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DMFT Index Comparison in Indian and Iranian Students in Bangalore - A Cross Sectional Study

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Abstract

Dental caries is the most prevalent disease of the oral cavity posing a greater threat to health throughout the world. It occurs in all age groups and in both genders. There is a recent raise in the occurrence of dental caries the prevalence of which is different worldwide. Owing to various factors immigrants may be at a higher risk of diseases including dental caries. Iranian students form a crux of educational system in Bangalore whose general health and oral health needs to be monitored. **Methods:** A cross sectional study was conducted using 250 Indian students and 250 Iranian students. A well-structured questionnaire was distributed among 500 students. **Results:** The answers from the questionnaire were scored and entered into excel sheets and submitted for statistical analysis. The results obtained were presented as cumulative percentile and the DMFT index of Indian and Iranian students was analyzed using ANOVA test showed a p value of 0.05. **Interpretation and Conclusion:** DMFT index of Indian and Iranian students showed that more emphasis was given to restorative measures than preventive measures due to lack of knowledge.

Keywords: Dental Caries, DMFT Index, Indian Students, Iranian Students

1. Introduction

The oral cavity is one of the most important organs in the body. It influences the general health of the individual and hence the health of the society to a great extent[1]. Dental Caries (DC) is the most prevalent disease of the oral cavity which has become a serious oral health issue on a global scale. Though its occurrence is seen in all age groups it is comparatively more common in children[2]. Many reports of significant decline in dental caries have emerged in the past decades; indicating the effectiveness of fluoride application, improvements in diet, oral health education and dental care. However, recent reviews of the available epidemiological studies from different countries around the world reveal that the prevalence of dental caries is rising with a change in the shift from children to

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adults[3]. Various dental indices have been developed to compare the extent and severity of oral health disorders. Dental indices are not only indicators of health but also can be hallmarks of socioeconomic status. They can lead to development of various methods of control and accepted index is the DMFT; developed in 1938 by Henry T. Klein, Carrole E. Palmer and Knutson J. W.[1,3,4].

Reports have indicated that immigrants are considered to be risk population as they face a vast difference in terms of social, culture and environmental factors completely different from that back home[5]. Bangalore city has a wide base of students from Iran who have immigrated for educational purposes who come across various challenges which may affect their health including oral health. Thus, the purpose of this study was to compare the DMFT index values of Indians to Iranians aged 18–30 years studying in Bangalore city, India.

1.1 Aims

- To assess the oral health status of Indian and Iranian students in Bangalore city.

1.2 Objectives

- To evaluate the DMFT index among Indian students.
- To evaluate the DMFT index among Iranian students.
- To compare the DMFT index among Indian and Iranian students.

2. Materials and Methods

The study population comprised of 500 students of which 250 were Indian students and 250 were Iranian students, between 18 to 30 years of age, studying in various colleges in Bangalore city. Ethical clearance from the institutional ethical committee was obtained before undertaking the study. All the students were explained about the procedure and a written consent was taken. They were then asked to fill out a questionnaire which included data about type of diet, frequency and type of sugar consumption, monthly family income, personal oral health care and etc. The clinical examination was carried out in the OPD of Sri Rajiv Gandhi Dental College; Bangalore using standard No. 23 explorer and a mouth mirror DMFT index was assessed and calculated.

Criteria for Decayed tooth was any permanent tooth showing frank cavity with or without pulpal involvement, discolored lesion in the pits and fissures or smooth surfaces with detectable soft floor, undermined enamel or softened wall with definite catch of explorer tip, teeth with temporary filling or crown, filled teeth with recurrent caries or with primary caries in other surface of same tooth.

Criteria for Filled teeth was any permanent tooth with adequate permanent restoration without any defective or decayed areas, teeth with permanent crowns, endodontically treated teeth with permanent crown, teeth whose pits and fissures are sealed with fissure sealants without any signs of decay.

Criteria for Missing teeth were any permanent teeth extracted due to caries, unrestorable carious crowns, or root stumps which cannot be used for post and core. Loss of teeth due to avulsion, orthodontic purposes, periodontal diseases, irreparable crown or root fracture, missing, unerupted, congenitally missing, impacted teeth were not considered as missing.

Students willing to participate in this study in the age range of 18-30 years were included. Third molar teeth, non-erupted, congenitally missing, supernumerary and the teeth which were extracted or restored due to causes other than dental caries (orthodontics, trauma, aesthetic, abutments, etc.) were excluded from the study. The DMFT index were scored and entered into an excel sheet and were analyzed by ANOVA two-way analysis. The p value of ≤ 0.05 was considered to be statistically significant.

3. Results

The current study group comprised of a total of 500 students including both Indian and Iranian students in the age group of 18-30 years. Among the Indian students 88% (220) of them consumed mixed diet whereas 100% (250) of Iranian students consumed mixed diet. 61.6% of Indian students and 58.8% of Iranian students fell under moderate monthly family income of 10,000-20,000. The physical state of carbohydrate consumed was solid, sticky and liquid, non-sticky by both Indian 90% and Iranians 82.4%. The frequency of ingestion of carbohydrate was mostly noted to be thrice daily among Indian students 23.2% with only 10.8% consuming more than three times daily. Whereas more than half of Iranian students 54.8% of this study ingested carbohydrate more than three times a day.

