

Original research

Oral health behaviors and dental caries in a sample of portuguese militaries



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ABSTRACT

Objectives: To determine the prevalence of dental caries and oral health behaviors in a sample of the Portuguese army.

Methods: An observational cross-sectional study was conducted in a sample of army soldiers of the Infantry Regiment no. 14 of Viseu, Portugal, using a questionnaire. The study involved 122 members of the armed forces, who were asked to complete a questionnaire autonomously. The questionnaire enquired about general oral-health behaviors but focused mainly on: i) frequency of toothbrushing, ii) use of dental floss and iii) frequency of dental appointments. It also asked about sociodemographic information, like age and gender. An intra-oral observation was also conducted to determine the DMFT index and to record dental plaque based on the Silness and Løe plaque index (1964).

Results: The prevalence of dental caries was high (51.6%±7.4%; DMFT of 4.6±3.5). The most prevalent score of the Silness and Løe plaque index was score 2 - visible plaque (58.2%). Regarding oral hygiene habits, most of the sample reported brushing their teeth at least twice a day (65.6%) and using fluoride toothpaste (64.8%). However, very few participants (18%) used dental floss. More than 30% of the participants had not visited a dentist within the previous year. Furthermore, 45.9% were current smokers.

Conclusion: Prevention programs and promoting actions for oral health with these specific groups are important and should be adopted to reduce the prevalence of dental caries and to increase the knowledge about oral-health behaviors. (Rev Port Estomatol Med Dent Cir Maxilofac. 2018;59(1):18-23)

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Comportamentos de saúde oral e cárie dentária numa amostra de militares portugueses

R E S U M O

Palavras-chave:

Pessoal militar
Cárie dentária
Placa dentária
Saúde oral
Higiene Oral

Objetivos: Determinar a prevalência de cárie dentária e os comportamentos de saúde oral numa amostra de militares portugueses.

Métodos: Foi realizado um estudo observacional transversal numa amostra de 122 militares do Regimento de Infantaria n.º 14 de Viseu, Portugal, através da aplicação de um questionário. O questionário incidia sobre os comportamentos de saúde oral, com especial foco na frequência de escovagem dentária, uso de fio dentário e frequência de visitas ao Médico Dentista. Também foram recolhidas informações sociodemográficas, como a idade e o género. Além disso, foi feita observação intraoral para determinar o índice de CPOD. O índice de placa de Silness and Løe (1964) foi usado para determinar a quantidade de placa bacteriana existente na amostra estudada.

Resultados: A prevalência de cárie dentária encontrada foi elevada (51,6%±7,4%; CPOD – 4,6±3,5). De acordo com o índice de placa de Silness and Løe a prevalência mais elevada correspondeu ao nível 2 – placa visível (58,2%). Relativamente aos hábitos de higiene oral, a maioria (65,6%) reportou que escova os dentes pelo menos duas vezes por dia e 64,8% usava pasta dentífrica com flúor. No entanto, muito poucos participantes (18%) usavam fio dentário. Mais de 30% dos participantes não visitaram o médico dentista no último ano e cerca de 45,9% eram fumadores.

Conclusão: É necessária a criação e adoção de programas de prevenção e ações de promoção de saúde oral junto desta população, de modo a reduzir a prevalência de cárie dentária e aumentar o conhecimento dos militares sobre os comportamentos de saúde oral mais indicados. (Rev Port Estomatol Med Dent Cir Maxilofac. 2018;59(1):18-23)

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Introduction

Oral health is considered an important part of general health.¹ Therefore, data obtained from oral-health surveys is important to identify groups that are more susceptible to oral diseases, in order to develop prevention strategies, specific health programs and dental care.² Thus, oral health among the military population is a significant component not only of their general health but also of their military performance, since it influences their health status and their ability to perform their duties.^{3,4}

Consequently, military personnel's oral health has a significant impact on military operations since untreated oral conditions can result in increased rates of disease and non-battle injuries among deployed soldiers.⁵ In addition, the military personnel's dental wellness and readiness are important not only for immediate deployment but also for their well-being during non-deployment.⁶ Thus, a fundamental purpose of military dental services is to ensure that the operational effectiveness of soldiers is not compromised by oral diseases or disability⁷ during deployments and to enable operational readiness at the optimum level.³

It is worth to mention that the improvement of oral health and its impact on mental and physical health is among the major objectives of the World Health Organization (WHO) for 2020.^{8,9} Good oral health would lead to a reduced number of

urgent dental interventions, fewer absences from training and battlefield events and decreased threats to the security of the whole unit formation.¹⁰ However, to maintain good oral health, adherence to optimal oral-hygiene behaviors is essential.¹¹

To our knowledge, there are very few studies about Portuguese military population's oral health published in the scientific literature.¹² However, there are some studies on the Portuguese military population's oral health published in poster format or thesis.¹³⁻¹⁷

The aim of this study was to determine the prevalence of dental caries and the oral-health behaviors in a sample of the Portuguese army population.

