Original Article

Prevalence of periodontal disease, oral mucosal lesions and oral habits among seafood industry employees of Visakhapatnam, Andhra Pradesh

ABSTRACT

Background: Epidemiological studies serve to generate knowledge of the distribution and determinants of disease frequency. To be able to find effective tools for prevention and health promotion, we have to know the causation that preceded the disease onset.

Aim: To assess the periodontal status, prevalence of oral mucosal lesions, and oral habits among seafood industry employees in Visakhapatnam district, Andhra Pradesh.

Materials and Methods: A cross-sectional survey was conducted among 162 participants aged between 18 and 60 years of age, using WHO oral health questionnaire for adults (2013) and the oral health assessment form for adults (2013), which recorded demographic details, routine oral hygiene habits, adverse oral habits, community periodontal index, and oral mucosal lesions. Descriptive statistics were performed to analyze frequency and percentage distribution of study variables.

Results: The majority of the subjects used a toothbrush (98.1%) and toothpaste (97.5%) to clean their teeth. Smoking and tobacco chewing habits were recorded among 41 (25.3%) and 21 (12.9%) subjects, respectively. The prevalence of periodontal disease was 79.6% among the study population. About four (2.4%) subjects had leukoplakia, five (3.1%) subjects had ulcerations, and three (1.8%) subjects had smoker's palate.

Conclusion: The findings of this study provided an insight into the periodontal health status, oral habits, and the prevalence of oral mucosal lesions of seafood industry employees in Visakhapatnam, which may be useful in designing and planning oral health promotion programs.

Keywords: Oral habits, oral mucosal lesions, periodontal disease, prevalence

INTRODUCTION

With mentions of fish farming in Kautilya's Arthashastra (321–300 BC) and King Someswara's Manasoltara, aquaculture in India has a long history (1127 AD). Fish farming in small ponds has been a common practice in eastern India for hundreds of years; nevertheless, in the early nineteenth century, controlled carp rearing in bundhs achieved considerable advancements in the State of West Bengal. As early as 1911, the state of Tamil Nadu (formerly Madras) began to pay significant attention to fish culture. Subsequently, states like Bengal, Punjab, Uttar Pradesh, Baroda, Mysore, and Hyderabad started to cultivate fish through the establishment of Fisheries Departments and the support of fishermen and farmers for the development of the industry.[1]

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India has 8118 km of marine coastline and 3827 fishing villages. India's freshwater resources consist of 195,210 km of rivers and canals. Fisheries in India is a very important economic activity and a flourishing sector with varied resources and potentials.[2] Only after the Indian Independence, has fisheries together with agriculture been recognized as an important sector. The vibrancy of the sector can be visualized by the 11-fold increase that India achieved in fish production in just six decades, that is, from 0.75 million tonnes in 1950–51 to 9.6 million tonnes during 2012–13. This resulted in an unparalleled average annual growth rate of over 4.5% over the years, which has placed the country at the forefront of global fish production, only after China.[2]

Directly or indirectly, the livelihood of more than 500 million people in developing countries depend on fisheries and aquaculture, and fisheries sector has been faring high regarding its forex earning potential and employability of vast majority of coastal communities. Andhra Pradesh is one of the major maritime states in India having huge potential for marine fisheries development.[2] Industrial employees constitute well-defined population groups, and although not representing nationwide samples, such groups are often readily available; therefore, they have several practical advantages in epidemiologic studies.[3] Little is currently known about the periodontal status, oral habits, and oral mucosal lesions, since no prior studies are conducted on this specific population in Andhra Pradesh.

As an initial step, the collection of baseline information on the periodontal status is necessary in a state where no prior studies are conducted on this specific population. Until now, there are no reports regarding the periodontal health status of seafood industry employees. The prevalence of tobacco use in various forms is very high in the state of Andhra Pradesh; yet, there is no literature in regard to the prevalence of oral mucosal conditions in this region. Hence, the aim of this study was to assess the periodontal health status, oral mucosal conditions, and prevalence of oral habits among the seafood industry employees in Visakhapatnam, Andhra Pradesh.

MATERIALS AND METHODS

Selection criteria for study objects

In this study, seafood industry workers aged 18–60 years, in the city of Visakhapatnam, Andhra Pradesh, were included as the study participants. Participants aged between 18 and 60 years were willing to participate in both questionnaire survey and clinical examination; they had no cognitive impairment and enable to read and understand the content of the questionnaire clearly. Exclusion criteria were as follows: Participants who did not meet any one of the above inclusion criteria were not included in this study.