Tooth paste and tooth brush were used all the participants of our study 100%. Majority of the Indian students brushed their teeth twice daily 70.8% and Iranian students brushed their teeth once daily 51.6%. 69.2% of Indian students changed their tooth brush once in 3 months whereas 56% of Iranian students changed their tooth brush once in 6 months. 70.8% of Indian students had never flossed their teeth 72.4% did not use a mouth wash. 48.8% of Iranian students had never flossed their teeth and 76.8% did not use mouth wash. 62.7% of Indian students and 65.2% of Iranian students self assessed their oral health to be average. 82.4% of Indian students had visited the dentist before with 60.8% of them visiting dentist within last 12 months. 90% of Iranian students had visited dentist earlier and their last visit was more than 12 months ago 55.6%.

Out of the 250 Indian students who participated in this study 69 had sound teeth, 90 of them showed decayed teeth, 17 had teeth missing due to caries, 05 of them showed decayed teeth filled and 69 of them showed teeth filling for other reasons but not caries. Out of the 250 Iranian students in this study 10 had sound teeth, 135 of them showed decayed teeth, 56 had teeth missing due to caries, 44 of them showed decayed teeth filled and 130 of them showed teeth filling for other reasons but not caries. The correlation of DMFT index of Indian and Iranian students statistically analyzed using ANOVA test and was noted to show a statistically significant correlation with a p value of 0.05 (Table 1).

4. Discussion

Dental caries is the most common disease of the oral cavity which is found globally. It is a chronic disease of the tooth where cariogenic bacteria in the oral cavity ferment the dietary carbohydrates forming acids causing destruction of dental hard tissues. Dental caries causes a high morbidity resulting in reduced quality of life. The prevalence of dental caries is related to the socioeconomic status of the population. It has been noted that the caries prevalence has been reduced in the past three decade in most developed countries[6].

WHO claims that poor oral health will have profound effect on general health related to chronic diseases[7]. Prevalence of dental caries can be reduced by periodic evaluation as well as monitoring of oral health. The most commonly used indicator to evaluate oral health status for over 50 years remains to be DMFT index[8]. This index represents a mean of decayed, missing and filled teeth in a group of population and is recommended by WHO to measure and compare dental caries prevalence among populations[9].

The city of Bangalore is multicultural with a good population of Iranians who have immigrated mostly for educational purposes. Shuval has described immigration to be a stressful process while adapting into a new environment. The social cultural shock may have effect on the self confidence, low utilization of health services and unfavorable health[10].

The current study was comparison of DMFT index among Indian and Iranian students in Bangalore city. The majority type of diet consumed by both Indian and Iranian students was noted to be mixed diet and physical form of carbohydrate consumption was both solid and sticky and liquid and non sticky. It is a well known fact that carbohydrate is the main causative agent of dental caries and our study group is exposed to cariogenic agent. Thus we advised our study participants to intake sugar as per recommendation by WHO in 2015 as to keep the total energy intake of free sugars to be <10% (includes added sugars as well as sugars naturally present in fruit juices as well as fruit juice concentrates)[11]. Nowadays it is noted that irrespective of economic status it is common to consume diet rich in fat, cholesterol, sugar and refined carbohydrates along with sedentary life style. All of which are direct or indirect etiological agents for caries. Though majority of the students in the study both Indian and Iranian belonged to families with moderate family income, caries was noted in students belonging to all economic status. This is despite the fact that income is inversely proportional to education and thereby knowledge [12].

The primary oral hygiene measure practiced worldwide is cleaning the teeth with tooth paste and brush in order to

Table 1. ANOVA on comparison parameters of DMFT index among Indian and Iranian students

Source	SS	Df	MS	F	α5%Fcritical	p-value
Between	141204	1	141204	7.4293	7.7086	0.0527
Within	76025.5	4	19006			
Total	217230	5				

eliminate the dental plaque. In our study the participants unanimously used tooth paste and brush to eliminate dental plaque. Brushing the teeth twice daily with tooth paste and brush is recommended for oral care and majority of Indian students followed it. However, majority of Iranian students brushed their teeth once daily. Though this finding of ours is parallel to the findings of Khami, it is suggested that a there is a discrepancy that exists in between internationally accepted recommendations and reports regarding brushing frequencies of Iranian students. Additional oral hygiene measures like flossing use of mouth wash and professional oral prophylaxis eliminates plaque even from sites inaccessible to tooth brush. Majority of Iranian students used dental floss more over Indian students whereas majority of Indian students used mouth wash more over Iranian students[13].

Though ADA recommends that tooth brushes needs to be changed once in every 3-4 months. But a tooth brush with frayed bristles warrants its replacement irrespective of time limit specified. Majority of Indian and Iranian students changed the toothbrush every once in 3 months[14].

This may be the influence of captivating ads by various companies telecasted on television. Majority of participants of our study had a previous experience of visit to dentist. Frequent visit to dentist is a positive attitude towards ensuring oral health which requires appreciation and encouragement.

Based on the above mentioned practices and awareness we found that Indian students showed a relatively greater proportion of sound teeth compared to Iranian students. However Iranian students showed a relatively higher proportion of decayed teeth and missing teeth. The total number of teeth filled with restoration was vastly greater in Iranian students in comparison to Indian students. We hypothesize that this could be due to more consumption of refined carbohydrates, use of carbohydrate rich snacks, biscuits and beverages by Iranian students at the same time it also shows more number of restored teeth which seems like prominence was given to restoration than prevention.

4. Conclusion

This comparative study to assess the DMFT index among Indian and Iranian students shows that there is lack of knowledge of preventive measure for oral diseases whereas more emphasis was given to restorative measures to maintain oral health. The lack of knowledge about main etiological agents needs to be highlighted along with advantages of using oral care aids like flossing and mouthwash so as to make it a routine habit.

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