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Research Article

Knowledge, Attitudes, and Practices Related to Oral Health among University Students in Saudi Arabia; a Cross-Sectional Study

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Abstract

Aim/Objectives: The aim of this study is to evaluate the level of knowledge, attitude, and practice related to oral hygiene of the second-year pre-professional students at King Saud bin Abdulaziz University for Health Science.

Methodology: Cross sectional study with questionnaire survey. The sample size was 250 and the target population was the second year pre-professional students. The students were randomly selected. Chi-square, t-test, and ANOVA statistical tests were used.

Results: Females had significantly better knowledge, attitude, and practice compared to males. Dental students had better knowledge when compared to the other groups. Dental students had better knowledge about plaque (43.3%) compared with medical (29.1%) and nursing (25.0%) students (P value=0.006). Almost two-third of the students were using fluoride containing toothpaste (58.4%) with medical students (61.6%) being more than both nursing (56.2%) and dental (53.3%) students (P value= 0.029).

Conclusion: In this study, female students had better knowledge, attitude and practice compared with male students. When comparing between the various specialties, dental students had significantly better knowledge about oral hygiene practices compared with the other groups. Further research in a more diverse population is recommended to expand on the findings of this study.

Keywords: Knowledge; Attitude; Practice; Oral; Health

Introduction

Oral diseases are related to certain behaviors of an individual [1]. A decline in the prevalence of dental caries and periodontal disease has been reported with the improvements in oral hygiene and with reduced sugar consumption. This decline is mainly experienced in countries like the United Kingdom, Italy, and Norway [2-4]. However, this is not yet seen in countries such as Turkey, Lebanon, and Saudi Arabia [5-7]. In a study that was done in Saudi Arabia it was found that among children aged 12-14 with a 14 year follow-up that the prevalence of tooth decay was as high as 93.7% of the population [8]. As a consequence of improved oral health the tendency of being dentulous is increasing [9]. The knowledge, attitude, and practice of the individual clearly have an impact on the oral health [10]. Studies have shown that there is an association between increased knowledge and better oral health [10,11]. In another study conducted in Jeddah among school students, it was found that 87.1% knew that brushing teeth helps preventing periodontal diseases; however, only 33.1% knew that the use of dental floss has the same effect. It was also found in the same study that the use of miswak for cleaning was more prevalent in males than females, while females used brushing and flossing more [12]. Very little is known about the attitude and practices of students with different medical specialties and as they will become the future pioneer of the country it is important to assess the knowledge, attitude and practices of such students thus the aim of this study is to evaluate the level of knowledge, attitude, and practice related to oral hygiene of the second-year pre-professional students of King Saud bin Abdulaziz University for Health Science.

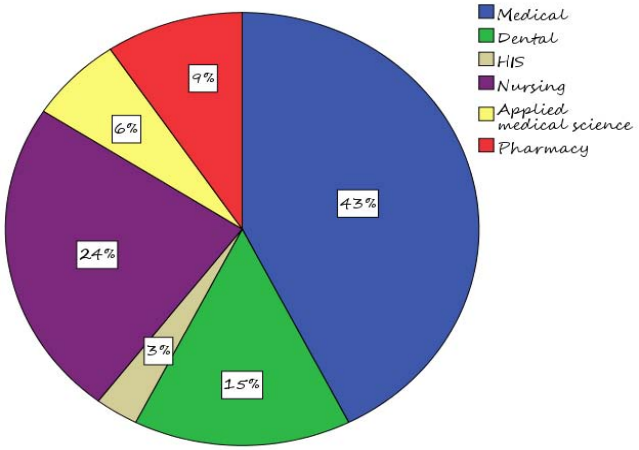

Figure 1: Pie chart of university colleges of the study population (N = 202).

Methodology

This cross sectional study was conducted at King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia. It

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Table 1: Showing frequencies and percentages of different factors related to dental caries in total study participants and there differences among gender (N = 202).

