Medico Research Chronicles

ISSN No. 2394-3971

Original Research article

INFLUENCE OF LITERACY AND SOCIOECONOMIC STATUS ON AWARENESS OF PERIODONTAL DISEASE

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Submitted on: February 2015
Accepted on: February 2015
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Abstract

Aim: The purpose of the study was to assess the impact of educational qualification and socioeconomic status (SES) on self-reported periodontal disease and periodontal visits in a south Indian population.

Materials and methods: A multicentre questionnaire based study was performed among 600 people who visited dental hospitals. Questions regarding self-reported complaints, history of visits to health practitioner and habits were evaluated with respect to educational qualification and SES. Statistical analysis was done using SPSS v 12.0 software.

Results: SES influenced reasons for dental visits. 9.8% of graduates and 19.2% of > Rs. 20,000 income visited dentists for specific gum problems. Visits to dental clinic were dependant on SES and related to visits to general health practitioner. More number of smokers and tobacco chewers reported with gum bleeding and oral malodor. Self-reporting of periodontal variables was very low irrespective of their education or SES.

Conclusion: SES greatly influences the utilization of dental care facilities and hence the oral health status of a subject. The influence of education on oral health-related behavior was limited to awareness of the disease, which did not translate to greater reporting for dental care.

Key words: Education, Socioeconomic status, self-reported periodontal disease.

Introduction

Periodontal disease has been shown to be a leading cause of tooth loss all over the world [1]. Risk factors for periodontal disease include genetic factors, co-morbidity factors like diabetes mellitus (DM) and lifestyle factors like smoking which play a vital role in the initiation and progression of the disease [2]. Financial strain and distress are also shown to be a significant risk factor for diseases like oral cancer, dental caries and periodontal disease [3]. Though periodontal disease is multifactorial, microbial in origin, its low-grade, non-resolving, chronic inflammatory course is affected by several non-disease factors such as patient's attitude, behavior and socio demographic characteristics [4]. Among these various

patient related factors, education and socioeconomic status (SES) have been shown to influence patient's behavioral patterns, as far as both awareness of the disease and seeking preventive care are concerned [5, 6, 7].

The general population has been shown to predominantly ignore their oral health, lacking knowledge in identifying symptoms of periodontal disease and thereby not taking necessary measures to access dental care. Consequently they tend to underestimate their dental treatment needs, especially in the field of periodontology [8]. Global epidemiological studies have indicated that education and socio-economic discrepancies could contribute to this [9, 10]. In some countries like India, with major social inequalities, these factors could have a major impact on the prevalence of periodontal disease.

In India, the prevalence of periodontal disease has been reported to be high with studies showing every second person above the age of 35 years with periodontal pockets and 85% of total teeth extracted after 30 years attributed to periodontal diseases [11, 12]. With preventive dental care almost non-existent in most of the rural masses [13] and the literary rate being low across the population, [14] the present state of dental-health knowledge and awareness of periodontal disease is an issue of interest to the dental practitioner. Self-reported periodontal disease has been suggested as a fair surrogate indicator of this awareness level [15].

The aim of the study was to assess the influence of education and SES on the visit to dentist and periodontist, habits like smoking and tobacco chewing, prevalence of self-reported periodontal disease and knowledge of its reasons, in an Indian population using a questionnaire designed to specifically target these issues.

Materials and Methods:

Study design and sample collection. The study was a multicentric cross-sectional study comprising of a sample size of 600 patients randomly selected from the patients attending three different out- patient clinics during the period Aug 2012- Oct 2014. The participants were over 20 years of age. Prior informed consent was obtained from the subjects and the study was approved by the institution's ethical committee.

Data collection. Demographic data was collected from all the subjects, who were then interviewed by qualified examiners and asked to answer a structured questionnaire. Each patient was interviewed on an average for ten minutes. Questions regarding visited to health care specialist, self-reported periodontal conditions like bleeding gums, oral malodor and tooth mobility, tobacco consumption either in the form of smoking or chewing were evaluated based on educational qualification and socioeconomic attributes. Of the 600 patients who participated in the study finally 545 questionnaires were included in the study and the rest were omitted for void in filling the data.

Serial No of the patient:		Age :
Sex	:	Education :
Occupation	:	Monthly income :

1. What is your reason for the present dental visit? a) General check up b) Cleaning of teeth c) Pain d) Gum problem e) Bad breath	**5. Do you have bleeding gums?** a) Yes b) No **5a. What do you think is the reason behind?** a) Gums are weak b) Part of aging c) Traditional belief d) Do not know
2. How often do you visit a dental clinic? a) Once a year b) Once in 6 months c) Only when in need d) First visit	**6. Do you have malodor?** a) Yes b) No **6a. What do you think is the reason behind?** a) Improper tooth brushing b) Gums are weak c) Traditional belief d) Do not know
3. How often do you visit your general doctor/ physician? a) Once in a year b) No specific schedule c) Only when there is a need	**7. Do you have loose tooth?** a) Yes b) No
4. Have you been to a Periodontist / Gum specialist before? a) Yes b) No	**8. Do you smoke?** a) Yes b) No
7a. What do you think is the reason behind loose tooth? a) Part of aging b) Weak tooth c) Gum disease d) Do not know	**9. Do you have the habit of tobacco/betel chewing?** a) Yes b) No

Statistical analysis

Data was collected and analyzed by SPSS Windows v.12.0 (SPSS Inc., Chicago, IL). Descriptive statistics were used to summarize the data and inspect the variable's distribution. Statistical analysis of association between the oral health variables, demographic indicators and other questions were done by means of t-test and Pearson's Chi-square test. Frequency distribution, number and percentage were calculated. Statistical tests were interpreted.

