RISK INDICATORS FOR PERIODONTAL DISEASE AND TOOTH LOSS AMONG TWO RURAL COMMUNITIES IN INDIA

by

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"If money is your hope for independence you will never have it. The only real security that a man will have in this world is a reserve of knowledge, experience, and ability."

-Henry Ford

Dedicated to my loving parents

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References

The references are cited in the thesis by listing the author(s) and date of publication in the parenthesis. Harvard author date referencing system has been followed. In the text, up to two authors are included to distinctly identify references. Where there are three or more authors, the first author is named followed by "et al." in the text. All authors are listed in the bibliography.

List of abbreviations

AAP	American Academy of Periodontology
ARCPOH	Australian Research Centre for Population Oral Health
BOP	Bleeding on Probing
CAL	Clinical Attachment Loss
CDC-AAP	Centre for Disease Control and American Academy of Periodontology
CDC	Centre for Disease Control and Prevention
CEJ	Cemento-Enamel Junction
CI	Confidence Interval
CPI	Community Periodontal Index
CPITN	Community Periodontal Index of Treatment Need
DALY	Disability Adjusted Life Year
DCI	Dental Council of India
FGM	Free Gingival Margin
HREC	Human Research Ethics Committee
IPW	Inverse Probability Weight
LOA	Loss of Attachment
n	Number

NHANES	National Health and Nutrition Examination Survey
ns	Not significant
NSAOH	National Survey of Adult Oral Health
OHIP	Oral Health Impact Profile
OHRQoL	Oral Health Related Quality of Life
OR	Odds Ratio
PAF	Population Attributable Fraction
PHC	Primary Health Centre
PPD	Probing Pocket Depth
PR	Prevalence Ratio
PS	Propensity Scores
Ref	Reference category
RR	Risk Ratio
Rs	Rupees
Sig	Significant
SLT	Smokeless Tobacco
USD	United States Dollar
VIF	Variation Inflation Factor
WHO	World Health Organisation

Abstract

Introduction

Chronic periodontal disease is a frequently occurring disease among middle-aged adults. It results from a complex interplay of host, environmental and local factors. There are no published data on the risk indicators for periodontal disease in rural Indian populations. Hence, the present study was conducted to identify the risk indicators for periodontal disease and tooth loss in two rural populations, which were diverse in nature with respect to their occupation, education, habits and diet. The hypotheses of the study were as follows:

1. Prevalence, extent and severity of periodontal disease and tooth loss vary between the fishing and farming communities.
2. Tobacco use, psycho-social factors, alcohol consumption, diet and poor oral hygiene are risk indicators for periodontal disease in the Indian rural population.
3. Risk indicators for periodontal disease show clustering in the Indian rural population.
4. Tooth loss is associated with dental visiting behaviour in the Indian rural population.

Methods

This was a cross-sectional population-based study. Two coastal districts in rural Karnataka state where the fishing and farming populations formed a majority were chosen for the study. A multistage (stratified cluster random) sampling design was followed. Men and women in the age group of 35-54 years were randomly selected and recruited in each cluster. Data were collected by conducting face-face interviews and oral examinations for consenting participants.

For statistical analyses, prevalence, extent, and severity of periodontal disease and prevalence of tooth loss were the primary outcomes. Univariate, bivariate and multivariate analyses using analytical techniques for stratified clustered sampling were used to identify significant risk

indicators. The risk indicators were quantified by calculating the prevalence ratios from multivariable models. Propensity score adjustment was used to control for potential selection bias in evaluating the risk indicators for tooth loss. The population impact of the risk indicators were estimated using population attributable fraction (PAF).

Results

The response rate in the study was 62.3%. During the study period, 1401 eligible participants from 50 villages of two coastal districts were approached. Of the total 873 participants, 522 were from the fishing and 351 were from the farming communities. The prevalence of periodontal disease was 46.6% in the total rural population according to the Centre for Disease Control and Prevention and the American Academy of Periodontology (CDC-AAP) case definition. Both communities had similar levels of periodontal disease measured by prevalence, extent and severity. Patterns of health behaviours varied between subgroups by socioeconomic status (SES). The prevalence of tobacco chewing was high in both communities. Farming people had better SES compared to the fishing population. Age, dental plaque, SES, method of cleaning, tobacco chewing and alcohol were the significant risk indicators in the models for prevalence, extent, and severity of periodontitis. Clustering of risk indicators for periodontal disease was observed in the study population. Tooth loss (≥6 missing teeth) was greater (27.9%) in the farming than in fishing population (11.1%). Tooth loss was significantly associated with age, socioeconomic status, dental visiting, alcohol and periodontal disease. In the study population, 50%, 27%, 15% and 9% of tooth loss were attributable to the dental visiting, age, periodontal disease and education respectively.

Conclusions

The study showed that the rural populations in India carried significant burden of periodontal disease and tooth loss. The first null hypothesis was retained since the prevalence, extent, and

severity of periodontal disease were similar in both the communities. Other hypotheses were supported. The risk indicators of periodontal disease such as plaque accumulation, tobacco and alcohol showed clustering. Tooth loss was higher in the farming than the fishing community. Dental visiting was strongly associated with tooth loss in the models and remained significant after propensity score adjustment. Health behaviours are modifiable factors important in controlling periodontal disease and tooth loss. There is an urgent need for improving oral health in this rural Indian population. The findings from the present study point to the importance of concerted efforts by oral health groups, the Dental Council of India along with other health stakeholders in planning public health programs to improve oral health and reduce oral health inequalities.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide

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Meghashyam Bhat Date

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