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"Oral health and related behaviors among Dentistry students in Portugal and Turkey"

Diogo Ribeiro Castro Pereira

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Dental Medicine Investigation Article

Master in Dental Medicine

ORAL HELTH AND RELATED BEHAVIORS AMONG DENTISTRY STUDENTS IN PORTUGAL AN TURKEY

Author

Diogo Ribeiro Castro Pereira

5th class student, Master in Dental Medicine,

diogoribeiroup@gmail.com

+351914938167

Supervisors

Maria de Lurdes Ferreira Lobo Pereira,

Professor of Preventive Dentistry and Community Oral Health I, II and III,

mpereira@fmd.up.pt

Maria Benedita Almeida Garrett de Sampaio Maia Marques,

Professor of Microbiology I and II,

bmaia@fmd.up.pt

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Abstract

Introduction: Today`s dentistry students will provide dental services and will be responsible for public oral health education in the future. Their health beliefs and attitudes will have a role in society and it is important to know if they are in conformity with professional recommendations.

Objectives: Evaluate the oral health status and related behaviors among dentistry students of the 2nd and the 5th academic year of the Faculdade Medicina Dentária da Universidade do Porto (FMDUP, Portugal) and EGE Üniversitesi Dis Hekimliği Fakültesi (EUDHF, Turkey).

Materials and methods: This cross-sectional study included the participation of 259 students (120 from EUDHF, 139 from FMDUP). A 15 items questionnaire was designed to evaluate students' oral health attitudes and behaviors. Oral health status was evaluated by an oral examination for Decayed, Missing and Filled Teeth Index (DMFT-I), recorded according visual and tactile parameters of World Health Organization (WHO) criteria, and Simplified Oral Health Index (OHI-S), using Greene and Vermillion defined criteria for Debris and Calculus Index. Dental fissure sealants were recorded. Data analysis was performed using the Statistical Program for the Social Sciences (SPSS® v.21.0), considering a significance level of 0.05.

Results: Portuguese and Turkish students presented similar median values for OHI-S, decreasing in both students' population throughout their educational years. In both countries, students did not differ regarding DMFT-I, but Portuguese students presented an inferior score of decayed teeth. When considered dental program evolution, an increased amount of filled teeth was observed in Portuguese students and a decrease in decayed teeth in Turkish students. The prevalence of fissure dental sealants was higher in Portuguese students, but presenting an increasing tendency from 2nd to 5th academic year in both countries. According to questionnaire, overall students from both countries reported appropriate oral health related attitudes and behaviors.

Conclusion: Portuguese and Turkish dental students from both years show good oral health status. In addition, the oral health of these students is significantly improved over the progression of their academic life (from 2nd to 5th academic year), suggesting that dental educational enhances awareness about personal oral health.

Key words: oral health behaviors; oral health knowledge; Turkey; Portugal; Dental students.

Resumo

Introdução: Os estudantes de Medicina Dentária prestarão cuidados de saúde dentária e serão responsáveis pela educação pública de saúde oral. As suas opiniões e atitudes terão impacto na sociedade, sendo importante aferir se as mesmas estão de acordo com as recomendações dos profissionais de saúde oral.

Objectivos: Avaliar o estado de saúde oral e comportamentos associados nos estudantes de Medicina Dentária do 2º e 5º ano da Faculdade Medicina Dentária da Universidade do Porto (FMDUP, Portugal) e da EGE Üniversitesi Dis Hekimliği Fakültesi (EUDHF, Turquia).

Materiais e métodos: Este estudo transversal incluiu a participação de 259 estudantes (120 da EUDHF, 139 da FMDUP). As atitudes e comportamentos de saúde oral foram analisados através de um inquérito composto por 15 questões. O estado de saúde oral foi avaliado através de uma examinação intra-oral onde foi registado o índice de dentes cariados, perdidos por cárie e obturados (CPO), de acordo com os parâmetros visuais e tácteis definidos pela Organização Mundial de Saúde (OMS). O índice de higiene oral simplificado (I-HOS) foi registado usando os critérios de Greene e Vermillion para os índices de tártaro e placa bacteriana. Os dados foram analisados através do Statistical Program for the Social Sciences (SPSS® v.21.0) e considerado um nível de significância de 0,05.

