IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 9 Ver. V (Sep. 2015), PP 26-32
www.iosrjournals.org

The oral health behavior of Palacky university students

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Abstract:
Introduction*: Two major factors have been found to shape attitudes and health behaviors: one is learned experience and the other is culturally determined attitudes.*
Materials and methods*: 200 students were chosen randomly from every faculty at Palacky university. 1800Anonymous questionnaires on oral health behavior were delivered at 9 faculties. The data were processed and analyzed usingsoftware IBM SPSS Statistics 22 statistical package. Chi-square test was used.*
Results: *72.6 % of students brush their teeth 2x a day, 53.3% do not use interdental floss when cleaning their teeth,55.5 % do not use interdental brushes in their oral hygiene practices,41.8% change their toothbrushes after 2 to 3 months of use.Colgate is the most popular toothpaste (37% of total), 38.7% do not use any kind of mouthwashes,Listerine is the most popular mouthwash used (41.8% of total), 57.9% visit their dentist for preventive check-ups 2x a year,Female students have better oral hygiene attitudes compared to male students.*
Conclusion*: Within the limitations of this study, the oral health behavior of students at Palacky University is acceptable, except for the interdental hygiene practices.*
Keywords*: Oral health, behavior, Palacky University, students*

I. Introduction:

There is a major role of dental plaque in the initiation of inflammatory periodontal changes [1, 2]. In addition, effective plaque control is an essential part in the treatment of inflammatory periodontal diseases [1]. Therefore, there is a massive need for providing patients with adequate information about their oral health behavior and actions [3].

Educational activity in the school environment had a positive effect on oral health conditions [4]. Therefore, oral health education should be started during early school education to improve the oral health knowledge of adults later on. In addition, oral health education should also be emphasized in university curriculums for non-dental students during their university study [5].

Al-Zarea found that students from scientific faculties had more information on periodontal disease causes, signs, preventive measures, and relations to general health than students from humanity disciplines. The author explained this finding by writing that students from scientific disciplines are more interested in health related-issues and get more general health education and oral health issues with their relations to general health[5].

Several studies showed that dental health attitudes become much more improved with increasing level of education [6–8]. The improvement of oral health behavior among dental students could be linked to their dental education experience [9] and oral health attitudes seem to increase significantly in the fourth and fifth years of dental education[10].

Female dental students have better oral health behavior than male dental students [11–13]. This could be explained on the basis that females care more about their body and appearance. Therefore, they visit dentistsmore often and are more educated about their dentition even before entering a dental school [8].

There is no study done yet on the oral health behavior of students at different faculties at Palacky University. Thus, we conducted our study.

II. Materials and methods:

After gainingapproval from the EthicsCommittee at Palacky University to conduct the study,200 students were chosen randomly from every faculty at Palacky University. Afterwards, questionnaires were delivered to them resulting in a total of 1800 questionnaires for 9 faculties. The questionnaire was anonymous and included 8 questions on the oral health behavior, (figure 1).

Statistical Analysis. The data were processed and analyzed usingsoftware IBM SPSS Statistics 22 statistical package. Chi-square test was used for the comparison between students of different faculties. Data

were summarized in tables. If the achieved level of statistical significance (asymptotic two-sided significance) chi-square test was less than 0.05, adjusted residuals were calculated. Using the adjusted residuals, we could identify in which cells the observed frequencies differ significantly from the expected frequency. If the value of adjusted residuals in the cell is smaller than - 1.96, it means that the observed frequencies in a given cell is significantly lower than expected. Conversely, residual levels higher than 1.96 indicate the occurrence of a statistically significantly higher rate in a given cell.

III. Results:

Our sample consists of 1800 students from 9 faculties at Palacky University, (table 1).

Regarding the first question in our questionnaire, which is about how often students brush their teeth. Most students of (72.6% of total) brush their teeth 2x a day, with the highest percentage at the Faculty of Law (80 % of students brushed their teeth twice a day) with a significant difference (pvalue <0.05, Adjusted residuals AR=2.5 > 1.96). The second most popular answer is many times daily with a 19.2% of students in total, and the highest percentage is at the Faculty of Medicine with 30.3% of students choosing this option. Students at the Faculty of Dentistry clean their teeth mostly 2x a day (74% of students) and then many times a day (26% of students).

