Original Article

Gender Differences in Prevalence of Dental Caries in Undergraduate Dental Students at Islam Dental College

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ABSTRACT

Objective: The current study is to evaluate the gender differences in the prevalence of dental caries..
Study Design: It is an observational cross sectional study.
Place and Duration of Study: This study was conducted at the undergraduate level dental students at Islam Dental College, Sialkot from May, 2017 to January, 2018.
Materials and Methods: A sample of 156 undergraduate dental students was selected representing both genders with age 18-25 years. The The Decayed, Missing, Filled **(**DMF) index (DMFT index) was used to quantify the aggregate life of the dental caries. The students were demanded to sit upright on the dental chair. Sterilized instruments were used for each student separate. World Health Organization (WHO) recommended procedure was followed to examine the oral dental status regarding caries. All permanent teeth were examined for the presence of caries. The relationship between gender and the prevalence of dental caries was assessed by the Chi-square test. Independent t-test was performed to test means differences between groups. P-value ≤ 0.05 was considered as significance results.
Results: A sample of 156 students was examined. The results of this study revealed that average overall DMFT score difference was not found significant with gender (1.64±1.25 vs 1.40±1.16; p=0.282). However, number of dental caries that is the factor of DMFT average was statistically significant with p=0.002 and number of missing teeth was significant (p=0.045) with graduate study years.
Conclusion: Females were the most affected by dental caries. According to DMFT scale low level decayed was presented in undergrad dental students. Relationship between DMFT score and age groups was highly statistical significant. However, the decayed factor of the average DMFT score was significant while other factors of DMFT score were non-significant.
Key Words: Prevalence; Dental Caries; DMFT Index; Cross Sectional Study; Gender

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INTRODUCTION

Dental caries is a long term microbial and infectious disease, in which normal molecular interactions between the teeth's surface and the adjacent microbial biofilm is disrupted. It results in the demineralization of teeth, which if left untreated, leads to cavitation and pulp damage. The interaction of different factors, such as, fermentable carbohydrates rich food, especially refined sugars, particular bacteria in dental plaque, and a susceptible tooth surface causes demineralization of the tooth.[1]

Dental caries is an extensive long-term infectious disease in which billions of people are effected globally. It is a single most prevalent chronic disease and its severity increases later in life which if left untreated. The decayed, missing teeth or damaged teeth has a great effect on daily life as they cause problem with eating, chewing, smiling and communication. Gender influences the people's oral health, eating habits, related DMFT index and behaviors. World Health Organization (WHO) categorized dental caries as third most prevalent oral disease that affect people irrespective of their demography.[2] The prevalence of dental caries is almost 100% of the adult population in the majority of countries worldwide.[3]

In Pakistan, oral health situation is showing desperate results; dental caries is five times more common than asthma and seven times more common than hay fever.[4] Now it is a major public health problem among developing countries because of inadequate oral hygiene practices, increased intake of sugar as well as inadequate exposure to fluoride supplements.[5] Thus, it is not surprising that the WHO calls for actions for

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continuous improvement in oral and dental health. [6] It has been documented that dental health workers play a significant role in enhancement of public health education level by motivating general public to take good care of their oral health during their clinical practicing years at undergraduate level.[7]

The **D**ecayed, **M**issing, **F**illed **(**DMF) index has been used for almost 80 years and is well accepted as the significant measure of caries experience in dental epidemiology.[8],[9] When the index is used for teeth, this index is called DMFT, and scores per individual can range from 0 to 28 or 32. The DMFT values will be interpreted according to DMF scoring scale. In dental caries, sex differences have also been commonly observed, with most studies showing that women and girls are at higher risk of caries.[10] The factors causing increased burden of dental caries in females are not fully understood, and some of these factors may differ among populations. The current study was conducted to assess the influence of gender and age on the DMFT index. For the dental caries, both variables (gender and age) are considered as significant variables.

Current study also seeks to assess the prevalence of dental caries with gender differences in undergrad dental students. Hence it was essential to evaluate the present condition of dental caries status as well as awareness about oral health.

MATERIALS AND METHODS

An observational cross sectional study was performed. A sample of 156 students was selected by non-probability convenient sampling. The study was conducted between May, 2017 to January, 2018. The current study was conducted on the undergraduate dental students with 18-25 ages of Islam dental collage, Sialkot, Panjab. Confidentiality and security of data was ensured and written consent form was signed by participant. The subjects were informed that there are no disadvantages or risks involved in the study. More than 25 years age students, belonging to the other field except dental students and unwilling students were excluded**.**

WHO recommended procedure was followed to examine the oral dental status regarding caries. Students were examined by qualified dentist in the operative department of Islam dental college. A Performa was filled by researcher herself which consists two parts. In this 1st part, demographic data such as name, age, gender, area and year of degree are included while in other part DMFT index was used to assess the dental caries condition in undergraduate dental students. This index is used to quantify and calculate the aggregate life of the dental caries situation. In DMFT index, (D) indicates the decayed, (M) missing, (F) filling and (T) teeth. DMFT index=D+M+F, in this equation D is the untreated number of dental caries teeth, M presents the missing teeth due to caries and F indicates the number of teeth with filling. For the interpretation, DMF scale was used, according to this scale, 0-4, 5-9 and >9 scores represent the low, moderate and high decayed status respectively. The students were required to sit upright on the dental chair. Sterilized instruments were used for each student separately. Whole procedure and protocol to examine the teeth of students was followed by examiner.