Risk Factors and Protective Factors of Dental Caries				
Factors	**Total (%) N=202**	**Male (%) n=98**	**Female (%) n=104**	**P Value***
Smoking (Yes)	192 (95.5)	92 (94.8)	100 (96.2)	0.654
Tobacco Chewing (Yes)	181 (90.0)	81 (82.7)	100 (97.1)	**0.001**
Coffee (Yes)	160 (79.6)	72 (74.2)	88 (84.6)	0.068
Chocolate and Sweets (Yes)	168 (83.6)	85 (86.7)	83 (80.6)	0.239
Soft Drinks (Yes)	176 (87.6)	90 (92.8)	86 (82.7)	**0.03**
Cheese (Yes)	150 (77.7)	72 (80.0)	78 (75.7)	0.477
Fluoride (Yes)	152 (78.8)	73 (77.7)	79 (79.8)	0.717
Calcium (Yes)	159 (79.9)	80 (84.2)	79 (76.0)	0.147
Dental Plaque				
Don't know	57 (28.4)	35 (36.1)	22 (21.2)	
Soft deposit on teeth	59 (29.4)	21 (21.6)	38 (36.5)	
Hard deposit on teeth	49 (24.3)	21 (21.6)	38 (36.5)	**0.003**
White patches on teeth	36 (17.9)	23 (23.7)	13 (12.5)	
Oral Infection				
Don't Know	30 (15.2)	19 (20.2)	11 (10.7)	
Healthy gums	11(5.6)	3(3.2)	8(7.8)	
Tooth Infection	4(2.0)	2(2.1)	2(1.9)	0.224
Calcium deficiency in the body	4(2.0)	1(1.1)	3(2.9)	
Gum disease/inflammation	148 (75.1)	69 (73.4)	79 (76.7)	
Risk Factors of Dental Caries				
Don't Know	64 (32.0)	38 (39.6)	26 (25.0)	
Calcium deficiency	15(7.5)	7(7.3)	8(7.7)	
Gum disease due to improper brushing	117 (58.5)	50 (52.1)	67 (64.4)	0.14
High intake of sweet	4(2.0)	1(1.0)	3(2.9)	
Protective Factors of Dental Caries				
Don't Know	74 (36.8)	39 (40.2)	35 (33.7)	
Regular tooth brushing	116 (57.7)	53 (54.6)	63 (60.6)	
Reduction in sweet consumption	4(2.0)	1(1.0)	3(2.9)	0.729
Calcium supplement	5(2.5)	3(3.1)	2(1.9)	
Eating soft food	2(1.0)	1(1.0)	1(1.0)	
Most Important Factors that Cause Dental Caries				
Diet	26 (12.9)	15 (15.3)	11 (10.6)	
Improper brushing	82 (40.6)	41 (41.8)	41 (39.4)	
Hereditary	17(8.4)	7(7.1)	10(9.6)	0.357
All of the above	67 (33.2)	28 (28.6)	39 (37.5)	
Others	10(5.0)	7(7.1)	3(2.9)	
Health Status that Affect Dental Caries				
Diabetes (Yes)	163 (83.2)	73 (77.7)	9. (88.2)	0.48
Cardiac diseases (Yes)	101 (51.8)	47 (50.5)	54 (52.9)	0.737
Arthritis (Yes)	88 (44.4)	42 (44.7)	46 (44.2)	0.949
Hypertension (Yes)	84 (43.3)	38 (40.9)	46 (45.5)	0.511
Pregnancy (Yes)	123 (62.1)	51 (54.3)	72 (69.2)	**0.03**
Epilepsy (Yes)	83 (44.4)	37 (44.0)	46 (44.7)	0.933

Table 2: Showing frequencies and percentages of different factors related to dental caries and there differences among different specialities (N = 202).

