

# Assessment of Oral Health Behaviour & Self Practice among Hazrat Bari Sarkar Medical & Dental Students using the Hiroshima University - Dental Behavioural Inventory (HU - DBI)

Ahmad Usman Yusuf<sup>1</sup>, Qurat-UI-Ain<sup>2</sup>, Shazia Sarwat Iqbal<sup>2</sup>, Mudassir Hussain<sup>4</sup>, Farhan Butt<sup>5</sup>, Syed Tariq Ali Adnan<sup>6</sup>

## Abstract

**Objectives:** To assess oral health behaviour & self-practice among HBS undergraduate medical & dental students in Islamabad, Pakistan & to evaluate the variations in oral health behaviour & self-practice based on age, gender, academic program (MBBS/BDS) & education year.

**Methods:** Hiroshima University Dental Behaviour Inventory (HU-DBI) questionnaire in English version consisting of 20 dichotomous responses (Agree/Disagree) was self-administered among 300 undergraduate medical & dental students of HBS Medical & Dental College in Islamabad. Three hundred medical and dental students were selected by convenience sampling. This cross-sectional study was conducted in the month of October 2019 & 38 questionnaire forms were excluded from the study which were incomplete & data was analysed on 262 (51 from dental & 211 from medical students) student's responses using SPSS Version 24 and statistical significance was set at  $P < 0.05$ .

**Results:** The mean age of students who participated in the study was  $21.26 \pm 1.90$  years with a total number of 109 males & 153 females. A significantly higher HU-DBI score was observed among students from higher years of education only (p-value of 0.015). Majority of students (80.1%) brush their teeth daily. About 64.5% of students mentioned that they use toothbrushes & 15.6% used miswak on daily basis for cleaning their teeth. About 88.6% of students did not use mouthwash & toothpicks regularly.

**Conclusion:** It can be concluded from the results that students belonging to higher year of education showed improved oral health behaviour and attitude as compared to early year of education. Overall health behaviour observed was adequate.

**Keywords:** Medical students, Dental students, Hiroshima University-Dental Behavioural Inventory, Oral attitudes, Oral health behavior.

**IRB:** Approved by institutional board of Hazrat Bari Sarkar Medical and Dental College.

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## Introduction

The ideal level of general health cannot be achieved without maintaining an optimum level of

<sup>1,2</sup>Department of Community Dentistry HBS, Medical and Dental College

<sup>3,4</sup>Department of Community Dentistry, Karachi Medical & Dental College

<sup>5</sup>Department of Periodontics

<sup>6</sup>Department of Community Medicine, Karachi Medical and Dental College

**Correspondence:** Dr. Ahmad Usman Yusuf  
Department of Community Dentistry  
HBS Medical & Dental College

Email: dr\_usman11@hotmail.com

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oral health. Oral health cannot be isolated from the rest of the body as the mouth acts as the main gateway for providing all kinds of nutrition to the human body plus a healthy mouth also promotes self-confidence, social interaction, and feeling of well-being. Many research studies have suggested a strong association of oral health to systematic health in a way that compromised or untreated oral health can lead to certain systematic diseases<sup>1</sup>.

This signifies the importance of maintaining oral hygiene in one's life. The main reason for oral health being compromised is due to lack of timely

dental visits, untreated dental problems & unhealthy practices like the use of tobacco<sup>2</sup>. The goals for the year 2020 by World Health Organization (WHO) recommends oral self-care (ROSC) which includes limiting consumption of snacks containing sugar to once daily or rarely, developing a habit of tooth-brushing more than once & use of toothpastes containing fluoride regularly<sup>3</sup>. In order to achieve this goal for a developing country like Pakistan, it is mandatory to evaluate the level of oral hygiene awareness among the population.

