

Relationship between Socioeconomic Factors and Periodontal Disease – A Cross-sectional Study

Monika Kumari¹, Manish Kumar², Binod Shankar³, Lav Kumar Niraj¹, Ananthalekshmy Rajeev¹, Ambar Khan¹

¹Department of Public Health Dentistry, D.J College of Dental Sciences and Research, Niwari Dehat, Uttar Pradesh, India, ²Department of Prosthodontics Crown and Bridge, Hazaribagh College of Dental Sciences and Hospital, Hazaribagh, Jharkhand, India, ³Department of Prosthodontics Crown and Bridge, Dental Practitioner, Patna, Bihar, India

Abstract

Introduction: Periodontal disease (PD) is regarded as the 6th most prevalent disease in the world. The presence and severity of oral diseases were reported to be increased among socially disadvantaged populations, thus suggesting a correlation between PD and social inequalities. Hence, the present study was conducted to assess the relationship between socioeconomic factors and PD. **Materials and Methods:** A descriptive cross-sectional study was carried out among a sample of 400 subjects. Socioeconomic status of the study participants was collected with the use of a questionnaire and the intraoral examination was carried out according to the WHO oral health survey guideline using community periodontal index periodontal probe. Chi-square analysis was used to assess the relationship between socioeconomic factors and PD. Any $P < 0.05$ was considered significant. **Results:** Out of 400 study participants, 63.8% were at age group of 35–39 years while 67.8% were males. Illiterate people were more prevalent to periodontitis than literate people. Most of the unskilled workers (107) had periodontitis while only few professionals had the same. About 163 participants with smoking habit and 78 participants who consume alcohol had periodontitis. A statistically significant difference ($P \leq 0.05$) was observed for all characteristics except alcohol consumption habit. **Conclusion:** The present study revealed a significant relationship between PD and socioeconomic factors.

Keywords: Periodontal diseases, Social class, Socioeconomic factors.

INTRODUCTION

The global burden of disease revealed that periodontal disease (PD) as the 6th most prevalent disease in the world with a prevalence of 11.2%.^[1,2] Numerous epidemiological studies have shown that the diseases of periodontium are among the most common human illnesses.^[3] Many individuals, particularly adult's aged ≥ 30 years, suffer from severe PD; in fact, its global prevalence is higher than that of diabetes.^[4]

Periodontitis can be defined as an inflammatory disease affecting the supporting tissues of the teeth, caused by specific microorganisms or groups of microorganisms.^[5] The initial symptoms of PD include gingival redness and bleeding, later progressing to gingival swelling and destruction of the alveolar bone, then eventual tooth loss.^[4]

Major etiologic factors of PD include plaque microorganisms, immunological, and genetic factors.^[3] PD has been also found to be associated with age, gender, poor lifestyle, low-socioeconomic status (SES), poor access to healthcare, and health-related risk behaviors including smoking, obesity,

alcohol intake, carbohydrate diets, and poor oral hygiene practice.^[1,6]

Socioeconomic inequalities exist in oral health and many studies have reported it.^[7] The concept of socioeconomic inequalities in oral health can be defined as the differences in the prevalence or incidence of oral health problems between individual people of higher and lower SES.^[8] The presence and severity of oral diseases were reported to be increased among socially disadvantaged populations, thus suggesting a correlation between PD and social inequalities.^[9,10] Many studies revealed an inverse relationship between the severity of PD and level of education and income which

Address for correspondence: Dr. Monika Kumari,
Department of Public Health Dentistry, D.J College of Dental Sciences and
Research, Niwari Dehat, Uttar Pradesh, India.
E-mail: mr078242@gmail.com

Received: May 13, 2021; **Accepted:** Jun 23, 2021; **Published:** Jul 20, 2021

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

How to cite this article: Kumari M, Kumar M, Shankar B, Niraj LK, Rajeev A, Khan A. Relationship between Socioeconomic Factors and Periodontal Disease – A Cross-sectional Study. J Res Adv Dent 2021;12(5): 1-181.

Access this article online

Website:
www.jrad.co.in

DOI:
<https://doi.org/10.53064/jrad.2021.12.5.39>

are the most common and relevant indicators used in SES measurement.^[11-13] Hence, the present study was conducted to assess the relationship between socioeconomic factors and PD.

MATERIALS AND METHODS

A descriptive cross-sectional study was carried out to assess the relationship between socioeconomic factors and PD among a sample of 400 subjects. The ethical clearance was obtained from the Institutional Review Board of dental college. The written informed consent was also obtained from the study subjects after explaining the purpose and methodology of the study.

