Oral Health Survey of Military Personnel in the Phramongkutklao Hospital, Thailand

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Objective: To evaluate chief complaints, the prevalence of the oral diseases and the treatments needed in military personnel in comparison to the civilians.

Material and Method: The dental records of new patients at Phramongkutklao Hospital from January to December 2003 were reviewed. The retrieved information included demographic status, chief complaint, diagnosis and the treatment needed. Descriptive analysis was used to describe the data. Univariate analysis was used to obtain the odds ratios and 95% CI for the independent association between factors (age, status), chief complaint, diagnosis and treatment needed.

Results: A total of 4,662 consecutive dental records were evaluated during the study period, in which, 69.7% persons were civilians, and 30.3% persons were military personnel which included; commissioned officers (COs) 23.6%, non-commissioned officers (NCOs) 15.3%, conscripts 44.8%, and retired officers 16.3%. The military personnel had higher rates of toothache (OR = 1.27, 95% CI = 1.08-1.47), and gum swelling (OR = 1.41, 95% CI = 1.07-1.84) than the civilians. Military personnel showed increased risk of having pulp and periapical diseases (OR = 1.23, 95% CI = 1.05-1.44), and fracture teeth (OR = 1.44, 95% CI = 1.04-1.97) more than those observed in the civilians. Only 1.2% of the active duty military personnel required no dental treatment. It was found that the military personnel had significantly higher treatment needs than the civilians in all categories except for removal of impacted teeth. The conscripts had the highest needs for dental treatments.

Conclusion: This survey showed that the military personnel, especially the conscripts had a relatively high prevalence for oral diseases. In order to make their oral conditions fit for deployment, the predicted treatment times and resources used were estimated to be convincingly high.

Keywords: Military personnel, Oral health

Oral health is an essential part of achieving and maintaining readiness to deploy and fight. The dental health of the military personnel have a significant impact on military operations since the untreated oral conditions can result in increased rates of disease and non-battle injury for deployed soldiers[1].

The primary mission of the military dental service is to maintain the dental health of the military personnel at an optimum level to ensure their operational readiness. In addition, personnel dental wellness and readiness are important not only for immediate deployment but also for the well-being during non-deployment. The dental problems should be solved and the preventive measurements should be employed to avoid unnecessary "sick calls". In the US armed forces, all soldiers receive dental examinations and the necessary dental treatment before deployment. The dental health status is then classified according to dental disease severity. Only those who have treatment complete or no treatment indicated (class 1) and those who require non-urgent treatment, oral conditions

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which are unlikely to result in dental emergencies within 12 months (class 2) were worldwide deployable[2,3]. However, even when pre-deployment oral health screening was performed, there were approximately 20 to 25% of all soldiers who were reported to be on dental sick call during a one-year deployment, and approximately a half of them required endodontic intervention. Besides, if selected conditions were identified and treated before deployment, approximately three-fourths of these sick call visits could have been prevented[4].

The Royal Thai Army Phramongkutklao Hospital provides comprehensive dental services for the military personnel and civilians. The services include oral examination, diagnosis, treatment planning, all restorative and rehabilitative services, primary preventive dentistry procedures and counseling, and recall.

However, the comprehensive oral examination and the treatment needed in the military active duty personnel were not systemically recorded and classified according to necessity and readiness for deployment. Thus, the objectives of this survey were to evaluate the prevalence and severity of the chief complaints, the diagnosis of the oral diseases and all treatments needed of military personnel compared with civilians.

Material and Method

All new patients and the patients who did not have a dental check-up for more than six months, requiring dental treatment at the Dental Department, of the Royal Thai Army Phramongkutklao Hospital were obliged to have their complete oral examinations to determine the treatment plan at the oral diagnosis clinic. All patients had oral examination and specific radiographic examinations, if needed. All of the clinical findings were recorded in the hospital oral records using the same protocol for all patients. The patients' chief complaints, diagnoses, other findings and the treatments needed were recorded before they were referred to the appropriate dental clinics of the department.

The data collection was done by reviewing the chart records from January to December 2003 including demographic status, chief complaints, diagnosis and present illness, the treatment needed according to age, sex, status of the patients, and rank. The diagnosis was also classified according to the WHO I-CD-10[5].

Subsequently, data underwent statistical analysis, using the descriptive statistics rate, mean and standard deviation for quantitative data. For the comparison of the qualitative data univariate analysis was used for finding the independent association between factors (age, status) and chief complaint, diagnoses, and treatment needed. Analyses were performed using Statistical Program for Social Science program (SPSS version 13, Chicago, USA).