Factors Related to Dental Caries	Medical (%) N=86	Dental (%) n=30	HIS (%) n=6	Nursing (%) n=48	AMS (%) n=13	Pharmacy (%) n=19	P Value*
Risk Factors and Protective Factors of Dental Caries							
Smoking (Yes)	82 (96.5)	29(96.7)	4(66.7)	48(100.0)	12(92.3)	17(89.5)	**0.006**
Tobacco Chewing (Yes)	80 (93.0)	28(93.3)	4(66.7)	45(95.7)	12 (92.3)	12(63.2)	**0.001**
Coffee (Yes)	65 (75.6)	25(86.2)	5(83.3)	42(87.5)	7 (53.8)	16(84.2)	0.106
Chocolate and Sweets (Yes)	73 (85.9)	23(76.7)	5(83.3)	39(81.2)	12 (92.3)	16(84.2)	0.808
Soft Drinks (Yes)	76 (88.4)	27(90.0)	5(83.3)	41(85.4)	10 (83.3)	17(89.5)	0.978
Cheese (Yes)	69 (83.1)	24(82.8)	3(60.0)	30(63.8)	12 (92.3)	12(75.0)	0.086
Fluoride (Yes)	69 (84.1)	28(93.3)	3(60.0)	28(63.6)	10 (76.9)	14(73.7)	**0.027**
Calcium (Yes)	71 (84.5)	29(96.7)	1 (16.7)	31 (64.6)	12(100.0)	15 (78.9)	**<0.001**
What is Dental Plaque							
Don't know	18 (20.9)	6(20.0)	5(83.3)	16(33.3)	4(30.8)	8(44.4)	
Soft deposit on the teeth	25 (29.1)	13(43.3)	0(0.0)	14(29.2)	3(23.1)	4(22.2)	
Hard deposit on the teeth	22 (25.6)	9(30.0)	1(16.7)	12(25.0)	0(0.0)	5(27.8)	**0.006**
White patches on the teeth	21 (24.4)	2(6.7)	0(0.0)	6(12.5)	6(46.2)	1(5.6)	
Oral Infection							
Don't know	8(9.4)	7(23.3)	3(50.0)	5(10.6)	3(23.1)	4(25.0)	
Healthy gum	5(5.9)	2(6.7)	1(16.7)	2(4.3)	0(0.0)	1(6.2)	
Tooth infection	1(1.2)	1(3.3)	0(0.0)	1(2.1)	0(0.0)	1(6.2)	0.488
Calcium deficiency in the body	3(3.5)	0(0.0)	0(0.0)	1(2.1)	0(0.0)	0(0.0)	
Gum disease or inflammation							
	68 (80.0)	20(66.7)	2(33.3)	38(80.9)	10(76.9)	10(62.5)	
Risk Factors of Dental Caries							
Don't know	25 (29.4)	10(33.3)	3(50.0)	13(27.1)	5(38.5)	8(44.4)	
Calcium deficiency	2(2.4)	2(6.7)	2(33.3)	5(10.4)	2(15.4)	2(11.1)	
Gum disease due to improper brushing	56 (65.9)	18(60.0)	1(16.7)	28(58.3)	6(46.2)	8(44.4)	0.234
Excess sweet eating							
	2(2.4)	0(0.0)	0(0.0)	2(4.2)	0(0.0)	0(0.0)	
Protective Factors of Dental Caries							
Don't know	35 (40.7)	14(46.7)	4(66.7)	13(27.1)	4(30.8)	4(22.2)	
Regular tooth brushing	47 (54.7)	16(53.3)	1(16.7)	31(64.6)	7(53.8)	14(77.8)	
Reduction in sweet consumption	2(2.3)	0(0.0)	0(0.0)	2(4.2)	0(0.0)	0(0.0)	
Calcium supplements							**0.051**
Eating soft food	0(0.0)	0(0.0)	1(16.7)	2(4.2)	2(15.4)	0(0.0)	
	2(2.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	
Most Important Factors that Cause Dental Caries							
Diet	7(8.1)	10(33.3)	0(0.0)	4(8.3)	0(0.0)	5(26.3)	
Not brushing teeth properly	42 (48.8)	10(33.3)	1(16.7)	14(29.2)	6(46.2)	9(47.4)	
Hereditary							**<0.001**
All of the above	7(8.1)	0(0.0)	0(0.0)	8(16.7)	1(7.7)	1(5.3)	
Others	26 (30.2)	9(30.0)	3(50.0)	22(45.8)	5(38.5)	2(10.5)	
	4(4.7)	1(3.3)	2(33.3)	0(0.0)	1(7.7)	2(10.5)	

