RESEARCH PAPER

DEMOGRAPHIC DISTRIBUTION OF DENTAL CARRIES IN NORTH INDIA

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Dental caries are among most common oral diseases including others like bad breath, dry mouth, periodontitis or gum disease, including gingivitis, and sometimes oral cancer. The present study was planned to assess the prevalence of dental caries among population after the eruption of permanent dentition and to find out the association of socio-demographic characteristics with the prevalence of dental caries. Majority of the patients were between 15 years and 35 years old (41.35%). A small percentage (16.67%) of the patients were 40-60 years old. 56.14% students were male and 43.86% were female. 66.67% population belonged to Hindu religion and the rest population was Muslims. Our study raised serious concern about individual and social habit regarding oral hygiene. Data showed washing mouth, financial condition and number of family members affected oral hygiene habit which finally landed as dental carries.

Key words: Dental carries, Oral hygiene, Socio-demographic characteristics, Oral disease.

INTRODUCTION

Dental health and overall oral health is an extremely important, but generally overlooked and underrated part of human health. Dental caries are among most common oral diseases including others like bad breath, dry mouth, periodontitis or gum disease, including gingivitis, and sometimes oral cancer (Hujoel and Lingstrom, 2017). General overall oral care including regularly brushing teeth, flossing, avoiding junk food, smoking, sugary foods and drinks. Visit to dentist at regular intervals for cleanings and checkups may also help to maintain oral health (Arboleda *et al* 2019). Dental caries is one of the common and rapidly increasing dental problems due to unnecessary changes in the dietary habits of Indians (Aroor *et al* 2014). Dental caries is the scientific term for tooth decay or cavities. It is caused by specific types of bacteria. They produce acid that destroys the tooth's enamel and layer beneath it,

termed as the dentin.

Increased consumption of junk food, drinks and high consumption of sugars are responsible for increasing Dental caries in 60-65% of Indian population including majority of children (60-90%) and adults (Adeniyi and Odusanya, 2017). Many different types of bacteria normally live in the human mouth. They build up on the teeth in a sticky film called plaque 9 (Tafere *et al* 2018). This plaque also contains saliva, bits of food and other natural substances. It forms most easily in certain places. These include: Cracks, pits or grooves in the back teeth, between teeth, around dental fillings or bridgework, near the gum line (Kanupuru *et al* 2015).

The bacteria turn sugar and carbohydrates (starches) in the foods we eat into acids. The acids dissolve minerals in the hard enamel that covers the tooth's crown (the part you can see). The enamel erodes or develops pits. Early caries may not have any symptoms. Later, when the

decay has eaten through the enamel, the teeth may be sensitive to sweet, hot or cold foods or drinks (Ravishankar *et al* 2013).

Other factors like genetics, immunity and susceptibility and inadequate exposure to fluorides (Jepsen *et al* 2017). The cavities may be a number of different colors from yellow to black. Complications may include inflammation of the tissue around the tooth, tooth loss, and infection or abscess formation (Shyam *et al* 2017, de Souza *et al* 2014).

Primary diagnosis involves inspection of all visible tooth surfaces using a good light source, dental mirror and explorer. Dental radiographs (X-rays) may show dental caries before it is otherwise visible, in particular caries between the teeth. Large areas of dental caries are often apparent to the naked eye, but smaller lesions can be difficult to identify. Visual and tactile inspection along with radiographs are employed frequently among dentists, in particular to diagnose pit and fissure caries (Venugopal *et al* 1998). Early, uncavitated caries is often diagnosed by blowing air across the suspect surface, which removes moisture and changes the optical properties of the unmineralized enamel.

Caries caught in the very early stages can be reversed. White spots may indicate early caries that has not yet eroded through the enamel. Early caries may be reversed if acid damage is stopped and the tooth is given a chance to repair itself naturally.

Caries that has destroyed enamel cannot be reversed. Most caries will continue to get worse and go deeper. With time, the tooth may decay down to the root. How long this takes will vary from person to person. Caries can erode to a painful level within months or years (Prasad *et al* 2017).

The present study was planned to assess the prevalence of dental caries among patients after the eruption of permanent dentition and to find out the association of socio-demographic characteristics with the prevalence of dental caries. The present work was aimed for the assessment of dental caries in Bareilly region and to find the socio-demographic characteristics in Bareilly with the prevalence of dental caries.

MATERIALS AND METHODS
The study was conducted in different regions of Bareilly at different hospitals and clinics of Dentists in Bareilly in Civil Lines, Green Park,

Dohra Road, and also in Nawabganj and Aonla. 150 patients of different age, sex, religion, and socio-economic status were included in the study.