The population of Pakistan addressed their oral health concerns mainly to personals belonging to the field of medicine & dentistry. Dentist to population ratio recommendation by WHO for developing countries (like Pakistan) should be 1:7500<sup>4</sup>. According to Pakistan Medical & Dental Council (PM&DC), the total number of registered dentists in Pakistan by the year 2016 were 17,12<sup>5</sup> which makes dentist to population ratio of 1:130,581 in urban areas & in rural areas of the country the condition gets, even more, worse with the ratio dropping down to more than 1:200,000<sup>5</sup>. Due to the availability of a limited number of dentists, it is essential to provide medical doctors with relevant knowledge related to oral health during their academic years for addressing any oral health-related problem & promoting oral hygiene among the population with limited or no approach to dental health professionals.

A cross-sectional study was conducted in Karachi (city of Pakistan) among students of private medical & dental college using HU-DBI questionnaire. In this study, statistical significance was observed on the basis of the academic program (MBBS/BDS) with results showing better oral health attitude & behaviour among dental students<sup>6</sup>. Another cross-sectional study was conducted in Hyderabad (city of Pakistan) among nursing students to investigate their oral health behaviour & practice using HU-DBI questionnaire in which the statistical difference was observed on the basis of gender only with male nursing students showing better oral health behaviour & practice compared to female nursing students<sup>7</sup>. Health professionals in-

cluding most medical doctors & dentists are considered as role models of society & thus their attitude & behaviour in regard to oral health is reflected upon in society as being the right method<sup>8</sup>. Medical & especially dental students are taught in their academic tenure to master knowledge relating to attitude & behaviour of general health including oral health & it's quite essential for medical/dental institutions to provide with the appropriate training for students before they enter their professional career. Medical & dental students in their clinical years come across a large number of patients with different diseases related to general health/oral health & hence given appropriate knowledge & training by medical/dental institution may bring an improvement in behaviour & attitude of patients in regard to maintenance of oral hygiene & prevention from oral diseases<sup>9</sup>. There is limited data available in regards to assessing oral health behaviour and self-practice among medical and dental students of Pakistan. Hence, the main purpose of this study is to assess the level of knowledge, attitude, and behaviour towards oral health, so that, we can justify our research statement, 'the difference that exists among medical and dental students in regard to their oral hygiene knowledge and practice'.

## Subjects and Methods

Non-Probability Convenience Sampling technique was used to select three hundred medical students (from 1st, 2nd, 3rd & 4th year MBBS) & dental students (from 1st year BDS). This cross-sectional study was done in the month of October 2019 at HBS Medical & Dental College situated in Islamabad (Pakistan) in multiple sittings. Ethical approval was taken from Ethical Committee prior to conducting this study & informed consent was taken from students who were willing to participate in the study.

Raosoft software was used to calculate sample size with 95% confidence interval, 2% margin of error and population size of 342, software generated sample size resulted of 300. A total of 300 questionnaire forms were distributed to students of differ-

ent years of medical and 1st year dental students after their lectures during free time in classrooms on multiple sittings in the month of October 2019 under the supervision of department of Community Dentistry. Out of 300, 38 forms were excluded which were not attempted at all or were not completely filled. A total of 262 questionnaire forms was included in this study with 211 forms from medical & 51 from dental students. The medical & dental students (boys and girls) of different years (1st, 2nd, 3rd and 4th year) with the age range of 18 to 27 years were only included from one private medical and dental college (HBS Medical & Dental College) while the other staff and faculty of the same college were excluded.

English version of Hiroshima University Dental Behavioural Inventory (HU-DBI) questionnaire was given to students to be filled out. HU-DBI questionnaire comprising of twenty dichotomous responses (agree/disagree) was developed by Kawamura to assess behaviour & attitude of patients in regard to their oral health during tooth brushing & calculating clinical outcomes. Most of the students completed the questionnaire in about 8-10 minutes with no complaint registered in regard to difficulty in understanding any statement. Additional information related to gender, education program, education year, age, brushing methods, brushing timing & duration was also collected. For calculation of HU-DBI score, 12 statements from the HU-DBI questionnaire were selected & one point was given for each correct answer & zero points were given for each incorrect answer. Responses of 'Agree' to statements<sup>4,10,11,12,16,19</sup> were given a score of one each, while responses of 'Disagree' to statements<sup>2,6,8,9,14,15</sup> were also given a score of one each. Hence, the total score was calculated out of 12 for each participant. The higher HU-DBI score near 12 indicated better behaviour & attitude in regards to oral health.