Health Status that Affect Dental Caries							
Diabetes (Yes)	63 (75.0)	25(83.3)	6(100.0)	43(93.5)	12(100.0)	14(77.8)	**0.042**
Cardiac diseases (Yes)	37 (44.6)	15(53.6)	5(83.3)	29(61.7)	4(30.8)	11(61.1)	0.112
Arthritis (Yes)	32 (37.6)	13(43.3)	3(60.0)	25(52.1)	6(46.2)	9(52.9)	0.587
Hypertension (Yes)	35 (41.2)	15(51.7)	2(40.0)	18(40.0)	2(15.4)	12(70.6)	0.062
Pregnancy (Yes)	44 (51.8)	21(70.0)	2(50.0)	37(77.1)	7(53.8)	12(66.7)	0.075
Epilepsy (Yes)	29 (36.2)	17(58.6)	2(50.0)	24(50.0)	6(46.2)	5(38.5)	0.37

has separate campus for female and male students. The programs offered by the university include Nursing, Pharmaceutical, Medical Sciences, Oral and Dental Health, Applied Medical Sciences, Health Information System. The target population was the second-year preparatory students (N =381) during the academic year 2013/2014, and the sample size of 196 was calculated through EpiInforstatcal based on the estimate that 50% of students may have enough knowledge on oral health status. Precision was set at 10%, for a P value 0.05% and 80% power of the study. However, the sample size was increased to 250 (28%) considering the chance of non-respondents. The participants were randomly selected from the student's registry where every student was assigned a number and then numbers were chosen randomly following a lottery system until the desired sample size was reached. The questionnaire was adopted and modified from previous studies. The questionnaire had 26 questions, three of them have branches such as (if yes how many cigarette do you smoke? etc.). The questionnaire included three aspects; knowledge, attitude, and practice. First it started with practice such as (1-How often do you brush your teeth? and 2-can you specify the amount of toothpaste you put on the brush? etc.). Then it was followed by knowledge as (1-What does gum bleeding mean? and 2-What are the methods to prevent bleeding from gums? etc.). The third aspect was attitude and it included (1-Do you think it is important to visit the dentist every six months? and 2-Do you think having good teeth is important for your appearance? etc.). At the end of the questionnaire, the participants were provided with some useful oral hygiene instructions. We went and distributed the questionnaire, with the help of the student's affairs officers, the male students were requested to remain in the classroom after the lecture hours to fill in the questionnaire and were briefed them about the questionnaire. On the other hand in the female campus due to the limitation of access to the female students, there was female volunteer who was asked to distribute the questionnaire with the help of the student's affairs there. Altogether 202 questionnaires were returned giving a response rate of 80.8%. The data was entered using Statistical Package for Social Sciences (SPSS) version 16 for windows. Chi-square test was used for the analysis of data. Also ANOVA and Benferroni Post Hoc tests were conducted to compare the level of knowledge, attitude, and practice between students in four groups (medical, dental, nursing, and others). T-test was also used to compare between males and females with respect to level of knowledge, attitude, and practice as well.

Results

Out of the 202 students surveyed, 48 % (N=98) were males. The majority of students were in the age range between 20-25 years old (86%). Figure 1 shows the percentages of students according to their professional college. The highest proportion of students was in the medical school (43%) followed by nursing school (24%), dental (15%) and pharmacy (9%).