The study was done by interviewing the patients using a ethically approved pre-designed questionnaire. The data generated were entered in Microsoft excel sheet and copied into a SPSS sheet (version 16.0). The analysis was done using SPSS (version 16.0). Chi square test was used to test the statistical significance between different groups (Kumar *et al* 2017).

RESULTS
Majority of the patients were between 15 years and 35 years old (41.35%). A small percentage (16.67%) of the patients were 40-60 years old. 56.14% students were male and 43.86% were female. 66.67% students belonged to Hindu religion and the rest students were Muslims (**Figure 1**, **Table 1**).

As far as socio-economic status is considered, using modified Prasad scale, majority belonged to lower middle and upper lower socioeconomic class (22.81% and 33.33% respectively). Only 7.89% students belonged to upper class. 49.12% students had one sibling, 22.81% had two siblings and 28.07% students were the only child of their parents. Habit is one of the most important elements for over all human health. In respect to dental health brushing the teeth is crucial for oral health. It is surprisingly to know that 14.91% population doesn't do brushing every day. As per good brushing practicing two times in day is best. Only 16.67% population follow this. Mostly 68.42% patients were doing one time brushing the teeth (**Figure 2**, **Table 2**). Food remaining in teeth is one of the crucial even to start any decay related microbial activity. To get rid of this, washing mouth after every eating only solution. All participants were asked about this habit in this study and it was found that about 67.80% patients rarely wash their mouth after taking food, 22.80% often wash and 11.40% always wash mouth (**Table 3** and **Table 4**).

