and taught about the oral pre malignant lesions and conditions so that they can identify them at the right time and seek treatment for the same. The risk factors for oral cancer were also highlighted along with a short self oral examination video to motivate the participants to stay vigilant about the oral health and not indulge in any harmful activities leading to oral cancer.
b) Oral health and oral diseases: Participants were given a general overview of healthy mouth and the most prevalent oral diseases in India. Pictorial presentations of diseases like gingivitis, dental caries, malocclusion and fluorosis helped the participants to co-relate and understand things.
c) Prevention of oral diseases and tobacco cessation: This section included preventive measures both at

the participant's and professional level to avoid oral diseases. A brief outline was also given about the basic dental procedures like pit and fissure sealants, dental caries restoration procedures and root canal treatment. People were motivated to quit tobacco use in all forms and a few tips were given to help them in tobacco cessation. This session was ended by a demonstration of correct brushing technique through a brushing model and measures of maintaining oral hygiene.

Following the sessions, an open discussion was encouraged where participants shared their experiences and problems which were addressed by the present doctors. Next oral screening was done for oral diseases and pre malignant lesions. Participants having any oral disease were explained about their condition with the help of corresponding models and then referred for the treatment of the same. Participants consuming tobacco in any form were counselled briefly and patient education material was provided to them on tobacco cessation.

Data Collection

A close ended questionnaire was pre designed for the data collection. It included questions on demographic details, personal tobacco history and oral hygiene practices, oral health status and anxiety. In oral health status; caries experience and periodontal status was assessed through Decayed, Missing and Filled index and Community Periodontal Index respectively. Level of anxiety was calibrated using modified Generalised Anxiety Disorder Questionnaire (GAD-7). Originally it is 7 point scale; however, it was modified to 5 pointer scale after a discussion by the expert committee. Questions which experts found irrelevant or repetitive were excluded. Further, emoji was added with each question to make the questions more explicit and enhance the understanding of the participants for the same. Oral examination was carried out with the help of a mouth mirror, explorer and CPI probe under a natural light.

Statistical analysis

Descriptive analysis was done for the baseline demographic details, personal oral hygiene practices, GAD scale and oral health status. Further association between oral hygiene practices and oral health status was estimated through inferential statistics. All statistical tests were performed at 5% significance level.

Results

A total of 137 males and 48 females were included in the study. The mean age of the population was 38.2 ± 13.0. Nearly 81% were BSF personnel and 70% were married. There were 50% participants who were either graduate or post graduate while other 50% had primary or secondary education. Only 19 participants had some history of some systemic illness. More than 80% of the participants had sleep between 7 hours to 10 hours (Table 1).

Table1. Demographic status of the participants

	N (186)	%
Gender		
Male	137	73.7
Female	48	25.8
Participants		
BSF personnel	152	81.7
BSF family members	34	18.3
Educational Qualification		
Primary/secondary	75	40.3
Graduation	57	30.6
Post-Graduation	54	29.0
Rank		
Constable	12	22.6
S.I.	100	53.8
R.M.	40	23.8
Marital Status		
Yes	130	69.9
No	56	30.9
Sleep Hours		
2 -6	35	18.8
7-10	151	81.1
Medical History		
Yes	19	10.2
No	151	81.2

It was reported that all the participants used toothbrush with 70% using tooth paste while others using toothpowder. Majority of the population brushed teeth once daily and changed the tooth brush once in three months. Khaini was most widely used tobacco product followed by bidi and cigarette (Figure 1). Mean GAD score was 7.4 ± 1.93 which indicated mild anxiety amongst the study participants (Figure 2).

