# Knowledge, Attitude, and Practice of Oral Hygiene Among Students of a Private University

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**Objective:** The objective of the study was to evaluate the knowledge, attitude, and practice among pre-final and final year students of pharmacy, medicine, biotechnology, and business faculties about oral hygiene. **Materials and Methods:** A cross-sectional observational study was conducted to evaluate the knowledge, attitude, and practice of students towards oral hygiene at a private university in Malaysia. Validated questionnaires were distributed to a convenient stratified sample of 324 students studying in the different selected faculties, namely pharmacy, medicine, biotechnology, and business, respectively. The Statistical Package for Social Science (SPSS) Version 24.0 was used to analyze the data. **Results:** With regard to knowledge, upon evaluation, it was seen that the students of the Faculty of Pharmacy had the highest percentage of adequate knowledge, which was statistically significant with a $P$-value of 0.001 and the effect size of 0.246. On the evaluation of attitudes, it was seen that the Faculty of Biotechnology had the highest positive attitudes. According to race, Malay students had the highest positive attitude among all the races that participated in the study, which showed a $P$-value of 0.037 with the effect size of 0.034. Regarding practice, the Faculty of Pharmacy had the lowest practice compared with the other faculties. This variable had a $P$-value of 0.001 and showed to have significance against the practice with an effect size of 0.193. **Conclusion:** Overall, a good attitude was seen amongst the students on their oral hygiene. It was also observed that the attitude, knowledge, and practice of the students in a private university increased with an increasing level of education. **Keywords:** Attitude, knowledge, oral hygiene, practice, students

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## INTRODUCTION

Oral hygiene is related to every aspect of our lives but is often taken for granted. Our mouth is the window to the health of our bodies.[1] It can show signs of nutritional deficiencies or general infection. Whether you are 90 or 9 years of age, oral hygiene is important. Oral hygiene is a vital aspect of everyone including university students.[2] Having a busy student life should not be an excuse to neglect the importance of oral hygiene. It is especially important to students taking up courses related to the medical field.[2] After completing their studies, the university students would be a role model to the community and having proper oral care is important to encourage others to take care of their oral hygiene.[3]

Oral hygiene is vastly related to the knowledge and behavior towards it. Knowing oral health status leads...
to decent oral hygiene practice. However, even with knowledge, without having the proper attitude and practice, oral hygiene may be unsatisfactory.\textsuperscript{[4,5]} The impact of improper oral hygiene practice should be known by everyone. Being a student, they will one day deal with a lot of people belonging to different cultures, age groups, and from different backgrounds in the field. By having a proper knowledge and oral hygiene behavior as well as a good attitude, they can act as role models for their family and also to the community at large.\textsuperscript{[6]}

There are many ways to obtain good oral hygiene. Many techniques have been proved to have a good impact on oral hygiene. One of the main practices is brushing the teeth.\textsuperscript{[7]} The right way recommended by the American Dental Association (ADA) is by placing the toothbrush at a 45º angle against the gums and move it back and forth in short strokes.\textsuperscript{[8]} Brushing of the tongue can also be done to help remove the bacteria and also to freshen the breath.\textsuperscript{[9]} Using a mouth rinse or mouthwash, together with daily brushing and flossing, will increase oral hygiene. Antimicrobial mouthwash helps to reduce bacteria and plaque activity, which can lead to gingivitis and gum disease.\textsuperscript{[9]} Fluoride mouth rinses can also help by preventing the decaying of the teeth. Another step that can help in oral hygiene is by reducing the number of sweetened drinks consumed.\textsuperscript{[10]}

The knowledge, attitude, and practice of oral hygiene are very important among students from different faculties, such as the Faculty of Pharmacy, Medicine, Business, and also Biotechnology. This research was done to evaluate the knowledge, attitude, and also the practice of oral hygiene among students in a private medical university.

**MATERIALS AND METHODS**

This study was conducted on pre-final and final year students from the Faculty of Medicine, Pharmacy, Business, and Biotechnology at a private medical university to evaluate their knowledge, attitude, and practice on the way the students take care of their oral hygiene. This study was carried out over a period of 9 months (September 2017 to May 2018), during which data collection and data analysis were performed.

Stratified convenient sampling was done\textsuperscript{[11-13]} to determine the sample size of this research. This method was used to collect data from different faculties with different gender, race, marital status, year of study, place of living, and age group. For avoiding any bias and discrimination, the sample was obtained by random recruitment of Medical, Business, Biotechnology, and Pharmacy pre-final and final year students at a private medical university who were willing to participate in the study voluntarily. Participants’ consent was obtained before answering the questionnaire, and the survey was conducted through a self-administered questionnaire written in English. The sample size (n = 350) was decided based on the student population in the pre-final and final year from each faculty. The questionnaire was prepared after a couple of days of the literature reviews of many studies performed globally. Thus, a modified questionnaire was prepared and validated by experienced professionals from related fields, like dentists, doctors, and professors, before the questionnaire was improved and developed for data collection.

