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Original Research Article

Oral health assessment and associated lifestyle behaviors among adults in Mathura city: a cross-sectional study

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ABSTRACT

Background: Oral health is recognized as an important aspect of an individual's general health and quality of life. Impairment of oral health diminishes the quality of life. The aim of the study was to assess the oral health (the number of natural teeth, pain or discomfort on teeth, having dentures), oral health behaviors (e.g., using toothbrush, dental flossing, and toothpaste containing fluoride) and lifestyle behaviors (e.g., sugar consumed, tobacco, alcohol) of people living in Mathura city, Uttar Pradesh.
Methods: This study was cross-sectional study conducted at K. D. Dental College and Hospital, Mathura. Pre-validated WHO oral health questionnaire was used to assess oral health, lifestyle and oral health behaviors of the study participants. Face to face interview sessions were conducted with consenting individual participants to ensure transparency and consistency, to reduce interviewer and misclassification bias.
Results: Total 550 participants were participated, in which 272 (100%) participants of 18-35 years of age group had 20 teeth or more. Majority of the participants had reported average status of teeth and gums. More than half of the participants were unaware of fluoride containing tooth paste i.e.; 122 (89.1%) participants of 36-50 years age group and 107 (75.9%) participants of 51-65 years age group.
Conclusions: Although majority of the Mathura adults considered their oral health status good, only a small population considered their oral health status poor. Use of oral hygiene aids such as toothpick, dental floss etc., was limited in participants.

Keywords: Oral health status, Adults, Lifestyle

INTRODUCTION

Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat pain, oral infection, sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial well-being.[1] The oral hygiene can be described as a practice for maintaining the cleanliness of the mouth and keeping the oral cavity healthy by brushing and flossing in order to prevent the gum or gingival diseases and the tooth decay. Maintenance of good oral hygiene is considered a lifelong habit. It is very crucial and important to have a positive attitude and a good knowledge towards these oral hygiene practices in order to have a disease-free oral cavity. Periodontal diseases, dental caries, and oral mucosal disease constitute a major proportion of the oral health problems in developing countries. About 90% of rural population and adults worldwide would have experienced dental caries, which could be due to various factors among which, the important ones are consumption of refined

carbohydrate and the lack of oral health knowledge.[2] Periodontal diseases (gingivitis and periodontitis) are highly prevalent, affecting up to 90% of the worldwide population. They have been associated with various systemic diseases such as heart diseases, diabetes, respiratory diseases, rheumatism, metabolic syndrome, and so on. Therefore, the prevention and treatment of periodontal diseases have become increasingly important.[3] There are a number of factors known to be associated with oral health of the adult population, such as socioeconomic status, literacy level, smoking or chewing tobacco and alcohol consumption. Other factors such as oral hygiene practices, social and cultural beliefs and attitudes, perceptions regarding oral health, function and philosophy of the dentists, can all influences oral health in the adult population.[4] Impairment of oral health diminishes the quality of life. Due to the continuous changing trends of lifestyle and diet patterns, there is an increased risk to poor oral health and hygiene in the community especially in an urban setup.[5] There is strong evidence that untreated oral diseases and disorders not only negatively affect general health but also increase the probability of diabetes and cardiovascular diseases.[6] Unhealthy diet, tobacco use, harmful alcohol use, and poor oral hygiene are all considered as risk factors for oral diseases.[7] Enforcement of good oral hygiene practices is an important step in maintaining oral health. In order to adopt good preventive measures, we need to have a good understanding of the oral hygiene practices of a population.[8] It is well known that tooth loss tends to increase with ageing. Tooth loss also depends upon the socioeconomic level and the life style of the individual. Tooth loss is reported to have a significant impact on food preferences and to cause malnutrition among older persons.[9]

Lifestyle constitutes the behaviors performed by an individual, which are linked directly to health outcomes. Healthy lifestyles are the behaviors performed by an individual to protect and promote his or her health. Healthy mouth requires the promotion of healthy lifestyles. Some of the major risk factors for dental caries related to unhealthy lifestyles are consumption of sugar-rich diet, poor nutrition, and use of tobacco, inadequate oral hygiene practices, stress, and inferior living conditions.[10] In developing countries, changing living conditions due to urbanization and adoption of western lifestyles are often considered potential risk factors for the incidence of dental caries.[11] The aim of this study was to assess the oral health (the number of natural teeth, pain or discomfort on teeth, having dentures), oral health behaviors (e.g., using toothbrush, dental flossing, and toothpaste containing fluoride) and lifestyle behaviors (e.g., sugar consumed, tobacco, alcohol) of people living in Mathura city, Uttar Pradesh. Such information is essential for future prevention programs and oral health interventions.