Statistical Analysis: Date was entered and analyzed by software, statistical package for social sciences (SPSS) Version 20.0. Mean and standard deviation were analyzed for quantitative data, while for qualitative data frequency and percentages were calculated. The relationship between gender and the prevalence of dental caries was assessed by the Chi-square test. Independent t-test was performed to test the average DMFT, dental caries or decayed, missing, and filling differences between different groups. Leven's test for homogeneity was also performed to fulfill the assumption of equal variance for independent t-test. 95% confidence level was used and P-Value ≤ 0.05 was considered as significant.

RESULTS

A sample of 156 undergraduate dental students was selected in this study. Socio demographic characteristics of participants are displayed in Table 1. A large number 114(73%) of total were females while approximately fourth part 42(27%) were male students.

Table No.1: Socio demographic characteristics of participants

Characteristics		n	%
Gender	Male	42	26.9
	Female	114	73.1
Age (Years)	<19	28	17.9
	19-21	49	31.4
	21-23	51	32.7
	23-25	28	17.9
Area	Rural	67	42.9
	Urban	89	57.1
Graduation Year	1st Year	43	27.6
	2nd Year	38	24.4
	3rd Year	40	25.6
	4th Year	35	22.4
Caries Status	DMFT=0 (Healthy)	46	29.5
	DMFT>0 (Caries present)	110	70.5
DMFT Index (Score)	0	46	29.5
	1	30	19.2
	2	45	28.8
	3	31	19.9
	4	4	2.6
Total		156	100.0

Most of the students 51(32.70%) and 49(31.40%) belong to the age group 21-23 and 19-21 respectively. Participants 89(57.10%) were the residents of urban area. While, students 43(27.60%), 40(25.60%), 38(24.40%) and 35(22.40%) were taken from 1st, 3rd, 2nd and 4th year respectively which is approximately equal. 110(70%) students out of total were positive with dental caries with DMFT score (>0), while other 46(30%) were healthy students with DMFT score=0. 79(71.82%) female and 31(28.18%) male students were examined with dental caries out of 110 students with DMFT score >0 which are presented in Figure.1. DMFT Index score was also presented in Table 1. DMFT Score with 0 were 46(29.50%) which were free from dental caries; with 2 DMFT Score were 45(28.80%) which make a large number of dental caries. DMFT Score 1 and 3 were 30(19.20%) and 31(19.90%) while 4 score was 4(2.60%) of total. The association of DMFT Index score with demographic characteristic was presented in Table 2. Age and graduation year were statistically significant with p-value 0.000 and 0.015 respectively. While other variables like gender and area were non-significant with P>0.05. Comparison of average DMFT Index score in male and female in Table 3. Number of decayed which was the one portion of DMFT Index had mean±S.D, 1.10±0.93 and 0.62±0.80 in male and female respectively which was statistically significant with p=0.005 between male and female. While other portion such as number of missing and filling teeth were not significant with P>0.05 in male and female. Overall DMFT Index was also not significant.

Table No.2: Association of DMFT Index with demographic characteristic

Variables		DMFT Index					Total	Chi-Square	df	P-Value
		0	1	2	3	4				
Gender	Male	11	7	12	10	2	42	1.94	4	0.747
	Female	35	23	33	21	2	114			
Age (Years)	<19	18	0	7	2	1	28	57.15	12	0.000*
	19-21	21	5	11	10	2	49			
	21-23	7	20	12	11	1	51			
	23-25	0	5	15	8	0	28			
Area	Rural	22	5	20	17	3	67	13.13	12	0.36
	Urban	24	25	25	14	1	89			
Graduation Year	1st Year	14	3	13	11	2	43	12.41	4	0.015*
	2nd Year	9	9	12	7	1	38			
	3rd Year	13	13	8	6	0	40			
	4th Year	10	5	12	7	1	35			
Total		46	30	45	31	4	156			

*significance results with p-value≤0.05 using Chi-Square test

Table No.3. Comparison of average DMFT Score in male and female

Association of DMFT Score with Gender				t	df	P-Value	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Characteristics		n	Mean±S.D						Lower	Upper
DMFT Index	Male	42	1.64±1.25	1.084	68.709	0.282	.23935	.22071	-.20100	.67969
	Female	114	1.40±1.16							
No. of Decayed	Male	42	1.10±0.93	2.911	64.705	0.005*	.47243	.16228	.14831	.79655
	Female	114	0.62±0.80							
No. of Missing Teeth	Male	42	0.0±0.0	-1.228	154	0.221	-.03509	.02858	-.09154	.02136
	Female	114	0.04±0.18							
No. of Filling Teeth	Male	42	0.57±0.67	-1.476	80.028	0.144	-.18296	.12395	-.42963	.06371
	Female	114	0.75±0.74							