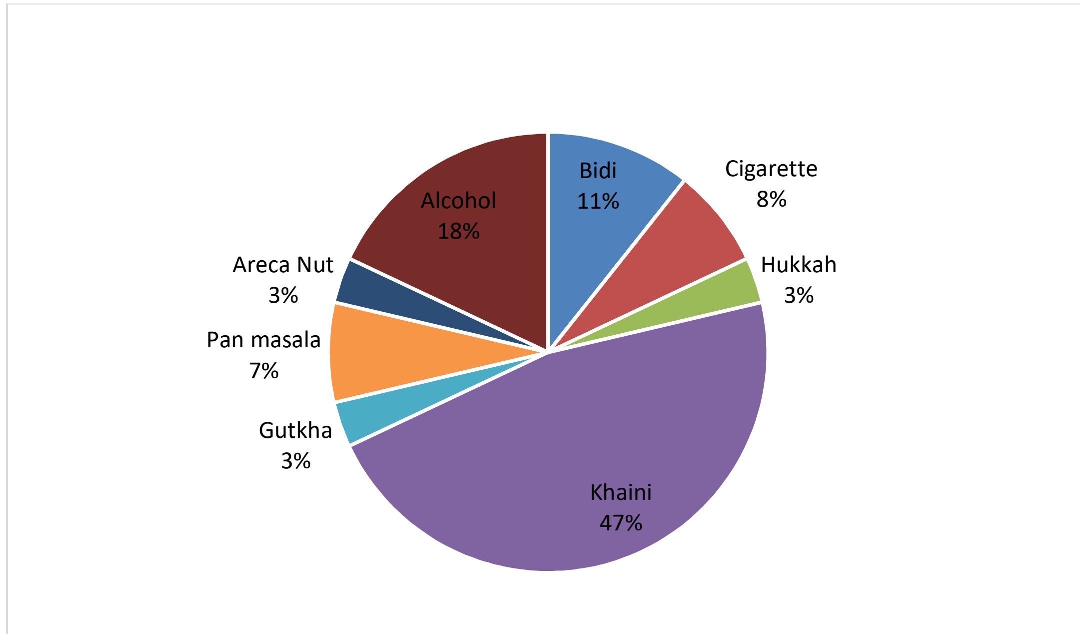


Figure 1. Forms of tobacco habits among those who consumed tobacco (n = 25)

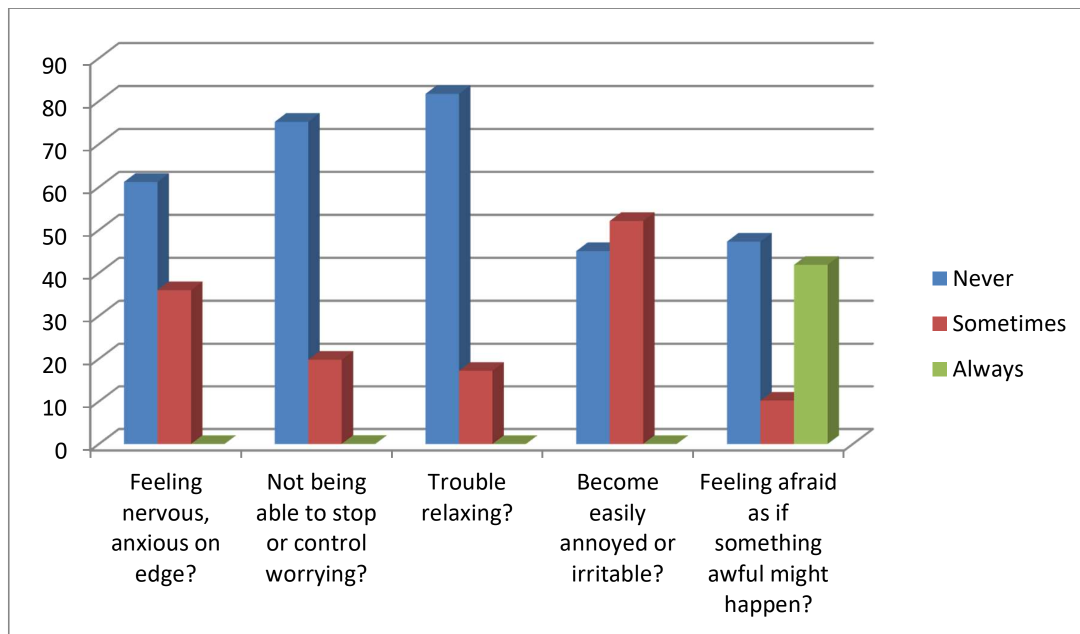


Figure 2. Generalised Anxiety Disorder Scale

Oral health status evaluation showed mean DMFT index to be 2.2 ± 3.2. Nearly 49% participants had healthy peridontium, 27.4% showed bleeding from gingiva, 18.8% had calculus and 4.8% had gingival pockets (Tables 2 and 3).