Material and methods

An observational cross-sectional study was conducted in a sample of army soldiers of the Infantry Regiment no. 14 of Viseu, Portugal, using a questionnaire (Appendix 1). The authors delivered the questionnaires to the militaries, who answered them autonomously. The questionnaire enquired about general oral-health behaviors but focused mainly on: i) frequency of toothbrushing, ii) use of dental floss and iii) frequency of dental appointments. It also asked about sociodemographic information, like age and gender.

An intra-oral observation (Appendix 2) was also conducted to determine the decayed, missing, and filled permanent teeth index (DMFT index), which indicates the experience of dental caries and dental treatments (extraction or restoration due to dental caries). The Silness and Løe plaque index (1964) was used to record the dental plaque in the sample studied.¹⁸⁻²⁰ The plaque index's score is determined based on the amount of dental plaque at the gingival margin, which is assessed by passing a WHO probe across the gingival margin.

The questionnaires were given to all army personnel available in the Regiment on a given day previously set by the Army Chief of State. The questionnaires were collected immediately after they were completed, following the intra-oral examination. The subjects were examined by a group of dental students supervised by a military dentist in a military ward, using a mouth mirror and a WHO probe. The observers were trained and calibrated according to the diagnostic criteria for dental caries set out by the WHO.²¹

Permission to carry out the study was obtained from the Army Chief of State. All the participants agreed to and authorized this study, and signed an informed consent.

The data were analyzed using the software Statistical Package for Social Sciences (SPSS) 23.0 for Windows (SPSS Inc, Chicago, IL, USA). The results of this study were analyzed using descriptive statistics. The level of significance (α) was set at 5% (0.05). The chi-square test was used to analyze the association between qualitative variables. The intensity of the relationship between the variables was obtained by the Cramér's V.

Results

In total, 127 army soldiers were observed, but only 122 filled the questionnaire correctly. The remaining five questionnaires were considered invalid because either they were not correctly filled or they were not completely filled. The final sample examined included 122 (95.9% male) of the 408 militaries of the Infantry Regiment no. 14 of Viseu, Portugal, corresponding to a response rate of 29.9%. This relatively low number was a result of many militaries being on missions overseas or posted to do tasks outside the Regiment.

The mean age of the sample was 25.8 ± 7.5 years (age range, 18-52 years), and the major age group (58.2%) was 20-24 years, as shown in Table 1.

Table 1. Age distribution of the sample (n=122)

Age group (years)	Frequency	Percentage
18-20	20	16.4%
21-24	55	45.1%
25-29	26	21.3%
30-34	5	4.1%
35-39	4	3.3%
40 and above	12	9.8%
Total	122	100%

In the examined military sample, the prevalence of dental caries was $51.6\% \pm 7.4\%$ (mean \pm standard deviation) with a confidence interval of 95%. These values mean that the prevalence of dental caries was in the range of 44.2%-59.1% with a confidence of 95%. The DMFT index in our sample was 4.6 ± 3.5 . Although third molars are not included in the DMFT, in our sample, the lower third molars (teeth 38 and 48) were the teeth most severely affected by dental caries. However, according to the DMFT index, we can consider that the prevalence of dental caries was higher in the first and second molars (37, 36, 47, 16).

Eighty army soldiers (65.6%) had fillings, which were most prevalent on teeth 36 and 46 (41.8%). Regarding the "missing" component of the DMFT, which means that at least one tooth was lost due to dental caries, the prevalence was 32%, and the first lower molars were the most affected teeth (21.3%).

The most prevalent score of the Silness and Løe plaque index was score 2 – visible plaque (58.2%), as shown in Table 2.