IBM SPSS Statistics for Windows version 24 was used for coding & entry of data into spreadsheets. Analysis was done by keeping the variable of HU-DBI score as a dependent & other variable

such as education program, education year, age & gender as an independent. The statistical value of  $p < 0.05$  was considered to be significant.

## Results

Out of the total of 300 undergraduate medical & dental students, 262 students completed the questionnaire form, thereby calculating a decent response rate of 87% which includes 109 (41.6%) males and 153 (58.4%) females. Total of 262 students include 211 (80.5%) medical students & 51 (19.5%) dental students. The age of the students in this study ranges from a minimum of 18 years to a maximum of 27 years with most of the students falling in the age group of 19-21 years having an overall mean age of 21.26.

**Table 1.** Distribution of study participants based on Gender, Education Program, Age and Education Year

Gender	Number of Students(n)	Percentage(%)
Male	109	41.6
Female	153	58.4
Total	262	100

Education Program	Number of Students(n)	Percentage(%)
BDS	51	19.5
MBBS	211	80.5
Total	262	100

Age	Number of Students(n)	Percentage(%)
18	10	3.8
19	41	15.6
20	53	20.2
21	51	19.5
22	35	13.4
23	36	13.7
24	23	8.8
25	8	3.1
26	3	1.1
27	2	0.8
Total	262	100

Education Year	Number of Students (%)	Mean Age
1st Year BDS	51 (19.5)	19.6
1st Year MBBS	50 (19.1)	19.5
2nd Year MBBS	52 (19.8)	21.50
3rd Year MBBS	54 (20.6)	22.07
4th Year MBBS	55 (21.0)	23.32
MBBS + BDS	262 (100)	21.26 (Overall Mean Age)

The overall HU-DBI mean score among medical & dental students was reported to be 5.60, which shows students of average behaviour & attitude in perspective to oral health. On comparing HU-DBI among medical education years, MBBS 4th Year reported highest score of 6.2 while MBBS 1st Year results showed lowest score of 5.1, MBBS 2nd & 3rd Year scores were 5.4 & 5.7 respectively. On relating the results of dental (BDS) 1st Year students with MBBS 1st Year, dental students showed a slightly better score of 5.4 as compared to 5.1 score of MBBS 1st Year.

**Table 2.** Mean HU-DBI score based on Education Year, Gender, Age and Education Program

HU - DBI Score Based on Education Year		
Education Year	Mean/S.D	No of Students
1ST YEAR BDS	5.4902 ± 1.78183	51
2ND YEAR MBBS	5.4231 ± 1.93367	52
3RD YEAR MBBS	5.7222 ± 1.49738	54
4TH YEAR MBBS	6.2364 ± 1.57484	55
Total	5.6069 ± 1.76221	262

ANOVA-test F= 3.144, \*P= 0.015, ANOVA-Analysis of variance. (p<0.05\*)

Based on Gender		
Gender	Mean/S.D	No of Students
Male	5.4679 ± 1.71361	109
Female	5.7059 ± 1.79503	153
Total	5.6069 ± 1.76221	262

ANOVA-test F= 1.162, \*P=0.282, ANOVA-Analysis of variance. (p<0.05\*)

Based on Age		
Age	Mean/S.D	No of Students
18.00	6.2000 ± 1.87380	10
19.00	4.8293 ± 1.61094	41
20.00	5.8679 ± 2.00995	53
21.00	5.5294 ± 1.54082	51

22.00	5.6286 ± 1.92638	35
23.00	5.5278 ± 1.62983	36
24.00	6.0435 ± 1.29609	23
25.00	5.6250 ± 2.26385	8
26.00	7.3333 ± 1.15470	3
27.00	7.0000 ± 1.41421	2
Total	5.6069 ± 1.76221	262