Resultados: Os estudantes Portugueses e Turcos apresentaram valores medianos similares para I-HOS, decrescendo em ambas as populações ao longo da sua evolução académica universitária. Em ambos os países os estudantes não mostraram diferenças relativamente ao índice CPO, mas os estudantes portugueses apresentaram um número inferior de dentes cariados. Quando se considerou a evolução curricular ao longo do curso, os estudantes Portugueses apresentaram um aumento do número de dentes obturados e os estudantes Turcos um decréscimo na mediana de dentes cariados. A prevalência de selantes de fissuras foi superior nos estudantes portugueses. De acordo com os dados obtidos no questionário, a maioria dos estudantes de ambos os países apresentava comportamentos de saúde oral apropriados.

Conclusão: Os estudantes de Medicina Dentária de Portugal e da Turquia apresentam bons níveis de saúde oral, sendo esta significativamente melhorada ao longo da progressão da sua vida académica universitária (do 2º ao 5º ano), sugerindo que a educação medico dentária aumenta a consciencialização pessoal sobre a saúde oral.

Palavras chave: Comportamentos de saúde oral; conhecimentos de saúde oral; Turquia; Portugal; Estudantes Medicina Dentária

Introduction

Oral health knowledge is considered to be an essential prerequisite for health related practices, and dental health providers should be an example to maintain excellent oral health standards and serve as instructors for their patients, family, friends and society [1-4]. In the future, today`s dentistry students will provide dental services and will be responsible for public oral health education [2, 5, 6] . Their health beliefs and attitudes will have a role in society and hopefully a good impact in general oral status [6].

The improvement of personal oral health among dental students has shown to be linked to their dental education experience as well as their evolution during the dental program: from first to final year [2, 4] and from pre-clinical to clinical years [7]. Using questionnaires, oral health related habits can be evaluated, such as tooth brushing, dental flossing, Dentist appointments frequency and a proper diet [4, 7-14]. However, it is widely accepted that self-report is an imperfect predictor of behavior. Notwithstanding, clinical indices for physical signs of oral health related behaviors compliance have limitations as well [11]. Therefore, the most adequate assessment strategy should include both self-report and clinical indices [11]. The World Health Organization (WHO) criteria for caries diagnostic are used to obtain an estimation of how much the dentition has been affected by dental caries until the day of examination. The Decayed, Missing, Filled Teeth Index (DMFT-I) is a simple index and has been used for over 60 years, being well established as a measure of caries experience in dental epidemiological surveys of dental caries.[15] Little is known about the oral health behaviors and attitudes of Turkish and Portuguese dental students and the influence of educational training on the development of their oral health related behaviors throughout their educational years, and how it reflects in their personal oral health. Also, is important to known if their oral behaviors and attitudes are in conformity with professional recommendations.

This study aims to evaluate the oral health status and related behaviors among dentistry students of the 2nd and the 5th academic years of the Faculdade Medicina Dentária da Universidade do Porto (FMDUP, Portugal) and EGE Üniversitesi Dis Hekimliği Fakültesi (EUDHF, Turkey).

Materials and methods

In this cross-sectional study, all students from the 2nd and the 5th academic year of FMDUP and EUDHF were invited to participate in the present study, after a complete explanation of the methods and aims of the investigation. To all students that voluntarily decided to participate it was given a written study explanation and it was asked a signed informed consent, both approved by the Ethics Committee of either FMDUP or EUDHF. This study included the participation of 259 students. The information collected by questionnaire was anonymous, voluntary and irreversibly confidential.