Table 2. Oral Hygiene Habits of the participants (n=186)

	N	(%)
Q1. Type of cleaning?		
Toothbrush	186	100
Other		
Q2. Oral hygiene Aid Used?		
Tooth paste	130	69.8
Tooth Powder	56	30.1
Q3. Frequency of Cleaning/ No. of times brushed?		
Once daily	140	75.2
Twice daily	46	24.7
Q4. Frequency of changing toothbrush?		
Once in 3 months	169	90.9
Once in 6 months	13	7.0
Never	2	1.1

Table 3. Oral health Status of the participants (n=186)

Variables	N(SD)
Mean decayed teeth	1.18(5.0)
Mean Missing teeth (MT)	0.65(1.4)
Mean Filled teeth (FT)	0.69(1.9)
Mean DMFT	2.2 (3.2)
Lesions	
TPK	1(0.5%)
Treated Case of Oral Cancer	1(0.5%)
Codes of CPI	
Healthy	91 (48.9)
Bleeding	51 (27.4)
Calculus	35 (18.8)
Pocket 4-5 mm	9 (4.8)

Discussion

This study concluded that the oral health status of BSF personnel was similar to the general population. This may be because, as a general rule, before the recruitment, the candidates must pass both physical efficiency test and medical fitness. This medical fitness includes oral health as well, because of which all the candidates get their oral health check-ups and treatment done if required before applying for the post of BSF personnel. In this study, about 37% were recruited and hence had fair oral health.

The current study showed that nearly 49% of participants had healthy peridontium which is in agreement to the findings by Jain et al. who assessed the oral health status amongst the BSF personnel in the Labana Cantonment, Jaipur, Rajasthan. However, the mean DMFT was higher in the current study when compared to that reported by Jain et al. probably owing to the inclusion of small number BSF family members in the current study. On the contrary the mean DMFT was reported to be 9.7 ± 5.3 and 8.15 ± 5.3 by Khalilazae et al. [9] and Jasmine et al. [10] amongst Iranian Armed Forces and Malaysian Territorial Army personnel which is much higher than observed in the current study population. Similarly, in these studies, the percentage of army personnel with significant calculus was higher compared to the current study population.

Oral hygiene practices like use of fluoridated toothpaste and frequency of brushing teeth were similar to that documented by Jasmin et al. [10] and Skec et al. [11] in Malaysian and Croatian Army respectively. However, use of tobacco products in any form was much less than usually found amongst the army personnel Sandhu et al. [8], Jasmin et al. [10] and Skec et al. [11]. Most commonly smokeless tobacco in the form of Khaini was used by the BSF personnel. Social desirability bias giving misleading information, BSF family members and new female recruits forming a significant part of the study population and further the study setting i.e. training centres where the people were not much stressed and fairly aware of the ill effects of tobacco use could be a the possibilities for this difference in tobacco usage pattern.

GAD scale depicted mild stress amongst the study population which is against to that documented by Sandhu et al.[8] where majority of the cadets visiting the dental care unit at Indo Tibetian Border Police Force Station showed significant occupational stress in all age groups.

Recommendations

The following lacunae and recommendations were identified from the present program:

1. Paucity of dental manpower to aid in preventive and treatment procedures for BSF jawans.
2. Scope of integration with the existing medical and nursing health professionals in BSF to provide oral health services.
3. Need for training programs for medical and allied professionals on oral health.
4. Scope of integration of oral health promotion activity and maintenance of oral health at two levels:
    a. During the time of induction at BSF camps
    b. During the time of promotion.
5. Incorporation of curative health services in outreach programs through the mobile dental van.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

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