METHODS

This was a cross-sectional study conducted among adult population (18-65 years) of Mathura at K. D. Dental College and Hospital. The outpatient (OP) department in K. D. Dental college and hospital was selected for the study. This study was conducted from November 2020 to January 2020. Convenient sampling technique was implemented for selection study participants. Before scheduling the present study, the ethical clearance was obtained from institutional ethical clearance committee of K. D. Dental College and Hospital. Informed consent was also obtained from each participant before filling out the questionnaire. The study was explained in detail to each participant before beginning the interviews.

Sample selection criteria

Inclusion criteria

Adult participants aged 18-65 years; those residing in the study area; those having no diagnosis of mental or cognitive disorders; and those who were willing to participate were included.

Exclusion criteria

Those who were not willing to participate and t hose who had significant cognitive impairment or mental disabilities were excluded.

Expected sample size

$$N = \frac{(Z_{1-\alpha/2})^2 pq}{d^2}$$

$Z_{1-\alpha/2}$ [critical value and a standard value for the corresponding level of confidence. At 95% CI or 5% level of significance (type-I error) it is 1.96] = 1.96; P (expected prevalence of edentulous cases) = 30% (0.3), q(1-p) = 1-0.3; d (margin of error or precision) = 4% (0.04).

$$N = \frac{(1.96)^2(0.3)(1-0.3)}{(0.04)^2} = 505$$

Based on the sample size determination obtained for adult population it was necessary to take 505 as the minimum sample size. However, a higher sample size of 550 was selected to compensate for any kind of permissible error and to increase the accuracy of study.

Data collection

Prior to being finalized, language of the questionnaire was translated from English to Hindi (regional language of Mathura city) for convincing and better understanding of the patient. Face validity of the questionnaire was ensured by back translation method, that is blind retranslation into English by experts in both languages. The questionnaire was pilot tested on 20 patients coming at K. D. Dental College and Hospital for estimation of sample size. Pre-validated WHO oral health questionnaire was used in the present study to assess oral health, lifestyle and oral health

behaviors of the study participants. Face-to-face interview sessions were conducted with consenting individual participants to ensure transparency and consistency, to reduce interviewer and misclassification bias, and also to retain the internal validity of the study estimates.

The study questionnaire consisted of two parts:

Section A (socio-demographic profile)

It contained four items, measuring the age, gender, level of education, and residential location of the study participants.

Section B (oral health questionnaire)

It consisted of 14 items (social questions), measured on a variety of scales- yes/no and Likert scales. This section of the questionnaire consisted of two sub-sections. The first sub-section consisted of questionnaire regarding oral health assessment such as a composite weighted score of number of natural teeth present, presence of pain or discomfort, presence of dentures, types of dentures if present, frequency of brushing, and last dental visit. The second sub-section explored the lifestyle and other risk factors.

Under the risk factors, the use of tobacco and alcohol was asked. For the lifestyle factors, the amount of sugar consumed in different ways such as eating sweet pies, buns, jam, and honey as well as in soft drinks was asked. Finally, participants were asked whether or not (and how regularly) they had tea and coffee with sugar. For ease of analysis of items of lifestyle factors (use of tobacco, alcohol and diet), we recategorized responses as often (several times a day, every-day and several times a week), occasionally (once a week and several times a month), seldom (seldom and never) and frequently (very often and fairly often).

Statistical analysis

Data was entered in Microsoft excel 2007 and exported to statistical package of social sciences software (SPSS) version 23 for statistical analysis. Normality of data was analyzed using Kolmogorov-Smirnov test. Proportion was calculated using chi-square test to assess relationship between demographic (age and gender) variables and oral health condition, oral health behaviors, lifestyle behaviors. Level of significance (p value) $p<0.05$ was considered statistically significant.