SAMPLING METHODS

Study setting and design

A cross-sectional descriptive survey was conducted to assess the periodontal status, routine oral hygiene habits, adverse oral habits, and prevalence of oral mucosal lesions among 18- to 60-year-old seafood industry employees in the Visakhapatnam, Andhra Pradesh, India. Visakhapatnam, a major city in Andhra Pradesh, comprises most of the seafood industries in Andhra Pradesh and is a major exporter of frozen seafood. It was selected as the study area.

Ethical clearance and informed consent

The ethical clearance was obtained from the Institutional Ethics Committee, and permission was obtained from the authorities of the seafood industries. Written informed consent was obtained from all the participants who fulfilled the eligibility criteria.

Sample size calculation

The sample size required for this study was calculated using G*Power version 3.1.9.4, with a 95% confidence interval and a 5% of permissible error. The sample size determined was 124. Considering the potential nonresponse rate, the sample size was intentionally increased by 20%, and the minimum sample size is 149 cases. This study actually included 162 participants aged 18–60 years to ensure the representativeness of the sample.

Sampling methods

A purposive sampling method was employed in this study. Fourteen seafood industries were identified, and required permissions were obtained from seven industries. A total of 162 participants were included in the study from the seven industries, and data were recorded.

Clinical examination

Type-III clinical examination was carried out as per American Dental Association specifications. Subjects were made to sit upright on an ordinary chair, and the examinations were carried out under natural light with a mouth mirror and a CPI probe. The examination used WHO Oral Health Assessment Form for adults (2013) to assess the periodontal health status and prevalence of oral mucosal lesions. All the examinations were carried out by a single examiner assisted by a trained recording clerk. A total of 20–25 participants were examined every day. Data collection was carried out from July to August 2022.[4]

Questionnaire and data collection

The WHO oral health questionnaire for adults (2013) was used to assess oral hygiene practices and adverse habits among the study participants. The questionnaire was administered by the examiner, and the responses were recorded.[4]

Statistical analysis

All the obtained data were coded, entered into a Microsoft Excel sheet, and analyzed using statistical package for social science (SPSS, IBM, USA) version 21. Descriptive statistics were performed to analyze frequency and percentage distribution of study variables. The chi-square test was used to compare the prevalence of periodontal disease among age, tobacco smokers-chewers, and education level groups.

RESULTS

A total of 162 individuals were examined, of which 149 (91.9%) were males and 13 (8.1%) were females. A majority of the participants (n = 116, 71.6%) were in the 18- to 30-year-old age group. The entire study population resided in peri-urban areas. Only 36 (22.2%) participants had no formal education, with the majority of the study participants completing primary schooling [Table 1].

On mucosal examination, about four (2.4%) subjects had leukoplakia, five (3.1%) subjects had ulcerations, and three (1.9%) subjects had smoker's palate [Table 2].

The majority of the participants used a toothbrush (98.1%) with only three (1.9%) participants using chewstick or miswak to clean their teeth. Toothpaste was used by 97.5% participants to clean their teeth. Smoking and tobacco chewing habits were recorded among 41 (25.3%) and 21 (12.9%) subjects, respectively [Table 2]. The prevalence of periodontal disease was 79.6% among the study population. The habit of smoking was found to have significant association with the presence of pockets (P = 0.035) and loss of attachment (P = 0.035) [Table 3].

DISCUSSION

The seafood industry constitutes a sizeable part of the Indian industrial sector. Hence, assessment of the oral health status may provide data to better plan and implement oral health programs for the workforce of the seafood industry. This study was conducted among 162

Table 1: Frequency distribution of socio-demographic variables of the study population

Socio-demographic variable	*n* (%)
Gender	
Male	149 (91.9)
Female	13 (8.1)
Age groups	
18–30	116 (71.6)
31–40	34 (20.9)
41–50	8 (4.9)
51–60	4 (2.4)
Location	
Peri-Urban	162 (100)
Education	
No formal education	36 (22.2)
Less than primary school	36 (22.2)
Primary school completed	52 (32.1)
Secondary school completed	38 (23.5)

Table 2: Frequency distribution of oral hygiene practices, adverse habits, and oral mucosal lesions among the study population