Above observation shows that most of the tooth decay patients rarely wash their mouth after taking food. This may be one of the regions which initiate bacterial flora growth and progression of dental carries. We asked about toothache complain in last 15 days 57.89% patients. When data was analyzed, it was found that 25.44% were taking medicine daily on reference to clinical advice.
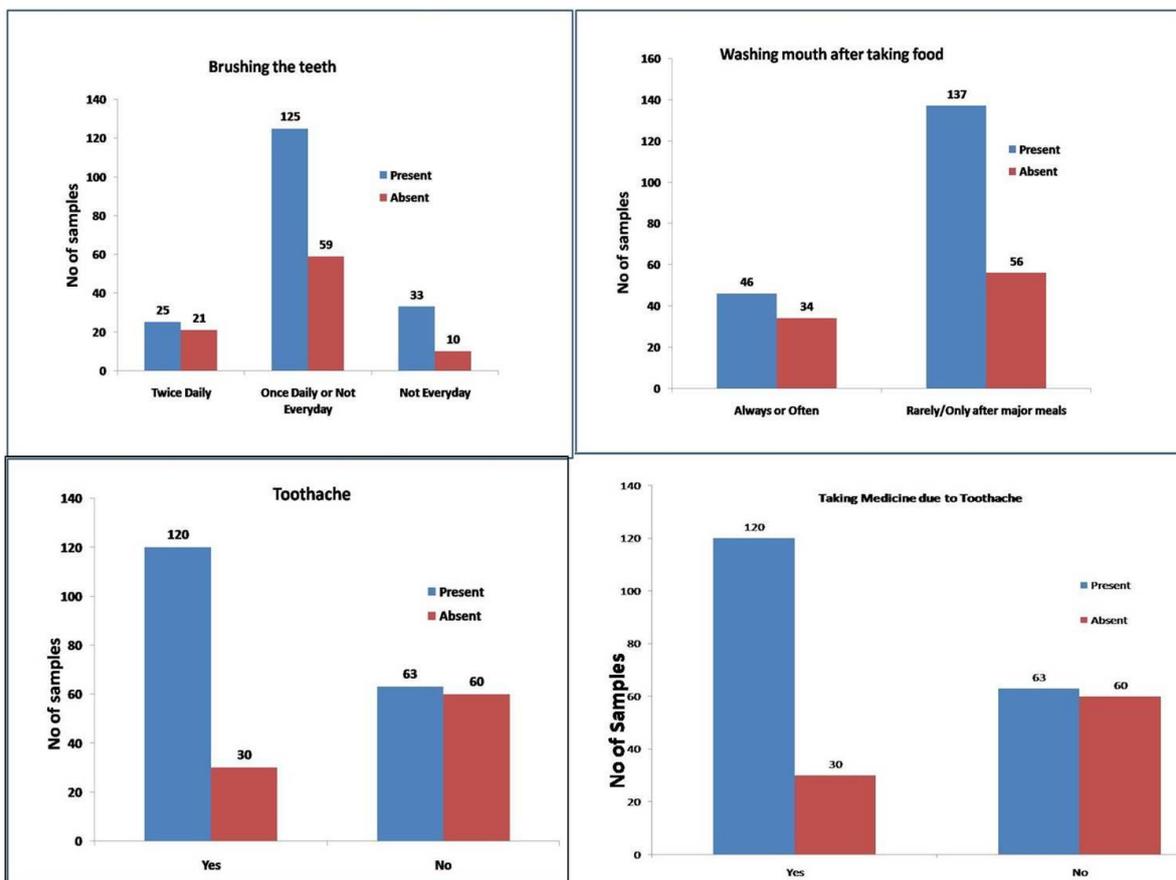
Fig. 1. Habits of the study population
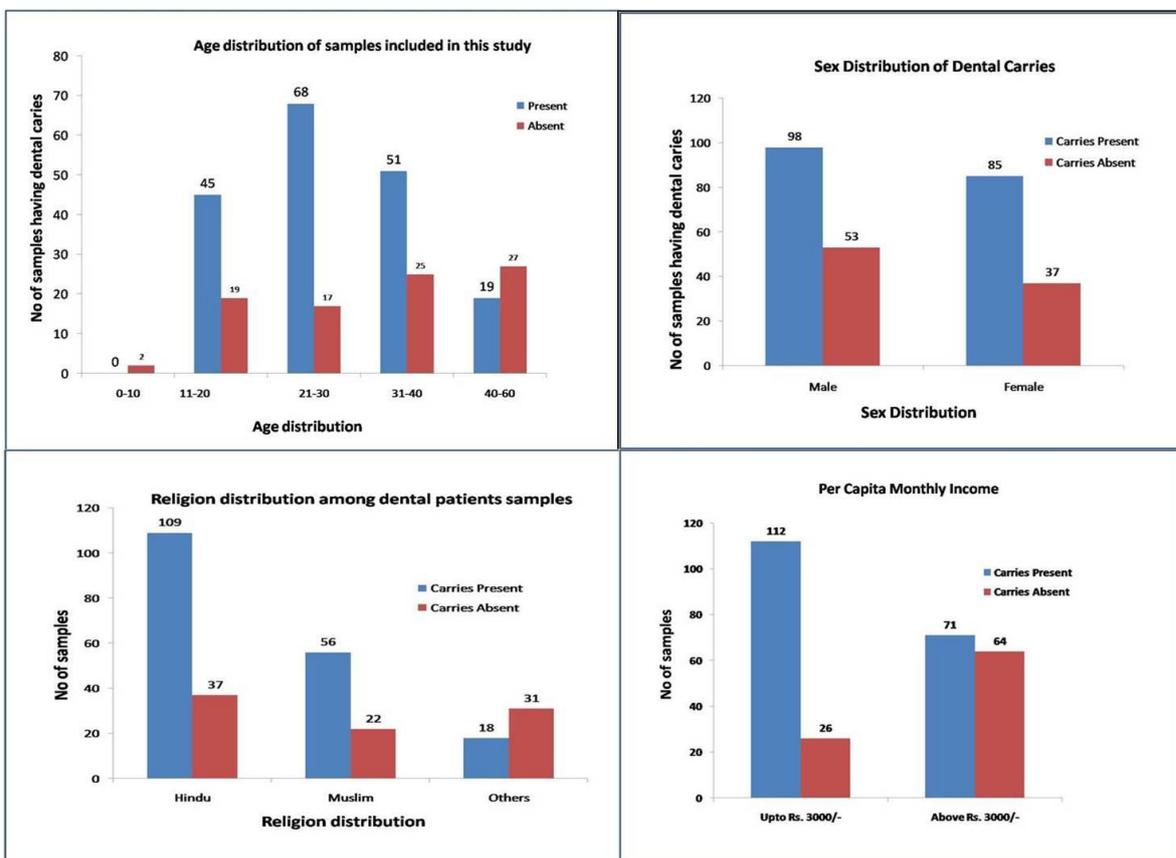
Fig. 2. Socio-demographic characteristics of the study population

Table 1. Socio-demographic characteristics of the study population

Socio-demographic parameters		Number	Percentage
Age	0-10	2	0.73%
	11-20	64	23.44%
	21-30	85	31.14%
	31-40	76	27.84%
	40-60	46	16.85%
Sex	Male	145	53.11%
	Female	128	46.89%
Religion	Hindu	136	49.82%
	Muslim	78	28.57%
	Others	59	21.61%
Socio-economic status	Upper	34	12.45%
	Upper middle	59	21.61%
	Lower middle	98	35.90%
	Upper lower	56	20.51%
	Lower	26	9.52%
Siblings	None	47	17.22%
	One	137	49.08%
	More than one	92	33.70%

Table 2. Habits of the study population

Parameters		Number	Percentage
Brushing the teeth	Twice daily	46	16.85%
	Once daily	184	67.40%
	Not everyday	43	15.75%
Washing mouth after taking food	Always	30	10.99%
	Often	50	18.32%
	Rarely/only after major meals	193	70.70%
Toothache in last 15 days	Yes	150	54.95%
	No	123	45.05%
Taking medicine due to toothache	Yes	78	28.57%
	No	195	71.43%