RESULTS

Demographic characteristics

Table 1 describes demographic details, total five hundred fifty participants participated in this study. Out of the 550 participants, 349 (63.5%) were males and 201 (36.5%) were females. The age of participants ranged from 18 to 65 years, among which 272 (49%) participants were from 18-35 years of age group, 137 (24.9%) participants were from 36-50 years of age group, 141 (25.6%) participants were from 51-65 years of age group.

Dental health status of participants according to age

Table 2 describes dental health status of participants, 21 (14.9%) participants from 51-65 years age had no natural teeth. All the participants i.e.; 272 (100%) from the 18-35 years of age had 20 teeth or more, 107 (78.1%) participants from the 36-50 years of age had 20 teeth or more and 64 (45.4%) participants from 51-65 years of age had 20 teeth or more. Statistically significant difference was found among different age groups regarding number of natural teeth. More than half of the participants i.e.; 146 (53.7%) from 18-35 years of age experienced pain/discomfort during last 12 months. No significant difference was found among different age groups regarding pain/discomfort during last 12 months. Only 17 (12.1%) participants of 51-65 years of age group had full upper and lower denture. Statistically significant difference was found among different age groups.

With regards to self-perceived status of teeth and gums, none of the participants had reported excellent status of teeth.

Oral hygiene habits of participants according to age

Table 3 describes oral hygiene habits of participants, result revealed that 6 (4.3%) participants never cleaned their teeth. Almost all the participants clean their teeth once a day. With regards to tooth cleaning habits, more than 90% participants used tooth brush and tooth paste. Majority of participants i.e. more than 50% participants did not know whether their toothpaste contained fluoride or not.

Dental visit and reasons for these visits among participants according to age

Table 4 describes dental visit and reasons for these visits, result revealed that 52 (19.1%), 26 (19%) and 26 (18.4%) participants aged 18-35 years, 36-50 years, and 51-65 years, respectively, had visited a dentist less than 6 months. The most frequent reason for visiting the dentist was dental or oral pain or discomfort and treatment/follow-up.

Oral health problems experienced during the previous 12 months according to age

Table 5 describes oral health problems experienced during the previous 12 months, result revealed that participants from 51-65 years of age experienced more difficulty in biting (31.1%) and chewing food (32.5%), speech/pronouncing difficulty (18.4%) and dry mouth (7.1%). Participants from 18-35 years of age felt more embarrassed due to appearance of teeth (12.8%), avoided smiling because of teeth (9.6%) and felt less tolerant of spouse or close people (5.1%).

Table 1: Demographic details.

Demographic variables		Percentage (100%)
Age (in years)	18-35	272 (49.5)
	36-50	137 (24.9)
	51-65	141 (25.6)
Gender	Male	349 (63.5)
	Female	201 (36.5)
Location	Urban	158 (28.7)
	Peri-urban	201 (36.5)
	Rural	191 (34.7)
Education	No formal schooling	72 (13.1)
	Less than primary school	15 (2.7)
	Primary school completed	16 (2.9)
	Secondary school completed	50 (9.1)
	High school completed	96 (17.5)
	College/university completed	127 (23.1)
	Postgraduate degree	40 (7.3)
	Intermediate school	134 (24.4)

Table 2: Dental health status of participants according to age.