The research protocol was reviewed and approved by the Ethics Committee of the Royal Thai Army Medical Department.

Results

There were 4,662 consecutive patients' records reviewed during the study period. The records were collected from 1,414 (30.3%) military personnel and 3,248 (69.7%) civilians, whose characteristics are shown in Table 1. The sex ratio of the patients was 1:1. The mean age of participants were 36.0 ($\pm$ 17.6) and 37.6 ($\pm$ 17.3) years among the military personnel patients and civilian patients, respectively.

The common reason for all dental clinic visits were dental check-up (n = 1106, 23.7%), toothaches (n = 1016, 21.8%), request for tooth extraction (n = 762, 16.3%), request for tooth filling (n = 333, 7.1%), sensitive teeth (n = 296, 6.3%), gum swelling (n = 242, 5.2%), request for scaling (n = 199, 4.3%), request for dentures (n = 197, 4.2%) and orthodontics treatment (n = 159, 3.4%), respectively. The patients who were 60 years or older were less likely to have a toothache when compared with those who were 25 years or younger, but they were more likely to present with gum swelling. Those who were in older age groups, either 25-59 years or 60 years or older had a significantly lower rate of request for tooth extraction than those who were 25 years or younger. Those who were in older age groups

Table 1. The characteristics of the study population

Characteristics	Frequencies	%
Sex		
Male	2362	50.70
Female	2300	49.30
Status		
Military personnel	1414	30.30
Comissioned officer	334	7.20
Non comissioned officer	216	4.60
Conscripts	634	13.60
Retired officers	223	4.80
Civilians	3248	69.70
Total	4662	100.00

were significantly more likely to present with tooth mobility and the complaint rate of having tooth mobility increased with age (Table 2).

The rates of request for dental check-up were not different between military personnel and civilians. The authors found that military personnel had the higher rate of toothache and gum swelling than with civilians. The distribution of the reason for dental visit by age groups and status of the patients, either military personnel or civilian are shown in Table 2.

The most common diagnoses of all participants were gingivitis and periodontal diseases (n = 1495, 32.1%), dental caries (n = 1044, 22.4%), diseases of the pulp and periapical tissues (n = 876, 18.8%), embedded and impacted teeth (n = 757, 16.2%), disorders of gingival and edentulous alveolar ridge including loss of teeth, retained root (n = 527, 11.3%), post dental treatment complications including broken filling, improper filling (n = 369, 7.9%), dentofacial anomalies including malocclusion (n = 261, 5.6%), other diseases of hard tissues of teeth including abrasion and attrition (n = 249, 5.3%) and tooth fracture (n = 174, 3.7%).

The distributions of the diagnoses by age groups and patient's status, either military personnel or civilians are shown in Table 3. Those who were in the older age groups, either 25-59 years old or 60 years old or older had a significantly higher rate of gingivitis and periodontal diseases than those who were 25 years old or younger. The rate of dental caries in those who were 25 years old or younger was significantly higher than those who were in older age groups. Those who were 60 years old or older were less likely to be diagnosed the diseases of pulp and periapical tissues than those who were 25 years old or younger.

The rate of embedded and impacted teeth in those who were 25 years or younger was significantly higher than those in older age groups as well as the rate of dentofacial anomalies including malocclusion. The rate of tooth fracture in the age groups of 60 years old or older had a significantly higher rate than those who were 25 years old or younger.

It was found that military personnel had higher rates of diseases of pulp and periapical tissues and tooth fracture compared with civilian patients

There was relatively high prevalence of embedded and impacted teeth in military personnel (n = 259, 18.3%). Of these, 90 (34.7%) had pain as the indication of dental emergency. The majority of those who had embedded and impacted teeth were conscripts (n = 169, 65.2%). Additionally, among these conscripts, 56 (33.1%) had acute pericoronitis.