Results

The study was conducted to assess the influence of education and income on the reason and frequency of dental visits, self-reported periodontal disease and habits among a population who visited dental hospitals.

Education

The study subjects were grouped as School dropouts **(SD),** those who completed schooling (HSC) and Graduates (Grad). The distribution of these samples in our population was: SD- 53.9%; HSC- 10.5 % and Grad- 35.6%. (Fig. 1a)

Socio economic status

Based on their income, the study population was grouped as following: less than Rs. 5,000 (22.9%), Rs. 5000-10000 (14.1%); Rs. 10,000-20,000 (8.8%); more than Rs. 20,000 (8.4%). (Fig 1b). 30.6% of the subjects who had responded as no income group (comprising 43.7% students and 55% house wives) and 15% of the subjects who did not answer the question were grouped together as non-responders in total (45.6%). (Data not represented in the article)

There was a significantly greater prevalence of people who did not complete schooling (53.9%) when compared to the other groups ($p < .05$). There were no subjects in our population who had never attended school. Similarly, there was a significantly lesser number of people in the higher income group (8.4%) when compared to the other groups ($p < .001$)

Frequency of dental visit

Education did not seem to influence the frequency of dental visit; while income played a major influence with 63% of < Rs. 5000 income group visiting dentist only in need and 36.4% having visited the first time when compared to subjects in better income strata. (Fig. 2a and 2b)

Visit to general physician and periodontist

There was no significant difference among the educated groups with respect to their visit to general physician, dentist and periodontist. ($p > 0.5$)

The frequency of distribution among the different income groups for their need based visit to general physician (<5000- 80%; 5000-1000- 77.9%; 10000-20000- 70.8% >20000- 61.7%), dentist (<5000- 63%; 5000-1000- 54.5%; 10000-20000- 50% >20000- 51%) and periodontist (<5000- 4.2%; 5000-1000-6.5%; 10000-20000-8.3% >20000- 10.9%) were statistically significant. ($p < 0.05$) (Fig. 3)

Habits

There was a significant decrease in the percentage of smokers and tobacco chewers among the graduates (14.9%; 9.3%), when compared to subjects who completed schooling (17.5%; 15.8%) and school dropouts (34.7%; 32.1%) respectively.

Smoking habit was less significantly associated with income, though there is a decrease in the percentage of people who smoke with increase in income (<5000- 27.6%; > 20000- 15.6%). But tobacco chewing habit was more prevalently reported by the lower income group (<5000- 22.4%; >20000- 10.9%). (Fig 4)

Reason for dental visit

Out of the total number of people included in the study, about 10.5% reported for general check up, 30.8% had come for cleaning of teeth; 26.4% for pain and 8.3% for gum problems.

The influence of educational status on reason for dental visit is depicted in Figure 5a. A significantly greater number of graduates came with specific complaint of gum problem (9.8%) while school drop outs reported more often for cleaning of their teeth (38%) and pain (19%). ($p < .05$)

There was a statistically significant association between the different income groups and the reason for dental visit (Fig 5b), with subjects in lower income group (< 5000) visiting dental clinic for cleaning of teeth (41.6%) and pain (27.2%), while subjects in higher income group visiting for more periodontal specific problems (10000-20000- 12.5% and > 20000- 19.2%).

50% of smokers and 47.1% of tobacco chewers reported to the dental hospital for cleaning of teeth; while a statistically significant proportion (7.5%) of tobacco chewers had complained of gum problem as

their reason for dental visit. (p <0.0001) (Fig 5c)

Self-reported periodontal disease

There was a significant reporting of bleeding gums among the school dropouts (30.6%), while subjects who completed schooling reported more of malodor (40.4%) and tooth mobility (29.8%). The frequency of distribution of self-reported periodontal disease was less among the graduated subjects when compared to the other two groups (Fig 6a). The lowest income group had more self-reported periodontal disease (32.8% reported bleeding gums, 29.6% reported malodor and 19.2% reported tooth mobility). (Fig 6b)

Among the people who reported with gum problem, 68.1% reported with bleeding gums and among those who complained of pain 26.9% also reported of tooth mobility. These data were statistically significant p< 0.001 (Fig 7a)

Malodor was the significant self-reported factor among smokers (19.4%) and tobacco chewers (14.3%), while 15.5% of smokers also reported of tooth mobility. (p <0.0001) (Fig 7b)

Awareness of self-reported periodontal disease

There was no difference among the educated population and different income strata with respect to awareness of the reasons for bleeding gums, malodor and tooth mobility. Most of them responded the following reasons for periodontal disease: weak gums for bleeding gums (20.6%); improper brushing for malodor (8.1%); weak tooth and aging for tooth mobility (6.8% and 4.6% respectively). (Data not represented in the study)

Discussion

Periodontal disease constitutes a major risk factor for tooth mortality [1]. In addition, recent evidence suggests that it may also contribute to the systemic inflammatory burden [16]. It has been estimated that tertiary care of periodontal disease imposes a significant financial burden to the individual and the population as a whole, especially in developing countries like India.