Variables	18-35 (years) (%)	36-50 (years) (%)	51-65 (years) (%)	Chi-square value	P value
Number of natural teeth					
No natural teeth	0 (0)	0 (0)	21 (14.9)	199.898	0.000*
1-9 teeth	0 (0)	0 (0)	6 (4.3)		
10-19 teeth	0 (0)	30 (21.9)	50 (35.5)		
20 teeth or more	272 (100)	107 (78.1)	64 (45.4)		
Teeth/mouth pain or discomfort during last 12 months					
Yes	146 (53.7)	88 (64.2)	87 (61.7)	6.805	0.147
No	109 (40.1)	46 (33.5)	47 (33.3)		
Don't know	17 (6.2)	3 (2.2)	7 (5.0)		
Presence of removable denture- partial removable denture					
Yes	7 (2.6)	9 (6.6)	38 (26.9)	64.497	0.000*
No	265 (97.4)	128 (93.4)	103 (73.1)		
Full upper denture					
Yes	0 (0)	2 (1.5)	17 (12.1)	38.682	0.000*
No	272 (100)	135 (98.5)	124 (87.9)		
Full lower denture					
Yes	0 (2.2)	2 (1.5)	17 (12.1)	38.62	0.000*
No					
Status of teeth					
Excellent	0 (0)	0 (0)	0 (0)	209.071	0.000*
Very good	2 (0.7)	0 (0)	2 (1.4)		
Good	135 (49.6)	8 (5.8)	10 (7.1)		
Average	119 (43.8)	88 (64.3)	55 (39.0)		
Poor	7 (2.6)	36 (26.3)	44 (32.2)		
Very poor	6 (2.2)	5 (3.6)	20 (14.2)		
Don't know	3 (1.1)	0 (0)	10 (7.1)		
Status of gums					
Excellent	0 (0)	0 (0)	0 (0)	182.67	0.000*
Very good	2 (0.7)	0 (0)	2 (1.4)		
Good	145 (53.3)	11 (8.0)	11 (7.8)		
Average	113 (41.5)	99 (72.3)	81 (57.4)		
Poor	3 (1.1)	24 (17.5)	39 (27.7)		
Very poor	0 (0)	3 (2.2)	4 (2.8)		

Continued.

Variables	18-35 (years) (%)	36-50 (years) (%)	51-65 (years) (%)	Chi-square value	P value
Don't know	9 (3.3)	0 (0)	4 (2.8)		

Note: p<0.05*(significant), Chi-square test.

Table 3: Oral hygiene habits of participants according to age.

Variables	18-35 years (%)	36-50 years (%)	51-65 years (%)	Chi square value	P value
Frequency of teeth cleaning					
Never	0 (0)	0 (0)	6 (4.3)	55.089	0.000*
Once a month	0 (0)	0 (0)	0 (0)		
2-3 times a month	0 (0)	0 (0)	0 (0)		
Once a week	0 (0)	0 (0)	0 (0)		
Once a day	223 (82)	133 (97.1)	133 (94.3)		
Twice or more a day	49 (18)	4 (2.9)	2 (1.4)		
Use of the following to clean teeth toothbrush					
Yes	257 (94.5)	131 (95.6)	127 (90.1)	4.242	0.120
No	15 (5.5)	6 (4.4)	14 (9.9)		
Wooden toothpicks					
Yes	32 (11.7)	7 (5.1)	7 (4.9)	8.124	0.017*
No	240 (88.2)	130 (94.8)	134 (95.1)		
Plastic toothpicks					
Yes	17 (6.3)	4 (2.9)	3 (1.1)	4.698	0.96
No	255 (93.7)	133 (97.1)	138 (97.9)		
Thread (dental floss)					
Yes	22 (8.1)	5 (3.6)	2 (1.4)	9.233	0.010*
No	250 (91.1)	132 (96.4)	139 (98.6)		
Chew-stick					
Yes	24 (8.8)	14 (10.2)	19 (13.5)	2.167	0.338
No	248 (91.2)	123 (89.8)	122 (86.5)		
Other					
Yes	22 (8.1)	5 (3.6)	9 (6.4)	2.943	0.230
No	250 (91.9)	132 (96.4)	132 (93.6)		
Use of tooth paste					
Yes	262 (96.3)	126 (92)	115 (81.6)	25.960	0.000*
No	10 (3.7)	11 (8)	26 (18.4)		
Use of fluoride containing toothpaste					
Yes	92 (33.8)	8 (5.8)	9 (6.4)	79.154	0.000*
No	27 (9.9)	7 (5.1)	25 (17.7)		
Don't know	153 (56.2)	122 (89.1)	107 (75.9)		

Note: p<0.05*(significant), Chi-square test.

Table 4: Dental visit and reasons for these visits among participants according to age.