Table 2. The univariate analysis of chief complaint among the study population

Reason for dental visit	Total	Check up	OR (95% CI)	Toothache	OR (95% CI)	Tooth extraction requested	OR (95% CI)	Gum swelling	OR (95% CI)	Tooth mobility	OR (95% CI)
Age											
≤ 25	1585 (34.0)	374 (23.6)	1	370 (23.3)	1	339 (21.4)	1	67 (4.2)	1	7 (0.4)	1
25-59	2411 (51.7)	589 (24.4)	1.050 (0.90-1.22)	532 (22.1)	0.967 (0.82-1.12)	342 (14.2)	0.608 (0.51-0.71)	125 (5.2)	1.314 (0.96-1.78)	80 (3.3)	8.145 (3.74-17.74)
≥ 60	666 (14.3)	143 (21.5)	0.887 (0.71-1.10)	114 (17.1)	0.691 (0.54-0.87)	81 (12.2)	0.509 (0.39-0.66)	50 (7.5)	1.895 (1.29-2.77)	35 (5.3)	12.840 (5.66-29.08)
Status											
Civilians	3248 (69.7)	769 (23.7)	1	667 (20.5)	1	520 (16.0)	1	153 (4.7)	1	82 (2.5)	1
Military personnel	1414 (30.3)	337 (23.8)	1.018 (0.87-1.18)	349 (24.7)	1.266 (1.08-1.47)	242 (17.1)	1.001 (0.84-1.18)	89 (6.3)	1.407 (1.07-1.84)	40 (2.8)	1.347 (0.91-1.98)
Total	4662	1106 (23.7)		1016 (21.8)		762 (16.3)		242 (5.2)		122 (2.6)	

Table 3. The univariate analysis of oral diagnoses among the study population

Diagnoses	Total	Gingivitis and periodontal diseases	OR (95% CI)	Dental caries	OR (95% CI)	Diseases of pulp and periapical tissues	OR (95% CI)	Embeded and impacted teeth	OR (95% CI)	Dentofacial anomalies (including malocclusion)	OR (95% CI)	Fracture tooth	OR (95% CI)
Age (years)													
≤ 25	1585 (34.0)	434 (27.4)	1	407 (25.7)	1	328 (20.7)	1	437 (27.6)	1	157 (9.9)	1	50 (3.2)	1
25-59	2411 (51.7)	816 (33.8)	1.372 (1.19-1.58)	538 (22.3)	0.840 (0.72-0.97)	446 (18.5)	0.900 (0.76-1.05)	294 (12.2)	0.368 (0.31-0.43)	90 (3.7)	0.315 (0.24-0.413)	92 (3.8)	1.297 (0.91-1.85)
≥ 60	666 (14.3)	245 (36.8)	1.552 (1.28-1.88)	99 (14.9)	0.508 (0.39-0.64)	102 (15.3)	0.705 (0.55-0.90)	26 (3.9)	0.107 (0.07-0.16)	14 (2.1)	0.183 (0.10-0.31)	32 (4.8)	1.599 (1.01-2.52)
Status													
Cilvilians	3248 (69.7)	1037 (31.9)	1	712 (21.9)	1	576 (17.7)	1	498 (15.3)	1	208 (6.4)	1	109 (3.4)	1
Military personnel	1414 (30.3)	458 (32.4)	1.071 (0.93-1.22)	332 (23.5)	1.067 (0.91-1.24)	300 (21.2)	1.232 (1.05-1.44)	259 (18.3)	1.054 (0.88-1.25)	53 (3.7)	0.464 (0.33-0.63)	65 (4.6)	1.438 (1.04-1.97)
Total	4662	1495 (32.1)		1044 (22.4)		876 (18.8)		757 (16.2)		261 (5.6)		174 (3.7)	

It was found that the most common diagnosis for those who had pain as their chief complaints were different among military personnel either in active duty or retired as well as the civilians. The most common diagnosis in the COs, NCOs, and the civilians was diseases of the pulp and periapical tissues (n = 18, 32.1%; n = 19, 39.6%; n = 260, 39.0%, respectively). Gingivitis and periodontal diseases among the COs, NCOs, and the civilians were the second most common causes with the frequency of 26.8% (n = 15), 29.2% (n = 14), and 24% (n = 160), respectively. Embedded and impacted teeth were the third most common diagnosis with the rate of 12.5% (n = 7) in the COs, 10.4% (n = 5) in the NCOs and 19.5% (n = 130) in the civilians. In contrast, the most common causes of dental pain in the conscripts were embedded and impacted teeth (n = 76, 37.8%) and diseases of the pulp and periapical tissues (n = 74, 36.8%). The causes of pain in retired officers were mainly gingivitis and periodontal diseases (n = 20, 45.5%) and diseases of the pulp and periapical tissues (n = 15, 34.1%).