For the second question, which focuses on the use of interdental floss. The majority of students (53.3% of total) donot use interdental floss when cleaning their teeth. The second most popular answer is irregular use of dental floss (29.8% of total). Students at the Faculty of Sports have the highest percentage of no use of dental floss (76% of students) with a significant difference (pvalue <0.05, AR=6.8 > 1.96), while the lowest percentage have students at the Faculty of Dentistry (36% of students) and the Faculty of Medicine (40.5% of students).

Regarding the third question, which deals with the use of interdental toothbrushes. The highest percentage of students do not use interdental brushes in their oral hygiene practices (55.5% of total), with the Faculty of Sports in the first position (77% of students do not use interdental brushes) with a significant difference **(**p value <0.05, AR=6.5 >1.96). The most popular use of interdental brushes was at the Faculty of Dentistry and the Faculty of Health Sciences (only 36% of students, and only 37% of students respectively) donot use interdental brushes.

Regarding the fourth question in our questionnaire, which is how often students change their toothbrushes. The majority of students (41.8% of total) change their toothbrushes after 2 to 3 months of use, with the highest percentage for the Faculty of Health Sciences (56% of students chose this answer) with a significant difference (p value <0.05, AR=4.3 >1.96). The second most popular answer is that students change their toothbrushes irregularly (32.9%).

Regarding the type of toothpaste used, Colgate(Colgate-Palmolive, Poland) is the most popular toothpaste (37% of total), with Elmex(Gaba Internationa, Switzerland)and Odol (GlaxoSmithKline, UK)in the second position (26.2% of total) and Signal(Unilever, Czech Republic)in the third position (24.4% of total), (Table 2). Colgate toothpaste is the most popular in the Faculty of Medicine (55.5% of students) (pvalue <0.05, AR=5.7 >1.96), (Table4). Whereas, Elmex is the most popular toothpaste in the Faculty of Dentistry (52% of students)(pvalue <0.05, AR=8.8 >1.96), Odol is the mostly used toothpaste in the Faculty of Sports (55% of students) (pvalue <0.05, AR= 9.8 >1.96), and Signal is the most popular toothpaste in the Faculty of Science (32.5% of students) (pvalue <0.05, AR= 2.8 >1.96).

Regarding the use of mouthwash, most of the students do not use any mouthwash (38.7% of total), with irregular use of mouthwash in the second position (36.3% of the total). The Faculty of Sports has the highest percentage of no use of mouthwash (83.5% of students) (pvalue <0.05, AR= 13.8 >1.96), while the highest percentage of irregular use of mouthwash is for the Faculty of Theology (48% of students) (pvalue <0.05, AR= 3.6 >1.96).

Listerine (Johnson & Johnson, USA)is the most popular mouthwash used (41.8% of the total), with Odol (GlaxoSmithKline, UK) in the second place (9.4%) and Elmex (Gaba Internationa, Switzerland) in the third place (3.6%), (Table 3). Listerine is the most popular mouthwash used in the Faculty of Medicine (52.5% of students)(pvalue <0.05, AR= 3.2 >1.96), (Table 5).

Regarding the last question in the questionnaire, which deals with the preventive visits to the dentist, the highest percentage of students visit their dentist 2x a year (57.9% of total) and very small percentage of students do not visit a dentist for preventive check-ups at all (2.3% of total). The Faculty of Education has the highest percentage of students visiting their dentists for prevention 2x a year (67% of students) (pvalue <0.05, AR= 2.8 >1.96), while the Faculty of Theology has the highest percentage of students not visiting the dentist at all for prevention (5% of students) (p value<0.05, AR=2.6 >1.96).

After comparing the results between the different faculties, the Faculty of Sports has the worst level of oral health attitudes (76% of students never use interdental floss, 77% never use interdental brush, 83.5% never use any mouthwash). Conversely, the Faculty of Dentistry has the best level of oral health attitudes(only 36% never use interdental floss, only 36% never use interdental brush, and only 35.5% never use mouthwash).

Regarding the gender, female students have better oral hygiene attitudes compared to male students. More male students (65.4% of male students)(p value<0.05, AR= 6.1 >1.96) never use interdental floss in comparison to female students (49% of female students) (p value <0.05, AR= -6.1 < -1.96). More male students (65.8% of male students) (p value<0.05, AR=5.3 >1.96) never use interdental brushes than female students (51.8% of female students) (p value <0.05, AR= -5.3 < -1.96). More male students (46.2% of male students) (p value <0.05, AR= 3.9>1.96) never use mouthwash compared to female students (36% of female students) (p value <0.05, AR= -3.9<-1.96).