Three third of the students knew the protective effects of fluoride on teeth (78.8%). Between the professionals, significantly higher number of dental students (93.3%) compared to medical (84.1%) and nursing (63.6%) students knew the beneficial effects of fluoride (P value=0.027). Almost one third of the participants (29.4%) knew that plaque is soft deposit on the teeth with females having better knowledge (36.5%) compared to males (21.6%) (P value= 0.003). For the same criteria, dental students had better knowledge (43.3%) compared with medical (29.1%) and nursing (25.0%) students (P value=0.006). Only one third of the students (33.2%) knew that caries is a multifactorial disease. More females (69.2%) knew that pregnancy can affect oral health than males (54.3%) (P value=0.03). (Table1 & 2)

It was observed that female students had a significantly better attitude towards oral hygiene practices such as attitude towards brushing and oral health is important for general health with p value 0.023 and 0.003 respectively (Figure 2). However, there was no

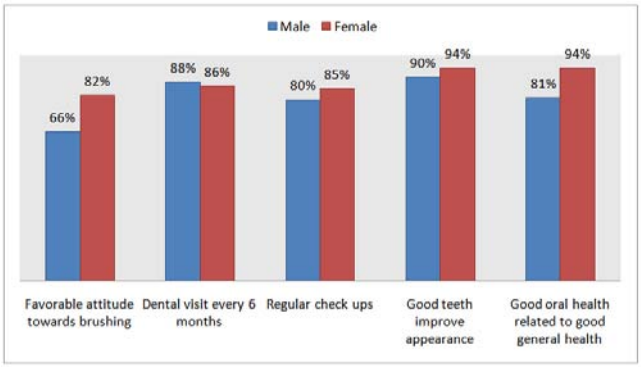

Figure 2: Bar graph showing percentages of attitude related to different oral hygiene practices among gender (N = 202).

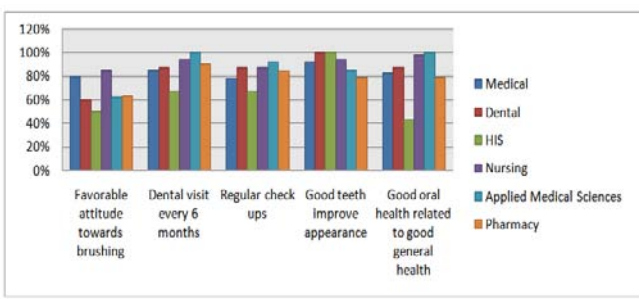

Figure 3: Bar graph showing percentages of attitude related to different oral hygiene practices among different specialties (N = 202).

Table 3: Showing frequencies and percentages of different practices related to dental caries in total study participants and there differences among gender (N = 202).

Oral Health Related Practices	Total (%) N=202	Male (%) n=98	Female (%) n=104	P Value*
Frequency of brushing a day				
Once	63(31.5)	41(41.8)	22(21.6)	
Twice	84(42.0)	35(35.7)	49(48.0)	**0.014**
Thrice	34(17.0)	12(12.2)	22(21.6)	
More than three times	12(6.0)	5(5.1)	7(6.9)	
I don't brush	7(3.5)	5(5.1)	2(2.0)	
Means of cleaning				
Brush and paste	159(78.7)	73(74.5)	86 (82.7)	0.252
Brush, paste, and miswak	33 (16.3)	18(18.4)	15 (14.4)	
Others	10(5.0)	7(7.1)	3(2.9)	
Amount of paste on brush				
Less than half	43 (21.6)	21(21.6)	22(21.6)	0.463
Half	96 (48.2)	43(44.3)	53 (52.0)	
More than half	60 (30.2)	33(34.0)	27(26.5)	
Fluoride containing toothpaste				
Yes	118(58.4)	54(55.1)	64(61.5)	**0.052**
No	22 (10.9)	7(7.1)	15(14.4)	
I don't know	62 (30.7)	37(37.8)	25(24.0)	
Frequency of changing brush				
Every 3 months	83 (41.1)	30(30.6)	53 (51.0)	
Every 6-12 Months	76 (37.6)	48(49.0)	28 (26.9)	**0.001**
After one year	30 (14.9)	11(11.2)	19 (18.3)	
Others	13(6.4)	9(9.2)	4(3.8)	
Reason for changing brush				
Fraying of bristles	80 (39.8)	38(38.8)	42 (40.8)	0.643
Broken tooth brush	30 (14.9)	17(17.3)	13 (12.6)	
No reason	91 (45.3)	43(43.9)	48 (46.6)	
Tongue cleaning				
Yes	114(56.4)	49(50.0)	65 (62.5)	0.073
No	88 (43.6)	49(50.0)	39(37.5)	
Other cleansing methods				
Dental floss	49 (24.5)	17(17.7)	32(30.8)	
Mouthwash	38 (19.0)	23(24.0)	15 (14.4)	**0.003**
Both	32 (16.0)	9(9.4)	23 (22.1)	
None	81 (40.5)	47(49.0)	34 (32.7)	
Cleaning mouth after food and drink				
Yes				0.243
No	127(64.1)	57(60.0)	70(68.0)	
	71(35.9)	38(40.0)	3 (32.0)	