Primary preventive measures, therefore, greatly impact the burden posed by periodontal disease, which in turn, have been shown to be dependent on behavioral aspects relating to health care [17]. Regular dental visits are aimed not only at elimination of etiological factors but also modification of behavioral patterns that are involved in plaque control measures [18, 19]. The periodicity of dental visit in our country is a measure of self-reported periodontal disease. This study was aimed at identification of the underlying factors that lead to self-reporting or the lack of it in relation to periodontal disease.

In our study population, income and not education was the major determinant of regular health care visits. A significant percentage of (63%) the lower income group visits dentists only in need, attributing financial strain as their reason for not being able to procure preventive dental care. A similar attitude existed even for their visits to general physician. Having a regular check up is directly associated with a regular medical checkup, which in turn is significantly influenced by the income generated by the family [20, 21]. Even in the higher income group of our study population, visits to periodontist tended to be very low (10.9%) showing their lack of interest in their periodontal health leading to increased loss of tooth due to extraction for periodontal reasons [22, 23]. These findings suggest that financial considerations significantly impact health care in India. It must however be borne in mind that the study population comprised primarily of lower SES population (22.9%), who attended out-patient dental clinic of teaching institutions. This paper as a whole may arguably belong to the weaker socioeconomic status subjects when

compared to the general population as a whole.

Deleterious habits like smoking and tobacco chewing were more prevalent among the lesser educated group, indicating their lack of knowledge of its impact on oral health [24, 25]. The smokers were not influenced by income strata, while a greater percentage of the tobacco chewers belonged to the low income strata (22.4%).

A majority of the low income and less educated subjects in our study population visited dental clinic for cleaning of their teeth (41.6% & 38% respectively) and pain (27.2% & 19% respectively), while subjects belonging to higher income and educational qualification reported for specific periodontal complaints like gum problem (19.2% & 9.8% respectively). These findings are in accordance with studies which reported on significant association of education and socioeconomic strata on preventive dental behavior [26, 27]. Among the population that reported for cleaning of teeth, a significant number were smokers or tobacco chewers and gum problem was a noticeable complaint among subjects who chewed tobacco (7.5%) indicating a probable causal relationship [28, 29].

Environmental risk factors like smoking and tobacco habits were influenced more by education than income. A significantly greater percentage of population with less education indulged in smoking when compared to tobacco chewing. When coupled with inadequate health care, the prevalence of periodontal disease is likely to be severely affected by this environmental risk factor.

Among the various variables of periodontal disease, self-reporting was primarily related to bleeding gums. Oral malodor was the next most common variable, predominantly found among people with tobacco consumption habit, in agreement with earlier studies [30]. Smokers also reported greater prevalence of tooth mobility in lieu with the other studies [31]. Tooth mobility was not the most frequently reported chief complaint, probably indicating the extent of the disease at the time of examination, as mobility is majorly present as a clinical symptom only following extensive periodontal breakdown.

Even though the percentage of graduates reporting self-reported variables was comparatively lesser than the other groups, self-reporting related more closely to the income levels than the educational status of the population. This suggests that economically driven factors were the greatest inhibitors to seeking dental care.

The awareness of the reasons of periodontal disease symptoms was very minimal among the study population on the whole, irrespective of their education and SES. Though traditional belief was the least related cause, even the educated subjects in our study population had very less understanding of the concepts of periodontal disease [32]. This could be attributed to the fact that health-related, especially oral health-related education is not imparted to any significant extent as a part of schooling program. In a similar study conducted in a Chinese population, people exhibited similar attitudes towards periodontal health [33]. To summarize; our study suggests that there exists an inequality in general and dental health in our population as in other countries [33, 34, 35].

To conclude, self awareness of oral health status and regular professional care is essential for better periodontal health. Reorientation of oral health care in India is the need of the hour to lessen the financial strain on our population. Preventive measures must make greater emphasis on health care behavior in school programs. This can be achieved by having a better understanding of the relationship between SES and oral health to reveal areas which are important for health intervention, prevention and promotion of oral health

through efficient mass communication strategies.