IV. Discussion:

Two major factors have been claimed responsible for shaping attitudes and health behaviors,one is learned experience and the other is culturally determined attitudes/beliefs/behaviors(social norms) [14, 15].

Good oral health attitudes should be emphasized during the early education years [8].

The role of parents, and in particular mothers,is very important as they influence the oral health behavior of their children [16]. In addition, the frequency of tooth brushing in parents is in accordance with the frequency of tooth brushing in their children, becausechildren learn most behaviors from their parents [18].

Frandsen claimed that a brushing frequency up to two times a day, was still substantiated and that no significant gains could be achieved by increasing this frequency [19]. 72.6 % of the students included in our study brush their teeth 2x a day, which is a sign of high quality of oral health behavior.

In the past, interdental brushes were available only in large diameters, which made them only suitable for clients with open embrasures. However, the newer interdental brushes are available in diameters suitable for most type I embrasures[20]. In addition, Pauline and colleagues found that interdental brush is an effective alternative to dental floss for reducing interproximal bleeding and plaque in clients with filled or open embrasures[21]. In our study, the majority of students (53.3% of total) do not use interdental floss when cleaning their teeth. Furthermore, the highest percentage of students do not use interdental brushes in their oral hygiene practices (55.5% of total). Thus, the interdental hygiene practices of the students included in our study seem to be inadequate and have to be reinforced.

A high incidence of bacterial contamination in toothbrushes was observed in the study of Ferreira and colleagues. The authors concluded that not only a good cleaning will ensure the reduction of microbial load, but the toothbrush exchange can also ensure better oral health [22]. Sudeep and Sharma found that children who changed their brush every 3 months and 6 months showed significantly less caries prevalence (p<0.001) when compared to children who changed once in a year [23]. In our study, the majority of students (41.8% of total) change their toothbrushes after 2 to 3 months of use, which shows a good level of oral health attitudes of these students.

Boyle and colleagues found that there is evidence for the value of using mouthwash for preventing or reducing the risk of developing dental plaque, gingivitis and dental caries without any adverse effects [24]. However, most of the students included in our study do not use any mouthwash (38.7% of the total), with irregular use of mouthwash in the second position (36.3% of the total). This could be explained by the extra cost involved to buy a mouthwash, which many students cannot afford.

The results of this study showed that the most popular toothpaste used is Colgate. This could be justified by the powerful advertising of this product in the Czech market, client's satisfaction and the cheap price. The most popular mouthwash used is Listerine. This could be only related to the powerful advertising or client's satisfaction, because the price is almost the highest compared to other types of mouthwashes.

According to the guidelines of the National Institute for Health and Care (Nice) in England and Wales(http://publications.nice.org.uk/ifp19 October 2004, *When should my next dental check-up be?*), the time interval between dental check-ups could be as short as 3 months or as long as 2 years – or up to 1 year for people under 18. In addition, the lower the risk of dental problems, the longer the gap will be before next check-up. This may vary at different times of life depending on the condition of teeth, gums and mouth or other changes in health or lifestyle [25]. In our study, the highest percentage of students visit their dentist 2x a year (57.9% of total) and very small percentage of students do not visit a dentist for preventive check-ups at all (2.3% of total). These results show a good level of oral health attitudes of the students included in this study.

Dentists should be an example for their patients, friends, family members, and their society to maintain good oral health. Therefore, dental students should develop their attitudes towards their oral health through the years of study [32]. Many studies showed a better oral health behavior of dental students compared to students of other faculties. Alwahdani et al found that dental students had better oral health attitudes in comparison with dental technology and dental hygiene students [8]. Furthermore, Dogan found that dental students had better oral health attitudes than nursing students [32]. Jaramillo et al showed that dental students had a significantly higher level of oral health behavior than civil engineering students [33]. The results of our study are in agreement with these studies.

Female students reported better behavior in terms of frequency of teeth brushing and visits to the dentist.Most studies showed a significant difference in oral health behavior in relation to gender difference among students[11, 12, 26–29], which agrees with the results of our study. On the other side, some studies showed that gender was not a major factor in health attitudes and behavior among students [30, 31].

This study has some limitations, which may have influenced the results. One limitation is that the questionnaire used in this study did not include questions on the diet of students, which is a major predisposing factor in tooth caries and erosion. Another limitation is that some students might have not answered the questions correctly, in order to show a good picture about themselves and their oral hygiene. However, the big sample size (1800 questionnaires) in addition to the introduction of the questionnaire, which writes clearly that the questionnaire is anonymous might have helped to reduce such errors.