Concerning oral-hygiene habits, as shown in Table 3, 65.6% of the sample brushed their teeth at least twice a day, and only 4.1% did not brush their teeth daily. Nearly 27.9% brushed their teeth after meals. The use of dental floss was very low (18%). When we grouped the sample according to their age (≥ 25 years and < 25 years), statistical differences were found regarding the use of dental floss ($P=0.045$; Cramér's $V=0.181$). The relationship was weak (18.1%), but significant, since army soldiers with more than 25 years old tended to use dental floss more.

The analysis of the use of dental floss and the plaque index revealed statistical differences ($P=0.010$; Cramér's $V=0.234$). Accordingly, the Silness and Løe plaque index was higher (scores 2 and 3) among those who did not use dental floss comparing with those who did. This association was weak (23.4%), but significant.

Moreover, only 64.8% of the sample used fluoride toothpaste, although 22.1% did not know if their toothpaste contained fluoride. There was also a significant relationship between the use of fluoride toothpaste and the prevalence of dental caries ($P=0.034$; Cramér's $V=0.236$), as those who used fluoride toothpaste seemed to have a lower risk of dental caries.

Nearly 45.9% of the sample were current smokers.

Less than half of the sample (45.1%) had visited the dentist in the previous six months. On the other hand, 18.9% of the sample had not visited the dentist for more than a year. The main reasons for not having a dental appointment more frequently was not thinking they needed a dental appointment (43.4%) and only visiting the dentist when feeling pain (20.5%). The cost of the dental appointment (19.7%) was also referred. Furthermore, 3.3% indicated fear as a reason for not visiting the dentist on a regular basis.

Table 2. Distribution of the Silness and Løe plaque index

Silness and Løe plaque index scores	Frequency	Percentage
0 – absence of plaque	20	16.4%
1 – plaque detected with probe	25	20.5%
2 – visible plaque	71	58.2%
3 – abundant plaque	6	4.9%

Table 3. Distribution of the examinees according to habits/behaviors important for oral health

Behaviors/habits for oral health	Frequency	Percentage
Smoking:		
No	66	54.1%
Yes	56	45.9%
How often do you brush your teeth?		
At least once a day	37	30.3%
At least twice a day	80	65.6%
Do not brush every day	5	4.1%
Do you always brush your teeth after meals?		
Never	7	5.7%
Yes	34	27.9%
Sometimes	81	66.4%
Do you use a toothbrush?		
No	4	96.7%
Yes	118	3.3%
Do you use dental floss?		
No	100	82%
Yes	22	18%
Do you use a mouthwash?		
No	79	64.8%
Yes	43	35.2%
Do you use an interdental brush?		
No	116	95.1%
Yes	6	4.9%
Do you use a tongue brush?		
No	112	91.8%
Yes	10	8.2%
Do you use fluoride toothpaste?		
No	16	13.1%
Yes	79	64.8%
I do not know	27	22.1%
When was the last time you visited the dentist?		
More than 2 years ago	15	12.3%
More than a year ago	23	18.9%
Less than a year ago	29	23.8%
Less than 6 months ago	55	45.1%
Why do you not visit the dentist more frequently?		
Only visit when I feel pain	25	20.5%
Price of the appointment	24	19.7%
I do not need to	53	43.4%
I do not want to	11	9%
Other reason	9	7.4%

Statistical differences were found between age groups regarding the time since the last dental appointment ($P=0.042$; Cramér's $V=0.184$). In this case, there seemed to be a tendency to visit the dentist more frequently (last visit in the previous 12 months) for those who were under 25 years old.

No association was found between dental caries or plaque index and other variables. However, based on the descriptive analysis, the prevalence of dental caries was lower among those who visited the dentist more frequently (bi-annually or annually). There were no statistical differences between different age groups regarding other variables.

Discussion

The main limitation of this research in the Infantry Regiment no.14 of Viseu, Portugal, was the reduced sample of army personnel (with a response rate of only 29.9%). However, that low number resulted mainly from many militaries being on missions in other countries or posted to do tasks outside the Regiment (e.g., forest surveillance) in the time span defined by the Army Chief of State.

