



## DENTAL CARIES EXPERIENCE AMONG PATIENTS ATTENDING A PRIVATE DENTAL INSTITUTE: A RETROSPECTIVE STUDY

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### ABSTRACT

**Background and objectives:** The study was undertaken at I.T.S CDSR, Muradnagar, Ghaziabad (Uttar Pradesh). A total of 29,282 thousand patients who had visited the institute from August 2011 to January 2012 were assessed for dental caries experience using retrospective design.

**Basic research design:** The study was carried out using OPD records by a systematic random sampling and the data was assessed for dental caries using WHO modification of DMFT index. The standard error of mean was calculated for all the mean values of decayed, missing and filled component.

**Results:** A total of 1100 records were taken in the study after sampling, male and female ratio was 48% and 52% respectively. The mean DMFT score was  $2.70 \pm 1.275$  in the <15 year age group and  $5.08 \pm 2.581$  for 35-44 age group and  $13.50 \pm 5.038$  for 65 and above year age group. Mann-Whitney U test and Kruskal Wallis test were applied to check the difference of mean DMFT scores between males and females, and between age groups respectively. Mandibular 1<sup>st</sup> and 2<sup>nd</sup> molars were found to be most affected teeth among the study population.

**Conclusion:** The prevalence of dental caries among adults was found to be high among this population. There is need to generate the awareness about oral health and prevention of dental caries and to institute measures for the provision of dental care services at the primary level.

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### INTRODUCTION

Dental caries is the most prevalent oral disease with high morbidity potential. There is no geographic area in the world whose inhabitant does not exhibit some evidence of dental caries. It affects all age groups genders, all races, socioeconomic status. Dental caries still remains a dental health problem in several countries; several studies have been carried out in Mexico during the last two decades in different age-groups. Prevalence was 48% to 95% reported in preschool children while 42% to 88% dental caries prevalence in a group of 12-year-old children and 53.4% prevalence in a 15-year-old group of adolescents.(1)

The disease is more prevalent in Latin America, Middle East, from 97% in 1970's but prevalence is still high i.e. 92%; south Asia and least prevalent in China.(2) Dental caries (tooth decay) has been estimated to be the most prevalent health problem in Australia (AIHW 2002).(3) Oral diseases can lead to infection and tooth loss, and may be associated with pain and discomfort, eating difficulties and problems with speech, communication and socializing (AIHW 2002). The scenario in

India has shown similarities with other developing countries with the prevalence of dental caries ranges from 31.5% - 89%.(4) Dental caries was assessed on the basis of DMFT index.(5) The treatment pattern is derived from the care index, which is defined as the ratio of filled teeth (F) to the total DMF component of the decayed missing filled (DMFT) teeth. The care index of DMFT is used to monitor changes in treatment provision and to highlight inequalities in provision of care. It is a practical application of the DMFT index to aid in planning the provision of publicly funded dental services and can help in targeting these services at areas where people have greatest need.(6) The objectives of the study was to find out the prevalence of dental caries among patients who had attended dental OPD in private dental institute, Ghaziabad, Uttar Pradesh and to find out the treatment received by them using the care index of DMFT.

### MATERIALS AND METHOD

This was a retrospective study of the patients who attended the Institute of Technology and Science College of Dental

Sciences and Research, Ghaziabad (I.T.S. CDSR, Ghaziabad) in Ghaziabad.

**Collection of Data**

The patient records/information was de-identified prior to analysis to have a random selection of the patients. The total number of new patients who had visited the institute was 29,282 from July 2011 to January 2012 out of which 1,100 cards were selected by systematic random sampling at confidence interval 95% and precision 0.5. The patient information was obtained from the previous records (OPD cards) for the following information: Name, age and gender, diagnosis of caries based on caries status and tooth affected.

The 7 age groups were less than 15 years, 15-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years, more than 65 years. The mean DMFT scores were calculated for all 7 age groups for male and females.

**Ethical clearance**

Ethical clearance was obtained from the institutional review board, I.T.S. CDSR Muradnagar, Ghaziabad in accordance with the World Medical Association declaration of Helinski.

**Data Collection**

Data was obtained from OPD cards by a predesigned Proforma. The Proforma was used to enter the data which consisted of questions on personal details, oral hygiene practices, dental problem, other adverse habits, Diet etc.

**Statistical analysis**

The data was recorded and transferred from assessment form to the computer and master chart was created in the excel sheet using Microsoft Excel Software. The statistical analysis was performed using SPSS version 16 software.

The data was summarized in the form of mean and standard deviation for numerical data, and frequencies and percentages for categorical data. Presentation of summarized data was done using Tables.