The questionnaire included 15 items designed to evaluate the oral health students' attitudes and behaviors (Table I). The oral examination was performed using a WHO CPI probe [15] and a flat surface mouth mirror. Cotton rolls and gauze were used when needed. Caries experience was quantified using the DMFT index (sum of decayed, missing and filled teeth), and complete dentition was defined as 28 teeth. Decayed, missing and filled teeth were identified using visual and tactile parameters according to the WHO criteria [15]. The presence of dental sealants, the use of dentures (full or partial) and orthodontic braces was recorded. In order to assess the dental students oral hygiene, the Simplified Oral Hygiene Index (OHI-S) was calculated using Greene and Vermillion [16] defined criteria for Debris and Calculus Index (DI-S and CI-S).

The data analysis was performed using the Statistical Program for the Social Sciences (SPSS® v.21.0). For descriptive analysis of the sample were applied appropriate summary statistics. The categorical variables were described through absolute and relative frequencies (%), continuous variables were described using mean and standard deviation or median, minimum and maximum, depending if their distribution was symmetric or asymmetric, respectively. Were applied when appropriate independence tests; Chi-square to test hypotheses regarding the categorical variables and Students' t-test and Wilcoxon-Mann-Whitney test hypotheses concerning continuous variables with symmetrical and asymmetric distribution, respectively. It was considered a significance level of 0.05.

Table I. Questionnaire for oral health related behaviors evaluation.

Question	Answer options
1. How often do you visit your dentist?	Never; Rarely; Annually; Every 6 months; Every 3 Months; Monthly
2. How many tooth brushings do you perform?	< 1 time/day; 1 time/day; 2 times/day; 3 times/day; 4 times/day; > 4 times day
3. For how long you brush your teeth? (In seconds)	0-30; 31-60; 61-90; 91-120; 121-150; > 150
4. Do you brush your tongue dorsum?	Never; Annually; Monthly; Weekly; Daily
5. Do you brush your cheeks mucosa?	Never; Annually; Monthly; Weekly; Daily
6. Do you brush your gums?	Never; Annually; Monthly; Weekly; Daily
7. Do you brush your palate?	Never; Annually; Monthly; Weekly; Daily
8. Do you use electric toothbrush?	No; Yes
9. How regularly do you change your toothbrush?	Almost never; Annually; Every 6 months; Every 3 Months
10. Do you use dental floss?	Never; Annually; Monthly; Weekly; Daily
11. Do you use a mouthwash?	Never; Annually; Every 6 months; Monthly; Every 15 days; Weekly; Daily
12. Does your mouthwash contain clorohexdine?	No; Yes; Don´t know
13. How often do you smoke?	Never; Annually; Monthly; Weekly; 1-5 Cigarettes/day; 6-10 Cigarettes/day; 11-20 Cigarettes/day; > 21 Cigarettes/day
14. Per day; how many meals do you do?	Average
15. Per day; how many sweets do you eat?	Average

Results

The study included a total 259 participants with a mean age of 21.9 and a standard deviation of 2.2 years old. A total of 154 participants were female, representing 59.1% and 106 were male, representing 40.9% of the total study population. Table II presents the demographic characterization of the study sample in both countries, divided by 2nd and 5th academic years. The Turkish sample presented a similar proportion between males and females students whereas the Portuguese sample presents more females than males in both academic years.

Table II. Demographic characterization of the study sample.

	Portugal (n= 139)			Turkey (n= 120)			P
	2nd Year	5th Year	Total	2nd Year	5th Year	Total	
N	69	70	139	60	60	120	*1.000*
Gender - n (%)							
Female	52 (75.4%)	45 (64.3%)	97 (68.7)	29 (48.3%)	28 (46.7)	57 (47.5)	
							<0.001
Male	17 (24.6%)	25 (35.7%)	42 (30.2)	31(51.7%)	32 (53.3)	63 (52.5)	
Age (Mean ± SD)	20.7 ± 1.4	23.8 ± 1.7	22.3 ± 2.1	19.6± 0.8	23.2 ± 1.6	21.4 ± 2.2	0.001

Clinical evaluation

The results of the clinical evaluation are shown in tables III and IV. In table III are shown the results regarding Portuguese and Turkish students' independently of the academic year. Table IV shows the results regarding dental program evolution in both Portugal and Turkey students' population.