*P value for Chi Square.

difference in the dental attitude between the specialties except for the favorable attitude towards brushing with p value 0.005 (Figure 3).

Less than half the students (42.0%) brushed their teeth twice a day. Significantly more female students (48.0%) than male students (35.7%) had better oral hygiene practices (P value=0.014). Almost two-third of the students were using fluoride containing toothpaste (58.4%) with medical students (61.6%) being more than both nursing (56.2%) and dental (53.3%) students (P value= 0.029). More females (51.0%) changed their brush every 3 months than males (30.6%) (P value= 0.001). Only a small portion of the participants (16.0%) were using both dental floss and mouthwash, with more females (22.1%) than males (9.4%) (P value=0.003) (Table 3&4).

ANOVA test showed statically significant mean difference between the four groups in the level of knowledge (F=4.43, P=0.005) with the dental students having better knowledge than the other three groups (Table 5) Benferroni Post Hoc exam showed that the statistical significant difference in knowledge was between the dental and the others group (P=0.009) and between the nursing and the others group (P=0.014). But not in attitude (F=2.1, P=0.1) or practice (F=0.4, P=0.75)

T-test has also showed significant mean difference between males and females in knowledge (t=3.15, P=0.002), attitude (t=2.53, P=0.012) and practice as well (t=3.13, P=0.002) with females being better than males in all the three aspects (Table 5).

Discussion

This study evaluated the knowledge, attitude, and practice of oral health among second year pre-professional students at King Saud bin Abdulaziz University of health science (KSAU-HS). The response rate of this study was high (80.8%). Majority of students were from college of medicine.

On analyzing the students' knowledge about dental health, it was observed that most of the participants didn't know what "plaque" was or considered "calculus" and "plaque" to be the same. This finding is different from those reported in a study from Jordan study where majority of the study population were knowledgeable about plaque and its effects [13]. More than 50% of the study participants correctly identified gum bleeding as an indicator of gum diseases. This is in agreement with a similar study from Saudi Arabia where more than half of study sample were able to associate gum bleeding with gum disease [12]. It was observed that more than half of students were aware of the fact that regular brushing and flossing will prevent bleeding from gums. This again contradicts the findings of the study conducted in Jordan [14].

Half of the male and female students think that not brushing properly is the only cause of dental caries, but what really is that diet, hereditary and not brushing properly all contribute in dental caries instead of not brushing properly only.

On evaluating the attitude towards oral health, above 60% students were of the opinion that purpose of brushing their teeth is to have white and shiny teeth, to get rid of bad breath and to have healthy teeth. On the other hand, in the study done in China the majority of participants brushed their teeth to get rid of foul breath. Also prevention of caries was a common belief [15]. Majority of students thought that, visiting a dentist regularly "every 6 months" are important for prevention oral diseases. This finding is similar to the

Table 4: Showing frequencies and percentages of different practices related to dental caries and there differences among different specialities (N = 202).