Variables	18-35 years (%)	36-50 years (%)	51-65 years (%)	Chi square value	P value
Last dental visit					
Less than 6 months	52 (19.1)	26 (19)	26 (18.4)	82.775	0.000*
6-12 months	23 (8.5)	23 (16.8)			
More than 1 year but less than 2 years	25 (9.2)	25 (18.2)	6 (4.3)		
2 year or more but less than 5 years	23 (8.5)	17 (12.4)			
5 years or more	45 (16.5)	4 (2.9)			
Never received dental care	104 (38.2)	42 (30)	18 (12.8)		
Reason for last dental visit					
Consultation/advice	18 (6.6)	14 (10.2)	7 (4.9)	113.42	0.000*

Continued.

Variables	18-35 years (%)	36-50 years (%)	51-65 years (%)	Chi square value	P value
Pain or trouble with teeth, gums or mouth	59 (21.7)	41 (29.9)	27 (19.1)		
Treatment/ follow-up treatment	66 (24.3)	25 (18.2)	78 (55.3)		
Routine check-up	9 (3.3)	18 (13.1)	16 (11.3)		
Don't know/don't remember	120 (44.1)	39 (28.5)	13 (9.2)		

Note: p<0.05*(significant), Chi-square test.

Table 5: Oral health problems experienced during the previous 12 months according to age.

Variables	18-35 years (%)	36-50 years (%)	51-65 years (%)	Chi-square value	P value
Difficulty in biting food					
Frequently	36 (13.3)	18 (13.2)	25 (17.7)	8.552	0.200
Sometimes	38 (13.9)	10 (7.2)	19 (13.4)		
No	190 (69.9)	104 (75.9)	89 (63.2)		
Don't know	8 (2.9)	5 (3.7)	8 (5.7)		
Difficulty in chewing food					
Frequently	31 (11.4)	16 (11.6)	26 (18.4)	18.826	0.004*
Sometimes	55 (20.2)	15 (10.9)	34 (24.1)		
No	173 (63.6)	103 (75.1)	73 (51.8)		
Don't know	13 (4.8)	3 (2.1)	8 (5.7)		
Speech/trouble pronouncing difficulty					
Frequently	4 (1.5)	3 (2.1)	10 (7.1)	26.952	0.000*
Sometimes	9 (3.3)	3 (2.1)	16 (11.3)		
No	259 (95.2)	131 (95.8)	115 (81.6)		
Don't know	0 (0)	0 (0)	0 (0)		
Dry mouth					
Frequently	0 (0)	0 (0)	0 (0)	21.477	0.000*
Sometimes	3 (1.1)	1 (0.7)	10 (7.1)		
No	249 (91.6)	130 (94.9)	115 (81.6)		
Don't know	0 (0)	0 (0)	0 (0)		
Felt embarrassed due to appearance of teeth					
Frequently	0 (0)	0 (0)	0 (0)	7.490	0.024*
Sometimes	3 (1.1)	1 (0.7)	10 (7.1)		
No	249 (91.6)	130 (94.9)	115 (81.6)		
Don't know	0 (0)	0 (0)	0 (0)		
Felt tense because of problems with teeth or mouth					
Frequently	4 (1.5)	3 (2.2)	0 (0)	5.845	0.211
Sometimes	16 (5.9)	4 (2.9)	11 (7.8)		
No	252 (92.7)	130 (94.9)	130 (92.2)		
Don't know	0 (0)	0 (0)	0 (0)		
Have avoided smiling because of teeth					
Frequently	2 (0.8)	2 (1.5)	0 (0)	16.217	0.003*
Sometimes	24 (8.8)	0 (0)	15 (10.6)		
No	246 (90.4)	135 (98.5)	126 (89.4)		
Don't know	0 (0)	0 (0)	0 (0)		
Had sleep that is often interrupted					
Frequently	19 (6.9)	7 (5.1)	9 (6.4)	7.444	0.114
Sometimes	51 (18.7)	25 (18.3)	13 (9.2)		
No	202 (74.3)	105 (76.6)	119 (84.4)		
Don't know	0 (0)	0 (0)	0 (0)		
Have taken days off work					
Frequently	1 (0.4)	1 (0.7)	0 (0)	1.819	0.796
Sometimes	7 (2.6)	4 (2.9)	2 (1.4)		
No	264 (97.1)	132 (96.4)	139 (98.6)		
Don't know	0 (0)	0 (0)	0 (0)		

Continued.

