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The Prevalence of Dental Caries in 18 to 30 years Individual Associated with Socio-economic status in an Outpatient Population Visiting a Hospital in Chennai

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The prevalence and incidence of dental caries in a population is influenced by a number of risk factor such as sex, age, socioeconomic status, dietary patterns and oral hygiene habits. Thus the present study was designed to assess the prevalence of dental caries in 18 to 30 year old individuals associated with their socio-economic status in an outpatient population visiting a tertiary care dental hospital in Chennai. To determine the prevalence of dental caries in the specific age group of 18 to 30 years associated with varying socio-economic status. This study is to show how the socio-economic status of the individual will affect their dental caries occurrence. The study group comprised of 100 patients that visited a tertiary care dental hospital in Chennai as outpatients. The data obtained are their dental caries indices (DMFT), sex and economic status. The results later will be analyzed based on their income categories and dental caries indices. In medium socioeconomic status patients, most of the patients had DMFT score of 0. There were no DMFT score more than 1 from this range of socioeconomic status patients. From the data collected, the average DMFT score for low income patients is 3.4 and average for the medium income patients is 0.0. More campaigns and programs need to be done in order to raise awareness in low income family regarding the oral hygiene and thus decrease the DMFT score in community. Health workers and dental profession have the most important role in community to change the quality of dental health in developing countries such as India.

Keywords: Prevalence; Dental caries; Socio-economic; Outpatient, Chennai.

Oral health is a vital part of general well-being. Despite huge efforts to increase awareness of oral health on a world scale, dental caries and disease of periodontium continue to plague many populations around the world. Dental caries is a multifactorial disease. Dental caries is a crippling affliction of the oral cavity. The pathogenesis is complex involving many contributing elements. Apart from diet, oral flora, and morphology of the tooth, an array of risk factors which are both local and general—have been implicated[1].

Oral diseases such as dental caries, periodontal disease or tooth loss may affect general health and will decrease life quality. The health care expenses will increase due to the morbidity of dental caries and become the financial burden to families and societies, which are of concern. Although the overall dental caries prevalence and the number of decayed, missing and filled teeth (DMFT) have decreased in adolescents and adults in past few decades, the burden associated with caries remains high in disadvantaged for poor and

older populations.[2] Schwendicke reviewed that people with lower educational level or occupational background, or lower income were more likely to have higher risk of dental caries incidence.[3]

There is a complex relationship between socioeconomic status (SES) of societies with oral health. Hobdell showed that there is a noticeable relationship between oral diseases and SES, and the constant caries lesions development is thought to be a good measurement for socioeconomic development.[4] Previous studies have shown that societies that show a low SES have poorer oral health status than to those with a higher SES and that oral health worsens continuing from higher SES to lower SES.[5] SES includes educational level, monthly house income and residential area and is considered to be one of the strongest determinants of dental caries. Household income and educational level are significantly associated with periodontitis and edentate status among elderly people. Therefore, the literatures suggest that socioeconomic factors are important oral health determinants and that socioeconomic inequality is an important challenge for public oral health.

Though UK and USA have been using scales based only on occupation, India had been using different scales giving a continuum of scoring. Prasad's classification are based on per capita monthly income and later modification in 1968 and 1970 has been vastly used. Kuppuswami scale (1981) is vastly used to indicate the individual socioeconomic status in urban community based on three main variables such as education, occupation and income. Adjusting income for inflation using All India Consumer Price Index (AICPI) has also become impractical today and has lower validity due to great variations in the Consumer Price Index. The inflation rate was governed by the All India Whole Price Index series7, creating an urgent need to link classification with the All India Whole Price Index.

Gender, socioeconomic status (SES), oral hygiene, and social life attitude like alcohol consumption and use of tobacco products may lead to the progress of disease.[6] Though the extent to which each of these factors can influence the disease process has been analyzed earlier individually, the impact of SES in our population is still not much known in research paper.[7] Socioeconomic status is commonly indicated of human capital, such as social class, wealth, education and individual income, and educational and occupational prestige. Income, education, and occupation, the three important determinants of health, are not likely to have a direct effect but serve as proxies for other determinants.[8]

Hence, what appears to be a direct impact of socioeconomic inequality may instead be operating through differential exposure to conditions that have more immediate effects on health issues. This including health care management, personal environmental exposure, social behavior, and specific lifestyle.[9]

Dental caries is the most prevalent of oral diseases. It has a very high morbidity potential that brought this disease into the main focus of the oral health profession.[10] There are no geographic places in our world whose population does not exhibit some evidence of dental caries. It affects both the sexes, various races, all socioeconomic status and multiple age groups. It not only causes pain and discomfort, but also in addition, will cause economic expenditure to the person.[11] The prevention of dental caries has long been considered as an important task for the dental health profession. Scientific research studies continue to make progress in identifying the best practices for diagnosing, treating, and preventing dental caries in our world communities. Conventional approaches for treating carious lesions in a surgical manner are being replaced by newer strategies that emphasize disease prevention and conservation of tooth structure.

