

Comparison of Oral Health Status of Students Attending Three Different Education Systems in Pakistan

Nadia Zaib¹, Mahrukh Zafar², Rabia Masood³, Amber Kiyani⁴

ABSTRACT

Background and Objective: The objective of this study was to compare the prevalence of dental caries through the Decayed, Missing and Filled Teeth (DMFT) index of students belonging to the three different educational systems of Pakistan in order to ascertain the baseline statistics for the Pakistani student population.

Methods: A cross-sectional study was conducted during the year 2018 to record DMFT scores of students studying in madrassas, government and private schools of Rawalpindi and Islamabad. A total of 663 students underwent a DMFT evaluation by trained dentists following the consent of their parents. The results were analyzed by using one way ANOVA and post-hoc tests for comparing DMFT scores among the students of different school system using Statistical Package for Social Sciences (SPSS) version 23 and a P-value of <0.05 was taken as significant.

Results: Madrassa group of students had the best DMFT scores; mean DMFT of 1.2 ± 1.9 whereas private school students had a mean DMFT of 2.17 ± 2.9 and Government school children had a mean DMFT score of 2.09 ± 2.08 . While comparing the DMFT scores of madrassa students with government and private school students, statistically significant results were observed.

Conclusion: Although an acceptable DMFT score was obtained for each of the three education systems; madrassa, government and private schools; the DMFT scores were the lowest for the madrassa students indicating best dental health in them.

KEY WORDS: DMFT, School children, Pakistani education systems, Socioeconomic status.

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INTRODUCTION

The National Oral Health Program (NOHP) of India affirms that oral health is essential for general health and well-being of every individual and oral diseases are a major public health concern owing to their higher prevalence and their effects on the individual's quality of life.¹ Among oral diseases, dental caries is the most common dental disease affecting individuals around the globe.² According to the World Health Organization (WHO) Path Finder Survey report majority of the people do not

have access to the basic curative dental health facilities in the public and the private sectors in Pakistan. Also the individuals in the age group of 12-15 years, lost about two to three teeth due to dental caries.³ The DMFT score has been used as a relevant tool in monitoring the severity and distribution trends of dental caries since 1938. It is used by the World Health Organization (WHO) for assessment of oral health by reflecting intensity or frequency of dental caries.⁴ The WHO DMFT index is categorized as very low in the value of 0.0-1.1, low in the value of 1.2-2.6, moderate in the value of 2.7-4.4, high in the value of 4.5- 6.5, and very high in the value above 6.6.⁵

Studies have shown a lack of oral health awareness in human populations with limited education and low socioeconomic status (SES).^{6,7} The report from the US committee on oral health strategic framework shows increased differences in the oral health status of individuals with a high SES and those with low SES over the last decade. The reason behind this difference is expensive dental care.⁷ Apart from finances, individuals with high SES are more likely to have better education and oral health awareness levels.⁶ Education may compensate some effects of poverty on health. Other factors that can affect oral health include genetics, lifestyle, and environment.⁹

The National Education Census (NEC) recognizes two educational systems in Pakistan including public and private sector educational institutes. In urban areas, 51% students are enrolled in private schools, while 49% in the public sector. The situation is reversed in rural areas, where over 80% of students attend public schools.¹⁰ The madrassas are part of a very important and widespread education system that exists in Pakistan & also in south Asian countries the religious seminaries are commonly called as Madrassa.¹¹ Madrassa is the Arabic word for educational institution, secular or religious (of any religion).¹² Madrassas and government/public educational institutes, being more economical, mostly attract students from lower SES. Private schools in Pakistan present with better infrastructure and teaching environment and are therefore expensive. Unfortunately, the madrassa students are most ignored by the Pakistani government.¹¹ This is probably because they belong to lower SES with a weak academic background.

In previous studies, comparisons regarding oral health status of students attending government and private school systems have been made.¹³⁻¹⁶ However, a gap in literature exists when it comes to evaluation and comparison of oral health status of madrassa students with other school systems in Pakistan. While considering these facts, the objective of this study was to determine the DMFT indices in students attending these three different school systems and compare their results. To the best of our knowledge, no such study has ever been performed before. It will determine the baseline statistics of dental health of Pakistani students belonging to three different education systems and help us to plan awareness campaigns for each target population more effectively in future.

METHODS

This study was approved by the Ethical Committee of Riphah International University, Islamabad vide Letter No. IIDC/IRC/2018/10/02. It was a cross-sectional, comparative study conducted from November 2018 to December 2018, in the cities of Rawalpindi and Islamabad. The sample size was calculated using the WHO sample size calculator. With a confidence interval of 95% and a margin of error at 5% the estimated sample size was $n = 387$. However, to improve accuracy we collected data from 700 students. Inadequate information led to exclusion of some incomplete proformas giving us a final sample of $n = 663$.

The students whose parents gave consent and were present on the day of the oral examination were included. While the students whose parents did not give consent or were absent on the day of the examination were excluded from the study.