The knowledge part of the questionnaire consisted of 15 multiple choice questions in a conventional format of one correct answer and two wrong answers. Students were to read and choose only one preference between A to C, based on their knowledge. The participants’ response was scored based on their correct and wrong answers. A score of 0 was credited to each wrong answer, while a score of 1 was credited to each correct answer. The criteria for scoring were taken from a former study performed in Malaysia,\textsuperscript{[14-16]} and the results found were calculated as follows: The criteria for the scoring of participants’ Knowledge were as follows:

Criteria for the scoring of participant’s Knowledge.

| 0–8 Right answers (<60%) | Inadequate Knowledge |
|--------------------------|----------------------|
| 9–15 Right answers (≥60%)| Adequate Knowledge   |

The second part consisted of 10 attitude-based questions to check on participants’ attitudes regarding oral hygiene. All the statements were positively keyed, and participants were requested to read and express as to what extent they agreed or disagreed with the statements. Participants were to choose their answer from the 5-point Likert scale ranging from “Strongly disagree” to “Strongly agree” and scored as (strongly disagree = 1, disagree = 2, neutral = 3, agree = 4, and strongly disagree = 5).\textsuperscript{[17]} The criteria for the scoring of attitudes of the respondent were as follows:

Criteria for the scoring of the participant’s Attitude.

| Score 0–20 (≤40%) | Negative attitude |
|-------------------|-------------------|
| Score 21–30 (41–60%) | Neutral attitude |
| Score 31–50 (61 to 100%) | Positive attitude |

The practice part of the questionnaire consisted of 10 statements, of which participants were to read and choose the option of either “Yes” or “No” based on their practice in taking care of their oral hygiene in their daily life. The same scoring procedure was employed for the practice part. A score of 0 was credited to the
wrong answer and 1 to the correct answer. The criteria for evaluation were defined by the Bloom’s cut-off point. The criteria for the scoring of participants’ Knowledge were as follows:

Criteria for the scoring of participants’ Practice.

| Criteria                               | Practice     |
|----------------------------------------|--------------|
| 1–5 right answers (less than 59%)      | Poor practice|
| 6–7 right answers (60 to 79%)          | Moderate practice|
| 8–10 right answers (80 to 100%)       | Good practice|

P-value < 0.05 shows the presence of statistical significance.

Ethical approval and confidentiality

All aspects of the study protocol, including access to and the use of clinical information and demographics of the participants, were authorized by the AIMST Ethical Board and Committee with reference number AUHEC/FOP/2018/21 before this study was carried out. All the ethical aspects of the study were reviewed. The students participated in this study out of their own will, and those who refused or were not willing to take part were not forced to participate. Distribution of consent form was done to patients who were voluntarily willing to participate in the survey, and all information given by the participants was strictly confidential, protected, and was used for this particular clinical research only.

RESULTS

Demographics of the current study were different, including faculty, year of education, gender, age, residence, race, and marital status of the students. The results of this study are shown in Table 1.

The sample size (n = 350) was decided based on the student population in the pre-final and final year from each faculty. From the Faculty of Pharmacy, 50 students were chosen from each year. However, 110 students voluntarily answered the survey form. As for the Faculty of Medicine, 100 students were expected to fill in the survey, but only 81 students took part. Thirty students from each year were chosen from the Faculty of Biotechnology, and the answered survey collected was 67. The final number of the survey response collected was 324.

Table 2 represents the total mean knowledge score of respondents from the study participants. There were 15 different questions regarding oral hygiene.

Table 3 represents the total mean attitude score of respondents from the study participants. Ten different questions were asked to the study participants regarding oral hygiene.

Statistically significant difference was seen between the total attitude score of respondents and the students’ faculty (P = 0.006) and the year of education (P = 0.027). In contrast, none of the other variables show a statistically significant association with the knowledge score.

Table 4 represents the total mean practice score of respondents from the study participants. Ten different questions were asked to the study participants regarding the oral hygiene practices of respondents.

DISCUSSION

Oral hygiene is vastly related to the attitude, practice, and the amount of knowledge a person has towards it. Having proper knowledge of oral hygiene will help in better oral hygiene practice. However, even with knowledge, without having the correct habit and mindset put into practice, a person’s oral hygiene may be unsatisfactory. It is believed that students of higher educational levels should take into consideration the importance of maintaining proper oral hygiene.