ANOVA-test F= 1.828, \*P=0.064, ANOVA-Analysis of variance. (p<0.05\*)

Based on Education Program		
Education Program	Mean/S.D	No of Students
BDS	5.4902 ± 1.78183	51
MBBS	5.6351 ± 1.76055	211
Total	5.6069 ± 1.76221	262

ANOVA-test F=0.277, \*P= 0.599, ANOVA-Analysis of variance. (p<0.05\*)

The results showed statistical significance for education years only (p-value = 0.015). Table 3 represents responses to each of the 20 statements of HU-DBI questionnaire on the basis of medical & dental education years. About 61% of students agree with statement 1 (don't worry much about visiting the dentist, if needed) with a majority of MBBS 3rd Year students showing significant responses to agree (78%) in their group. Almost 56% of students have not been taught professionally how to brush their teeth (statement 10) with mostly MBBS 2nd Year students in their group (73%) agree with this statement. About 70% of students disapprove of statement 11 (cleaning teeth well without using toothpaste) with a significant number of 4th Year MBBS students (76%) in their group disagree with this statement. Around 69% of students agree with the statement 15 (never go to a dentist until I have a toothache) with a significant number of MBBS 1st Year students (82%) in their group approve of this statement. Around 64% of students do not use a toothbrush with hard bristles (statement 17) with a

significant number of BDS 1st Year students (80%) agreeing to this statement.

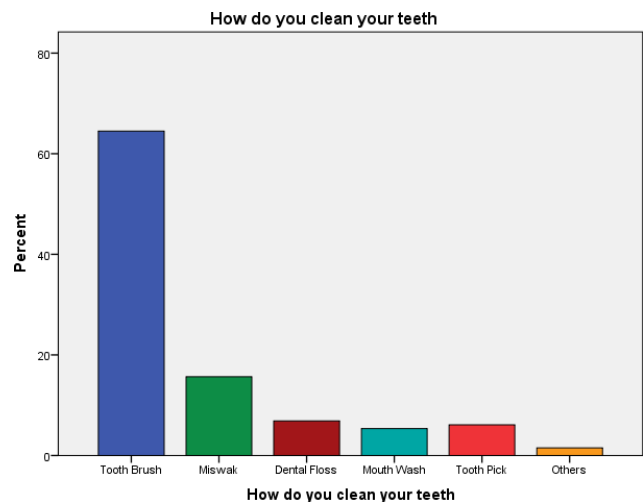
**Table 3.** Responses Obtained for Each Statement Based on Years of Study