Dental examination was carried out by four dental students and two house officers for all three education systems i.e. government schools, private schools and madrassas. All examiners were trained to perform dental examination and record information on standardized DMFT proformas. Two observers performed the examination independently, however, only the information confirmed by both observers was considered. DMFT scores of both primary and permanent teeth, except third molars, were assessed. Record of demographic details including name, age, gender, class and institute and the recommended treatment

based on the clinical finding was also recorded on the proformas.

STATISTICAL ANALYSIS

The data was analyzed using Statistical Package for Social Sciences (SPSS) version 23. Descriptive analysis was done for the age and gender. To compare the mean DMFT scores between the genders, independent t-test was applied. One-way ANOVA, Post-hoc analysis was done to compare DMFT scores between institutions. A P-value equal or less than 0.05 was considered as statistically significant.

RESULTS

DMFT scores of n = 663 students were recorded from the three mentioned education systems of Pakistan. This included 233 madrassa, 217 private school and 213 government school students. The age of the students ranged from 02 to 25 years with mean-age of 11.47 (SD ± 3.9). The mean age of madrasa, private school and government school students was 13.81 (SD ± 3.5), 9.79 (SD ± 3.7) and 10.62 (SD ± 3.3) years, respectively. There were 351 male and 312 female students (Fig.1).

The overall mean DMFT score of current study population was 1.82 (SD ± 2.3) with around 58% having a DMFT scores of either 0 or 1. This shows that current study population had an overall acceptable dental health because lower DMFT score indicates better oral health. Out of n = 663 students 40.6% had DMFT scores of zero. This included 118 (50.6%) of madrasa students, 91 (41.9%) of private school students and 60 (28.2%) of government school students (Table-1). The mean

DMFT score among male students was 1.96 (SD ± 2.3), and 1.66 (SD ± 2.3) in female students. An independent T-test rendered statistically insignificant results when the DMFT scores of the two genders were compared (P-value = 0.1). Detailed DMFT scores of both genders are summarized in (Table-1).

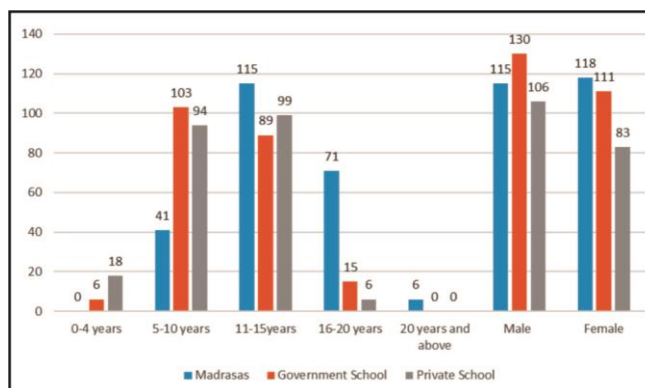


Fig.1: Distribution of participant's age and gender among different education systems.

The Mean DMFT scores of madrasa, government school and private school students were 1.2 (SD ± 1.9), 2.09 (SD ± 2.08) and 2.17 (SD ± 2.9), respectively. These results then suggest that although students belonging to all three education systems had acceptable dental health; nonetheless madrasa students had the best dental health as compare to the other students as they had the lowest DMFT score. Statistically, significant results (P value < 0.001) for madrasa students were seen in comparison to the other two groups (Table-2).

Table-1: Gender and institution wise DMFT score distribution.

Institutes		DMFT Score							Total n (%)
		0 n (%)	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)	6 and Above n (%)	
Madrassas	Male	62	16	13	12	3	3	6	115
	Female	56	27	16	10	3	3	3	118
	Total	118 (50.6)	43 (18.5)	29 (12.4)	22 (9.4)	6 (2.6)	6 (2.6)	9 (3.9)	233 (100)
Private Schools	Male	39	19	10	12	6	3	17	106
	Female	52	16	9	7	8	8	11	111
	Total	91 (41.9)	35 (16)	19 (8.8)	19 (8.8)	14 (6.5)	11 (5)	28 (12.9)	217 (100)
Government Schools	Male	28	27	22	21	18	8	6	130
	Female	32	12	16	6	5	6	6	83
	Total	60 (28.2)	39 (18.3)	38 (17.8)	27 (12.7)	23 (10.8)	14 (6.6)	12 (5.6)	213 (100)
Total		269 (40.6)	117 (17.6)	86 (13)	68 (10.3)	43 (6.5)	31 (4.7)	49 (7.4)	663 (100)

Table-2: Comparative DMFT Score of all the institutes.

