

# Evaluating dental awareness and periodontal health status in different socioeconomic groups in the population of Sundernagar, Himachal Pradesh, India

D. K. Gautam, J. Vikas, T. Amrinder, T. Rambhika, K. Bhanu

Department of Periodontics, Himachal Dental College, Sundernagar, Himachal Pradesh, India

Corresponding author (email:<gautam.devender3@gmail.com>)

Dr. D. K. Gautam, Himachal Dental College, Sundernagar, HP, India.

## Abstract

**Context:** Survey. **Aims:** To evaluate dental awareness and periodontal health status in different socioeconomic groups in the population of Sundernagar, Himachal Pradesh, India. **Settings and Design:** Cross-sectional study. **Materials and Methods:** This cross-sectional study was conducted in 300 patients with different socioeconomic status who visited Himachal Dental College, Sundernagar, and Dental OPD of the Civil Hospital, Sundernagar. Mouth mirror, CPI probe, and illuminated light source were used for examination. Periodontal health status was recorded using CPI index. Information about their lifestyle, education level, and socioeconomic status was recorded using a questionnaire and correlated with the periodontal status. **Statistical Analysis Used:** Chi-square test. **Results:** Majority of the subjects used toothbrush and toothpaste to clean their teeth once daily. Lower socioeconomic groups exhibited higher CPI scores characterized by bleeding gums and calculus deposition. The differences were statistically significant across various social strata ( $P < 0.01$ ). **Conclusions:** The utilization of the questionnaire on dental awareness facilitates the inclusion of multiple aspects of patient information. The study revealed that oral hygiene awareness and periodontal condition were significantly associated with socioeconomic status. The socioeconomic status and oral hygiene practices were significantly associated with CPI ( $P < 0.01$ ).

**Key words:** *Community periodontal index, dental awareness, periodontal disease, socioeconomic status*

## INTRODUCTION

The term inequality has a moral and ethical dimension. It refers to differences which are unnecessary and avoidable but, in addition, are also considered unfair and unjust.<sup>[1]</sup> Regarding oral health, the reasons of disparities are complex. There are differences caused by biological factors (such as aging), which are normal and inevitable in a balanced society. But there are also inequalities which can be avoided and are unacceptable in the modern society, being caused mainly by

the socioeconomic differences.<sup>[2]</sup> The concept of socioeconomic inequalities in oral health can be defined as differences in the prevalence or incidence of oral health problems between higher and lower socioeconomic status.<sup>[3]</sup> Studies had shown that over the last decade, the differences in the oral health status between the individuals with a high socioeconomic status and those with a low socioeconomic status had markedly increased.<sup>[4]</sup>

Oral care, as part of general health self-care, comprises wide spectrum of activities ranging from care, prevention, and diagnosis to seeking professional care. Oral self-care practices have been proved to be an effective preventive measure at individual level for maintaining good oral health as a part of general health.<sup>[5]</sup> To improve the oral health of population, the WHO has set the promotion of self-care as one of the goals for the year 2020.<sup>[6]</sup>

Access this article online	
<b>Quick Response Code:</b> 	<b>Website:</b> <a href="http://www.jispcd.org">www.jispcd.org</a>
	<b>DOI:</b> 10.4103/2231-0762.109367

Furthermore, periodontitis has been implicated as an emerging risk factor for a number of major systemic diseases or conditions, including cardiovascular disease, stroke, and diabetes, as well as for pre-term, low-birth-weight infants.<sup>[7-9]</sup> Prevention of and early intervention into periodontal disease is critical, and oral hygiene education is central to all stages of treatment. In addition to professional care, successful management of periodontal disease depends on the capacity of patient's oral self-care.<sup>[10,11]</sup> A change in patient's attitude and behavior is often desirable when periodontitis is treated. The information gathered relative to a patient's values and beliefs may be a useful guide in designing effective oral health care interventions.<sup>[12]</sup>

Presently, very few studies exist showing the effect of general education, lifestyle, and socioeconomic position on the prevalence of periodontal disease. Hence, in the present study, an attempt was made to investigate the effect of lifestyle, education, and socioeconomic status on the periodontal health of adult population in Sundernagar.

## MATERIALS AND METHODS

A cross-sectional study design was used. Subjects were recruited from the patients who visited Himachal Dental College, Sundernagar, and Dental OPD of the civil hospital, Sundernagar, for initial assessment and treatment of periodontitis. Mouth mirror, CPI probe, and illuminated light source were used for examination. The sample size consisted of 300 dental patients in the age range 25-55 years. Patients were categorized according to the differences in socioeconomic status.