V. Conclusion

Within the limits of this study, we found that the oral health behavior of Palacky university students is acceptable, except for the interdental oral hygiene practices. In addition, the Faculty of Dentistry shows the best oral health behavior, while the Faculty of Sports shows the worst. Furthermore, female students have better oral hygiene attitudes compared to their male colleagues.

VI. Recommendations

According to the results of this study, we recommend:

- More education on oral health attitudes especially at the faculty of sports and among male students at Palacky University.
- More instructions on the use of interdental flosses andinterdental toothbrushes at all faculties at Palacky University.
- More studies on the diet of students at Palacky university.

Funding: No funding was seeked to support this study
Conflict of Interest: No potential conflict of interest could influence this study

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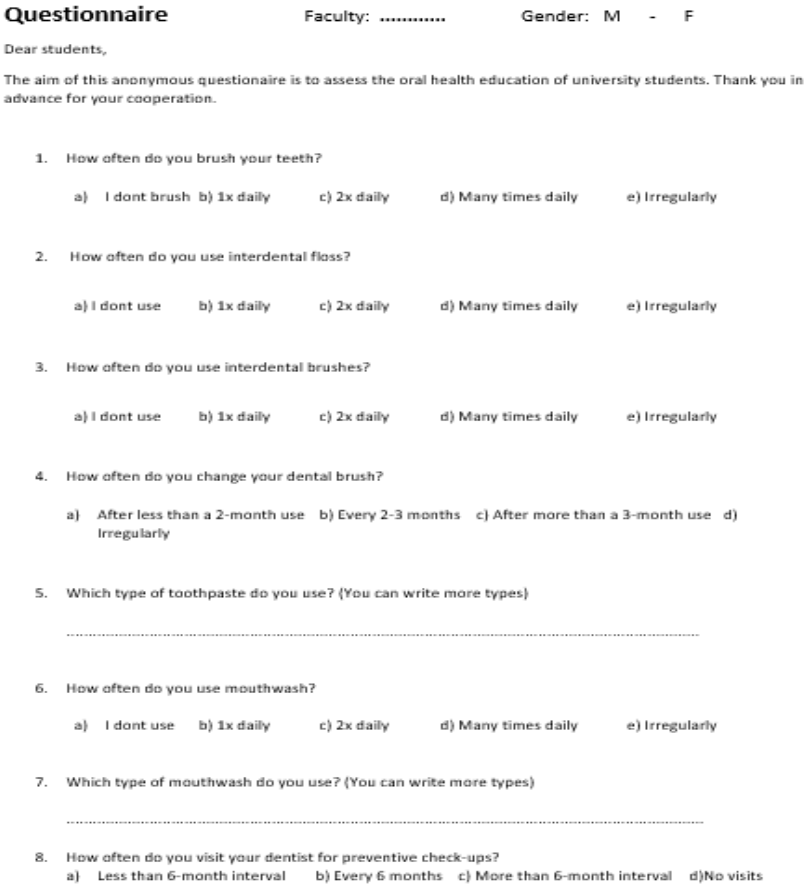
Figures and tables:

Figure 1: The questionnaire used in this study (Translated to english)
Table 1: The 9 faculties at Palacky University, which were included in this study
Table 2: The toothpastes mainly used by students
Table 3: The mouthwashes mainly used by students
Table 4: Colgate toothpaste use at different faculties
Table 5: Listerine mouthwash use at different faculties



Questionnaire Faculty: ..... Gender: M - F

Dear students,

The aim of this anonymous questionaire is to assess the oral health education of university students. Thank you in advance for your cooperation.