The purpose of this study is assess prevalence of dental caries in specific age group of 18 to 30 years associated with varying socio-economic status. This study is to show how the socio-economic status of the individual will affect their dental caries occurrence.

The DMFT index is one of the easiest and most common utilized indices in epidemiologic research of dental caries. It quantifies dental health status based on the quality of carious, missing and filled teeth.[12] However the index does not provide a precise description of previous dental care. Nor does it give information on the severity of the carious attack or the indicated treatment.[13] Therefore, a revision of the DMFT index was developed. This involved a division of the "D"

component into four separate categories. With the addition of these categories, the index remains simple, and yet give a description of one's past dental experience. It further demonstrates the extent of dental services needed by the population, which can be interpreted as far as treatment hours and expenses.[14]

MATERIALS AND METHODS

The study was conducted between October 2017 and December 2017. The study population consisted of patients aged 18 to 30 year who were attending the outpatient department of a tertiary care dental hospital in Chennai.. The study sample comprised of 100 patients, 47 were males and 56 were females. The subjects were randomly selected for the purpose of this study.

The nature of the survey and the objectives were explained to the patients. The writer assured the confidentiality regarding the information. Informed consent was obtained from the patients. Essential treatment was provided after the assessments were completed.

A pilot study was done and the sample size was calculated based on the results of the pilot study. A survey form was prepared to record information on the income sources or occupation, gender, and the caries exposure in terms of presence or absence of dental caries or a restoration in the format of DMFT score.

The writer strictly adhered to personal protective barrier protocol. All examinations were done under illumination using a sterile mouth mirror and explorer. The data were tabulated using Microsoft Excel and statistically analyzed.

In this study, DMFT index was used to record the dental caries prevalence. DMFT indices are simple and can be easily interpreted to analyze. Socioeconomic status score (SES) based on the income or the occupation of the patient only is used. No other parameter to assess socioeconomic status were used in this study. The socioeconomic status of the patients were categories as low, medium and high based on their income sources and occupation. [Table 1]

Table 1. Socioeconomic status (SES) based on income and occupation

Socioeconomic Categories	Income per annum	Income per month
Low	Less than 300,000 Rupees	25,000 Rupees
Medium	Between 300,000 Rupees to 10,00,000 Rupees	25,000 Rupees to 83, 000 Rupees
High	More than 10,00,000 Rupees	More than 83,000 Rupees

Table 2. The segregation of patients based on their income (socioeconomic status)

Parameter	Number of patients
Low	98
Medium	2
High	0

Table 3. The DMFT score for the low socioeconomic status patients

DMFT Score	Number of patients
0	6
1 to 2	29
3 to 5	45
6 to 7	8
8 to 10	8
More than 10	2

Table 4. The DMFT score for the medium socioeconomic status patients

DMFT Score	Number of patients
0	2
1 to 2	0
3 to 5	0
6 to 7	0
8 to 10	0
More than 10	0

Sample size of 100 is choose for this study with the expected reliability of the study is, r=0.80 and the test confidence of 80%. The

method used to calculate the sample size is non-parametric binomial reliability demonstration test. 100 sample size is ideal for this study as indicated in this method.

RESULTS

A total 100 participants in this study which consisted of 47 males and 53 females, are further categorized into their socioeconomic status as low, medium and high, and their DMFT score are segregated based on their socioeconomic status.

From the current study, 98% of participants had low income which is below 25,000 Rupees per month. Only 2% of participants had medium income which is between 25,000 Rupees to 83, 000 Rupees. There were no participants that had high income during the study.

The patients with the low socioeconomic status who had DMFT score of 3 to 5 were 45 patients out of 100. 29 patients from the low income are having the DMFT score of 1 to 2. Only 6 patients had DMFT scores of 0 in this socioeconomic range. There were 2 patients who had the worst DMFT score which is more than 10.

In medium socioeconomic status patients, most of the patients had DMFT score of 0. There were no DMFT score more than 1 from this range of socioeconomic status patients.

From the data collected, the average DMFT score for low income patients is 3.4 and average for the medium income patients is 0.0.

The study shows that the low socioeconomic status patients having higher DMFT indices values compared to the patients that having medium socioeconomic status.