After the oral examination the overall common treatment needed found were tooth fillings (n = 3441, 73.8%), scaling (n = 3186, 68.3%), dentures (n = 2589, 55.5%), tooth extractions (n = 2528, 54.2%), removal of impacted tooth (n = 974, 20.9%), root canal treatment (n = 714, 15.3%), and periodontal treatment (n = 415, 8.9%). The distributions of the treatment needed in different age groups and patients' status are shown in Table 4.

Those who were in age group 25-59 years old had a significantly lower rate of tooth extraction as their treatment required after the oral examination than those who were 25 years old or younger. The military personnel observed had the higher needed rates of tooth filling, tooth extraction, root canal treatment, dentures, scaling and periodontal treatment compared to the civilians. The rates for removal of embedded and impacted teeth were not significantly different between military personnel and civilians.

There were only 14 (1.2%) active duty military personnel who needed no treatments after the oral examination. The remarkably high percentages of requirement of dental treatments were found in the conscripts, *i.e.* 80.9% needed tooth fillings, 79.7% needed scaling, 76.8% needed tooth extractions (other than third molars), 44% needed removal of impacted tooth, 15.6% needed root canal treatment and 0.8% needed periodontal treatment.

Discussion

Regarding this study the military personnel

Table 4. The univariate analysis of the treatment needed

Treatment needed	Tooth filling		Tooth extraction		Removal of impact tooth		Root canal treatment		Dentures		Scaling		Periodontal treatment	
	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)
Age														
≤ 25	1167 (73.8)	1	937 (59.2)	1	594 (37.5)	1	217 (13.7)	1	639 (40.3)	1	1175 (74.1)	1	11 (0.7)	1
25-59	1810 (75.2)	1.117 (0.96-1.29)	1201 (49.8)	0.715 (0.62-0.814)	357 (14.8)	0.295 (0.25-0.34)	405 (16.8)	1.314 (1.09-1.57)	1440 (59.7)	2.287 (2.00-2.60)	1640 (68.0)	0.773 (0.67-0.89)	249 (10.3)	17.250 (9.38-31.71)
≥ 60	464 (69.8)	0.835 (0.68-1.02)	392 (58.9)	1.008 (0.83-1.21)	23 (3.5)	0.06 (0.03-0.09)	92 (13.8)	1.026 (0.78-1.33)	510 (76.6)	4.957 (4.03-6.09)	371 (55.7)	0.447 (0.36-0.54)	155 (23.3)	44.537 (23.95-82.81)
Status														
Civilians	2362 (72.8)	1	1680 (51.8)	1	628 (19.3)	1	479 (14.8)	1	1780 (54.8)	1	2162 (66.6)	1	284 (8.7)	1
Military personnel	1079 (76.6)	1.247 (1.07-1.44)	850 (60.1)	1.331 (1.17-1.51)	346 (24.5)	1.119 (0.95-1.31)	235 (16.6)	1.204 (1.01-1.43)	809 (57.2)	1.265 (1.10-1.44)	1024 (72.4)	1.281 (1.11-1.47)	131 (9.3)	1.298 (1.03-1.63)
Total	3441 (73.9)		2530 (54.3)		974 (20.9)		714 (15.3)		2589 (55.5)		3186 (68.4)		415 (8.9)	

had a relatively high rate of dental diseases. They had greater requirements of dental treatments than did the civilians at the same cohort's in all categories; except the need for removal of impacted tooth. The most frequent of chief complaint that brought the military personnel to the dental services was toothache. While it was the request for dental check-up as the most common reason for a dental visit among civilians.

More than 98% of the military personnel needed the dental treatments. Only 1.2% of the active military personnel in this survey that needed no dental treatments and could be classified as in dental readiness class 1[3] or dental fitness class A[6]. This information suggested that the military personnel delayed the utilities of dental services unless they had any concern problems such as pain and gum swelling. The most frequent oral health problems that led them to dental services were for those seeking help to relieve pain. Their oral conditions generally demonstrated advanced stages of lesions, advanced dental caries exposed to the dental pulp, and tooth became non-restorable and needed to be removed. The high percentage of those who needed tooth extractions other than the third molars can be seen in 60% of the military personnel.