Q. No	Responses	Total Responses 'n', Percentage (%)						P Value
		1stYear BDS		1st Year MBBS		Total (%)		
	n = 51	n= 50	n=52	n=54	n=55	n=262		
Q1	Agree	29 (57)	28 (56)	30 (58)	42 (78)	31 (56)	160 (61)	0.091
	Disagree	22 (43)	22 (44)	22 (42)	12 (22)	24 (44)	102 (39)	
Q2	Agree	20 (39)	10 (20)	16 (31)	25 (46)	17 (31)	88 (34)	0.057*
	Disagree	31 (61)	40 (80)	36 (69)	29 (54)	38 (69)	174 (66)	
Q3	Agree	42 (82)	36 (72)	33 (63)	33 (61)	33 (60)	177 (68)	0.078
	Disagree	09 (18)	14 (28)	19 (37)	21 (39)	22 (40)	85 (32)	
Q4	Agree	19 (37)	14 (28)	13 (25)	14 (26)	20 (36)	80 (31)	0.496
	Disagree	32 (63)	36 (72)	39 (75)	40 (74)	35 (64)	182 (69)	
Q5	Agree	44 (86)	46 (92)	21 (40)	41 (76)	39 (71)	191 (73)	<0.001*
	Disagree	07 (14)	04 (08)	31 (60)	13 (24)	16 (29)	71 (27)	
Q6	Agree	22 (43)	25 (50)	28 (54)	27 (50)	19 (35)	121 (46)	0.288
	Disagree	29 (57)	25 (50)	24 (46)	27 (50)	36 (65)	141 (54)	
Q7	Agree	28 (55)	26 (52)	23 (44)	29 (54)	31 (56)	137 (52)	0.757
	Disagree	23 (45)	24 (48)	29 (56)	25 (46)	24 (44)	125 (48)	
Q8	Agree	20 (39)	13 (26)	12 (23)	15 (28)	17 (31)	77 (29)	0.441
	Disagree	31 (61)	37 (74)	40 (77)	39 (72)	38 (69)	185 (71)	
Q9	Agree	35 (69)	30 (60)	31 (60)	38 (70)	24 (44)	158 (60)	0.037*
	Disagree	16 (31)	20 (40)	21 (40)	16 (30)	31 (56)	104 (40)	
Q10	Agree	27 (53)	28 (56)	38 (73)	36 (67)	18 (33)	147 (56)	<0.001*
	Disagree	24 (47)	22 (44)	14 (27)	18 (33)	37 (67)	115 (44)	
Q11	Agree	06 (12)	06 (12)	31 (60)	22 (41)	13 (24)	78 (30)	<0.001*
	Disagree	45 (88)	44 (88)	21 (40)	32 (59)	42 (76)	184 (70)	
Q12	Agree	44 (86)	33 (66)	38 (73)	34 (63)	47 (85)	196 (75)	0.011*
	Disagree	07 (14)	17 (34)	14 (27)	20 (37)	08 (15)	65 (25)	

Statistical significance was only found for level of education year for statement 2 (gums tend to bleed), statement 5 (toothbrush of standard sized), statement 9 (carefully brushing each teeth), statement 10 (professionally never taught how to brush), statement 11 (cleaning teeth without using toothpaste), statement 12 (checking teeth in mirror after brushing), statement 15 (having toothache to go to a dentist), statement 16 (using dye to see how clean teeth are), statement 17 (toothbrush with hard bristles), statement 18 (brushing not well unless brush with strong strokes) & statement 20 (dentist remarks on brushing well).

About 64.5% of students reported that they use a toothbrush for brushing their teeth while 15.6% mentioned about the use of miswak for

cleaning their teeth. Around 88.6% of students did not use mouthwash & toothpicks. Only 6.9% of students reported about the use of dental floss. The results on the frequency of brushing their teeth show that 50.4% of students reported brushing their teeth twice daily plus 38.5% mentioned fixing the time of morning for brushing their teeth & when asked about brushing duration, 52.7% stated about brushing for one minute.



**Fig 1.** Distribution of oral health practices among medical/dental students

## Discussion

According to WHO published review on global oral health which states that with all the advancement & improvements achieved in the field of dentistry, oral health problem still persists affecting each & every individual globally<sup>10</sup>. For tackling oral health-related problems, it's quite important for dentists to have relevant knowledge in regards to oral health and to transfer accurate information to patients for raising awareness & preventing oral diseases. As compared to a layperson, dental students are considered to be more informative regarding oral health due to relevant dental knowledge they have & are expected to reflect improved health attitude & behaviour in their life as well as in society for creating healthy environment<sup>11</sup>. The present study was done to assess the oral health knowl-

edge of students studying in HBS Medical & Dental College (Islamabad) using Hiroshima University Dental Behaviour Inventory (HU-DBI) questionnaire.

In this study, on assessing oral health behaviour & attitude among medical & dental students, statistical difference was observed on the basis of education year with clinical year students (3rd & 4th Year MBBS) showing good knowledge in relation to oral health behaviour & attitude as compared to pre-clinical year students (1st & 2nd Year MBBS). These findings are co-related with the study conducted by Yildiz et al in Turkey among dental students, the results of which show that the clinical year students have better oral health behaviour & attitude than pre-clinical students<sup>12</sup> but these results are opposite to the study conducted in Karachi among medical & dental students<sup>6</sup>.