Oral Health Related Practices	Medical (%) N=86	Dental (%) N=30	HIS (%) N=6	Nursing (%) N=48	AMS (%) N=13	Pharmacy (%) N=19	P Value
Frequency of brushing a day							
Once							
Twice	3(3.5)	0(0.0)	0(0.0)	2(4.3)	1(7.7)	1(5.3)	
Thrice	36(41.9)	8 (26.7)	3 (50.0)	25(54.3)	3 (23.1)	9(47.4)	0.07
More than three times	14(16.3)	7 (23.3)	0(0.0)	11(23.9)	0(0.0)	2(10.5)	
I don't brush	5(5.8)	1(3.3)	1 (16.7)	3(6.5)	0(0.0)	2(10.5)	
	3(3.5)	0(0.0)	0(0.0)	2(4.3)	1(7.7)	1(5.3)	
Means of cleaning							
Brush and paste	69(80.2)	25(83.3)	4 (66.7)	38(79.2)	10(76.9)	13(68.4)	0.857
Brush, paste, and miswak	12(14.0)	5 (16.7)	2 (33.3)	8(16.7)	2(15.4)	4(21.1)	
Others	5(5.8)	0(0.0)	0(0.0)	2(4.2)	1(7.7)	2(10.5)	
Amount of paste on brush							
Less than half	14(16.7)	8 (26.7)	4 (66.7)	9(19.1)	2(15.4)	6(31.6)	0.127
Half	46(54.8)	12(40.0)	0(0.0)	26(55.3)	5(38.5)	7(36.8)	
More than half	24(28.6)	10(33.3)	2 (33.3)	12(25.5)	6(45.2)	6(31.6)	
Fluoride containing toothpaste							
Yes	53(61.6)	16(53.3)	2 (33.3)	27(56.2)	5(28.5)	15(78.9)	**0.029**
No	13(15.1)	6 (20.0)	0(0.0)	2(4.2)	1(7.7)	0(0.0)	
I don't know	20(23.3)	8 (26.7)	4 (66.7)	19(39.6)	7(53.8)	4(21.1)	
Frequency of changing brush							
Every 3 months	38(44.2)	11(36.7)	5 (83.3)	22(45.8)	4(30.8)	3(15.8)	
Every 6-12 Months	26(30.2)	16(53.3)	0(0.0)	16(33.3)	3(23.1)	15(78.9)	**0.002**
After one year	16(18.6)	3 (10.0)	0(0.0)	8(16.7)	3(23.1)	0(0.0)	
Others	6(7.0)	0(0.0)	1 (16.7)	2(4.2)	3(23.1)	1(5.3)	
Reason for changing brush							
Fraying of bristles	30(35.3)	13(43.3)	0(0.0)	22(45.8)	3(23.1)	12(63.2)	**0.014**
Broken tooth brush	10(11.8)	5 (16.7)	2 (33.3)	6(12.5)	6(46.2)	1(5.3)	
No reason	45(52.9)	12(40.0)	4 (66.7)	20(41.7)	4(30.8)	6(31.6)	
Tongue cleaning							
Yes	43(50.0)	16(53.3)	6(100.0)	33(68.8)	7(53.8)	9(47.4)	0.08
No	43(50.0)	14(46.7)	0(0.0)	15(31.2)	6(46.2)	10(52.6)	
Other cleansing methods							
Dental floss	21(24.4)	7 (23.3)	0(0.0)	15(31.2)	1(8.3)	5(27.8)	
Mouthwash	16(18.6)	4 (13.3)	0(0.0)	8(16.7)	3(25.0)	7(38.9)	0.158
Both	17(19.8)	2(6.7)	2 (33.3)	9(18.8)	1(8.3)	1(5.6)	
None	32(37.2)	17(56.7)	4 (66.7)	16(33.3)	7(58.3)	5(27.8)	
Cleaning mouth after food and drink							
Yes							0.185
No	59(70.2)	17(58.6)	6(100.0)0(0.0)	29(60.4)19(39.6)	6(50.0)6(50.0)	10(52.6)	
	25(29.8)	12(41.4)				9(47.4)	

findings of a study from India, where more than 60% of the students reported that regular dental visits might prevent oral disease [16]. The results of a previous study conducted among the school children in Jordan had a similar result [13]. In Kuching, Sarawak study, which