Simplified oral hygiene index (OHI-S)

The Portuguese and Turkish students presented similar median values of OHI-S and similar DI-S and CI-S scores supported these results. When analysing the students' evolution throughout dental program it was possible to observe that OHI-S decreased in both population, although it was only significant in Portuguese students. In agreement, in Portuguese population it was observed a significant decrease in DI-S and CI-S during the program evolution and in Turkish students it was record a decrease in DI-S during the program evolution.

Decayed, missing and filled teeth index (DMFT-I)

Portuguese and Turkish students did not differ regarding DMFT-I. Nevertheless, Portuguese students present an inferior median score of decay teeth in comparison to Turkish students. Regarding Portuguese students' evolution, an increase in DMFT-I was observed. This result was related with an increase of filled teeth, from 2nd to 5th academic year. On the other

hand, DMFT-I did not differ between 2nd and 5th academic year in Turkish students. However, the number of decay teeth decreased significantly and the amount of filled teeth presented a tendency to increase throughout dental program evolution.

Dental fissure sealants

The prevalence of dental fissure sealants was higher in Portuguese Dental Students in comparison to Turkish Dental Students. In both countries students it was possible to observe an increasing tendency of dental fissure sealants from 2nd to 5th academic year, although not attaining statistically significance.

Table III. Intra-oral clinical observation: comparison between Portugal and Turkey.

	Portugal	**Turkey**	***P***
OHI-S	0.67 (0; 2.67)	0.67 (0; 2.83)	*0.240*
DI-S	0.5 (0; 2)	0.33 (0; 1.67)	*0.222*
CI-S	0.17 (0; 1.17)	0 (0; 1.67)	*0.189*
DMFT-I	4 (0; 19)	4 (0;12)	*0.944*
D	0 (0; 7)	1 (0;7)	*0.018**
M	0.12 (0; 3)	0 (0;4)	*0.191*
F	2 (0; 18)	2 (0;12)	*0.276*
Sealants	0 (0;15)	0 (0;7)	*<0.001**

Data are Median (Minimum; Maximum)**. OHI-S**, Simplified Oral Hygiene Index; **DI-S**, Debris Index; **CI-S** , Calculus Index; **DMFT-I**, Decay, missed and filled teeth Index; **D**, Decay teeth; **M**, Missing teeth by caries; **F**, Filled teeth; **Sealants** Dental Fissure Sealants. *Differences statistically significant (P< 0.05).

Table IV. Intra-oral clinical observation: students' evolution from 2nd to 5th academic year in Portugal and Turkey.

	Portugal (n= 139)			Turkey (n= 120)		
	2nd year	5th year	*P*	2nd year	5th year	*P*
OHI-S	0.83 (0; 2.67)	0.50 (0; 2.50)	*<0.001**	0.75 (0; 2.83)	0.42 (0; 2.83)	*0.107*
DI-S	0.50 (0; 2)	0.33 (0; 1.50)	*0.007**	0.67 (0; 1.67)	0.33 (0; 1.50)	*0.014**
CI-S	0.33 (0; 1.17)	0.17 (0; 1)	*0.001**	0 (0; 1.50)	0 (0; 1.67)	*0.959*
DMFT-I	2 (0; 19)	5 (0; 14)	*0.010**	4 (0; 11)	3.50 (0; 12)	*0.537*
D	0 (0; 7)	0 (0; 5)	*0.746*	1 (0; 7)	0 (0; 4)	*0.000**
M	0 (0; 3)	0 (0; 1)	*0.013**	0 (0; 4)	0 (0; 2)	*0.994*
F	2 (0; 18)	4 (0; 12)	*0.001**	2 (0; 9)	3 (0; 12)	*0.063*
Sealants	0 (0; 15)	1 (0; 14)	*0.092*	0 (0; 1)	0 (0; 7)	*0.091*

Data are Median (Minimum; Maximum). **OHI-S**, Simplified Oral Hygiene Index; **DI-S**, Debris Index; **CI-S** , Calculus Index**; DMFT-I**, Decay, missed and filled teeth Index; **D**, Decay teeth; **M**, Missing teeth by caries; **F**, Filled teeth; **Sealants**, Dental Fissure Sealants. *Differences statistically significant (P<0.05).