### Inclusion criteria

- Systemically healthy individuals aged 25-55 years
- Presence of more than 15 teeth

### Exclusion criteria

- Patients with history of systemic disease
- Pregnancy and lactation
- Use of tobacco in any form
- Undergone oral prophylaxis during the past 6 months

A questionnaire was administered by the examiner. From this questionnaire, information was obtained regarding dental awareness and socioeconomic status.

## Questionnaire

Name:  
Age:

Sex: M/F

Occupation:

Address:

Education:

Income per month:

- How do you clean your teeth?  
Toothbrush and paste  
Toothbrush and powder  
Others (Datun, Finger, Charcoal powder)
- How often do you brush your teeth each day?  
1  2  Sometimes
- How many minutes do you brush your teeth for?  
1  2  3  4  Over 4 minutes
- How frequently do you change your brush?  
Less than 3 months  
3 months  
3-6 months  
More than 6 months
- What type of tooth brushing movements do you employ?  
Vertical  
Horizontal  
Combined
- Do you use a mouth wash?  
Yes  
No  
If yes, then how often?
- Which secondary methods for plaque control do you use?  
Dental floss  
Interdental brushes  
Toothpicks  
None
- On what is your daily diet mainly based?  
Potato chips  
Vegetables  
Milk products  
Meat
- When was your last dental checkup?  
Less than 6 months  
Within past 6-12 months  
Between last 1 and 2 years
- Reasons for dental checkup?  
Pain in tooth  
Regular check up

The periodontal examination was conducted using mouth mirror and CPI probe and the CPI score was recorded.<sup>[13]</sup>

Codes and criteria of CPI index:

Code 0 = No periodontal disease (healthy

periodontium)

- Code 1 = Bleeding observed during or after probing
- Code 2 = Calculus or other plaque-retentive factors either seen or felt during probing
- Code 3 = Pathological pocket 4–5 mm in depth. Gingival margin situated on black band of the probe
- Code 4 = Pathological pocket 6 mm or more in depth. Black band of the probe not visible

Modified Kuppuswamy’s socioeconomic scale<sup>14</sup> was utilized in this study for the stratification of the patients. The stratification was done under five classes comprising upper, upper-middle, lower-middle, upper-lower, and lower.

Kuppuswamy’s socioeconomic status scale

(A) Education	Score
1 Profession or honors	7
2 Graduate or post graduate	6
3 Intermediate or post high school diploma	5
4 High school certificate	4
5 Middle school certificate	3
6 Primary school certificate	2
7 Illiterate	1

  

(B) Occupation	Score
1 Profession	10
2 Semi-profession	6
3 Clerical, shop-owner, farmer	5
4 Skilled worker	4
5 Semi-skilled worker	3
6 Unskilled worker	2
7 Unemployed	1

  

(C) Family income per month (in Rs.) – original	Score	Modified for 1998	Modified for 2007
1 =2000	12	=13,500	=19,575
2 1000–1999	10	6750–13,499	9788–19,574
3 750–999	6	5050–6749	7323–9787
4 500–749	4	3375–5049	4894–7322
5 300–499	3	2025–3374	2936–4893
6 101–299	2	676–2024	980–2935
7 =100	1	=675	=979

  

Total score	Socioeconomic class
26–29	Upper (I)
16–25	Upper-middle (II)
11–15	Middle (III)
5–10	Lower (IV)
<5	Lower (V)

RESULTS

Out of 300 subjects (Males = 180, Females = 120). Number of cases in each socioeconomic group from class I to class V. The demographic characteristics of the subjects at baseline are shown in Table 1.

On evaluating the dental awareness, it was revealed that both oral hygiene aids and frequency of cleaning teeth show significant difference in all socioeconomic classes. Majority of the subjects in all socioeconomic classes preferred to use toothbrush and paste as compared to other aids. It is reported that upper (100.0%) class used toothbrush and paste more as compared to upper-middle (93.33%), lower-middle (82.6%), upper-lower (67.14%), and lower (74.5%) classes. Only 15.7% and 16.36% in the upper-lower and lower socioeconomic classes used other oral hygiene aids such as datun (neem stick) and charcoal powder. Majority of them brushed once daily; around 30% among the upper socioeconomic class brushed their teeth twice daily ( $P < 0.01$ ) [Table 2].

Table 3 indicates that the socioeconomic status is associated with the regular attendance at dental clinics. There was a statistically significant difference between subjects from different socioeconomic classes ( $P < 0.01$ ).