A statistically significant association was seen with the faculty and the knowledge score of respondents with P-value 0.001 and year of education with P-value 0.003, which shows that this variable had a relationship...
with the knowledge that the respondents’ have towards oral hygiene. Based on this study, the highest percentage that showed adequate knowledge was by the pharmacy students. Based on a study performed at the University of Barcelona by Cortes et al.\textsuperscript{[19]} on The Evolution of Dental Health in Dental Students, it was seen that the knowledge of oral hygiene was adequate among dental students rather than medical students, which continued to increase throughout this previously conducted study. Statistically, no significant association was seen in any other variable with the knowledge score of the respondents.

The results of the current study correlate with the research done by Astrom et al.\textsuperscript{[20]} on the stability of oral health-related behavior in a Norwegian cohort between the ages of 15 and 35 years old. From this, it was seen that gender differences and better oral hygiene knowledge and practices were found among the female respondents and this may be due to their interest and concern in maintaining a good appearance. A study conducted by Peker et al.\textsuperscript{[21]} in Turkey on a group of Turkish dental students showed that oral and dental hygiene knowledge of female students was better than males.

Respondents’ attitude towards oral hygiene care obtained through different faculties (Faculty of Medicine, Pharmacy, Biotechnology, and Business) was considered as one of the vital factor variables for the current study. Statistical significance was seen in the student-faculty variable with the \( P \)-value 0.006 and year of education with \( P \)-value 0.021. Statistically, no significant association was seen in any other variable with the knowledge score of the respondents. A study done on a group of dental students in Bangalore, India, by Neraja et al.\textsuperscript{[22]} confirmed that oral hygiene attitudes improved with increasing levels of education. There is progress in personal oral hygiene, which was shown to be linked to their dental education experience.

Statistical significance was seen between the faculty of the students and practice with the \( P \)-value 0.001. Similarly, statistical significance was seen between the year of education and practice of students for their oral hygiene; it shows that these variables had a relationship with the practice of respondents towards oral hygiene.

A previous study conducted by Yildiz et al.\textsuperscript{[23]} in Turkey

| Table 2: Knowledge score regarding oral hygiene | Table 3: Attitude score regarding oral hygiene |
|-----------------|-----------------|
| Variables       | N (%)           | Mean ± SD   | P-value |
| Faculty         | Pharmacy        | 118 (36.4)  | 9.729 ± 1.662 | 0.001  |
|                 | Medicine        | 81 (25.0)   | 8.630 ± 2.517 |
|                 | Biotechnology   | 67 (20.6)   | 8.940 ± 1.898 |
|                 | Business        | 58 (17.0)   | 7.741 ± 2.164 |
| Year            | Prefinal        | 169 (52.2)  | 8.639 ± 2.137 | 0.003  |
|                 | Final           | 155 (47.8)  | 9.258 ± 2.135 |
| Place           | Hosteller       | 216 (66.7)  | 9.009 ± 2.059 | 0.566  |
|                 | Nonhosteller    | 108 (33.3)  | 8.766 ± 2.337 |
| Gender          | Male            | 90 (27.8)   | 8.753 ± 2.375 | 0.432  |
|                 | Female          | 234 (72.2)  | 9.013 ± 2.066 |
| Age, years      | 18–20           | 32 (9.8)    | 8.688 ± 2.177 | 0.457  |
|                 | 21–25           | 281 (86.7)  | 8.925 ± 2.148 |
|                 | >25             | 10 (3.1)    | 10.000 ± 2.309 |
| Marital status  | Single          | 322 (99.4)  | 8.953 ± 2.147 | 0.041  |
|                 | Married         | 2 (0.6)     | 6.000 ± 1.414 |
| Race            | Malay           | 8 (2.4)     | 9.500 ± 1.604 | 0.394  |
|                 | Chinese         | 231 (71.3)  | 9.104 ± 2.006 |
|                 | Indian          | 82 (25.4)   | 8.427 ± 2.514 |
|                 | Others          | 3 (0.9)     | 8.333 ± 2.517 |
| | | | |
| Variables       | N (%)           | Mean ± SD   | P-value |
| Faculty         | Pharmacy        | 118 (36.4)  | 39.136 ± 3.953 | 0.006  |
|                 | Medicine        | 81 (25.0)   | 38.161 ± 4.529 |
|                 | Biotechnology   | 67 (20.6)   | 40.119 ± 3.736 |
|                 | Business        | 58 (17.0)   | 41.517 ± 6.454 |
| Year            | Prefinal        | 169 (52.2)  | 38.722 ± 4.101 | 0.027  |
|                 | Final           | 155 (47.8)  | 40.394 ± 5.182 |
| Place           | Hosteller       | 216 (66.7)  | 39.259 ± 4.317 | 0.523  |
|                 | Nonhosteller    | 108 (33.3)  | 40.056 ± 5.437 |
| Gender          | Male            | 90 (27.8)   | 39.056 ± 4.225 | 0.236  |
|                 | Female          | 234 (72.2)  | 39.688 ± 4.896 |
| Age, years      | 18–20           | 32 (9.8)    | 39.469 ± 4.813 | 0.445  |
|                 | 21–25           | 281 (86.7)  | 39.541 ± 4.726 |
|                 | >25             | 10 (3.1)    | 39.900 ± 4.175 |
| Marital status  | Single          | 322 (99.4)  | 39.559 ± 4.694 | 0.146  |
|                 | Married         | 2 (0.6)     | 33.500 ± 6.364 |
| Race            | Malay           | 8 (2.4)     | 39.125 ± 2.696 | 0.118  |
|                 | Chinese         | 231 (71.3)  | 39.229 ± 4.900 |
|                 | Indian          | 82 (25.4)   | 40.427 ± 4.326 |
|                 | Others          | 3 (0.9)     | 38.333 ± 1.528 |

