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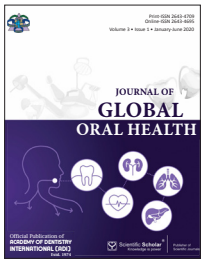

Research Article

Self-reported oral health attitudes and behavior of dentistry students

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ABSTRACT

Objectives: Dentistry students in the Philippines undergo 6 years of undergraduate dental education as their foundation to acquire the skills necessary to prevent, diagnose, and treat oral diseases, and educate their future patients. One of the learning outcomes of the entire course is to make them effective role models in the maintenance and improvement of their patient's oral health. Throughout their undergraduate years, oral health attitudes and behaviors are formed and may be modified. This study aimed to compare 4th-year preclinical and 5th-year clinical dentistry students in terms of their oral health attitudes and behavior. **Materials and Methods:** The research employed a descriptive cross-sectional research design. Purposive sampling was done using the Hiroshima University-dental behavioral Inventory (HU-DBI) questionnaire. The questionnaire contains 20 questions, which focus on oral health attitudes and behavior, with a dichotomous response format of "Agree" or "Disagree," giving one point in favor of good oral health attitudes and behavior for a maximum score of 12. Data was collected via an online survey using Google Forms shared in the appropriate year levels' official social groups. Higher mean scores indicate good oral health attitudes and behavior. The HU-DBI scores of the two groups were compared using the Mann–Whitney U-test. **Results:** A total of 225 dentistry students in a Philippine private dental college answered the survey, with 119 responses from the 4th year (41% response rate) and 106 responses from the 5th year (77% response rate). The overall mean score of answers favoring good oral hygiene was marginally higher in 4th-year preclinical students (M = 7.17, Standard deviation [SD] = 1.37) than in 5th-year clinical students (M = 7.15, SD = 1.24) but showed no statistical significance in their difference, z = −0.412, P = 0.681. **Conclusion:** There is no significant difference in the oral health attitudes and behavior between the 4th-year preclinical students and 5th-year clinical dental students. Future researchers can look into increasing the sample size and having respondents from other dental universities to provide a wider picture at a national level. Reinforcing oral health education for clinical students may be beneficial.

Keywords: Oral health attitudes, Oral health behavior, Hiroshima university-dental behavioral inventory (HU-DBI), Dental students

INTRODUCTION

Oral health is essential for the overall well-being of an individual. However, it is often a neglected part of general health, which usually leads to common oral diseases and consequently affects a person's quality of life.[1,2] An individual's attitudes and behavior toward oral health would reflect their oral health perceptions, and maintaining a good attitude and behavior toward oral health can drastically improve one's overall health status.[3] This emphasizes how crucial it is for the public and supporters of proactive dental healthcare to be aware of dental issues.

Both knowledge and motivation modify attitudes and actions regarding the oral health of dental students through dental education.[4] Moreover, schooling has the potential to impact students' self-care routines, fostering a greater sense of responsibility in maintaining good oral hygiene practices. Dental education is divided into two parts: Preclinical, which includes theory-based learning about oral health as a prerequisite, and clinical, which involves the patient-based practical application of all preclinical concepts and techniques. Similar levels of progression are used in Philippine dental education, where the preclinical phase is covered in the first 4 years, and the clinical stage is covered in the final 2 years, for a total of 6 years of dental education. This shift from preclinical to clinical is significant as the students undergo transition.[5] Clinical exposure to patients makes clinical dental students more conscious of their oral health. Self-realizations of dental students on their oral health attitudes and behavior allow them to evaluate, inspire, and educate their patients in raising oral health awareness.[6]

Similar to dental licensed professionals, dental students are expected to have better oral health knowledge, attitudes, and behavior than other courses since their curriculum mainly focuses on oral health and related disciplines.[7] The general idea is that the dental educational curriculum of different dental schools should have helped in building and reinforcing theories and concepts regarding oral health. This means that the students under the curriculum should have improved oral health attitudes and behavior the more they advance in their dental education.[7] However, the results of different studies showed that the idea of higher-year dental students having better oral health attitudes and behavior is not absolute. Several studies showed results relative to the initial idea wherein preclinical dental students had lower scores than their clinical counterparts.[5,7-11] On the other hand, there are studies which showed that preclinical dental students had a higher mean score than clinical dental students, which means that preclinical students had better oral health attitudes and behavior than clinical students.[5,12] Similarly, certain studies have revealed no notable distinction in the average scores of two sets of dental students, suggesting their shared attitudes and behaviors concerning oral health overall.[13,14] This study aimed to compare the oral health attitudes and behaviors of 4th-year preclinical and 5th-year clinical dentistry students within a dental school in the Philippines.