According to CPI, Code 0 ( $\chi^2 = 18.7, P < 0.01$ ) and Code 2 ( $\chi^2 = 20.9, P < 0.01$ ) were statistically significant at  $P < 0.01$  level. Code 1 ( $\chi^2 = 3.75, P > 0.05$ ), Code 3 ( $\chi^2 = 1.38, P > 0.05$ ), and Code 4 ( $\chi^2 = 1.44, P > 0.05$ ) were statistically nonsignificant across the various social strata. It is reported that Code 0 was more in upper (55.0%) and upper-middle (35.5%) classes, while Code 2 was more in lower-middle (33.33%), upper-lower (35.71%), and lower (40.0%) socioeconomic classes [Table 4].

DISCUSSION

Socioeconomic factors have been identified as predisposing factors in the development of periodontal

**Table 1: Demographic characteristics of the subjects at baseline (total N = 300)**

Gender	
Male	180
Female	120
Mean Age	34 years
Age distribution	25–55 years

**Table 2: Distribution of subjects in relation to socioeconomic status, oral hygiene aids used, and frequency of cleaning teeth**

Socioeconomic	Total no. of subjects	Oral hygiene aids		Others	Frequency of cleaning teeth	
		Toothbrush and paste (%)	Toothbrush and powder (%)		Once (%)	Twice (%)
Upper	40	40 (100)	-	-	28 (70)	12 (30)
Upper-middle	60	56 (93.33)	4 (6.66)	-	52 (86.6)	8 (13.3%)
Lower-middle	75	62 (82.6)	13 (17.33)	-	68 (90)	7 (9.33)
Upper-lower	70	47 (67.14)	12 (17.14)	11 (15.7)	67 (95.71)	3 (4.28)
Lower	55	41 (74.5)	5 (9.09)	9 (16.36)	54 (98.18)	1 (1.8)
Chi-square			34.05			24.4
P value			0.000*			0.000*

\*Significant at 0.01 level of significance

**Table 3: Regular visit to the dentist during the last 6–12 months according to socioeconomic status**

Social class	Yes (%)	No (%)	Total (%)	Chi-square	P-value
Upper	6 (15)	34 (85)	40	19.6	0.000*
Upper-middle	5 (8.33)	55 (91.66)	60	41.6	0.000*
Lower-middle	6 (8)	69 (92)	75	52.9	0.000*
Upper-lower	2 (2.85)	68 (97.14)	70	62.23	0.000*
Lower	-	55 (100)	55	-	-
Total			300		

\*Significant at 0.01 level of significance

**Table 4: Relation between CPI codes and the socioeconomic status**

CPI scores	Code 0	Code 1	Code 2	Code 3	Code 4 Deep	Total no. of subjects
	Healthy (%)	Bleeding (%)	Calculus (%)	Shallow pocket 4–5 mm (%)	pocket ≥6 mm (%)	
Upper	22 (55)	13 (32.5)	5 (12.5)	0.0 (0.0)	0.0 (0.0)	40
Upper-middle	21 (35)	22 (36.66)	9 (18.33)	7 (11.66)	2 (3.33)	60
Lower-middle	21 (28)	17 (22.66)	25 (33.33)	9 (12)	3 (4)	75
Upper-lower	10 (14.28)	21 (30)	25 (35.71)	10 (14.28)	4 (5.71)	70
Lower	3 (5.45)	14 (25.45)	22 (40)	11 (20)	5 (9.0)	55
Chi-square	18.78	3.75	20.9	1.38	1.44	300
P value	0.001*	0.441	0.000*	0.711	0.699	

\*Significant at 0.01 level of significance

disease and other oral diseases. People from lower educational, occupational, and income groups go to dentist for preventive care less than those of higher status do. Changing this pattern is not simply a matter of making services free. It requires both the change of dental attitudes and habits of low-income groups and finding new methods of organizing and paying for both preventive and restorative dental cares.

The variation in the oral hygiene practices between upper and lower socioeconomic groups may be attributed to lack of oral hygiene education in lower socioeconomic groups which is reflected in their oral hygiene maintenance.

Our study showed a positive association between higher socioeconomic groups and better periodontal status. This is in accordance with the report of Neuman *et al.*<sup>[14]</sup> who identified a lower occupational status limiting the use of dental services.

Our study demonstrated higher prevalence rate among low socioeconomic group children than in middle and higher socioeconomic group children. These results agree with the studies of Russell,<sup>[15]</sup> Nikias *et al.*,<sup>[16]</sup> and Waerhaug,<sup>[17]</sup> which showed that prevalence of periodontal disease was inversely related to increasing family income.

Dental visit is still not considered a positive dental behavior; at present, it only depends on treatment needs. Thus, people from the lower income group fail to make prophylactic visits to a dentist, thus giving them poorer dental health behavior.<sup>[18]</sup> A few shortcomings of this study were the self-reporting of all variables and the sample of 300 may not truly represent trends in the community on the whole. So, a larger, more representative sample would have to be studied for more direct correlations.