Those who had toothache as an emergency were mainly among the conscripts whose need was predominantly caused by embedded and impacted teeth either together, with or without acute pericoronitis, the diseases of the pulp and periapical tissues, tooth decay, or retained root. Forty four percent of the conscript needed the removal of impacted tooth, and half of them had pain because of acute pericoronitis of the impacted teeth. Due to the high prevalence observed in this survey thus it should be considered as an important affair for those who are responsible for the readiness preparation of the military. If left untreated, the inflammation and infection of the coronal soft tissues of a partial erupted mandibular third molar could occur with the possible development of symptoms ranging from a mild as low grade pain to more severe including infections with trismus, pharyngeal involvement, and septicemia[7]. Besides, the development of these complications under the circumstances, where the access to dental care is scarce, can lead to the worrisome, fear of increasing morbidity and may put the military mission at risk. A recent study reported that even low-grade dental pain could disrupt sleep, interfere with concentration, and degrade individual performance and frequently risk of medical evacuation[7]. Similar to the authors' information, studies in the American, Asian, and European soldiers showed that the problems

related to mandibular third molars and dental caries were also the leading causes in dental emergencies[(4,7-10)]. Moreover, acute pericoronitis or post-operative status following third molar surgery were the most frequently causes lost serving time of the patients on dental grounds[(11)]. The majority of military personnel were the conscripts whose ages were 18 to 23 years. This could be due to the younger age range of the conscripts, which has risk of eruption sequence of the third molars. Although dental caries was the leading oral diagnosis and treatment needed, the problems of the third molars was as important in the military medicine point of view[(11)]. The result of this survey is similar to the study of US AIR Force recruits that showed that those who enter the Air Force needed more dental care than do the civilians at the same age. In addition, the younger the recruits were, the greater need of restorative cares[(12)].

The high prevalence of dental diseases in the military may not be due only to the delay of their utilities of dental services. For the conscripts, dental utilities may be restricted during training unless there is an emergency. Their personal hygiene may not be up to the acceptable level during the training as the percentage of those required scaling were relatively high. Besides, the lesions of oral diseases may occur and probably be related to the level of oral care they received before the recruitment into the military. The conscripts were randomly selected from 21 year-old men nationwide including the rural area of the country that accounted for about 80% of the population. The relative poor oral health might reflex the low coverage of basic dental health care in the rural area.

The dental readiness class 1 or class A may be applied to only 1.2% of the military personnel in this survey; however, the study population cannot represent all military personnel since the data were taken only from those who seek dental treatment at the Phramongkutklao Hospital, which is an army hospital located in Bangkok. While research showed approximately 50-60% of the US force members were categorized as dental readiness class 1[(2)].

A relatively high predicted treatment time suggests a relatively high use of resources needed to make this group of military personnel dental fit. So to accomplish the acceptable level of dentally fit, all soldiers are obliged to have their routine bi-annual oral examinations re-enforced and provided by the Armed Forces. The set-up of a policy of standardization for oral and readiness classifications for the Thai military personnel is recommended by the Military Health Affairs policy. As a potential dental emergency, conditions can be accurately identified during a routine dental examination; prophylactic treatment may be useful such as the prophylactic removal of asymtomatic mandibular third molars either impacted, malposed or non-functional for the prevention of acute pericoronitis in the young military population. Oral health promotion and preventive measures are also important when handle with the military personnel especially those who may be deployed for extended periods of time and with limited dental care services.

Conclusion

The present study found that the military personnel had a relatively high rate of dental diseases and had a higher rate of dental treatment needed than among the civilians at the same cohort's. In order to accomplish the acceptable dentally fit, dental examination should be performed. routinely Proper diagnosis and treatment should be done before deployment as well as through preventive care measures.

References
1. Rothfuss LG, Johnson SA, Larsen SD, Chaffin J, Finstuen K. Staffing model for dental wellness and readiness. Mil Med 2004; 169: 604-8.
2. Moss DL, York A, Martin G. Changes in dental classification during the first 4 years of military service. Mil Med 2004; 169: 38-40.
3. Department of Defense (Health Affairs). Policy on standardization of oral and readiness classifications. Health Affairs policy letter 02-011, 2002.
4. Liewehr FR. Endodontics and dental readiness. Mil Med 2000; 165: 127-30.
5. World Health Organization. International Classification of Diseases (ICD) [Homepage on the Internet]. 2008 [cited 2008 May 15]. Available from: http://www.who.int/classifications/icd/en/
6. Marker OT, Vigild M, Praetorius F. Oral health problems and treatment needs in Danish military

personnel recruited for United Nations service. Mil Med 1997; 162: 416-21.