Dental caries directly affects military readiness, as service members with even modest levels of oral disease may not be available for deployment until their dental treatment is completed. Thus, the dental readiness of military personnel may significantly influence the primary goals and objectives of a military.²²

In our study, the prevalence of dental caries was overall substantially lower (51.6%) than in other army populations, such as that of Croatia and Australia (96.46% and 84.8%, respectively).^{10,23} On the other hand, when comparing the army soldiers workers with the general Portuguese population, the results are similar (61%).¹³

In our sample, the DMFT index was 4.6 ± 3.5 . In comparison, studies on the Iranian and Jordanian Armed Forces registered higher values (9.67 and 8.69, respectively).^{6,9} In contrast, a study on the Australian Army Recruits reported that 81% had a DMFT of 6 or less.²⁴ Considering the existing studies on the Portuguese military, which reported DMFT values between 6.3 and 8.5, our DMFT was substantially lower.^{13,14,16,17}

Studies similar to ours^{10,17} reported that the first lower molars were the teeth most prone to dental caries, which is in accordance with our results.

In our study, dental plaque was absent in only 20 examinees (16.4%), while the remaining 83.6% had different degrees of dental plaque. Likewise, in a study on the Spanish Army,²⁵ only 7.5% of the inquired population was healthy in all their sextants, without any dental calculus. Also, in the Portuguese Navy, a higher prevalence of scores 2 and 3 of the Silness and Løe plaque index (visible plaque and abundant plaque) were observed.¹⁶

Toothbrushing is considered a fundamental self-care behavior for the maintenance of oral health, and brushing twice a day is a social rule.²⁶ In this study, almost all respondents brushed their teeth daily (30.3% brushed their teeth at least once a day while 65.6% brushed their teeth at least twice a day). This finding is in accordance with other identical Portuguese studies, which reported that more than 70% of the participants brushed their teeth at least twice a day.^{13,14,16} However, the studies on the Iranian and Malaysian Army showed higher values, as 78.8% and 98.2% of the participants, respectively, declared to brush their teeth at least once a day.^{9,27}

Besides toothbrushing, which is the most common method for removing dental plaque, different interdental aids for plaque removal, such as dental floss and interdental brushes, are widely available and are recommended to be used in addition to toothbrushing.²⁸ The present study found that those who did not use dental floss had more dental plaque (scores 2 and 3). Only 18% of our sample used dental floss and 4.9% used interdental brushes. The same results were verified in the Dutch Army, in which only 13% used interdental cleaning aids,¹¹ and among the Portuguese Special Forces, in which only 25% used dental floss.¹³ However, these numbers are small

when compared to the Serbia military (27.7%),³ the Iran military (31.4%)⁹ and the Portuguese Navy (42.8%).¹⁶

In our study, most of the sample did not use a mouthwash (64.8%) and did not brush their tongue daily (91.8%). Similar values were found on the Serbian Army,³ where 74.3% did not use mouthwash, and on the Dutch Army, where 75% of the military personnel did not brush their tongue daily.¹¹

This work showed that 45.9% of the studied military personnel were current smokers. However, the Lithuanian Army recruits showed higher values (62.4%).²⁹ On the other hand, the Swiss Army recruits and another sample of the Portuguese army showed more satisfactory results (32% and 33%, respectively).^{14,30}

Regarding dental appointments, 18.9% of the sample had not visited the dentist for more than a year while 23.8% had visited the dentist within the previous year and 45.1% had visited the dentist in the previous 6 months. Although these results are similar to the results showed in a study on the Australian Army,²⁴ where only 34.3% had visited a dental professional in the previous 12 months, they are not in accordance with other several studies. For example, the research developed on the Department of Defense Recruits in 2008³¹ reported that 40.8% of the sample had seen a dentist within the previous 12 months. Furthermore, in studies on the Croatian Army¹⁰ and the Portuguese Forces,¹⁶ 81% and 86% of the respondents, respectively, had visited a dentist in the previous 12 months. Nevertheless, the main reason for dental appointments on the Croatia Army was some kind of emergency condition.¹⁰

Conclusion

Despite the limitations of this research, mainly related to the sample size, we can conclude that the prevalence of dental caries in the examined Portuguese military sample was high (51.6%±7.4%; DMFT, 4.6±3.5). Army soldiers seems to need more information about oral-hygiene behaviors and more promotion and motivation for oral health. The analyzed sample only booked a dental appointment when they had an oral condition, mainly if associated with pain and discomfort.

Ethical disclosures

Protection of human and animal subjects. - The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Confidentiality of data. The authors declare that no patient data appear in this article.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

Conflict of interest

The authors have no conflicts of interest to declare.

Appendices

Supplementary content Supplementary data associated with this article can be found, in the online version, at <http://doi.org/10.24873/j.rpemd.2018.06.217>.

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