Table 5: Showing comparison between the overall score of knowledge, attitude, and practice between genders and different specialties (Mean ± SD) (N = 202).

Variables	Males	Females	P value (T Test)	Medical	Dental	Nursing	Others	P value (ANOVA)
Knowledge	9.4±2.0	10.2±1.9	**0.002**	9.8±1.9	10.4±2.1	10.1±1.7	8.8±2.1	**0.005**
Attitude	4.0±1.0	4.5±0.9	**0.012**	4.1±1.1	4.2±0.7	4.5±0.7	4.0±1.0	0.1
Practice	3.0±1.3	3.5±1.2	**0.002**	3.2±1.4	3.1±1.3	3.4±1.1	3.2±1.1	0.75

conducted on secondary school student most of students agreed that regular dental visit was necessary but less than 25% reported to, practiced it. This indicates that the awareness of oral health doesn't always impact good dental practice [17]. In this study more than 80% of the students believed that visiting dentists before having a dental problem is important, compared to less than half of the students in Kuwait study which probably because they didn't visit dentists unless they had a pain [19]. Awareness of the importance of teeth in esthetic in this study was high among the students. In North Jordan study the majority of students knew that the caries teeth affect dental esthetics, which means they knew the importance of teeth in esthetics [13]. Almost all students in this study thought that oral health is important for general health.

Female students had a more favorable attitude toward brushing their teeth compared with males. This might be explained by the fact that the female students place more importance to the esthetic appearance of their teeth compared with males. No differences in the attitude toward visiting the dentist regularly every 6 months was observed between female and male participants. This indicates a high level of awareness among health sciences students.

Comparing the practice in this study to other studies, more than 60% of the students brushed their teeth more than once a day, the Kuwait and Jordan studies is nearly the same but in Jeddah study which was conducted among high school students more less, which means that there is significant difference between school students and university students in frequency of daily brushing [13-19]. In Jeddah study, it was found that using the brush and paste for cleaning their teeth was very high the same as in this study and the Jordan study [12,13]. Which means almost all populations know how to brush their teeth but they do not do it regularly especially for the high school student which was in Jeddah study. In this study and china study population approximately half of them change their toothbrush every three-month [15]. In the other hand, comparing to an Indian study showed that more than half of the Indian population changed their toothbrush every three month, maybe because the people which they were changing their tooth brush every three month's they brush too hard which leads to fraying of the toothbrush bristles [16]. Almost all of this population went to the dentist and the higher percentage is for the routine checkup; which means that this population is more interested in their oral health, compared with china and southern India study population which was less likely visiting a dentist and approximately all of them only visiting a dentist for mouth problems such as (dental caries, gum bleeding, tooth pain, tooth trauma and extraction) [14,15,19]. Nevertheless, above 60% of the population and other study populations were brushing their teeth after eating a meal [13, 18,19].

This study was performed in a single teaching hospital in Riyadh among a single batch of pre-professional students. This limits the generalizability of the study findings. Despite these reservations, this study forms a baseline description of knowledge, attitude, and practice of oral health among second year pre-professional students, which can be compared with a later study to establish possible trends and differences between various entering classes.

Conclusion

In this study, female students had better knowledge, attitude and practice compared with male students. When comparing between the various specialties, dental students had significantly better knowledge about oral hygiene practices compared with the other groups. Further research in a more diverse population is recommended to expand on the findings of this study.

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