Date collection

SES of the study participants was collected with the use of a questionnaire and the intraoral examination was carried out according to the WHO oral health survey guideline using community periodontal index (CPI) periodontal probe. A periodontal examination, for each participant, was performed with subjects seated in the dental chair. The sextant of each tooth was examined using a CPI probe around the whole circumference of the tooth, pocket depths were measured at two sites per tooth (buccal and lingual), and the highest sextant score was recorded. Finally, the participants were categorized based on their CPI results (CPI code: 0 = healthy periodontal tissue; 1 = bleeding on probing (BOP); 2 = calculus; and 3 = periodontal pocket PD 4–5 mm; 4 = PD $\geq$ 6 mm).

Statistical analysis

The data were analyzed using the SPSS v20.0 software package. Chi-square analysis was used to assess the relationship between socioeconomic factors and PD. Any $P < 0.05$ was considered significant.

RESULTS

Out of 400 study participants, 63.8% were at age group of 35–39 years while 67.8% were males. About 66.5% were literate people whereas 34.7% were unskilled workers and only 7.8% were professionals. More number of people (58.8%) used tooth brush and tooth paste for maintaining oral hygiene while 42.2% brushed only once daily. Smoking habit was seen among 48.5% participants while 24% had a habit of alcohol consumption (Table 1).

Table 2 illustrates the periodontal status of study subjects. About 39.5% had healthy gum while 26% had BOP. Calculus deposition was seen among 17.5% while 11.25% had a probing depth of 4–5 mm and 5.75% had probing depth $\geq$ 6 mm.

Periodontitis was seen more among age group of 40–44 years ($n = 188$). About 198 males had periodontitis while only 44 females had periodontitis. Illiterate people were more prevalent to periodontitis than literate people. Most of the unskilled workers (107) had periodontitis while only few professionals had the same. 185 participants from rural area and 188 participants with a monthly family income $>$ 25,000

Table 1: Socio-demographic characteristics of the study participants ($n = 400$)

Characteristics	Number (%)
Age	
35–39 years	255 (63.8)
40–44 years	145 (36.2)
Gender	
Male	271 (67.8)
Female	129 (32.2)
Educational status	
Illiterate	134 (33.5)
Literate	266 (66.5)
Occupation	
Unemployed	58 (14.5)
Unskilled	139 (34.7)
Skilled	81 (20.2)
Clerical	51 (12.8)
Semi-professional	40 (10)
Professional	31 (7.8)
Residency	
Urban	246 (61.5)
Rural	154 (38.5)
Monthly family income	
$\leq$ 25,000	153 (38.25)
$>$ 25,000	247 (61.75)
Oral hygiene method	
Tooth brush and Tooth paste	235 (58.8)
Tooth powder and Finger	126 (31.5)
Finger	22 (5.5)
Stick	17 (4.2)
Frequency of tooth brushing	
Once	169 (42.2)
Twice	139 (34.8)
After each meal	24 (6)
Sometimes	68 (17)
Smoking habit	
Yes	194 (48.5)
No	206 (51.5)
Alcohol intake	
Yes	96 (24)
No	304 (76)

Table 2: Periodontal status of study subjects

Periodontal status	Number (%)
Code 0 (Healthy Gum)	158 (39.5)
Code 1 (BOP)	104 (26)
Code 2 (Calculus Deposition)	70 (17.5)
Code 3 (Pocket depth 4–5mm)	45 (11.25)
Code 4 (Pocket depth $\geq$ 6mm)	23 (5.75)
BOP: Bleeding on probing	

reported to have periodontitis. About 163 participants with smoking habit and 78 participants who consume alcohol had periodontitis. A statistically significant difference ($P \leq 0.05$) was observed for all socioeconomic characteristics except alcohol consumption habit (Table 3).

Table 3: Relationship between socioeconomic factors and PD

Characteristics	Periodontitis		P-value
	Yes	No	
Age			
35–39 years	54	91	0.036**
40–44 years	188	67	
Gender			
Male	198	73	0.006**
Female	44	85	
Educational status			
Illiterate	114	20	0.043**
Literate	128	138	
Occupation			
Unemployed	31	27	0.048**
Unskilled	107	32	
Skilled	43	38	
Clerical	34	17	
Semi-professional	15	25	
Professional	12	19	
Residency			
Rural	185	61	0.032**
Urban	57	97	
Monthly family income			
≤25,000	54	99	0.024**
>25,000	188	59	
Smoking habit			
Yes	163	31	0.018**
No	79	127	
Alcohol intake			
Yes	78	18	0.08
No	164	140	

PD: Periodontal disease

DISCUSSION

The present cross-sectional study was conducted among 400 adult populations to assess the relationship between socioeconomic factors and PD. In this study, 63.8% were at age group of 35–39 years while 67.8% were males. In a study by Tefera and Bekele, 73.1% were at age group of 20–34 years while 51% subjects were males.^[1] About 66.5% were literate people whereas 34.7% were unskilled workers and only 7.8% were professionals. In a study by Hakeem and Sabbah, 57.1% had a qualification below degree.^[7]

