

Dental hygiene habits and oral health status of seafarers

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ABSTRACT

Background: This study has assessed the dental hygiene habits and problems of seafarers and their attitudes/perceptions regarding oral hygiene using a dental hygiene/habits questionnaire.

Materials and methods: A research questionnaire on oral hygiene habits was prepared along with a summary of all the questions and sent to ships via e-mail by Centro Internazionale Radio Medico (CIRM) networks. CIRM, is the Italian Telemedical Maritime Assistance Service (TMAS), and represents the Centre with the largest number of seafarers assisted on board ships worldwide. CIRM proposed the questionnaire to all ships (n = 1,198) asking for medical advice from 1 July 2014 till 31 October 2014. Two dental professionals were involved in the development and analysis of the questionnaire.

Results: Seafarers are at risk of several dental health problems due to their oral hygiene and dietary habits, smoking and alcohol consumption, poor oral hygiene knowledge and motivation. Dietary habits during voyages were also questionable and seafarers consume food rich in fermentable carbohydrates, which is a major risk factor for dental caries.

Conclusions: Seafarers need better oral hygiene education and care to enable them to manage their oral health in a better way. Life at the sea, under challenging circumstances is not without stress, that is why it is important that seafarers are given complete information about correct oral hygiene protocols and dental hygiene and the advantages for their health of keeping a healthy mouth.

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Key words: seafarers, dental hygiene, questionnaire, oral health, prevention

INTRODUCTION

Dental problems and oral pathologies are not infrequent among seafarers and these workers represent a group of special needs as they are isolated during long sea voyages [1]. On the other hand, provision of health care (including dental care) to sailors is a problematic task, as a large majority of merchant ships do not carry health professionals and are at sea for days or weeks before they can reach a port [2]. For centuries, the captain of the ship has been in charge of the treatment of diseases and the health protection of the crew, while at sea. The possibility of providing medical advice to ships via telecommunication systems became possible with the development of radiotelegraphy by Guglielmo Marconi in 1897. At present, telemedicine is

the only mean by which it is possible to get medical advice of a reasonable quality at sea, and there are significant advantages as well as limitations with this approach [3].

Poor oral health of seafarers is considered as a main cause of their dental problems that can result in complications (landing of the patient, diversions from the route) for shipping companies during voyages [1]. Another reason of frequent oral pathologies encountered in sailors is the use of excessive amounts of snacks. They also consume large quantity of tea, coffee and beverages because of their odd working hours and unique lifestyle. Most of dietary substances mentioned above contain fermentable carbohydrates and sugars, which are considered to be prime risk factors of dental caries and associated dental diseases [4, 5]. The

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topic of oral health of seafarers has been recently reviewed [1]. This paper has reported the lack of extensive information excluding some basic epidemiological studies among merchant ship crews. This review has also demonstrated that people working on board of navy units in general receive better and articulated dental care [1].

Based on the above consideration Centro Internazionale Radio Medico (CIRM), the Italian Telemedical Maritime Assistance Service (TMAS), developed and distributed a questionnaire on oral health habits of seafarers [6].

MATERIALS AND METHODS

An anonymous research questionnaire on oral hygiene was prepared [7]. It was proposed that all ships asking for medical advice from CIRM between 1st July 2014 and 31st October 2014 from CIRM should be requested to fill in the questionnaire. The questionnaire was prepared in English and Italian. A summary of all the questions on the questionnaire was also prepared for the captain of each ship to save time and paper work. Informed consent was taken from all sailors who wanted to be part of the research. Those interested in contributing to the initiative were required to send an e-mail in response, after which questionnaires and instructions were sent to the participating ships. In the 4 months CIRM conducted this survey, 1,198 ships required medical assistance to the Centre, but only 65 ships replied to CIRM's request and took part in the study by returning the summary of the filled questionnaires. The demographics of the sample taking part in the survey are shown in Table 1.

The captain of each ship was informed that he can fill the summarised chart after getting responses of all the seamen on board. In case the captain had any queries he was asked to contact via e-mail the CIRM dental specialists in charge of the project. To appreciate the efforts of the captain being part in this survey, CIRM also awarded certificates and appreciation letters. Ships collaborating with the initiative also received a complimentary copy of the book "Oral Hygiene and its Maintenance", specifically developed for increasing the awareness of seafarers to the problem [2].

The data analysis of the questionnaire was done as an active and interactive process. Researchers carefully sifted the results and analysed the data recorded through the questionnaire. Data was analysed after organising the questionnaire results systematically [8, 9]. Data analysis is the "Process of fitting data together, of making the invisible obvious, of linking and attributing consequences to anteced-

ents. This is the process of conjecture and verification, of correction and modification, of suggestion and defence" [10]. At the outset the data were coded to form categories and subcategories emerging from the data. Codes were developed based on the list of themes. Coding as method of conceptualising research data and classifying them into meaningful and relevant categories for the participations in the study [11].