<i>Types of Institutes</i>		<i>P*-Value</i>
Madrassa	Private Schools	0.000
	Government Schools	0.000
Private Schools	Madrassa	0.000
	Government Schools	0.741
Government Schools	Madrassa	0.000
	Private Schools	0.741

P* One way ANOVA following Post Hoc analysis applied comparing DMFT of all the Institutes

DISCUSSION

World Health Organization and Federation Dentaire International (FDI) made the goal regarding oral health that 12 years aged children will not have an average of more than three decayed, missing, and filled permanent teeth (DMFT score 3) by the year 2000.¹⁷

The mean DMFT score of current study population was 1.82 while 58% of our students had DMFT scores of 0 or 1. Although results of present study were better than those from Albania (DMFT = 4.41), and the United Kingdom (DMFT 3 or lower), still they were much higher than those reported by school going students in Belgium (DMFT = 0.3-1.3).¹⁸⁻²⁰ The Iranian school going students from Piranshahr and Hamadan cities showed mean DMFT scores of 0.79 and 2.53, respectively, while DMFT scores in Indian school going children from Chandigarh was 1.06.²¹⁻²³ A wide range of DMFT scores was noted in the populations, the scores appear to be higher in some western populations when compared to Asian countries. This is most likely due to a higher consumption of processed foods and sugar in the Western countries.²⁴ A local study from government schools of Bhakkar showed a mean DMFT score of 1.49, while that from 11 to 12-year-old children from private schools of Karachi produced scores of 1.27² and 10 to 16-year-old students from both government and private schools of northwest region of Pakistan had DMFT values of 1.75.²⁵⁻²⁷ All these Pakistani studies showed nearly similar DMFT findings as that of the current study, exhibiting an overall acceptable oral health status.

In the current study, no statistically significant results in the DMFT scores were found while comparing male and females. However, lower DMFT scores were prevalent in females which are in accordance to an Albanian study that showed

higher DMFT scores in males.¹⁸ This can be attributed this to a higher sense of responsibility incorporated in females in our culture that makes women more vigilant about maintaining oral hygiene. However, contrary to our findings, studies from Iran and Spain determined that DMFT scores of females were much higher than males.^{22,28}

To the best of our knowledge, present study is one of the first to evaluate the oral health status of madrassa students in Pakistan. This is most likely because madrassas restrict access in Pakistan.²⁹ Another reason can be that in Pakistan madrassas often represent an under privileged group and are more likely to be ignored by researchers. A prior study from Bangladesh evaluated the oral health status of 6 to 12-year-old madrassa students. Their mean DMFT score was 1.94 while comparing to 1.22 of current study.³⁰ This difference can be attributed to differences in staple diet between the two countries.

Oral health status of government and private school systems has been evaluated by multiple studies.¹³⁻¹⁶ A study from Bhakkar city revealed that almost 80% of the government school students were in the moderate to high risk caries group when compared with 24% students of private school systems.²⁵ A study from Karachi evaluated the periodontal health of students in government and private schools. It found a higher prevalence of periodontal diseases in government school students when compared with the private school students.¹³ An Indian study showed improved oral hygiene indices in students from private school when compared with government schools while a Nepalese study showed a higher percentage of students in government schools having low DMFT when compared with private schools.¹⁴⁻¹⁵ The superior oral health status of students from private schools in Pakistan and those in the neighboring countries can be due to better awareness, and higher SES of students allowing them to afford dental care.^{15,16} Our results were somewhat different.

Our mean DMFT scores from public schools were slightly better than those from private schools. These findings were similar to Sudan where mean DMFT values were high for private school when compared with students from public sector.¹⁶

Madrassa students in the present study had the best DMFT scores when compared with public and private school students. The most likely reason behind may be the use of miswak up to five times daily according to the Sunnah of Prophet Mohammad (PBUH). This would maintain optimum oral hygiene and prevent caries. Other reasons are the financial constraints of the parents that send their children to such schools and they don't have money to afford high sugar or processed products sold in the markets. However, in order to ascertain this, additional studies are required.

High cost of dental care and/or low oral health literacy is among the leading causes of current caries prevalence in our school going population. It can be recommended that collaborative efforts should be made by the government and non-government organizations to initiate oral health programs in all types of educational institutes to further improve the situation.

CONCLUSION

Though an acceptable DMFT score was obtained for each of the three education systems; madrassa, government and private schools; the DMFT scores were lowest for the madrassa students depicting best dental health.

LIMITATIONS OF THE STUDY

The authors were unable to assess effects of oral hygiene habits and dietary habits in this population, this limits the authors from making definitive assessments. It is believed that additional studies are required at a national level to determine the steps that can be taken to improve oral hygiene in Pakistani students.

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CONFLICT OF INTEREST

None to declare.

GRANT SUPPORT & FINANCIAL DISCLOSURE

None to disclose.

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Author's Contribution

NZ: Conception and design of study, drafting, data interpretation and revising it critically.

MZ: Drafting of manuscript and data interpretation.

RM: Data interpretation, revising it critically for important intellectual content.

AK: Manuscript drafting and revising it critically for important intellectual content.

ALL AUTHORS: Approval of the final version of the manuscript to be published.