*significance results with p-value≤0.05 using independent t-test

Table No.4: Association of graduate study years with DMFT Index Score with gender

Gender	Graduate Study Year (No. of Student)	DMFT Index	No. of Decayed	No. of Missing teeth	No. of Filling teeth
Male	1st Year (n=10)	1.70±1.42	1.40±1.17	_	0.30±0.48
	2nd Year (n=11)	1.73±1.10	1.36±0.92	_	0.36±0.50
	3rd Year (n=12)	1.25±1.14	0.67±0.65	_	0.67±0.78
	4th Year (n=9)	2.0±1.41	1.0±0.87	_	1.0±0.71
	Overall (42)	1.64±1.24	1.10±0.93	_	0.57±0.67
Female	1st Year (n=33)	1.61±1.30	0.97±0.92	_	0.63±0.65
	2nd Year (n=27)	1.44±1.15	0.70±0.87	_	0.74±0.59
	3rd Year (n=28)	1.14±1.04	0.39±0.63	0.071±0.26	0.68±0.82
	4th Year (n=26)	1.38±1.10	0.35±0.56	0.08±0.27	1.0±0.85
	Overall (114)	1.40±1.16	0.62±0.80	0.035±0.18	0.75±0.74
P-Value		0.282	0.002*	0.045*	0.16

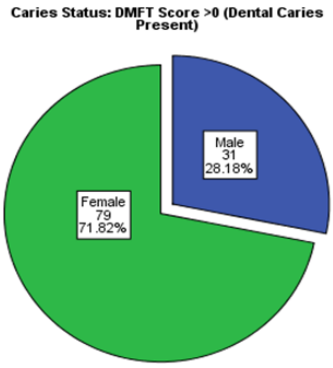

Figure No.1. Dental caries status in both genders

In Table 4. Association of gender and DMFT index score in different graduation years is presented. No of decayed average 1.10±0.93 and 0.62±0.80 in male and female students and this relationship is statistically significant with p=0.002. And number of missing teeth average were 0.00±0.00 and 0.035±0.18 in male and female students respectively and also significant with p=0.045 in different graduation years.

DISCUSSION

Current study was performed to evaluate the prevalence of dental caries with gender differences. A sample of 156 undergraduate dental students of both genders with age 18-25 years were selected by non-probability convenient sampling. In Pakistan, undergraduate dental program is comprised of four years of education with a year of house job. DMFT index score and oral health are affected by gender and age. [14]

In the current study, graduate students was divided in four groups, <19, 19-21, 21-23 and 23-25. Association between DMFT score and age was highly statistical significant with p<0.05.The results of current study were showed the same trend regarding age and gender to othercross sectional study conducted by an authoron undergraduate dental students in Lahore Medical and Dental College, Lahore.[11]Other studiesof same study design also supported that the caries prevalence was higher in females than males. [12,13,16]

In the current study, relationship of DMFT score and area was not significant with p=0.36, while another study which was published in 2016, author reported that caries was higher in rural area[17] which was the opposite to this study results, because that study was conducted in developed countries.

The results of this study revealed that average overall DMFT score difference was not found significant in male and female (1.64±1.25 vs 1.40±1.16; p=0.282). DMFT Index for male was found 1.64±1.25 (Low dental caries) with no. of decayed, no. of missing teeth and no. of filling teeth were 1.10±0.93, 0.0±0.0and 0.57±0.67examined while in femaleDMFT Index was examined 1.40±1.16 (Low dental caries), with no. of decayed, no. of missing teeth and no. of filling teeth wereobserved 0.62±0.80, 0.04±0.18 and 0.75±0.74 respectively. However, no. of dental caries that is the factor of DMFT average was statistically significant with p=0.002 and no. of missing teeth was significant (p=0.045) with graduate study years.The results of current study revealed that there is lower dental caries status in male and female both. Results of various studies which was conducted in Pakistan and Saudi Arabiaalso reported similar results.[11,15]

CONCLUSION

Dental caries is most common in female as compare to male.Average overall DMFT score difference was not significant in both genders. Results of current study revealed that low dental caries status in male and female both. Relationship between DMFT score and age groups was highly statistically significant. There was no significant difference in average DMFT score in females among the different academic levels. However, the decayed factor of the average DMFT score significantly decreased while other factors of DMFT score were non-significant.

Recommendations: Prevention is most important to control the dental caries, in updated dentistry must focus on prevention as compare to treatment. For this purpose, regular visits to the dentist to timely diagnose the oral problem at earlier stages. Firstly, it is essential to follow the dentist guidance regarding diet, oral hygiene and proper care of teeth from the dental caries.

Author's Contribution:

Concept & Design of Study:	Rehana Kausar
Drafting:	Suleman Atique
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Revisiting Critically:	Rehana Kausar, Suleman Atique
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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