Charts were created and the results were pasted on these charts into different sections and categories and finally typed into Excel files. After the whole process was completed, a list of themes of categories and subcategories were identified and data was compiled and discussed under the identified categories.

RESULTS

Figure 1 shows the research questionnaire [7]. The results of the survey are summarised in Table 2. A large percentage of seafarers consumed alcohol and nicotine during the voyages. 56.11% of sailors surveyed (n = 1,156) stated that they regularly smoked, out of that population, almost 45% of the smokers said they smoked more than 10 cigarettes a day. 11.45% of the total survey population (n = 236) responded that they consumed alcohol on a regular basis. In recent decades shipping companies have made an effort to restrict alcohol use on cargo ships but policies and implementation of the policies varies [12]. Cross tabulation between the population that consumed alcohol and smoked tobacco showed that 15.39% of smokers (n = 178) also consumed alcohol. Sailors who consumed alcohol were more likely to smoke (80.93%, n = 191), sample population that consumed alcohol admitted that they also smoked tobacco.

55.67% of the participants (n = 1,147) acknowledged use of dairy products or candies which contain fermentable carbohydrates. Only the 61.11% of sailors (n = 1,259) had a complete set of natural tooth. 82% (n = 656) of the total 801 sailors without a complete set of teeth, lost their tooth due to extraction. The remaining people lost their tooth as a result of tooth mobility.

Cross tabulation of the data set showed that older sailors (50–60 years) had higher frequency of tooth loss. 6.6% of the total sample population (n = 137) was from this age group (50–60 years), 63.5% of them (n = 87) had missing tooth or several missing teeth. Around 30.48% of the sailors (n = 628) reported suffering from diseases of the supporting structure of teeth including gingivitis or periodontitis at some

Table 1. Demographics of study sample

Ships contacted	Took part in survey	No. of seafarers filling in the questionnaire	Rate of return
1,198	65	2,060	5.4%

1.	Your age is between	20-30	30-40	40-50	50-60
2.	Are you satisfied with your smile?		Yes		No
3.	Do you have a complete set of natural teeth?		Yes		No
4.	If you answered 'No', could you specify how many teeth you have lost?	Specify the number of missing teeth	Total loss upper teeth	Total loss lower teeth	all teeth missing
5.	Of teeth that were lost, were they extracted for trauma?		Yes		No
6.	Of teeth that were lost, were they extracted because they were mobile?		Yes		No
7.	If you answered 'Yes', do you know that you suffer from periodontal disease?		Yes		No
8.	Do you often suffer from abscesses?		Yes		No
9.	If 'Yes', in which side of your mouth?	Upper right	Upper left	Lower right	Lower left
10.	Are you a smoker?		Yes		No
11.	If "Yes", how many cigarettes a day?	Less than 10	10-20	20-30	More than 30
12.	Do you drink hard liquor?		Yes		No
13.	Do you often eat pastries or candy?		Yes		No
14.	Do you brush your teeth regularly?		Yes		No
15.	If you answered 'No', the reason is because you have pain if you try to brush them?		Yes		No
16.	If you answered 'Yes', how many time a day?	1	2	3	
17.	When you brush your teeth, do you notice bleeding from the gums?		Yes		No
18.	Do you know if you suffer from halitosis (bad breath)?		Yes		No
19.	Do you have the sensation of dry mouth?	Yes	No	Sometimes	
20.	If 'Yes', could you specify whether you seem to have little salivation?		Yes		No
21.	Do you have the sensation of having a burning mouth?		Yes		No
22.	If you look at your tongue in the mirror, could you specify how it seems?	Pink	White	Dark	Speckled pink and white
23.	When you chew, do you have the perception that the tongue is being scratched with some sharp tooth root or fractured tooth?		Yes		No
24.	If you look at your lips in the mirror, could you specify how they seem?	Pinky	Dry	Dry and chapped	They have darker patches
25.	If there are some darker patches, can you specify when they appeared?	1 month	2 months	6 months	1 year
26.	Do you happen to bite your cheeks while you chew?		Yes		No

Figure 1. Questionnaire proposed to seafarers on board ships taking part to this survey

Table 2. Summary of key findings

Synthesis of the key results of the survey questionnaire	
Variable	No. (%) of seafarers
Tobacco use	1,156 (56.11%)
Alcohol use	236 (11.45%)
Smokers who also consumed alcohol	178 (15.39%)
Alcohol consumers who also smoked	191 (80.93%)
Regular use of fermentable carbohydrates	1,147 (55.67%)
Twice a day tooth brushing	834 (40.48%)
Sailors with complete teeth set of teeth	1,259 (61.11%)

point of their life. 27.03% of the sample (n = 557) reported bleeding gums during brushing. Over 75% of the sample were satisfied with their smile.

74.07% of the total sample population (n = 1,526) were regularly brushing their teeth, but interestingly only 40.48% seafarers (n = 834) questioned brushed their teeth twice, which is recommended by dental professionals around the world, whereas the majority of them only brushed once a day. 5% of the sailors surveyed reported that pain was a reason for not brushing their teeth regularly. 4.02% of the total sample (n = 83) reported bad breath or halitosis, whereas only 1.31% (n = 27) sample population indicated feeling the sensation of burning mouth. Whereas 2% of the sailors also referred occasional cheek biting while chewing or eating.