DISCUSSION
Social life for any individual may affect once dental carries decrease confidence level and overall health. Oral hygiene awareness may improve dental carries and tooth decay related problems in society. This study was conducted to search behavioral pattern which may affect oral health including dental carries (Rajesh *et al* 2017). Our study shows the seriousness and predominance of dental carries in society. Total 273 samples were collected in which total 183 was clinically defined dental carries patients were selected from Ruhelkhand region. There was no significance difference between gender (p=0.393) shows it affect both equally. When we analyzed these data on the basis of age group no significant difference were observe. This result shows poor oral hygiene awareness in general public in the Ruhelkhand region. Although, Muslim population was less but compare to Hindu, the occurrence of dental carries in

Muslim population predominate (p=0.768). Poverty and education level may also play significance role (p=0.004) in oral health awareness. No of siblings in a family also affect oral health since our data shows those family have more than one sibling found more dental carries in members (p=0.033) compare to those who have only one siblings. Personal habit about care and cleanliness of mouth play crucial role in occurrence of dental carries (p=0.009 and p=0.008).
A similar study in 460 male school going children of Namakkal district of Tamilnadu and found the prevalence of dental caries to be 69.57% with the mean dmft score of 2.89. Similar study was conducted in school children of Sunderban district and found 68.8% male children of 13 and 14 years affected with dental caries. Hence, dental caries show marked geographical variation along with variation in age (Karunakaran *et al* 2014).

Table 3. Association of prevalence of dental caries with socio-demographic characteristics
of the study population

Parameters		Dental caries		Total
		Present	Absent	
Age	0-10	0(0.00%)	2(100.00%)	2(100%)
	11-20	45(70.31%)	19(29.69%)	64(100%)
	21-30	68(80.00%)	17(20.00%)	85(100%)
	31-40	51(67.11%)	25(32.89%)	76(100%)
	40-60	19(41.30%)	27(58.70%)	46(100%)
	Chi square= 4.68, p=0.031, Odds ratio= 0.4, 95% C.I. of Odds ratio= 0.17-0.96			
Sex	Male	98(64.90%)	53(35.10%)	151(100%)
	Female	85(69.67%)	37(30.33%)	122(100%)
	Chi square= 0.68, p=0.473, Odds ratio=0.71 , 95% C.I. of Odds ratio= 0.23-1.67			
Religion	Hindu	109(74.66%)	37(25.34%)	146(100%)
	Muslim	56(71.79%)	22(28.21%)	78(100%)
	Others	18(36.73%)	31(63.27%)	49(100%)
	Chi square= 0.12, p=0.672, Odds ratio=0.91 , 95% C.I. of Odds ratio= 0.29-2.23			
Per capita monthly income	Upto Rs. 1800/-	112(81.16%)	26(18.84%)	138(100%)
	Above Rs. 1800/-	71(52.59%)	64(47.41%)	135(100%)
	Chi square= 8.52, p=0.004, Odds ratio=3.61 , 95% C.I. of Odds ratio= 1.37-9.67			
Siblings	None	108(64.67%)	59(35.33%)	167(100%)
	More Than One	75(70.75%)	31(29.25%)	106(100%)
	Chi square= 4.56, p=0.033, Odds ratio=0.27 , 95% C.I. of Odds ratio= 0.06-0.98			

Table 4. Association of prevalence of dental caries according to hygienic habit

Parameters		Dental caries		Total
		Present	Absent	
Brushing the teeth	Twice daily	25(54.35%)	21(45.65%)	46(100%)
	Once daily	125(67.93%)	59(32.07%)	184(100%)
	Not everyday	33(76.74%)	10(23.26%)	43(100%)
	Chi square= 6.81, p=0.009, Odds ratio=0.27 , 95% C.I. of Odds ratio= 0.09-0.84			
Washing mouth after taking food	Always or often	46(57.50%)	34(42.50%)	80(100%)
	Rarely/only after major meals	137(70.98%)	56(29.02%)	193(100%)
	Chi square=7.07, p=0.008, Odds ratio=0.32 , 95% C.I. of Odds ratio= 0.13-0.82			
Toothache	Yes	120(80.00%)	30(20.00%)	150(100%)
	No	63(51.22%)	60(48.78%)	123(100%)
	Chi square= 42.96, p<0.001, Odds ratio=32.05 , 95% C.I. of Odds ratio= 8.01-149.52			

CONCLUSION

This study raised serious concern about individual and social habit regarding oral hygiene. Data showed that washing mouth, financial condition and number of family members affect oral hygiene habit which finally landed as dental caries.

CONFLICT OF INTEREST

All authors declare no conflict of interest.

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