## References

1. Whitehead M. The concepts and principles of equity in health. WHO Regional Office for Europe; 2000.
2. Healthy people 2010. US Department of Health and Human Services; 2000.
3. Locker D, Ford J. Using area-based measures of socioeconomic status in dental health services research. *J Public Health Dent* 1996;56:69-75.
4. Oral health U.S. The National Institute of Dental and Craniofacial Research, USA, 2002.
5. Axelsson P, Albander JM, Rams TE. Prevention and control of periodontal diseases in developing and industrialized nations. *Periodontol* 2002;29:235-46.
6. Hobdell M, Petersen PE, Clarkson J, Johnson N. Global goals for oral health 2020. *Int Dent J* 2003;53:285-8.
7. Offenbacher S. Periodontal diseases: Pathogenesis. *Ann Periodontol* 1996;1:821-78.
8. Page RC. The pathology of periodontal diseases may affect systemic diseases: Inversion of a paradigm. *Ann Periodontol* 1998;3:108-20.
9. Rose LF, Genco RJ, Cohen DW, Mealey BL, eds. *Periodontal medicine*. St. Louis: BC Decker; 2000.
10. Løe H. Oral hygiene in the prevention of caries and periodontal disease. *Int Dent J* 2000;50:129-39.
11. Axelsson P, Nyström B, Lindhe J. The long-term effect of a plaque control program on tooth mortality, caries and periodontal disease in adults. Results after 30 years of maintenance. *J Clin Periodontol* 2004;31:749-57.
12. Vick VC, Harfst S. The oral risk assessment and early intervention system - A clinician's tool for integrating the bio/psycho/social risk into oral disease interventions. *Compend Contin Educ Dent Suppl* 2000;30:57-64.
13. *The Indian Journal of Pediatrics*. 2007;74.
14. Newman JF, Gift HC. Regular pattern of preventive dental services: A measure of access. *Soc Sci Med* 1992;35:997-1001.
15. Russell AL. A social factor associated with severity of periodontal disease. *J Dent Res* 1957;36:922-6.
16. Nikias M, Fink R, Sollecito W. Oral health status in relation to socioeconomic and ethnic characteristics of urban adult in the USA. *Community Dent Oral Epidemiol* 1977;5:200-6.
17. Waerhaug J. Prevalence of periodontal disease in Ceylon. Association with age, sex, oral hygiene, socio-economic factors, vitamin deficiencies, malnutrition, betel and tobacco consumption and ethnic group. Final report. *Acta Odontol Scand* 1967;25:205-31.
18. Sander AE, Slade GD, Turell G, John Spencer A, Marcenes W. The shape of the socioeconomic oral health gradient: Implications for theoretical explanations. *Community Dent Oral Epidemiol* 2006;34:310-9.

**How to cite this article:** Gautam DK, Vikas J, Amrinder T, Rambhika T, Bhanu K. Evaluating dental awareness and periodontal health status in different socioeconomic groups in the population of Sundernagar, Himachal Pradesh, India. *J Int Soc Prevent Communit Dent* 2012;2:53-7.

**Source of Support:** Nil, **Conflict of Interest:** None declared.

## Author Help: Online submission of the manuscripts

Articles can be submitted online from <http://www.journalonweb.com>. For online submission, the articles should be prepared in two files (first page file and article file). Images should be submitted separately.

**1) First Page File:**

Prepare the title page, covering letter, acknowledgement etc. using a word processor program. All information related to your identity should be included here. Use text/rtf/doc/pdf files. Do not zip the files.

**2) Article File:**

The main text of the article, beginning with the Abstract to References (including tables) should be in this file. Do not include any information (such as acknowledgement, your names in page headers etc.) in this file. Use text/rtf/doc/pdf files. Do not zip the files. Limit the file size to 1024 kb. Do not incorporate images in the file. If file size is large, graphs can be submitted separately as images, without their being incorporated in the article file. This will reduce the size of the file.

**3) Images:**

Submit good quality color images. Each image should be less than **4096 kb (4 MB)** in size. The size of the image can be reduced by decreasing the actual height and width of the images (keep up to about 6 inches and up to about 1800 x 1200 pixels). JPEG is the most suitable file format. The image quality should be good enough to judge the scientific value of the image. For the purpose of printing, always retain a good quality, high resolution image. This high resolution image should be sent to the editorial office at the time of sending a revised article.

**4) Legends:**

Legends for the figures/images should be included at the end of the article file.