Variable	*n* (%)
Oral hygiene practices	
Oral hygiene aid used	
Toothbrush	159 (98.1)
Chewstick/miswak	3 (1.9)
Frequency of brushing	
Once daily	159 (98.1)
Twice daily	3 (1.9)
Dentifrice used	
Toothpaste	158 (97.5)
Tooth powder	1 (0.6)
None	3 (1.9)
Adverse habits	
Habit of alcohol consumption	60 (37)
Tobacco usage	
Smokers	41 (25.3)
Chewing tobacco users	21 (12.9)
Oral mucosal lesions	
No abnormal conditions	149 (92)
Leukoplakia	4 (2.5)
Ulceration (apthous/traumatic/herpetic)	5 (3.1)
Abcess	1 (0.6)
Smoker's palate	3 (1.9)

Table 3: Association of periodontal health status with other variables

Variable	$\chi 2$	*P*-value
Association with bleeding gums		
Age	2.419	0.490
Tobacco usage		
Smoking	1.012	0.603
Chewing tobacco	0.784	0.376
Alcohol usage	8.211	0.084
Education	4.022	0.259
Association with the presence of pockets		
Age	2.633	0.452
Tobacco usage		
Smoking	6.725	0.035*
Chewing tobacco	0.054	0.816
Alcohol usage	6.208	0.184
Education	0.600	0.896
Association with loss of attachment		
Age	2.633	0.452
Tobacco usage		
Smoking	6.725	0.035*
Chewing tobacco	0.054	0.816
Alcohol usage	6.208	0.184
Education	0.600	0.896

*$P < 0.05$ = Statistically significant

individuals who were working in the seafood industry in Visakhapatnam, Andhra Pradesh. The survey instrument was the WHO Oral Health Assessment Form for Adults (2013).

The most prevalent oral hygiene practices among the subjects were the use of toothbrush (98.1%) with toothpaste (97.5%) or tooth powder (0.6%). These observations vary in comparison with a study by Kumar G *et al*.,[3] where 76% of the seafood industry employees used toothbrushes and toothpaste for cleaning their teeth, and a study by Sakthi *et al*.,[5] where 76.9% of the building construction employees used toothbrushes and toothpaste for cleaning their teeth. Contradicting evidence was reported in a study by Daniel T *et al*.,[6] conducted among peri-urban fishing community in Ghana, who presented with poor oral hygiene habits, as only 55.1% subjects cleaned their teeth with toothbrush.

The current study reported the overall prevalence of tobacco usage being 38.2%, with smoking and smokeless tobacco being used by 25.3% and 12.95% of the study participants, respectively. The tobacco use prevalence in the current study was lower than those which were reported by Kumar G *et al*.[3] (16.5% and 23.8%, respectively, and 24.7% and 10.5%, respectively), Mou *et al*.[7] (19.1% and 30.5%, respectively), and Ansari *et al*.[8] (62.28% and 66.07%, respectively). The lower rates of tobacco smoking and pan chewing reported in this study are due to the workplace regulations regarding possession or use of tobacco products on the factory premises.

The present study reported periodontitis in 79.60% of the study population, similar to a study by Kumar *et al*,[3] where 86.1% of the participants had periodontitis. It was observed that smoking, which in the present study population was prevalent at 25.3%, was the strongest independent factor which affected the periodontal status. Poor lifestyle is a significant factor in the high prevalence of periodontal disease as per a study by Tirth *et al*.[9] In a study by Pilot *et al*.,[10] lack of awareness was observed to be an important factor in Shanghai employees for the high prevalence of periodontal disease and poor oral hygiene practices. A previous study from Finland by Doughan B *et al*. showed that periodontal disease increased with the poor standard of oral hygiene and unhealthy lifestyles.

The overall prevalence of oral mucosal lesions was 8.1%, respectively, which was similar to the study by Kumar *et al*.,[3] who reported 7.3% in their study. This prevalence was relatively lower than those reported by similar studies conducted by Malaovalla *et al*.,[11] Jahanbani,[12] Ikeda *et al*.,[13] and Tang *et al*.[14]

Strengths and limitations

The advantages of this study are that this is the first study assessing the periodontal health status, oral habits, and prevalence of oral mucosal lesions in the state of Andhra Pradesh and standardized clinical examination protocol followed. The current study has a few limitations, such as (a) A small sample size; (b) this being a cross-sectional study, and there is a chance of the study variables being affected by factors such as recall bias and may be different from the real influencing factors; (c) since tobacco and alcohol consumption were assessed, there is a chance of social desirability bias arising in this study.

CONCLUSION

The findings of this study provided an insight into the periodontal health status, oral habits, and the prevalence of oral mucosal lesions of seafood industry employees in Visakhapatnam, Andhra Pradesh, which may be useful in designing and planning oral health promotion programs.

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Conflicts of interest

There are no conflicts of interest.

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