Variables	18-35 years (%)	36-50 years (%)	51-65 years (%)	Chi-square value	P value
Difficulty doing usual activities					
Frequently	1 (0.4)	0 (0)	0 (0)	2.312	0.679
Sometimes	9 (3.3)	4 (2.9)	2 (1.4)		
No	262 (96.3)	133 (97.1)	139 (98.6)		
Don't know	0 (0)	0 (0)	0 (0)		
Felt less tolerant of spouse or close people					
Frequently	0 (0)	0 (0)	0 (0)	2.393	0.302
Sometimes	14 (5.1)	3 (2.2)	0 (0)		
No	258 (94.9)	134 (97.8)	133 (94.3)		
Don't know	0 (0)	0 (0)	8 (5.7)		
Have reduced participation in social activities					
Frequently	0 (0)	0 (0)	0 (0)	0.719	0.698
Sometimes	4 (1.5)	1 (0.8)	1 (0.7)		
No	268 (98.5)	136 (99.2)	140 (99.3)		
Don't know	0 (0)	0 (0)	0 (0)		

Note: p<0.05*(significant), Chi-square test.

Table 6: Life style behaviors related to oral health according to age.

Variables	18-35 years (%)	36-50 years (%)	51-65 years (%)	Chi square value	P value
Fresh fruit					
Often	24 (8.8)	5 (3.6)	13 (9.2)	6.404	0.171
Occasionally	114 (41.9)	67 (48.9)	69 (48.9)		
Seldom	134 (49.3)	65 (47.5)	59 (41.8)		
Biscuit					
Often	16 (5.9)	3 (2.2)	6 (4.3)	5.908	0.206
Occasionally	75 (27.6)	30 (21.9)	31 (21.9)		
Seldom	181 (66.5)	104 (75.9)	104 (73.8)		
Sweet pies, bun					
Often	7 (2.6)	3 (2.2)	3 (2.1)	12.846	0.012*
Occasionally	78 (28.7)	21 (15.3)	24 (17)		
Seldom	187 (68.7)	113 (82.5)	114 (80.9)		
Jam or honey					
Often	13 (4.8)	3 (2.2)	6 (4.3)	4.700	0.319
Occasionally	76 (27.9)	31 (22.6)	30 (21.2)		
Seldom	183 (67.3)	113 (82.5)	105 (74.5)		
Chewing gum					
Often	7 (2.6)	0 (0)	2 (1.4)	7.338	0.119
Occasionally	28 (10.3)	13 (9.5)	7 (4.9)		
Seldom	237 (87.1)	124 (90.5)	132 (93.7)		
Sweet/candy					
Often	13 (4.8)	3 (2.2)	6 (4.3)	4.7000	0.319
Occasionally	36 (13.2)	31 (22.6)	30 (21.3)		
Seldom	223 (82)	103 (75.2)	105 (74.4)		
Lemonade, Coca cola or soft drink					
Often	1 (0.4)	1 (0.7)	0 (0)	8.248	0.083
Occasionally	75 (27.6)	25 (18.2)	25 (17.7)		
Seldom	196 (72)	111 (81.2)	116 (82.3)		
Tea with sugar					
Often	43 (15.8)	15 (10.9)	26 (18.4)	19.008	0.001*
Occasionally	44 (16.2)	46 (33.6)	25 (17.7)		
Seldom	185 (68)	76 (55.5)	90 (63.9)		
Coffee with sugar					
Often	2 (0.7)	1 (0.7)	0 (0)	2.525	0.640
Occasionally	33 (12.1)	12 (8.8)	13 (9.2)		
Seldom	237 (87.2)	124 (90.5)	128 (90.8)		

Continued.