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Figure 1a

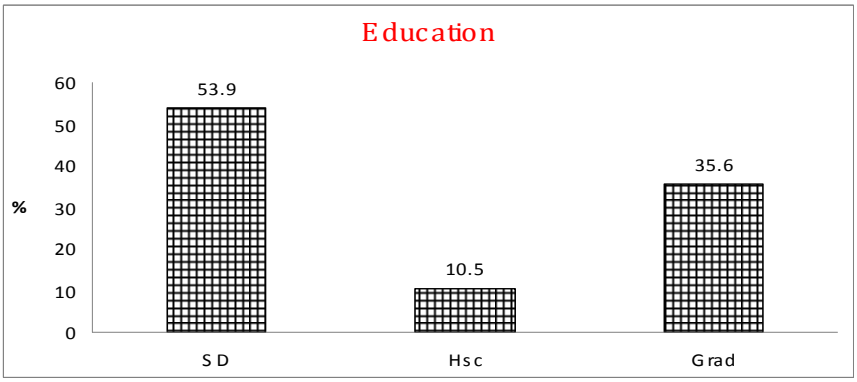
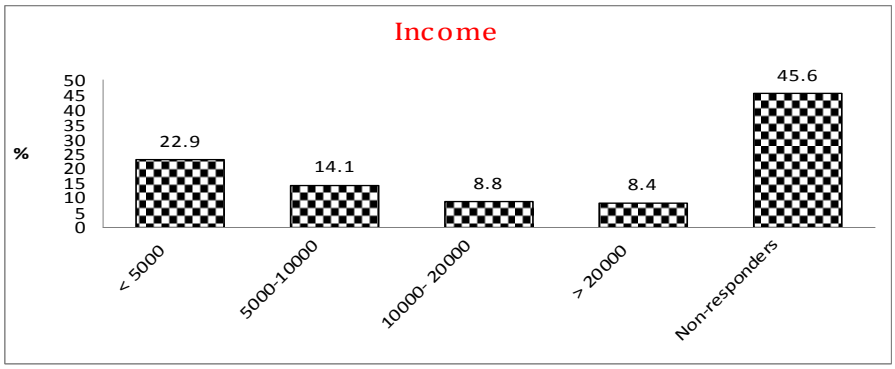


Figure 1b



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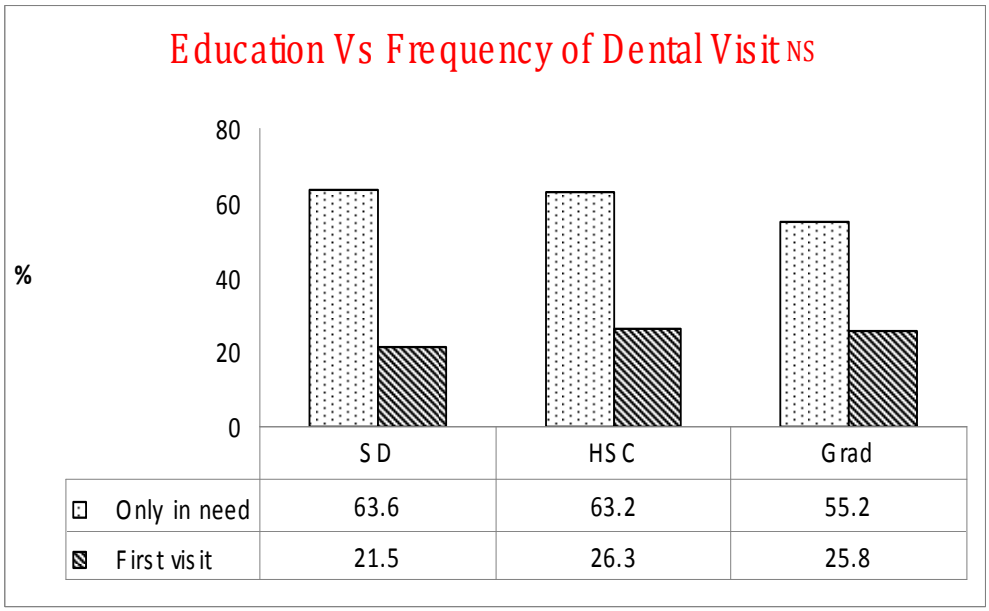

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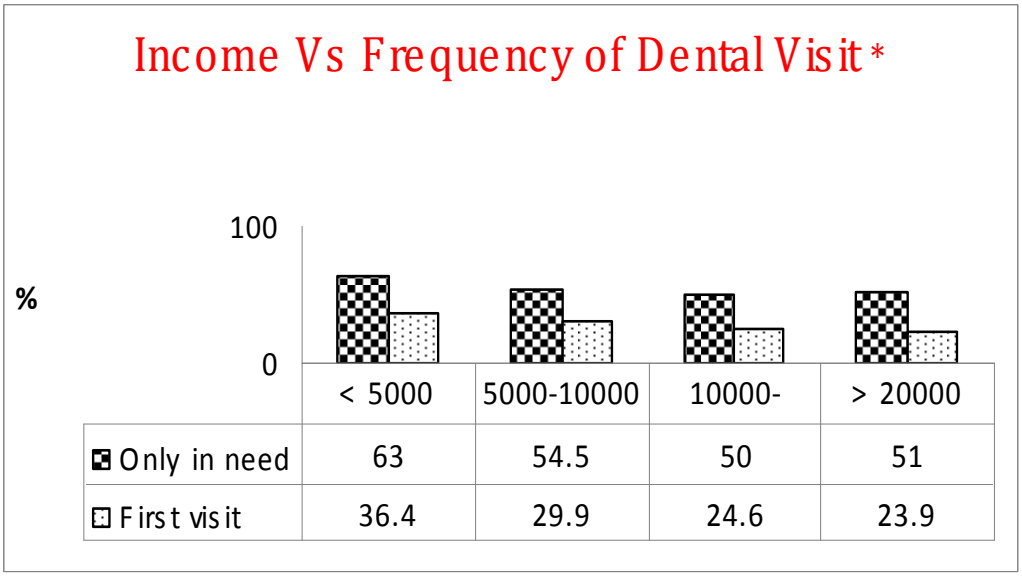

