ORIGINAL RESEARCH

Self-reported Oral Health Behavior and Socioeconomic Inequalities among the Industrial Trainees of Bhopal City: A Cross-sectional Survey

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ABSTRACT

Objective: Self-rating provides a simple direct way of capturing perceptions of health. This study aimed to assess socioeconomic inequalities in self-reported oral symptoms among industrial trainees of Bhopal city and to assess the association of health behaviors and material factors on social gradients in oral symptoms.

Materials and Methods: This was a cross-sectional study that used self-assessment questionnaire. With a sample of 498 students of Industrial Training Institute, Bhopal, socioeconomic indicators and their association with self-rated oral health behaviors were measured.

Results: Socioeconomically disadvantaged group showed significantly high impacts of oral conditions on quality of life than those in more advantaged counterparts.

Conclusions: We found that lower self-assessed socioeconomic status was significantly associated with higher prevalence of each of the self-reported oral symptoms.

Keywords: Oral health inequality, Oral symptoms, Self-assessed socioeconomic status, Self-rated oral health, Socioeconomic inequalities.

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INTRODUCTION

Oral diseases represent a global public health problem. Socioeconomic status (SES) is an important determinant of oral health.[1] The disease burden is substantially higher among poorer and disadvantaged populations in both developed and developing countries. Worldwide, studies have shown that socially disadvantaged people not only have poorer oral health but also exhibit different patterns of oral health service utilization.[2]

Self-rating provides a simple direct way of capturing perceptions of health and oral health that is valid, reliable, and cost-effective.[3] Self-rated oral health includes both clinical and subjective oral factors. Clinical factors include dental decay, fractured tooth, bleeding gums, and dental care. Subjective measures include reported general health, appearance of the mouth, and dental pain. In addition, demographic and socioeconomic variables such as sex, age, and social class have been associated with self-rated oral health.

SES is a central social construct in most societies.[4] However, it is only in recent times that rigorous investigation of the association between SES and health has been undertaken.[5] Understanding this relationship may help to reveal areas important for health intervention, epidemiological measurement, and public policy.[6]

As oral symptoms such as toothache, bad breath, and fractured teeth are quite common in adolescents and they impact on their quality of life, there is a need for a better understanding of socioeconomic inequalities in oral symptoms among adolescents.[7]

Industrial Training Institutes (ITIs) or "Industrial Training Centers" are training institute which provides training in a technical field. ITIs are government-run training organizations. They provide post-school technical training. These persons are trained in basic skills required to do jobs of say operator or a craftsman. Most of ITIs impart training in technical trades such as instrument mechanic, electrician, fitter, plumber, diesel mechanic, computer operator and programming assistant, electrical mechanic, information technology,

mechanic computer hardware, refrigeration and air conditioning (AC), turner, and welder.[8]

Studies have shown the associations between occupational exposure and greater incidence of oral diseases. ITI students being trained in various technical fields form a special group exposed to multiple tasks. Every workplace is really a work environment where there are interactions between people and the chemical and physical demands involved with performing job.

Hence, the present study is planned to assess the self-reported oral health behavior and socioeconomic inequalities among the industrial trainees of Bhopal city.

MATERIALS AND METHODS

Preparation of the Research Protocol

The protocol for the study was prepared, reviewed by experts in the Department of Public Health Dentistry, People's Dental Academy, Bhopal, and submitted to Institution's Research and Ethics Committee for approval. The study protocol was approved by the concerned committee and the ethical clearance was obtained. The permission to conduct the research was obtained from the concerned head of the ITI. Furthermore, all participants were given an informed consent statement and their approval to participate in the study was obtained.

Study Design and Setting

The study was cross-sectional in nature and conducted among students of government ITI, Govindpura, Bhopal district, Madhya Pradesh, India.

Selection of Study Participants

Before investigation of the study, a list of government ITI in Bhopal was obtained from District Education Office which consisted of four institutes. The total strength of trainees attending to this government ITI was 3600. Model ITI, Govindpura, was selected randomly for collection of data. Model ITI consisted of around 1000 trainees. Questionnaire was distributed to around 700 trainees and only 498 trainees completed the study.

Questionnaire

A structured self-administered closed-ended questionnaire was used to assess the oral health behavior and socioeconomic inequalities among the industrial trainees of Bhopal city. The survey questionnaire was prepared based on the survey items used in previous studies (Jung *et al*.).[9]

Inclusion and Exclusion Criteria

The age range for the study was 16–35 years.

Self-reported Oral Symptoms

Self-reported oral symptoms included toothache, bad breath, bleeding gums, malaligned teeth, fractured teeth, food lodgement, and hypersensitivity to cold or hot food.