DISCUSSION

Dental fitness of seafarers is considered critical by International Labour Organisation (ILO) and World Health Organisation (WHO) [13]. Seafarers are known to disregard oral hygiene during long voyages and also tend to consume high quantity of nicotine, which is probably done to relieve occupational stress due to odd duty hours and isolation [14]. Nicotine is considered the most important preventable risk factor associated with periodontal and lung disease [15]. The Danish Radiomedical service in its annual report 2010, which analysed 1,300 consultations, stated that dental problems (8.1%) were among the four most reported health issues of seafarers [16]. A study reported that on commercial cargo vessels, the causes of consultations for oral health problems at foreign ports can be as high as 67% [17]. A survey conducted in 1995 found that only 19 countries provide comprehensive oral health services for seafarers [18]. That is why more research is required to investigate the oral hygiene status of seafarers and to assess their awareness and concerns regarding oral health.

The results of the survey are reflective of poor oral hygiene of seafarers. Seafarers were also found to be smoking more than the general population. Global modelled age-standardised prevalence of daily tobacco smoking in the population older than 15 years was found to be 31% in 2012 [19], while 48% of the world population consumes alcohol [20]. In our sample of seafarers, 56% of them smoked and the 11% of them consumed alcohol (Table 2). Alcohol consumption on board vessels is a tricky subject as many shipping companies have banned or restricted alcohol consumption altogether, but implementation of these policies remains a subject of debate, hence it is entirely possible that seafarers are hesitant to openly talk about the subject [12]. The higher consumption of tobacco compared to the general population can be attributed to various factors including isolation, boredom and stress. The intake of dairy products and sweets were also deemed to be very high, which is clearly associated with high dental caries risk. Although a majority of the sailors surveyed were brushing their teeth, most of them were only brushing once, perhaps due to inadequate knowledge of oral hygiene protocols. Brushing the teeth twice a day with a fluoridated tooth paste is the recommended practice for maintaining good oral hygiene [21].

Over a quarter of the survey population suffered from bleeding gums which is troubling, and it could also signify underlying systemic diseases. Over half of the population didn't have complete natural teeth set which suggests that seafarers are more likely to lose tooth than the general population, perhaps due to ambivalent attitude towards oral hygiene.

The combination of high intake of alcohol, tobacco, refined carbohydrates (sweets/dairy products) and insufficient knowledge regarding oral hygiene creates a synergistic effect which is evident from the poor oral hygiene status exhibited by a majority of the seafarers. The fact that most seafarers only brushed teeth once daily is also proof enough that oral hygiene knowledge and motivation remains low in this group. There is a dire need to improve the motivation and knowledge level of seafarers regarding oral hygiene practices. Seafarers must also be made aware of the extreme dangers associated with the use of excessive amounts of alcohol, nicotine and refined carbohydrates. Alcohol and smoking are independent risk factors of many diseases, not just limited to diseases of the mouth, including oral cancer and submucous fibrosis [22].

In view of the oral status of seafarers, of the isolation of the ship and of the difficult access to health and dental care of seafarers, telemedicine based applications for dentistry (teledentistry) could represent a way for providing a reasonable level of oral assistance to seafarers. The emergence of teledentistry as a branch of telemedicine can be

traced back to 1994 when a United States Military project demonstrated that teledentistry reduced dental treatment costs and proved to be effective in providing dental care to distant communities living in rural areas [2]. Teledentistry has the potential to improve access to oral health care and decrease treatment costs [23] and could be integrated with electronic health records, digital imaging as a support of teleconsultations with dental specialists [24]. Teledentistry has been successfully implemented as models to improve dental education and access to care [25] and is effective in the management of oral health issues in remote and rural areas, where access to dentists and oral health specialists is limited [26, 27]. Teledentistry may become a new instrument for tending to the poor oral/dental conditions of people on board of seagoing vessels.

CONCLUSIONS

The results of this survey have shed light on important dental hygiene issues of seafarers. From the above discussion, it is clear that seafarers need better oral hygiene education and care to enable them to take care of their oral health in a better way. Life at the sea, under challenging circumstances is not without stress, that is why it is important that seafarers are given complete information about correct oral hygiene protocols and dental hygiene. Shipping companies should make sure that seafarers are exposed to regular health examinations including dental checkups, which should be made part of the health fitness test that are conducted before the sailor goes on board. Shipping companies should also develop comprehensive dental hygiene programs for seafarers which have shown to make a profound effect on overall dental health of any community [28]. Seafarers due to their unique lifestyle, represent a vulnerable community as far as oral health is considered, that is why more research is required on dental hygiene habits of sailors to expand our current understanding of the problems this community faces in maintaining its oral health, which has direct implications on overall health.

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