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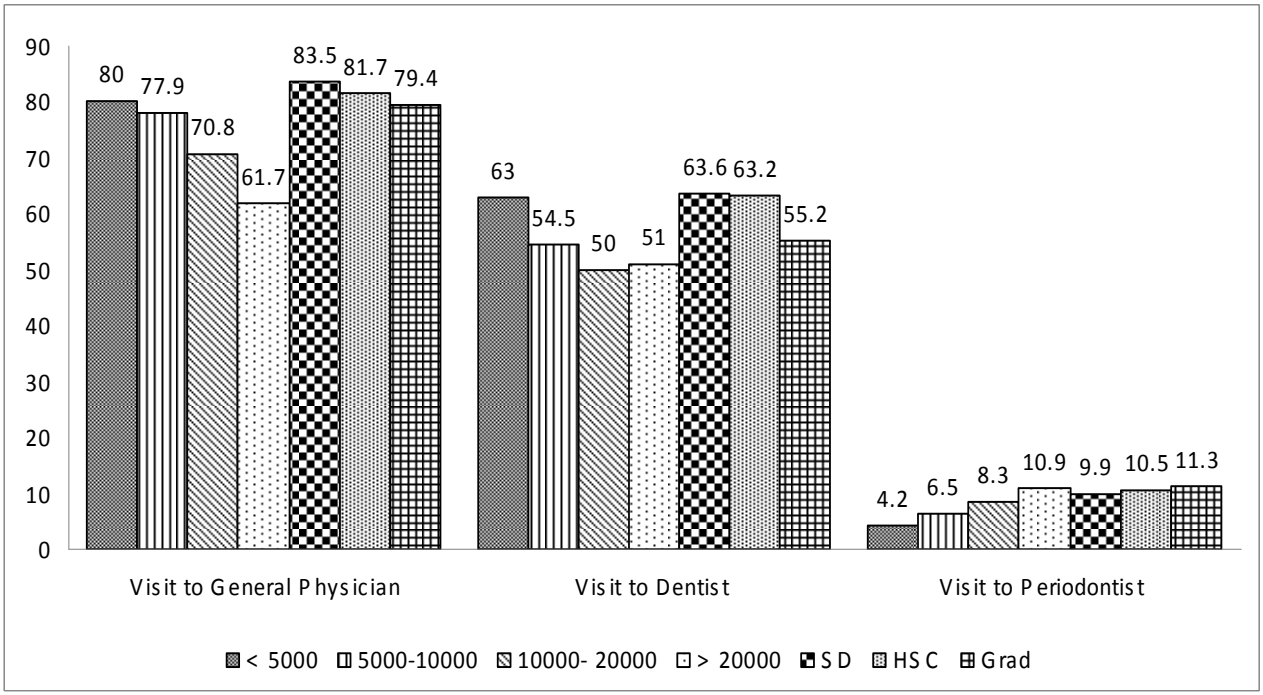