7. Halverson BA, Anderson WH 3rd. The mandibular third molar position as a predictive criteria for risk for pericoronitis: a retrospective study. Mil Med 1992; 157: 142-5.

8. Cheong YH, Chong LL. Dental survey on soldiers of an infantry battalion of Singapore Armed Forces (SAF) at the time of completion of national service. Singapore Dent J 1988; 13: 27-30.

9. Teweles RB, King JE. Impact of troop dental health on combat readiness. Mil Med 1987; 152: 233-5.

10. Dunn WJ, Langsten RE, Flores S, Fandell JE. Dental emergency rates at two expeditionary medical support facilities supporting operations enduring and Iraqi Freedom. Mil Med 2004; 169: 510-4.

11. Rajasuo A, Murtomaa H, Meurman JH, Ankkuriniemi O. Oral health problems in Finnish conscripts. Mil Med 1991; 156: 16-8.

12. Bartoloni JA, Chao SY, Martin GC, Caron GA. Dental caries risk in the U.S. Air Force. J Am Dent Assoc 2006; 137: 1582-91.

การสำรวจสภาวะช่องปากของทหาร ณ โรงพยาบาลพระมงกุฎเกล้า

สิริกาญจน์ สุทธวงษ์, สุภัค แซ่โง้ว, ราม รังสินธุ์

วัตถุประสงค์: ศึกษาเพื่อหาความชุกของอาการที่มาพบแพทย์, การวินิจฉัย, และการวางแผนการรักษาของ กำลังพล รวมทั้งและผู้ป่วยพลเรือนที่มาตรวจที่โรงพยาบาลพระมงกุฎเกล้า

วัสดุและวิธีการ: เป็นการเก็บข้อมูลย้อนหลังจากบันทึกประวัติของผู้ป่วยใหม่ ระยะเวลาเก็บข้อมูล 1 ปี ที่กองทันตกรรม โรงพยาบาลพระมงกุฎเกล้า ข้อมูลที่เก็บ ได้แก่ อายุ เพศ สถานภาพผู้ป่วย อาการที่มาพบแพทย์ การวินิจฉัย ความต้องการการรักษา วิเคราะห์ผลเปรียบเทียบกับ อายุ เพศ สถานภาพทหาร, พลเรือน ใช้สถิติร้อยละ ค่าเฉลี่ย, ส่วนเบี่ยงเบนมาตรฐานสำหรับวิเคราะห์ข้อมูลเชิงปริมาณ การเปรียบเทียบข้อมูลเชิงปริมาณใช้สถิติ univariate analysis หาความสัมพันธ์ระหว่างปัจจัยต่าง ๆ กับการวินิจฉัยโรคและการวินิจฉัยในช่องปาก ในรูปของ odds ratios และช่วงความเชื่อมั่นที่ 95% โดยใช้โปรแกรมสถิติสำเร็จรูป

ผลการศึกษา: จากจำนวนบันทึกของผู้ป่วย 4,662 คน ที่ทำการศึกษาเป็น พลเรือน 69.7% ทหาร 30.3% ประกอบด้วย นายทหาร 23.6% นายสิบ 15.3% ทหารกองประจำการ(พลทหาร) 44.8% พบว่าอาการที่มาพบทันตแพทย์ทหาร มีอัตราการปวดฟัน และเหงือกบวมมากกว่าพลเรือน OR = 1.27, 95% CI = 1.08-1.47 และ OR = 1.41, 95% CI = 1.07-1.84 ตามลำดับโดยเฉพาะในพลทหาร จากการวินิจฉัยพบทหารมีอัตราฟันผุลุกลามถึงโพรงประสาท และ ฟันแตกหักมากกว่าพลเรือน OR = 1.23, 95% CI = 1.05-1.44 และ OR = 1.44, 95% CI = 1.04-1.97 ตามลำดับ มีเพียง 1% ของทหารที่ไม่ต้องการการรักษา นอกนั้นมีความต้องการมากกว่าพลเรือน โดยเฉพาะในพลทหาร มีความต้องการการรักษาสูงกว่าทุกกลุ่ม

สรุป: จากการศึกษาพบกำลังพลมีความเสี่ยงต่อปัญหาในช่องปากค่อนข้างสูงโดยเฉพาะในทหารกองประจำการ ซึ่งต้องใช้เวลาและทรัพยากรในการรักษามากเพื่อทำให้กำลังพลเหล่านี้มีสภาวะช่องปากพร้อมเพื่อการรบได้