Paired t-test/ANOVA was used to find the \( P \)-values.

Statistically significant difference was seen between the total knowledge score of respondents and the students’ faculty (\( P = 0.001 \)), the year of education (\( P = 0.003 \)), and the marital status (\( P = 0.041 \)).
Table 4: Practice score regarding mental health disorder

| Variables     | N (%)   | Mean ± SD  | P-value |
|---------------|---------|------------|---------|
| Faculty       |         |            |         |
| Pharmacy      | 118 (36.4) | 5.389 ± 1.365 | 0.001 |
| Medicine      | 81 (25.0)  | 5.346 ± 1.905 |        |
| Biotechnology | 67 (20.6)  | 5.478 ± 1.511 |        |
| Business      | 58 (17.0)  | 6.448 ± 2.096 |        |
| Place         |         |            |         |
| Hosteller     | 216 (66.7) | 5.407 ± 1.579 | 0.017 |
| Nonhosteller  | 108 (33.3) | 5.952 ± 1.946 |        |
| Gender        |         |            |         |
| Male          | 90 (27.8)  | 5.517 ± 1.847 | 0.872 |
| Female        | 234 (72.2) | 5.615 ± 1.685 |        |
| Age, years    |         |            |         |
| 18–20         | 32 (9.8)   | 5.313 ± 1.469 | 0.043 |
| 21–25         | 281 (86.7) | 5.655 ± 1.758 |        |
| >25           | 10 (3.1)   | 4.700 ± 1.337 |        |
| Marital status|         |            |         |
| Single        | 322 (99.4) | 5.587 ± 1.685 | 0.981 |
| Married       | 2 (0.6)    | 5.500 ± 6.364 |        |
| Race          |         |            |         |
| Malay         | 8 (2.4)    | 5.000 ± 1.414 | 0.810 |
| Chinese       | 231 (71.3) | 5.610 ± 1.693 |        |
| Indian        | 82 (25.4)  | 5.598 ± 1.858 |        |
| Others        | 3 (0.9)    | 5.000 ± 1.732 |        |

Paired t-test/ANOVA was used to find the P-values.

Statistically significant difference was seen between the total practice score of respondents and the students' faculty (P = 0.001), the year of education (P = 0.037), the place of living (P = 0.001), and the age groups of students (P = 0.043).

In contrast, none of the other variables show a statistically significant association with the knowledge score.

among Turkish dental students shows that these students had a rather low oral hygiene awareness at the beginning of their dental education. Their oral hygiene behavior has improved tremendously in the final years of education.

A study conducted by Al-Ansari et al. in a college in Kuwait concluded that the male Health Sciences College students seemed to have appropriate knowledge on some oral hygiene topics, but limited knowledge on the others. A previous research done by Peker et al. among a group of Turkish Dental Students in Turkey states that oral and dental hygiene knowledge and attitudes about oral and dental hygiene care improved with increasing levels of education. From an article published in the European Journal of Dentistry by Rahman et al. on oral behavior of dental students in the United Arab Emirates, female students have shown better dental care practice than male students.

CONCLUSION

In conclusion, among the students of the Faculty of Medicine, Pharmacy, Biotechnology, and Business, the faculty of pharmacy had shown the most positive attitude towards oral hygiene. Final year students showed to have better oral hygiene knowledge, attitude, and practice when compared with pre-final year students. Generally, both genders had poor practice, but females had a slightly higher percentage of good practice than males. All the Malay and Chinese students showed the highest positive attitude compared with other races. Overall, it was found that most of the respondents showed a positive attitude, adequate knowledge, and poor practice towards their oral hygiene.

Limitations of the study

There are multiple limiting factors in the current study. This was a single-centre study and was conducted in a private medical university which is located in the state of Kedah, and the results cannot represent the entire Malaysian community. The results may be skewed due to a significantly higher number of female respondents, a higher number of respondents of the same age group (21–25 years old), a higher number of single students, and also higher number of pharmacy students. In terms of ethnicity, there was a difference in sample size from each group, which can lead to bias in results.

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