Figure 4

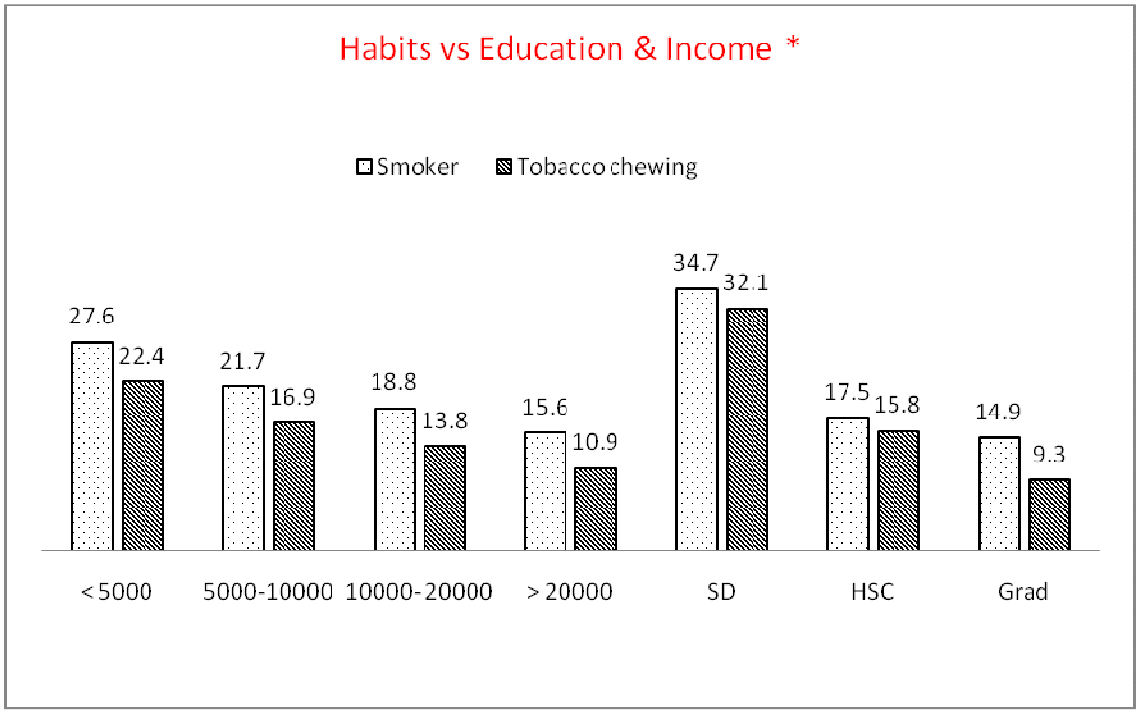
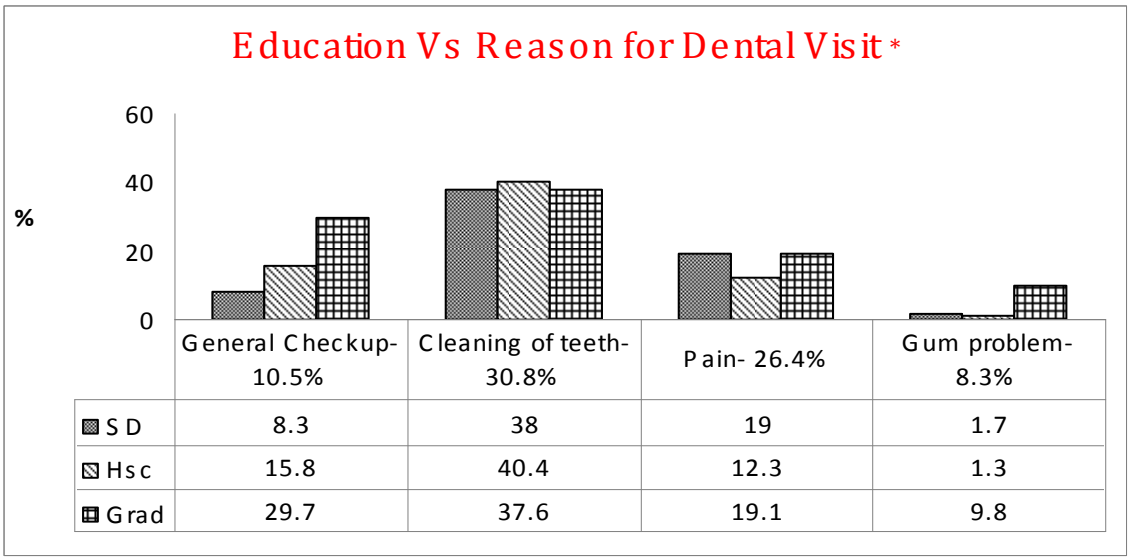


Figure 5a



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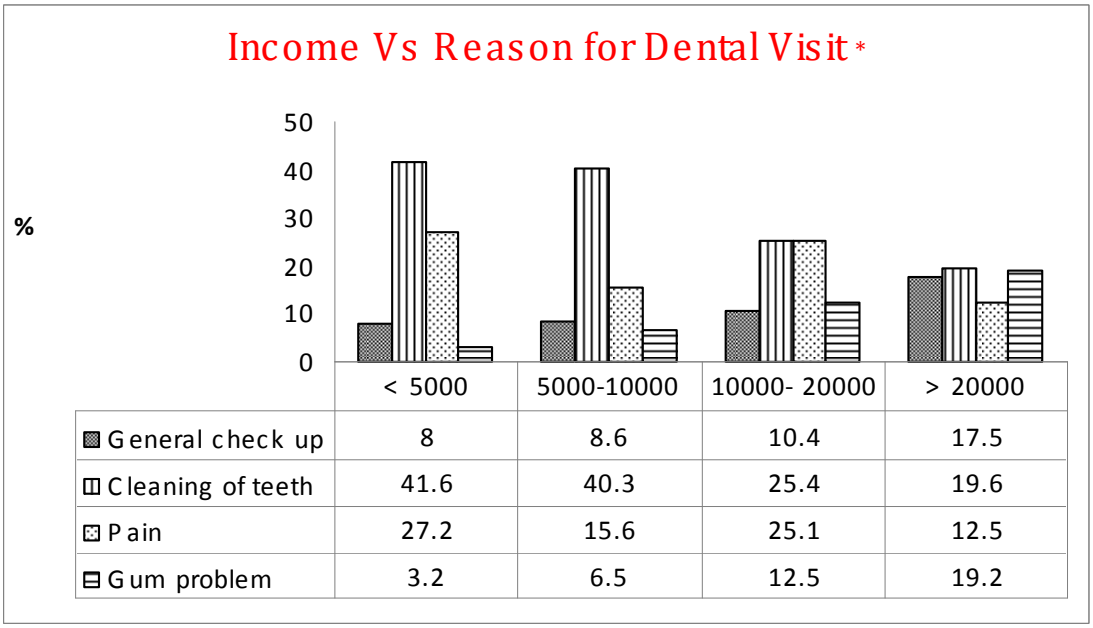
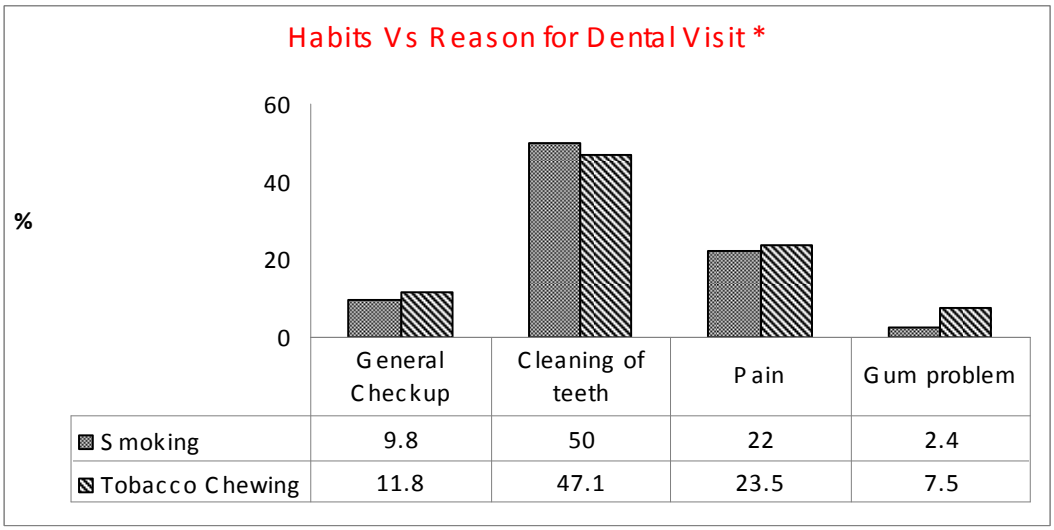