The normality of the data was checked using Shapiro Wilk test. Non-Parametric tests were used for the inferential statistics of those variables which failed to achieve normal distribution. Mann Whitney U test was used for comparison of the mean values between two groups. Kruskal Wallis test was used for comparison of the mean values between three or more groups. All the statistical tests were set at a 95% confidence level and p-value of less than 0.05 was considered to be statistically significant.

**RESULTS**

Among 1100 patients who visited ITS College of Dental Sciences and Research, there were 563 (51.18%) female and 537 (48.82%) male patients. Age and gender wise distribution of the patients is shown in [Table 1].

The prevalence of DMFT score more than 0 (DMFT≥1) among the study population was 92.55%. Of the study population, 92% had carious teeth, 46% had missing teeth and 15.6% had filled teeth. [Table 2]

The mean DMFT score among males was 5.74±3.90 and among females was 5.00±3.50. The mean DMFT score was higher among males in comparison to the females though it was not statistically significant. The Comparison between male and female was done using the Mann Whitney U test, the difference in the number of missing teeth was found to be highly significant (p < 0.001) with males having more number of missing teeth as compared to females. [Table 3]

**Table 1** Age and Gender wise distribution of patients

Gender	<15 years	15-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65 years & above	TOTAL
Male	42 (41.18%)	108 (45.38%)	98 (54.14%)	127 (51.00%)	69 (57.50%)	77 (45.83%)	16 (38.09%)	537 (48.8%)
Female	60 (58.82)	130 (54.62%)	83 (45.86%)	122 (49.00%)	51 (42.50%)	91 (54.17%)	26 (61.91%)	563 (51.2%)
Total	102 (100.0%)	238 (100.0%)	181 (100.0%)	249 (100.0%)	120 (100.0%)	168 (100.0%)	42 (100.0%)	1100 (100.0%)

**Table 2** Overall prevalence of Dental Caries with mean DMFT scores

	Absent (%)	Present (%)	Mean ± SD
DT	89 (8.09%)	1011 (91.91%)	3.25±1.876
MT	594 (54.00%)	506 (46.00%)	1.42±2.693
FT	929 (84.40%)	171 (15.55%)	0.70±0.987
DMFT	<b>82 (7.45%)</b>	<b>1018 (92.55%)</b>	5.35±3.716

DT=Decayed Teeth, MT=Missing Teeth, FT=Filled Teeth, DMFT=Decayed Missing Filled Teeth

Decayed component (DT) was highest among 55-64 years age group (3.82±1.585), M component was highest among 65-74 years age group (10.75±5.746), and F component was highest among 25-34 years age group (1.50±1.347). The Kruskal Wallis test was applied for comparison among the age groups which showed highly significant difference among all components of DMFT - decayed, missing, filled teeth and DMFT score (p < 0.001). [Table 4]

**Table 3** Prevalence of Dental caries among the study population according to Gender

GENDER	Decayed Teeth (mean ± SD)	Missing Teeth (mean ± SD)	Filled Teeth (mean ± SD)	DMFT (mean ± SD)
Male (n=537)	3.23±1.960	1.83±2.928	0.72±0.960	5.74±3.899
Female (n=563)	3.28±1.796	1.04±2.393	0.68±1.012	5.00±3.502
Total (n=1100)	3.25±1.876	1.42±2.693	0.70±0.987	5.35±3.716
Mann-Whitney U test value	143550.000	115600.000	145000.000	135900.000
Z-value	-1.458	-7.355	-1.288	-2.918
p-value <sup>b</sup>	0.145(NS)	< 0.001(HS)	0.198(NS)	0.004(HS)

<sup>b</sup> Mann-whitney U test  
 NS: Not Significant,  
 HS: Highly Significant