Mean DMFT for low SES=3.4

Mean DMFT for medium SES=0.0

DISCUSSION

Dental caries otherwise called tooth rot, is a standout amongst the most common unending maladies of individuals around the world; people are powerless to this sickness all through their lifetime.[15] Dental caries frames through a perplexing cooperation after some time between corrosive delivering microscopic organisms and fermentable sugar, and many host factors including teeth and spit. The infection creates in both the crowns and underlying foundations of teeth, and it can emerge in early youth as a forceful tooth rot that influences the essential teeth of newborn children and little children. Hazard for caries incorporates physical, natural, ecological, behavioral, and way of life related factors, for example, high quantities of cariogenic microbes, lacking salivary stream, deficient fluoride introduction, poor oral cleanliness, unseemly strategies for bolstering newborn children, and destitution. The way to deal with essential avoidance ought to be founded on normal hazard factors. Auxiliary aversion and treatment should concentrate on administration of the caries procedure after some time for singular patients, with an insignificantly unsafe, tissue-saving methodology.[16]

The DMFT indices scores and its association with the patients socioeconomic status has been studied in various research papers throughout the continents from varying ages of participants. In this current study, 100 participants which were divided into 47 males and 53 females examined and observations were done to calculate the DMFT score and their socioeconomic status based on income.

From the current study, the DMFT scores of the low income patients are higher compared to the medium income patients with the average of 3.4 differences between these two socioeconomic ranges. All the data was obtained from outpatient population visiting a multispecialty dental hospital in South India.

There has been a decrease in the prevalence of dental caries in both developed and developing countries. However, the prevalence remains higher in populations of low socioeconomic status.[17] Therefore, socioeconomic indicators are associated with high risk factors for dental caries. Socially disadvantaged society also experience disadvantages with regard to health in general. The greater disease frequencies in small population groups are known as polarization. The relationship between the relative position each social group occupies and differences in the risk in various health conditions and in healthcare services access makes social stratification a determinant of these conditions.[18]

There are few factors that might affecting the result in this current study. The socioeconomic status of patients will determine the dental hygiene

habits, dietary habits, education aspect and emotional support.[19]

In the World Health Organization (WHO) 2013 report, the oral hygiene is reported to be affected by the income of the societies. The projects for further demonstration of the affordable fluoridated toothpaste, milk and other oral hygiene kits in Africa, Asia and Europe was done in order to assess the rational of these healthy diet among the low income in remote areas and middle-income countries. From the result of these assessment, the dietary habits shows positive improvement in the oral hygiene.[20]

In low socioeconomic status societies, the education aspect especially in dental hygiene knowledge are lacking. The societies may not understand the importance of taking care of the oral hygiene in their everyday lifestyle. The negligence of the oral hygiene due to the lack of the education are common in the developing countries such as India, Bangladesh, Pakistan and others.[21]

The lack of emotional support in low socioeconomic status societies affect the oral hygiene of the community. The people in the low income background might experience difficulties in their everyday activities and suffer from emotional disturbances due to their economic problems and do not care much for their oral health.[22]

From a previous study done in 3 neighborhood committees and 3 village committees in Sichuan Province, China which included 744 people which consist of 362 males and 382 females aged between 65 to 74 years, showed that poor oral health was observed in these participants. Only the people from high income family were having better oral hygiene (less number of dental caries incidences), which is only 1.2% from the total participants. Surprisingly, the other 98% were having high dental caries incidences.[23]

In a previous study conducted in Mexico for 2445 participants aged 6 to 15 years in industrial city areas. The participants later divided into three socioeconomic groups. The results showed that the DMFT scores increased as the socioeconomic levels increased. It is contraindicated with this current study. However, later the writer suggested the conclusion based on other finding in his study to be the higher socioeconomics groups showing the evidence of more dental care compared to the low socioeconomic group.[24]

In another study on 209 children in Ibadan within the range of 1-15 years consisting of 98 males and 111 females showed surprisingly that the highest dental caries prevalence was found within the high social class compared to the middle and low social class. The mean DMFT is 1.58 in the high social class participants.

CONCLUSION

In conclusion, there is association between the different socioeconomic status and the DMFT score which showed the percentage of dental caries incidence. There are also few factors in the socioeconomic status that contribute to the DMFT score. The socioeconomic status of patients will determine the dental hygiene habits, dietary habits, education aspect and emotional support. All these factors are side effects of different income ranges.

More campaigns and programs need to be done in order to raise awareness in low income family regarding the oral hygiene and thus decrease the DMFT score in community. Health workers and dental profession have the most important role in community to change the quality of dental health in developing countries such as India.

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