Figure 5c



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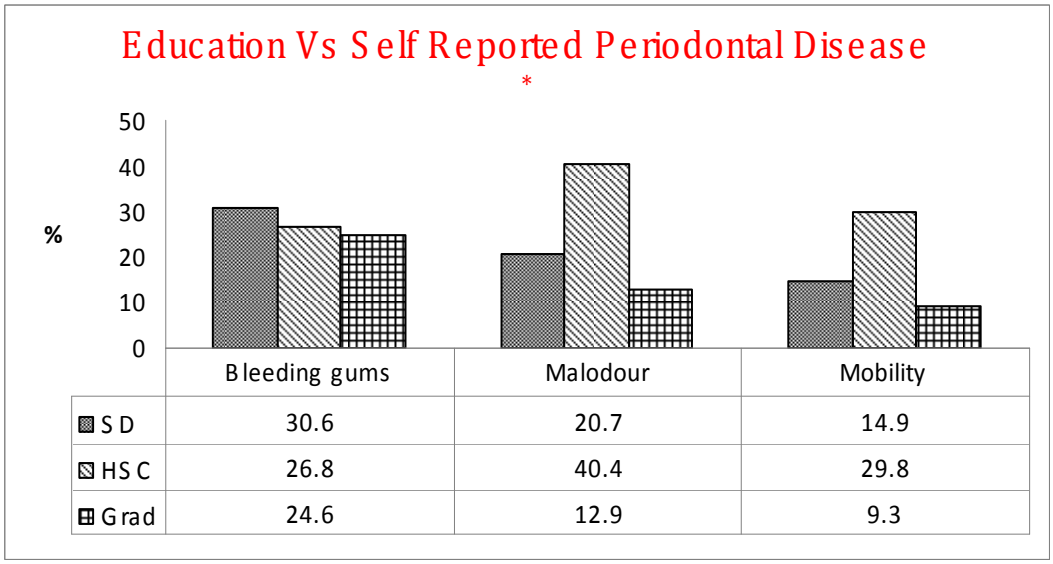
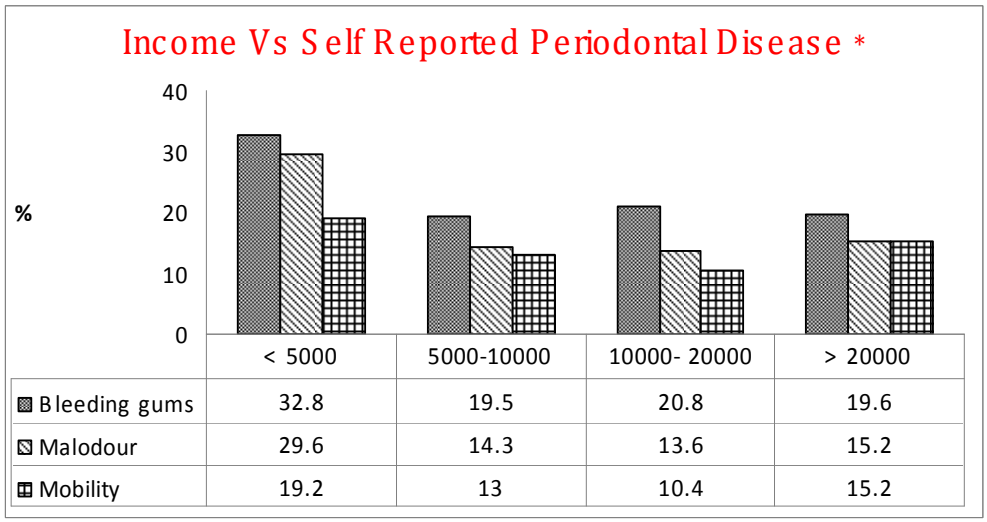
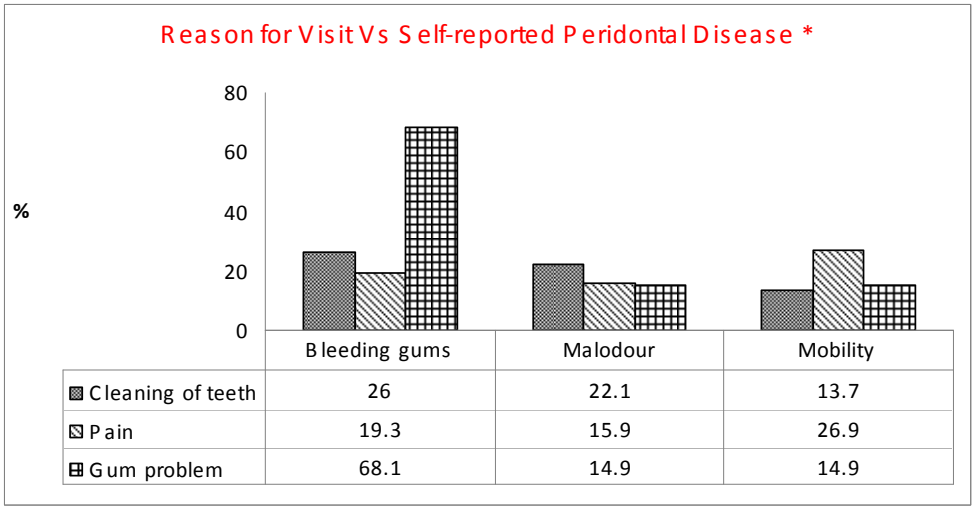