**Table 4** Distribution of decayed teeth, missing teeth and filled teeth among various Age groups

AGE GROUPS	N	DT (mean±SD)	MT (mean±SD)	FT (mean±SD)	DMFT (mean±SD)
1 Less than 15 yrs	102	2.60±1.119	0.00±0.000	0.10±0.302	2.70±1.275
2 15-24 yrs	238	2.67±2.362	0.17±0.625	0.25±0.522	3.00±2.368
3 25-34 yrs	181	3.56±1.838	0.56±0.687	1.50±1.347	5.61±2.917
4 35-44 yrs	249	3.44±1.838	0.76±0.863	0.88±0.865	5.08±2.581
5 45-54 yrs	120	3.67±1.380	2.17±2.084	0.75±0.833	6.58±3.834
6 55-64 yrs	168	3.82±1.585	3.18±2.314	0.59±0.977	7.59±3.441
7 65 and above yrs	42	2.25±1.104	10.75±5.746	0.50±0.877	13.50±5.038
<b>Total</b>	<b>1100</b>	<b>3.25±1.876</b>	<b>1.42±2.693</b>	<b>0.70±0.987</b>	<b>5.35±3.716</b>
<b>Chi-Square value<sup>a</sup></b>		<b>120.338</b>	<b>531.122</b>	<b>211.013</b>	<b>402.949</b>
<b>p-value</b>		<b>&lt; 0.000(HS)</b>	<b>&lt; 0.000(HS)</b>	<b>&lt; 0.000(HS)</b>	<b>&lt; 0.000(HS)</b>
<b>Post-hoc comparisons<sup>b</sup></b>		<b>6 &gt; 1, 2, 7</b>	<b>7 &gt; 1, 2, 3, 4, 5, 6</b>	<b>3 &gt; 1, 2, 4, 5, 6, 7</b>	<b>6, 7 &gt; 1, 2, 3, 4, 5, 7 &gt; 6</b>

<sup>a</sup> Kruskal wallis test

<sup>b</sup> Mann-whitney U test

HS = Highly Significant Statistical difference

Molars (74.45%) were the teeth most commonly affected with mandibular molars (65.03%) more commonly affected in comparison to the maxillary molars. With respect to premolars, canine and incisor, the maxillary teeth were more affected in comparison to mandibular teeth. The canines were the teeth least affected among all teeth. [Table 5]

**Table 5** Caries percentage among different type of teeth affected

Type of tooth	Subjects affected		
	Upper	Lower	Total
Incisors	92 (9.03%)	08 (0.79%)	96 (8.73%)
Canines	26 (2.56%)	04 (0.39%)	28 (2.55%)
Premolars	351 (34.48%)	201 (19.74%)	452 (41.09%)
<b>Molars</b>	<b>489 (48.04%)</b>	<b>662 (65.03%)</b>	<b>819 (74.45%)</b>

\*Percentages calculated out of 1018 affected subjects.

## DISCUSSION

All the data was collected from the OPD cards in the present study as DMFT index is recorded while taking the case history of the patients. The proforma used in the present study has been standardized by the entire institution and calibrated by the experienced faculty of the institute. Treatment records were used in this study because of consistence in record keeping which facilitated easy retrieval of information. It is an inexpensive method of data collection.

The present study was attempted to assess the Dental caries experience in patients attending private dental college in Ghaziabad. The overall prevalence of dental caries in the present study was 92.55%. This finding was similar to the finding of studies conducted by Robert et al (2), Zukanovic (7) and Guido.(8)

The mean DMFT score among males and females was 5.74±3.90 and 5.00±3.50 respectively, suggesting males are more prone to caries than females. This could have been due to a number of reasons, which include different attitudes towards oral hygiene and dental attendance between men and women and difference in dietary pattern, adverse oral habits etc between housewives and working men.(9)

The prevalence of DMFT scores increased with increasing in age. Mean DMFT score was highest in the age group 65 and above in this study. A study from south India among the elderly reported a mean DMF index of 13.5 (10) which is similar to that reported in the present study (13.50±5.04). Similar results was found in a study by Patro et al.(11)

This study demonstrated that caries activity continues throughout life and is not confined to any period of life, although the prevalence increase with an increase in age. A similar conclusion was made by Manji.(12) Assuming that the rate of progression of caries takes 3-4 years before it gets to pulpitis, (which is the trigger for seeking services), and considering that the age group most affected is 25-34 years, it is probable that the initial attack occurred in their teens. It is therefore beneficial to target the 10-19 age group with preventive programmes.(7)

In our study, it was found that Dental caries experience was 92.55% with overall mean DMFT score of 5.35±3.72. It was similar with the study done by Jose et al. (4.04±3.90).(13) The most affected teeth in the present study were lower molars 65.03%. This finding does not correlate with previous studies done in Uganda; (14) showed that a total of 80% students had DMFT>0. This was also dis-similar to the study by Rwenytonyi, where a mean DMFT of 0.34 was recorded which was much lesser than the present study.(15)

As expected the mean DMFT scores increased with age from 2.70 among less than 15year age group to 13.50 among 65 years and above. This was found to be similar to the results of the study done by Pashayev et al (16), it was found that the total DMFT scores increased with age from 3.61 among 15-19 years age group to 19.9 among 60 years and above age group.(16)

### The present study had certain limitations such as

DMFT status from institutional records is one of the common methods of assessing dental caries prevalence among population, because it is done without examining the patients. Hence, it underestimates the actual dental caries prevalence.