MATERIALS AND METHODS

The research employed a descriptive cross-sectional research design. Purposive sampling was done using the Hiroshima university-dental behavioral inventory (HU-DBI) questionnaire. The English version of the questionnaire, which consists of 20 questions, displayed good translation validity and reliability with an established Cronbach's alpha of 0.76.[15] The questionnaire contains 20 questions, which focus on oral health attitudes and behavior, with a dichotomous response format of "Agree" or "Disagree," giving one point in favor of good oral health attitudes and behavior for a maximum score of 12. Eight questions were not scored. These questions served to offer further information about the participants.[16]

The questionnaire was encoded on Google Forms, and the link was disseminated through the official social networks, that is, Facebook group messengers formed by the Dentistry Student Council of each year level. All participants were provided with comprehensive details regarding the study's aims and willingly agreed to participate by responding to the survey without revealing their identities. This was carried out in accordance with the provisions outlined in the Philippine Data Privacy Act of 2012 (Republic Act 10173). Engagement is optional, and individuals have the liberty to withdraw whenever they choose without facing any consequences. No time limit was established to complete the survey. To avoid repetition of answers from the same respondents, the university email address of each respondent was used. All the collected raw data were erased and discarded upon completion of the study. The scores were computed using the total mean scores, taking into consideration that item numbers 18–22 had to be reverse coded. Subsequently, the proportions for the four components were calculated and analyzed using the four overall ranges: 22–40% denoting poor, 41–60% indicating average, 61–80% representing good, and 81–100% signifying excellent. Higher mean scores indicate good oral health attitudes and behavior. The HU-DBI scores of the two groups were compared using the Mann–Whitney U-Test.

RESULTS

A total of 225 dentistry students [Table 1] responded to the survey conducted in a private dental college in the Philippines, with 119 responses from the 4th year (41% response rate) and 106 responses from the 5th year (77% response rate). Table 2 presents the frequency and percentage of "Agree" and "Disagree" answers from preclinical and clinical dental students per question. Only 1 out of 119 (0.8%) 4th-year dental students and 55 out of 106 (51.8%) 5th-year dental students got the correct answer to the question "I think I can clean my teeth well without using toothpaste." On the other hand, most of the 4th-year

Table 1: Distribution of respondents.

Distribution of students	4th year	5th year
Total no. of enrolled dentistry students	288	137
Total no. of respondents	128	106
Inclusions	119	106
Exclusions	9	0

Table 2: Question items of HU-DBI and percentage of responses according to year level.

No.	Question[a]	Year level	Agree	%	Disagree	%
1	I do not worry much about visiting the dentist	4th year	68	57.1	51	42.9
		5th year	79	74.50	27	25.5
2	My gums tend to bleed when I brush my teeth (D)	4th year	9	7.6	110	92.4
		5th year	10	9.4	96	90.6
3	I worry about the color of my teeth	4th year	81	68.1	38	31.9
		5th year	72	67.9	34	32.1
4	I have noticed some white sticky deposits on my teeth (A)	4th year	29	24.4	90	76.5
		5th year	37	34.9	69	65.1
5	I use a child-sized toothbrush	4th year	2	1.7	117	98.3
		5th year	6	5.7	100	94.3
6	I think that I cannot help having false teeth when I am old (D)	4th year	49	41.2	70	58.8
		5th year	57	53.8	49	46.2
7	I am bothered by the color of my gums	4th year	26	21.9	93	78.2
		5th year	21	19.8	85	80.2
8	I think my teeth are getting worse despite my daily brushing (D)	4th year	19	16.0	100	84.0
		5th year	15	14.2	91	85.8
9	I brush each of my teeth carefully (A)	4th year	116	97.5	3	2.5
		5th year	76	71.7	30	28.3
10	I have never been taught professionally how to brush (D)	4th year	26	21.9	93	78.2
		5th year	41	38.7	65	61.3
11	I think I can clean my teeth well without using toothpaste (A)	4th year	1	0.8	118	99.2
		5th year	5	4.7	101	95.3
12	I often check my teeth in a mirror after brushing (A)	4th year	108	90.8	11	9.2
		5th year	101	95.3	5	4.7
13	I worry about having bad breath	4th year	102	85.7	17	14.3
		5th year	94	88.7	12	11.3
14	It is impossible to prevent gum disease with brushing alone (D)	4th year	83	69.8	36	30.3
		5th year	71	66.9	35	33.0
15	I put off going to the dentist until I have a toothache (D)	4th year	15	12.6	104	87.4
		5th year	16	15.1	90	84.9
16	I have used a dye to see how clean my teeth are (A)	4th year	23	19.3	96	80.7
		5th year	4	3.8	102	96.2
17	I use a toothbrush that has hard bristles	4th year	12	10.1	107	89.9
		5th year	6	5.6	100	94.3
18	I do not feel I have brushed well unless I brush with strong strokes	4th year	28	23.5	91	76.5
		5th year	20	18.9	86	81.1
19	I feel I sometimes take too much time to brush my teeth (A)	4th year	63	52.9	56	47.1
		5th year	63	59.4	43	40.6
20	I have had my dentist tell me that I brush very well	4th year	64	53.8	55	46.2
		5th year	61	57.5	45	42.5