SES

Self-assessed SES was selected as a measure of SES. Trainees were asked to answer the question such as amount of pocket money every month, family possessions (refrigerator, TV, radio/transistor, AC, washing machine, mobile, credit card, sanitary latrine, and any newspaper subscribed throughout the month), living in a type of house, possession of a vehicle, number of earning members in the family, facility of some essentials in the family (tap water and electricity), employment of a domestic servant at home, and type of locality that the family is residing. Study participants were asked to rate their family's SES through a five-point Likert scale. Self-assessed SES was categorized into (1) lower, (2) lower-middle, (3) middle, (4) upper-middle, or (5) upper.

RESULTS

Table 1 shows the association between self-reported oral health behavior and oral health problems. The study population consisted of 498 industrial trainees. Of the total study population, 220 (44.177%) subjects reported that they had experienced toothache in their lifetime. Majority of the subjects (206) who had toothache used toothbrush and paste to clean their teeth, while the remaining (14) used finger and paste/powder. This difference was statistically significant ($P = 0.004$). Majority of the subjects (149) who had bleeding from gums used toothbrush and paste to clean their teeth, while the remaining (14) used finger and paste/powder. This difference was statistically significant ($P = 0.000$). 180 (36.144%) subjects complained of food lodgement, majority of the subjects (141) did not use and chew tobacco, while the remaining 39 subjects used chewing tobacco. This difference was statistically significant ($P = 0.012$).

Two hundred and twenty (44.177%) subjects had experienced toothache, majority of the subjects (174) did not consume alcohol, while the remaining 46 subjects consumed alcohol. This difference was statistically significant ($P = 0.002$). 26 (5.220%) subjects complained of fractured teeth, of which 18 subjects did not consume alcohol, while the remaining 8 subjects did consume alcohol. This difference was statistically significant ($P = 0.025$). 133 (26.706%) subjects had experienced hypersensitivity, 104 who had hypersensitivity did not consume alcohol, while the remaining 24 subjects

Table 1: Association between self-reported oral health behavior and oral health problems

Variable	Tooth ache (n)	Bleeding gums (n)	Fractured teeth (n)	Food lodgment (n)	Hypersensitivity (n)
Tooth brush +paste/powder	206	149	24	170	129
Finger +paste/powder	14	14	2	10	4
Chi-square value	8.358	17.011	1.288	2.973	0.205
P value	0.004	0.000	0.256	0.085	0.651
Once in a day	151	110	17	129	88
More than one	69	53	9	51	45
Chi-square value	1.428	0.360	0.001	4.531	0.021
P value	0.232	0.548	0.976	0.033	0.885
<3 months	131	92	16	103	74
>3 months	81	62	8	71	55
Chi-square value	0.135	0.139	0.347	0.352	0.950
P value	0.713	0.709	0.556	0.553	0.330
Tobacco yes	42	27	7	39	28
Tobacco no	178	136	19	141	105
Chi-square value	2.452	0.029	2.345	6.326	3.211
P value	0.117	0.865	0.126	0.012	0.073
Alcohol yes	46	25	8	31	29
Alcohol no	174	138	18	149	104
Chi-square value	9.299	0.000	5.018	0.760	5.823
P value	0.002	0.994	0.025	0.383	0.016
Sweets less than twice/day	191	116	20	148	104
Sweets more than twice/day	29	47	6	32	29
Chi-square value	7.245	16.869	0.366	0.122	1.245
P value	0.007	0.009	0.545	0.727	0.264

*Statistical significance - *P*<0.05

consumed alcohol. This difference was statistically significant ($P = 0.016$).

Two hundred and twenty (44.177%) subjects had experienced toothache, majority of the subjects (191) ate sweets less than twice per day, while the remaining 29 subjects ate sweets more than twice per day. This difference was statistically significant ($P = 0.007$). 163 (32.730%) subjects complained of bleeding gums, of which 116 subjects consumed sweets less than twice per day, while the remaining 47 subjects consumed sweets more than twice per day. This difference was statistically significant ($P = 0.009$).

Table 2 shows an association between self-reported SES and oral health problems. Majority of the study subjects reported toothache (220). On assessment of the association between self-reported SES and toothache, it was observed that 83 (16.666%) belonged to lower-middle class, and 76 (15.261%) belonged to lower class followed by 38 (7.630%) and 23 (4.618%) in upper middle and upper class, respectively. This difference was statistically significant ($P = 0.011$). 163 subjects complained of bleeding from gums. On assessment of the association between self-reported SES and bleeding gums, it was observed that 41 (8.232%) belonged to lower-middle class, and 33(6.626%) belonged to lower class followed by 18 and 12 in upper middle and upper class, respectively. This difference was statistically significant ($P = 0.0161$). 52 subjects complained of malaligned teeth from gums. On assessment of the association between self-reported SES and malaligned teeth, it was observed that 25 (5.0205) belonged to lower-middle class, and 11 (2.208%) belonged to lower class followed by 8 in upper middle and upper class each. This difference was statistically significant ($P = 0.000$). 180 subjects complained of food lodgement in their tooth. On assessment of the association between self-reported SES and food lodgement, it was observed that 83 (16.973%) belonged to lower-middle class, 63 (12.650%) belonged to lower class followed by 20 (4.016%) and 8 (1.606%) in upper middle and upper class, respectively. This difference was statistically significant ($P = 0.000$). 133 subjects complained hypersensitivity with their tooth. On assessment of the association between self-reported SES and hypersensitivity, it was observed that 50 (10.040%) belonged to lower-middle class, and 46 (9.236%) belonged to lower class followed by 20 (4.016%) and 17 (3.413%) in upper middle and upper class, respectively. This difference was statistically significant ($P = 0.045$).