Oral health related behaviors

In Table V are depicted the results of oral health related behaviors evaluated by questionnaire in Portuguese and Turkish students and in Table VI the evolution of these behaviors from 2nd to 5th academic year. Of notice that the survey answers presented in table I were recoded accordingly to what is considered correct in routine dental hygiene practice.

Portuguese and Turkish students population

There was a higher proportion of Portuguese students visiting their dentist more than one time a year in comparison to Turkish students. Of notice, fourteen Turkish students, representing 11.7%, and only one Portuguese student, representing 0.7%, had never visited their dentist (data not shown). More Portuguese than Turkish students brushed their teeth more than 2 times daily, but there was a lower proportion of Portuguese students that brush their teeth for more than 120 seconds, than Turkish students. Also, Turkey had a superior proportion of students that did not brush their tongue in a daily basis in comparison to Portugal. Regarding to electric toothbrush use, the proportion of Turkish students was higher than Portuguese students. When students were asked about additional bacterial plaque control methods, the use of mouthwash registered differences between countries, being the proportion of Portuguese students using mouthwash higher than Turkish students. In relation to smoking habits, the majority of both Portuguese and

Turkish students were non-smokers. In average, per day, Portuguese students eat more meals, and show a tendency to consume more sweets in comparison to Turkish students.

Portuguese and Turkish Students evolution from 2ⁿᵈ to 5ᵗʰ academic year

Regarding Portuguese students' population, the main differences observed throughout 2ⁿᵈ to 5ᵗʰ academic year were: an increasing proportion of students brushing their teeth for more than 120 seconds; an increasing proportion of students that daily brush their tongue, cheeks and gums; and an increasing proportion of students that change their toothbrush every 3 months.

Regarding Turkish students' population, the main differences observed throughout 2ⁿᵈ to 5ᵗʰ academic year were: an increasing proportion of students visiting their dentist more than one time a year; an increasing proportion of students that use electric toothbrush; an expected decreasing proportion of students that daily brush their palate and gums; and an increasing proportion of students that smoke.

In both countries, the percentage of students that never used dental floss tend to decrease from 2ⁿᵈ to 5ᵗʰ academic year (Data not shown), nevertheless, there was an increasing number of students using dental floss daily throughout their educational years, attaining statistical significance only in Portuguese students population. The proportion of Turkish students smoking increases from 2ⁿᵈ to 5ᵗʰ academic year students. Also, an increasing proportion of students from both countries used clorohexidine mouthwash.