Figure 6b



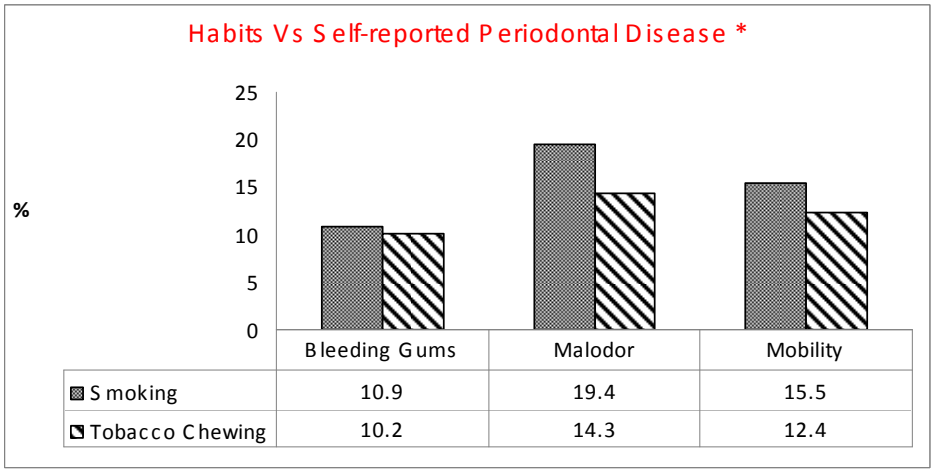
	< 5000	5000-10000	10000- 20000	> 20000
Bleeding gums	32.8	19.5	20.8	19.6
Malodour	29.6	14.3	13.6	15.2
Mobility	19.2	13	10.4	15.2

Figure 7a



	Bleeding gums	Malodour	Mobility
Cleaning of teeth	26	22.1	13.7
Pain	19.3	15.9	26.9
Gum problem	68.1	14.9	14.9

Figure 7b



Legend

Figure 1a: Frequency Distribution of Education among the Population
Figure 1b: Frequency Distribution of Income among the Population
Figure 2a: Education Vs Frequency of Dental Visit
Figure 2b: Income Vs Frequency of Dental Visit.
Figure 3: Education and Income Vs Visit to the General physician, Dentist, Periodontist
Figure 4: Education and Income Vs Habits
Figure 5a: Education Vs Reason for Dental Visit
Figure 5b: Income Vs Reason for Dental Visit
Figure 5c: Habits Vs Reason for Dental Visit
Figure 6a: Education Vs Self-reported Periodontal disease
Figure 6b: Income Vs Self-reported Periodontal disease
Figure 7a: Reason for Dental Visit Vs Self-reported Periodontal Disease
Figure 7b: Habits Vs Self-reported Periodontal Disease

[1] - p value significant < 0.05
NS- p value Non-significant