Variables	18-35 years (%)	36-50 years (%)	51-65 years (%)	Chi square value	P value
Tobacco use cigarettes					
Often	21 (7.7)	12 (8.7)	21 (14.9)	7.067	0.132
Occasionally	8 (2.9)	7 (5.1)	6 (4.3)		
Seldom	243 (89.4)	118 (86.1)	114 (80.8)		
Cigar					
Often	3 (1.1)	0 (0)	5 (3.5)	6.56	0.038*
Occasionally	0 (0)	0 (0)	0 (0)		
Seldom	269 (98.9)	137 (100)	136 (96.5)		
A pipe					
Often	0 (0)	0 (0)	0 (0)	5.823	0.054
Occasionally	0 (0)	0 (0)	2 (1.4)		
Seldom	270 (99.3)	137 (100)	139 (98.6)		
Chewing tobacco					
Often	8 (2.9)	7 (5.1)	10 (7.1)	6.850	0.144
Occasionally	10 (3.7)	5 (3.6)	1 (0.7)		
Seldom	254 (93.4)	125 (91.3)	130 (92.2)		
Snuff					
Often	0 (0)	1 (0.2)	0 (0)	8.812	0.066
Occasionally	2 (0.7)	0 (0)	4 (2.8)		
Seldom	270 (99.3)	136 (99.2)	137 (97.2)		
Other					
Often	0 (0)	0 (0)	0 (0)	6.055	0.049*
Occasionally	0 (0)	2 (0.7)	0 (0)		
Seldom	272 (100)	136 (99.2)	137 (97.2)		
Alcohol/day					
Less than 1 drink	0 (0)	6 (4.4)	2 (1.4)	40.957	0.000*
1 drink	2 (0.7)	3 (2.2)	12 (8.8)		
2 drink	5 (1.8)	6 (4.4)	1 (0.7)		
3 drink	0 (0)	1 (0.7)	0 (0)		
4 drink	2 (0.7)	1 (0.7)	1 (0.7)		
5 or more drink	1 (0.4)	1 (0.7)	2 (1.4)		
Did not drink	262 (96.3)	119 (86.9)	123 (87.6)		

Note: p<0.05*(significant), Chi-square test.

DISCUSSION

This study was first of its kind, to our knowledge no earlier study has been conducted with the aim to assess the oral health, oral health behaviors and lifestyle behaviors of people living in Mathura city, Uttar Pradesh. Dental caries and periodontitis are caused by microorganisms, but age, gender, socioeconomic status, oral hygiene habits, tobacco usage and regular dental visiting patterns may modify the progression of these diseases. Others reported factors associated with missing teeth include level of education, income, oral hygiene practices, marital status, gender and smoking.[12]

In present study out of 550 participants, 272 (49.5%), 137 (24.9%) and 141 (25.6%) participants belonged to 18-35, 36-50- and 51-65-years age group respectively.[6] However, result was found in contrast to study conducted by Leila et al in which 875 (37.9%), 719 (31.2%) and 716 (30.9%) participants belonged to 18-35, 36-50 and 51-65 years age group respectively. In present study, 272 (100%) participants of 18-35 years age group 107 (78.1%) participants of 36-50 years of age group and 64 (45.4%) participants of 51-65 years of age group had 20 teeth or more. Result was found similar to the study conducted by Leila et al in which 795 (92.7%) participants of 18-35 years age group, 513 (71.3%) participants 36-50 years age group and 362 (49.4%) participants of 51-65 years age group had 20 teeth or more.[6]

In this study, 146 (53.7%) participants of 36-50 years of age group, 88 (64.2%) of 36-50 years of age group and 87 (61.7%) of 51-65 years of age group had dental/mouth pain during last 12 months. However, similar trend was seen in the study conducted by Leila et al in which more than 50% participants had dental/mouth pain during last 12 months.[6] An epidemiological study has reported that poor oral health conditions affect 3.9 billion people worldwide. Due to a lack of prevention and dental treatment, tooth loss was found to be the most prevalent sequel among the population. Most dental losses are due to tooth decay, which, when left untreated, is the most common chronic disease and a major global public health problem, with significant impacts on people, health systems and economies.[13] In present study, 7 (2.6%) participants of 18-35 years of age group, 9 (6.6%) of 36-50 years of age group and 38 (26.9%) of 51-65 years of age group had removable partial denture however, 17 (12.1%) of 51-65 years of age

had full upper and lower denture. However, result was found in contrast to the study conducted by Leila et al, in which larger number of participants from different age group had full upper and lower denture.[6] In our study, it was observed that with regards to self-perceived status of teeth and gums, none of the participants had reported excellent status of teeth, which in contrast to the study conducted by Freah et al.[14] In present study poor status of teeth and gums were seen in one-third of participants aged 51-65 years, findings found similar to study conducted by Leila et al.[6]