Dental students included in this study were of 1st-year only as the dental department of HBS Medical & Dental College started recently in the year 2019 & currently enrolled 1st-year dental students. On comparison of results of 1st-year dental students with 1st-year medical students, dental students showed a slightly better oral health awareness attitude & behaviour. The reason might be the deliverance of their course-related basic dental awareness knowledge given to dental students in their 1st year as compared to their counterpart of 1st-year medical students.

No statistical difference was observed in this study regarding oral health behaviour & attitude on the basis of gender as females & males shows almost the same results which relate with the study which was conducted in India among dental students in Puducherry<sup>13</sup> but is contrary to the study of Swathi et al, the results of which show a significant difference for females having better oral health attitude & behaviour as compared to males<sup>14</sup>. When results were analysed based upon the factor of age with HU-DBI scores, no such significant relationship was observed which is similar to the result of the study conducted among Finnish & Japanese dental students<sup>15</sup>.

Similarly, no significant relationship was detected when HU-DBI scores were analysed with the education program (MBBS/BDS), it may be because of the availability of only BDS 1st-year in the study with a strength of total 51 students whereas medical students were 211 in figures and comprised of 1st, 2nd, 3rd & 4th year. Previous studies did show a significant difference of having improved attitude & behaviour for dental students as compared to medical students<sup>16 17</sup>.

In this study, the majority of students (80.1%) brush their teeth regularly which coincides with the study conducted in Hyderabad city of Pakistan among nursing students, the results of which showed 83.3% of students brush their teeth regularly<sup>7</sup>. The results of this study also conclude that about half of the students (50.4%) mentioned that they brush their teeth twice a day whereas another study that was conducted in Sharjah among dental students showed 86% of students brushing their teeth twice daily<sup>18</sup>. In this study, only 5.3% of students stated about the use of mouth wash for oral hygiene purposes whereas in another study conducted by Doshi among medical & engineering students showed 24.1% usage of mouthwash by medical students & 20% by engineering group<sup>19</sup>. In this study, only 6.9% of students reported about the use of dental floss for teeth cleaning purposes whereas in another study among Turkish dental students showed usage of dental floss about 32.3% regularly<sup>20</sup>.

The results of this study show that with the higher level of academic year, improvement is observed in oral health attitude & behaviour among medical students. The results also showed that other factors such as age, gender & education program did not have an influence on oral health attitude & behaviour among medical & dental students. The outcome of this study provides important valuable information which can be useful in reflecting oral health education level among medical & dental colleges on the basis of age, gender, education program & academic year.

The limitation of this study is that it is restricted to only one medical & dental college comprising of medical students of 1st to 4th academic years and dental 1st year students only, thereby the results of the study cannot be generalized.

Furthermore, the study design of this study is cross-sectional in nature, any variation in results cannot be exclusively be attributed to the educational curriculum. Moreover, the study involves an approach of self-reporting which may result in data being underreported or over-reported due to a sense of social desirability & social responsibility. Cultural plus socioeconomic factors regarding oral health behaviour & attitude were not included in the present study.

The recommendations for this study include that it needs to be carried out on a bigger scale involving students from multiple medical & dental colleges, so the generalize ability of the results can be obtained. Sample size to include both male & female students in equal proportion belonging to different academic years for proper analysis. Further studies are needed to be done among students globally on proving the strong relationship of academic year to HU-DBI score. Medical & dental students as future health professionals should be introduced to comprehensive programs based on oral health knowledge & oral hygiene practice at the beginning of the 1st academic year of medical & dental college. Further research needs to be done on larger sample size.

## Conclusion

The study concludes oral health attitude & behaviour among medical & dental students of HBS Medical & Dental College to be not satisfactory. In this study, students from higher academic years showed better oral health attitude & behaviour based on HU-DBI score. In this study, no significant difference in dental behaviour & attitude was observed based on the factor of age, gender & academic program.

## Conflict of Interest

Authors have no conflict of interest and no grant/funding from any organization.

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