1. How often do you brush your teeth?
   a) I dont brush b) 1x daily c) 2x daily d) Many times daily e) Irregularly
2. How often do you use interdental floss?
   a) I dont use b) 1x daily c) 2x daily d) Many times daily e) Irregularly
3. How often do you use interdental brushes?
   a) I dont use b) 1x daily c) 2x daily d) Many times daily e) Irregularly
4. How often do you change your dental brush?
   a) After less than a 2-month use b) Every 2-3 months c) After more than a 3-month use d) Irregularly
5. Which type of toothpaste do you use? (You can write more types)
   .....
6. How often do you use mouthwash?
   a) I dont use b) 1x daily c) 2x daily d) Many times daily e) Irregularly
7. Which type of mouthwash do you use? (You can write more types)
   .....
8. How often do you visit your dentist for preventive check-ups?
   a) Less than 6-month interval b) Every 6 months c) More than 6-month interval d)No visits

Figure 1: **The questionnaire used in this study (Translated to english)**

Faculty	Number of questionnaires
Faculty of Medicine	200
Faculty of Dentistry	200
Faculty of Philosophy	200
Faculty of Education	200
Faculty of Science	200
Faculty of Law	200
Faculty of Sports	200
Faculty of Health Sciences	200
Faculty of Theology	200

Table 1: The 9 faculties at Palacky University, which were included in this study

Toothpaste	Frequency	Percentage
Colgate	666	37,0%
Elmex	471	26,2%
Odol	471	26,2%
Signal	439	24,4%
Sensodyne	113	6,3%
Vademecum	95	5,3%
Lacalut	89	4,9%
Paradontax	75	4,2%

Table 2: The toothpastes mainly used by students

Mouthwash	Frequency	Percentage
Listerine	753	41,8%
Odol	169	9,4%
Elmex	65	3,6%
Colgate	35	1,9%
Parodontax	22	1,2%

Table 3: The mouthwashes mainly used by students

Crosstab

			Colgate		
			Yes	No	Total
Faculty	Philosophy	Count	93	107	200
		% within Faculty	46,5%	53,5%	100,0%
		Adjusted Residua	3,0	-3,0	
	Sports	Count	42	158	200
		% within Faculty	21,0%	79,0%	100,0%
		Adjusted Residua	-5,0	5,0	
	Medicine	Count	111	89	200
		% within Faculty	55,5%	44,5%	100,0%
		Adjusted Residua	5,7	-5,7	
	Education	Count	60	140	200
		% within Faculty	30,0%	70,0%	100,0%
		Adjusted Residua	-2,2	2,2	
	Law	Count	76	124	200
		% within Faculty	38,0%	62,0%	100,0%
		Adjusted Residua	,3	-,3	
	Science	Count	85	115	200
		% within Faculty	42,5%	57,5%	100,0%
		Adjusted Residual	1,7	-1,7	
	Religion	Count	79	121	200
		% within Faculty	39,5%	60,5%	100,0%
		Adjusted Residual	,8	-,8	
	Health sciences	Count	57	143	200
		% within Faculty	28,5%	71,5%	100,0%
		Adjusted Residual	-2,6	2,6	
	Dentistry	Count	63	137	200
		% within Faculty	31,5%	68,5%	100,0%
		Adjusted Residual	-1,7	1,7	
Total		Count	666	1134	1800
		% within Faculty	37,0%	63,0%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75,290	8	**<0,0001**
N of Valid Cases	1800		

Table 4: Colgate toothpaste use at different faculties

Crosstab

			Listerine		
			Yes	No	Total
Faculty	Philosophy	Count	87	113	200
		% within Faculty	43,5%	56,5%	100,0%
		Adjusted Residual	,5	-,5	
	Sports	Count	14	186	200
		% within Faculty	7,0%	93,0%	100,0%
		Adjusted Residual	-10,6	10,6	
	Medicine	Count	105	95	200
		% within Faculty	52,5%	47,5%	100,0%
		Adjusted Residual	3,2	-3,2	
	Education	Count	80	120	200
		% within Faculty	40,0%	60,0%	100,0%
		Adjusted Residual	-,6	,6	
	Law	Count	97	103	200
		% within Faculty	48,5%	51,5%	100,0%
		Adjusted Residual	2,0	-2,0	
	Science	Count	98	102	200
		% within Faculty	49,0%	51,0%	100,0%
		Adjusted Residual	2,2	-2,2	
	Religion	Count	90	110	200
		% within Faculty	45,0%	55,0%	100,0%
		Adjusted Residual	1,0	-1,0	
	Health sciences	Count	88	112	200
		% within Faculty	44,0%	56,0%	100,0%
		Adjusted Residual	,7	-,7	
	Dentistry	Count	94	106	200
		% within Faculty	47,0%	53,0%	100,0%
		Adjusted Residual	1,6	-1,6	
Total		Count	753	1047	1800
		% within Faculty	41,8%	58,2%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	120,864	8	**<0,0001**
N of Valid Cases	1800		

Table 5: Listerine mouthwash use at different faculties