In order to address this problem, it will be necessary to develop an oral health aid programs for all the age group that should seek to:

- Raise the awareness of the importance of oral health at workplaces and also where ever people gather together, in order to motivate people to visit dental clinics and to improve their oral hygiene and diet.
- Encourage dentist to provide dental examination and oral hygiene advice to the population.
- Identify funds to enable this to happen and maintain mobile dental units which could provide oral health care at work place.

## CONCLUSION

Frequency of dental caries and strength of DMFT score was high in our study population, the strength of dental caries increased with advance age. The study reveals that there is a need for accessible and affordable oral health services to provide to general population. This can be in the form of oral health education, simultaneously, services for oral health care at primary level can be established in order to bring oral health care to the door steps of the people. This will need to support by referral mechanisms for those who need specialized treatment in secondary and tertiary centers.

It may be concluded that there is lack of attention directed to elderly age group and that the use of specific and through dental programs aimed at health promotion of dental caries, as well as establishment of public health policies with easy access to this population are necessary to improve oral health conditions in the elderly population.

Dental Diseases like caries is not life threatening but may have expensive treatment modalities. It can be prevented or controlled by adopting new paradigm in public health dentistry like use of fluoride, brushing at night, low intake of refined carbohydrates, periodic oral check-up etc. Oral health program should be conducted to create awareness in community specially at school level. Brushing skill should be taught to children because they act as agents of social change.

## References

1. Duraiswamy P, Kumar ST, Dagli RJ, Chandrkant, Kulkaani S. Dental caries experience and treatment needs of green marble mines laborers in Udaipur district, Ghaziabad, India. *Indian J Dent Res* 2008;19(4):331-4
2. Roberts W, Wright T. The dynamic process of demineralization and remineralization, *Dimensions Dental Hygiene*. Res Dev Diabil 2010;31(6):1160-9.
3. Caries experience of public dental patients. AIHW Dental Statistics and Research Unit Research Report No. 2002; 10:1-4.
4. Petersen PE. World Health Organization global policy for improvement of oral health- World Health Assembly 2007. *Int Dent J* 2008; 58(3):115-21.
5. Grewal H, Verma M, Verma A. Prevalence of dental caries among School children of three educational zones in urban Delhi, India. *Indian J Dent Res* 2011; 22(4):1-12.
6. Kutesa A, Mwanika A, Wandera M. Pattern of dental caries in Mulago Dental School clinic, Uganda. *Afr Health Sci* 2005; 5(1):65-8.
7. Zukanovic A, Muratbegovic A, Kobaslija S, Markovic N, Weddell JA, et al. Relationship between socioeconomic backgrounds, microflora and caries experience in 12 years olds in Bosnia and Herzegovina in 2004. *Eur J Paediatr Dent* 2008; (9)3:118-24.
8. Guido JA, Mier EAM, Sotoa, Eggertsson H, Sanders BJ, Weddell JA, et al. Caries prevalence and its association with brushing habits, water availability, and intake of sugar beverages. *Int J Paediatr Dent* 2011; 21(5):321-400.
9. Joseph Z Anaise. Measurement of dental caries experience-modification of the DMFT index. *Comm Dent Oral Epidemiol* 1984; 12(1):43-6.
10. Thomas S, Raja RV, Kutty R, Strayer MS. Pattern of caries experience among an elderly population in south India. *Int Dent J* 1994; 44(6):617-22.
11. Patro BK, Kumar RB, Goswami A, Mathur VP. Prevalence of dental caries among adults and elderly in an urban resettlement colony of New Delhi. *Indian J Dent Res* 2008; 19(2):95-8.
12. Manji F, Fejerskov O, Baelum V. Pattern of Dental caries in an adult rural population. *Caries Res* 1989; 23(1):55-62.
13. Jose O, Cortes G, Carlo E. Solis M, Juan P et al. Dental caries experience prevalence and severity in Mexican adolescents and young adults. *Rev salud publica* 2009; 11(1):82-91.
14. Rwenyonyi CM, Birkeland JB, Haugejorden O, Bjorvatn K. Dental caries among 10- to 14- year-old children in Ugandan rural areas with 0.5 and 2.5mg fluoride per litre in drinking water. *Clin Oral Invest* 2001;5(1):45-50.
15. Okullo I, Astrom AN, Haugejorden O, Rwenyonyi CM. Variations in caries experience and sugar intake among secondary school students in Urban and rural Uganda. *Acta Odontol Scand* 2003; 61(4):197-202.
16. Pasheyev AC, Mammadov FU, Huseinova ST. An investigation in to the prevalence of dental caries and its treatment among the adult population with low Socio-economic Status in Baku, Azerbaijan. *Oral Health Dent Manag* 2011; 10(1):7-12.