DISCUSSION

Self-reported oral health is a valid and useful summary indicator of overall oral health status used in

Table 2: Association between self-reported SES and oral health problems

Variable	Lower (n)	Lower-middle (n)	Upper-middle (n)	Upper (n)	Statistical inference
Toothache	76	83	38	23	X=11.179 *P*=0.011
Bad breath	39	41	18	12	X=5.153 *P*=0.161
Bleeding gums	67	57	26	13	X=20.981 *P*=0.0161
Malaligned teeth	11	25	8	8	X=3.590 *P*=0.000
Fractured teeth	11	7	5	3	X=4.171 *P*=0.244
Food lodgement	63	89	20	8	X=19.916 *P*=0.000
Hypersensitivity	46	50	20	17	X=8.035 *P*=0.045

*Statistical significance – *P*<0.05, SES: Socioeconomic status

epidemiologic studies. Oral diseases over the years have been fluctuating with changing lifestyle. Many of oral disease and conditions are associated with unhealthy lifestyles.[10] Health-related behavior change would reduce unhealthy behaviors such as sugar in diet and smoking and as well as irregular dental attendance.[11] In this study, we found that majority of subjects brushed their teeth once daily. In contrast, the study conducted by Mizutani *et al*.[12] and Ericsson *et al*.[13] found that majority of their subjects (71%) brushed their teeth twice daily. We found an association between brushing frequency and self-reported oral symptoms. In the current study, we found a statistically significant difference between subjects who used finger/powder and toothache as compared to subjects who used toothbrush and paste. Similar studies conducted by Aggrawal and Panat and Sarah *et al*.[14,15] reported that majority of the subjects (90%) used fluoridated toothpaste.

The present study observed a significant difference between various self-reported socioeconomic groups and oral hygiene behavior among study population. In contrast to the results, Ericsson *et al*. found no significant difference between socioeconomic group and oral hygiene behavior.[13]

In the present study, around 22% of the subjects reported the problem of bad breath. In contrast to our result, Samnieng *et al*.[16] found a high prevalence of oral malodor among elderly Thai population. Similar results were found by Miyazaki *et al*. among Japanese[17] and Chinese general population.[18]

In the current study, there was no significant relationship between gender and toothache, and a similar result was found in review articles published during 1996–2001, but some previous investigation in many countries reported a higher number of female having experienced toothache during a certain period of time.[19,20]

In our study, we found a strong association between bleeding gums and self-reported lower SES, and a similar results were found by a study conducted by Chandra-Shekar and Reddy[21] who conducted the study among working population. In the current study, we found a statistically significant difference between self-reported SES and toothache, and a similar result was found in a study conducted by Chandra-Shekar and Reddy.[21] The difference among the subjects in lower classes in comparison with upper ones may be attributed to their poor oral hygiene practices, lack of awareness on the etiological factors for oral disease, and poor utilization of dental services. The study found no statistically significant difference between sweet consumption habits and different SES categories. Similar results were found in a study conducted by Chandra-Shekar and Reddy.[21]

The studies by Oliver *et al*.[22] and Borrell *et al*.[23] have all found the prevalence of periodontitis to be more among the subjects in lower SES classes than those in upper ones.[24] The findings in this study correspond with all these studies. In this study, we found a significant difference between bleeding gums and different SES classes. This could be attributed to the exposure of adolescents to various deleterious habits and negligent oral health behavior.

In this study, we found that subjects who reported tooth ache and fractured tooth did not consume alcohol, and this finding is contradictory with the finding of Jung *et al*. (2011)[9] who reported that subjects who used to smoke or consumed alcohol had a higher prevalence of a toothache, bad breath, and fractured tooth.

Overall, there are several reasons for investigating lay peoples' perceptions of their dental health. First, self-reporting is a part of the routine diagnostic procedure of clinicians. Second, realistic assessment of treatment needs requires information not only about normative (professional) but also about perceived (lay

defined) needs. Third, assessing self-rated oral health status is relatively simple and it may be an easier and complementary method to collect dental information on adolescents and adults. Fourth, it can be a useful tool for planning and monitoring health services and health promotion interventions.[24]

Limitations

One of the limitations of this study is that it used self-rated questionnaire, thus assuming the reading and understanding capability of participants. This problem may not have influenced this study much because all participants had at least 8 years of formal education. In addition, all doubts raised about questions were classified when students were completing their questionnaires. Self-reports are affected by cognitive, behavior, and situational factors to different extents. Therefore, the information bias in the present study may not be ruled out.

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