Each one of us loves to smile and look beautiful but very few of us take our oral health problems seriously. People are either not aware of the consequences of improper oral health care or they underestimate it. Regarding oral hygiene practice it was found that 90% participants in the present study clean their teeth once a day and almost all the participants used toothbrush for teeth cleaning. However, study conducted by Leila et al revealed that 60-70% Iranian population clean their teeth once a day and used toothbrush for teeth cleaning.[6] This study revealed that, more than half of the participants did not know about fluoride containing toothpaste. The use of other methods for teeth like toothpick, dental floss was also reported limited. This emphasizes the urgent need of education and motivating public to use efficient method for oral care.

In this study, about 20% of the participants had visited a dentist once in the previous 6 months, and the most common reason for the visit was oral/dental pain or discomfort and treatment/ follow-up. Similarly, Leila et al reported that 30% of participants had visited the dentist within the past year and most common reason for the visit was oral/dental pain or discomfort.[6]

Our study revealed that mastication difficulty was the most common problem experienced by the participants, especially the older adults (51-65 years). It is assumed that tooth loss and the presence of dentures decreases chewing ability, dietary intake, and overall health. There is evidence that a mastication problem has a significant and negative impact on oral health related quality of life. Participants from 18-35 years of age felt more embarrassed due to appearance of teeth, avoided smiling because of teeth and felt less tolerant of spouse or close people. India has also earned the name of 'oral cancer capital' of the world due to high intake of both smoked and smokeless tobacco products, which are strongly associated with oral cancers. Unhealthy diet, use of tobacco in any form and alcohol are the major risk factors for both oral diseases and leading chronic diseases- cardiovascular diseases, cancer, chronic respiratory diseases and diabetes.[15] Soft drinks have a lot of probable health harm. The sugars and inherent acids have equally cariogenic and cariogenic prospective, following in possible enamel erosion and dental caries. As we know that in current years there has been elevated importance in the part of soft drinks in dental diseases that is erosion and. dental caries.[16] There was strong evidence for a significant association between a sugar-laden unhealthy diet and poor oral health. In the present study, less than one-third of the participants consumed sweets every day and consumed tea with sugar daily. Poor oral health may have an indirect effect on general health by disrupting dietary intake. Oral health problems include edentulism, removable partial dentures that fit poorly, pain or cavities in teeth, and oral disease, all of which may compromise dietary intake by changing food choices.[6]

Limitations

The findings in this study had the following limitations: first, this study used a questionnaire that was structured and standardized. Respondents had to think and recall the answers to the questions which could have led to recall bias. Second, this study relied on self-reported oral health. Self-reports represent only the impressions of participants which led to response bias or social desirability bias. Third, it can be assumed that there was some selection bias, as this study was conducted among adults visiting in dental college. There was lack of generalizability of the study findings as all participants were recruited from K.D. Dental college and hospital. This might limit the ability to extrapolate these finding to large general population.

CONCLUSION

The findings of the present study implied that only 21 (3.8%) were edentulous and 321 (58.4%) participants had experienced pain in last 12 months. Although majority of the Mathura adults considered their oral health status good, only a small population considered their oral health status poor. Use of oral hygiene aids such as toothpick, dental floss etc. was limited in participants. More than half of the participants were unaware of fluoride containing toothpaste. Mastication difficulty was the main oral health problem among those aged 51-65 years and about one third of population consumed sweet. Findings showed that both male and female participants had overall good lifestyle. Lack of self-care behavior and poor use of dental health service were major contributing factors for high prevalence of oral problems. The findings of the study could aid planning strategies for oral health care among the adult population.

Recommendations

The present study was conducted on participants who visited at K. D. Dental College and Hospital. There was lack of generalizability of the study findings to the general population as this study was a hospital based cross-sectional study. Further exploratory type of future studies are recommended to conduct involving large population to expand the findings of this study. Further studies are recommended to assess dental caries and periodontal disease as risk factors for tooth loss, involving participants from different social classes that would enhance the applicability of finding to the general population. More than half of the participants did not know about fluoride containing toothpaste. The use of other methods for teeth

like toothpick, dental floss was also reported limited. This emphasizes the urgent need of education and motivating public to use efficient method for oral care.

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