More number of people (58.8%) in the present study used tooth brush and tooth paste for maintaining oral hygiene while 42.2% brushed only once daily. However, this result was in contrast with the study by Hakeem and Sabbah in which only 25.5% brushed once daily and rest 74.5% brushed twice daily.^[7] There were 659 participants, in the study by Almerich-Silla *et al.*, who use tooth brushing for oral hygiene.^[5] Smoking habit was seen among 48.5% participants in our study while 24% had a habit of alcohol consumption. In a study by Almerich-Silla *et al.*, 240 had a habit of smoking while 108 had habit of alcohol consumption.^[5]

About 39.5% participants in our study had healthy gum while 26% had BOP. Calculus deposition was seen among 17.5% while 11.25% had a probing depth of 4–5 mm and 5.75% had probing depth ≥6 mm. In a study by Bomfim *et al.*, 41.48% had gingival bleeding, 57.38% had calculus deposition, 22.6% had shallow pocket, and 6.53% had deep pocket.^[9]

Periodontitis was seen more among age group of 40–44 years ($n = 188$). About 198 males had periodontitis while only 44 females had periodontitis. In a study by Tefera and Bekele, more than two-thirds of elder patients developed a PD and moreover, females were 2 times at risk of developing PD than males.^[1] Illiterate people in our study were more prevalent to periodontitis than literate people and this result was in agreement with the study by Tefera and Bekele in which participants who had no formal education were 3.25 times at risk of developing PD.^[1] A statistically significant difference ($P \leq 0.05$) was observed for all socioeconomic characteristics except alcohol consumption habit. In a study by Tefera and Bekele, a statistically significant association was found between low educational level, low social class, and a higher prevalence of PD.^[1] The existence of socioeconomic inequalities in PD and gingival bleeding was demonstrated in a study by Hakeem and Sabbah.^[7] The present study included only a smaller sample size so generalization of the results will be impossible and it may be one of the major limitations.

CONCLUSION

The present study revealed a significant relationship between PD and socioeconomic factors. Oral health education should be given at community-level to reduce PD prevalence among adult population.

REFERENCES

1. Tefera A, Bekele B. Periodontal disease status and associated risk factors in patients attending a tertiary hospital in Northwest Ethiopia. *Clin Cosmet Investig Dent* 2020;12:485-92.
2. Patel AB, Il'yasova D, Owen-Smith A. Sociodemographic and clinical factors associated with poor oral health outcomes among United States adults. *Int J Oral Health Sci* 2020;10:86-93.
3. Gundala R, Chava VK. Effect of lifestyle, education and socioeconomic status on periodontal health. *Contemp Clin Dent* 2010;1:23-6.
4. Kim HN, Jang YE, Kim CB, Kim NH. Socioeconomic status and self-reported periodontal symptoms in community-dwelling individuals: Data from the Korea community health surveys of 2011 and 2013. *Int Dent J* 2018;68:411-9.
5. Almerich-Silla JM, Almiñana-Pastor PJ, Boronat-Catalá M, Bellot-Arcis C, Montiel-Company JM. Socioeconomic factors and severity of periodontal disease in adults (35-44 years). A cross sectional study. *J Clin Exp Dent* 2017;9:e988-94.
6. Niskanen MC, Mattila PT, Niinimaa AO, Vehkalahti MM, Knuuttila ML. Behavioural and socioeconomic factors associated with the simultaneous occurrence of periodontal disease and dental caries. *Acta Odontol Scand* 2020;78:196-202.
7. Hakeem FF, Sabbah W. Is there socioeconomic inequality in periodontal disease among adults with optimal behaviours. *Acta Odontol Scand* 2019;77:400-7.
8. Janakiram C, Varghese NJ, Joseph J. Review of the correlation between social economic status and oral diseases in India. *Amrita J Med*

- 2020;16:146-51.
9. Bomfim RA, Frias AC, Pannuti CM, Zilbovicius C, Pereira AC. Socio-economic factors associated with periodontal conditions among Brazilian elderly people-multilevel analysis of the SBSP-15 study. *PLoS One* 2018;13:1-12.
10. Al Saffan DA. The association between socioeconomic status, diet, psychological status, and oral health. *EC Dent Sci SI* 2017;1:6-20.
11. Opeodu OI, Arowojolu MO. Effect of social class on the prevalence and severity of periodontal disease. *Ann Ib Postgrad Med* 2007;5:9-11.
12. Mejia GC, Elani HW, Harper S, Thomson WM, Ju X, Kawachi I, *et al.* Socioeconomic status, oral health and dental disease in Australia, Canada, New Zealand and the United States. *BMC Oral Health* 2018;18:1-9.
13. Borrell LN, Beck JD, Heiss G. Socioeconomic disadvantage and periodontal disease: The dental atherosclerosis risk in communities study. *Am J Public Health* 2006;96:332-9.