[a]Questions are labeled with their correct answer (A: "Agree," D: "Disagree"), HU-DBI: Hiroshima University-dental behavioral inventory

and 5th-year dental students thought that they needed toothpaste to clean their teeth well. In the question "I often check my teeth in a mirror after brushing," only a few 4th-year (11 out of 119; 9.2%) and 5th-year dental students (5 out of 106; 4.7%) disagreed with this statement. The majority of the respondents, 104 out of 119 (87.4%) 4th-year dental students and 90 out of 106 (76.5%) 5th-year dental students disagreed that they should wait for a toothache to visit a dentist. Moreover, the majority of 4th-year dental students (80.7%) and 5th-year dental students (96.7%) disagree with using a dye to see how clean their teeth are.

The overall mean score of answers [Table 3] favoring good oral hygiene was marginally higher in 4th-year preclinical students ($M = 7.17$, Standard deviation *[SD]* = 1.37) than in 5th-year clinical students ($M = 7.15$, $SD = 1.24$) but showed no statistical significance in their difference, $z = -0.412$, $P = 0.681$ [Table 4].

DISCUSSION

As future dental health professionals, dental students need to develop good oral health attitudes and behavior during their

Table 3: HU-DBI mean scores between 4th-year and 5th-year dental students.

	4th year	5th year	Mann–Whitney U-test
Mean scores (SD)	7.17 (±1.37)	7.15 (±1.24)	Not significant

SD: Standard deviation, HU-DBI: Hiroshima University-dental behavioral inventory

Table 4: Mann–Whitney U-test statistics.

	Scores
Mann–Whitney U	6112.5
Wilcoxon W	11783.5
Z	−0.412
Asymptotic Sig. (2-sided test)	0.681

school years to guide their future patients appropriately. The results of this study are comparable to the results of a study by Mekhemar *et al*., which found that the HU-DBI mean score of preclinical students was marginally higher than that of clinical students.[5] The clinical students presented a slightly lower HU-DBI mean score which might be influenced by the increased stress during clinical semesters. This may be due to social stressors, clinical and academic requirements, and performance pressure. These aspects might potentiate the neglect of their oral hygiene, resulting in poor rates of oral health attitudes and behavior of clinical students.

The difference between these two groups was only observed in the following questions. In questionnaire Item 1, it is reported that a significant number of 4th-year preclinical and 5th-year clinical students do not worry about visiting the dentist. The 5th-year clinical students exhibited a higher percentage compared to the 4th-year preclinical students. This indicates that since 5th-year clinical students have already developed a deeper understanding of oral health, considering the amount of time learning about dentistry and their experience regarding various dental procedures, it enables them to take better care of their teeth and gums which in turn minimizes their worry of visiting the dentist.

According to a study by Yildiz and Dogan, questionnaire Item 4 was intended to clear out the respondents' awareness regarding microbial dental plaque.[11] Unexpectedly, the results of the study reported that a low percentage of preclinical and clinical students agreed with the statement. This may be due to the confusion that the question was asking about the cleanliness of their teeth rather than their knowledge regarding dental plaque. Thus, in a study conducted by Kawamura *et al*., this question was excluded from the calculation of HU-DBI scores because of interpretation problems.[17]

An interesting finding on questionnaire Item 11, where the correct answer is "agree," is that a significantly higher percentage of 5th-year clinical and 4th-year preclinical students disagreed that they can clean their teeth well without using toothpaste. According to the study by Creeth *et al*., using toothpaste did not enhance the removal of dental plaque, leaving its specific contribution to plaque removal uncertain.[18] In addition, the study indicated that extended brushing time yielded more clinically significant oral health advantages compared to the use of dentifrices.

Deviation from the notion of educational progression leading to better attitudes and behavior is possibly caused by differences in cultures, an educational curriculum of different dental colleges of different countries, or factors that may have affected the dental students' perception of their oral health attitudes and behavior such as stress, socioeconomic status, or motivation. These differences underscore that various elements beyond the progression in dental education should be taken into account when evaluating the attitudes and behaviors of dental students regarding oral health. Riad *et al*., stated that different countries would have different results, with some getting a noticeable difference between clinical or nonclinical dental students and some finding no differences at all.[7] Thorough assessment and acknowledgment of the importance of oral health deserve attention, as advocating for oral health is an integral aspect of the expected standard of care for every dental professional to uphold. Although cultural or societal differences are difficult to handle, the principles of oral health and dentistry as a whole should be similar for all countries and dental institutions to establish and maintain good oral health that will eventually lead to good overall health status.

CONCLUSION

There is no significant difference in the oral health attitudes and behavior between the 4th-year pre-clinical students and 5th-year clinical dental students. Future researchers can look into increasing the sample size and having respondents from other dental universities to provide a wider picture at a national level. Reinforcing oral health education for clinical students may be beneficial.

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Ethical approval

Institutional Review Board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation:

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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