Table V. Oral health related behaviors in Portuguese and Turkish students

Enquiry	Portugal	Turkey	P
	n (%)	n (%)	
Frequency of Dentist visit			
< 1 time/Year	9 (6.5)	52 (42.3)	<0.001*
>1time/Year	130 (93.5)	68 (56.7)	
Frequency of tooth brushing			
<2 times / day	2 (1.4)	13 (10.8)	0.002*
>2 times/day	137 (98.6)	107 (89.2)	
Tooth brushing duration (in seconds)			
< 120	130 (93.5)	90 (75)	<0.001*
>120	9 (6.5)	30 (25)	
Tongue dorsum brush			
Not daily	46 (33.1)	85 (70.8)	<0.001*
Daily	93 (66.9)	35 (29.2)	
Cheeks mucosa brush			
Not daily	107 (77)	104 (86.7)	0.066
Daily	32 (23)	16 (13.3)	
Gums brush			
Not daily	39 (28.1)	48 (40)	0.058
Daily	100 (71.9)	72 (60)	
Palate brush			
Not daily	123 (88.5)	105 (87.5)	0.958
Daily	16 (11.5)	15 (12.5)	
Electric toothbrush use			
No	126 (90.6)	94 (78.3)	0.010*
Yes	13 (9.4)	26 (21.7)	
Frequency of tooth brushing change			
Minimum every 6 months	61 (43.9)	43 (35.8)	0.234
Every 3 months	78 (56.1)	77 (64.2)	
Dental floss use			
Not daily	99 (71.7)	84 (70)	0.865
Daily	39 (28.3)	36 (30)	
Mouthwash use			
No	23 (16.5)	55 (45.8)	<0.001*
Yes	116 (83.5)	65 (54.2)	
Clorohexdine mouthwash use			
No	58 (63)	53 (66.3)	0.780
Yes	34 (37)	27 (33.8)	
Smoking habits			
<1	115 (82.7)	92 (76.7)	0.289
>1	24 (17.3)	28 (23.3)	
Frequency of daily meals			
<4	74 (53.2)	114 (95)	<0.001*
>4	65 (46.8)	6 (5)	
Frequency of daily sweet			
<1	31 (22.3)	38 (31.7)	0.119
>1	108 (77.7)	82 (68.3)	

*Differences statistically significant (P<0.05).

Table VI. Oral health related behaviors from 2nd to 5th academic year

Enquiry	Portugal			Turkey		
	2nd class n (%)	5th class n (%)	P	2nd class n (%)	5th class n (%)	P
Frequency of Dentist visit						
< 1 time/Year	4 (5.8)	5 (7.1)	1.000	32 (53.3)	20 (33.3)	0.043*
>1time/Year	65 (94.2)	65 (92.9)		28 (46.7)	40 (66.7)	
Frequency of tooth brushing						
< 2 times / day	1 (1.4)	1 (1.4)	1.000	9 (15)	4 (6.7)	0.240
>2 times/day	68 (98.6)	69 (98.6)		51 (85)	56 (93.3)	
Tooth brushing duration (in seconds)						
< 120	68 (98.6)	62 (88.4)	0.033*	45 (75)	45 (75)	1.000
>120	1 (1.4)	8 (11.4)		15 (25)	15 (25)	
Tongue dorsum brush						
Not daily	31 (44.9)	15 (21.4)	0.006*	41 (68.3)	44 (73.3)	0.688
Daily	38 (55.1)	55 (78.6)		19 (31.7)	16 (26.7)	
Cheeks mucosa brush						
Not daily	60 (87)	47 (67.1)	0.010*	48 (80)	56 (93.3)	0.058
Daily	9 (13)	23 (32.9)		12 (20)	4 (6.7)	
Gums brush						
Not daily	28 (40.6)	11 (15.7)	0.002*	14 (23.3)	34 (56.7)	<0.001*
Daily	41 (59.4)	59 (84.3)		46 (76.7)	26 (43.3)	
Palate brush						
Not daily	65 (94.2)	58 (82.9)	0.067	48 (80)	57 (95)	0.025*
Daily	4 (5.8)	12 (17.1)		12 (20)	3 (5)	
Electric toothbrush use						
No	61 (88.4)	65 (92.9)	0.542	56 (93.3)	38 (63.3)	<0.001*
Yes	8 (11.6)	5 (7.1)		4 (6.7)	22 (36.7)	
Frequency of tooth brushing change						
Minimum every 6 months	39 (56.5)	22 (31.4)	0.005*	27 (45)	16 (26.7)	0.057
Every 3 months	30 (43.5)	48 (68.6)		33 (55)	44 (73.3)	
Dental floss use						
Not daily	56 (81.2)	43 (62.3)	0.023*	47 (78.3)	37 (61.7)	0.073
Daily	13 (18.3)	26 (37.7)		13 (21.7)	23 (38.3)	
Mouthwash use						
No	16 (23.2)	7 (10)	0.062	33 (55)	22 (36.7)	0.067
Yes	53 (76.8)	63 (90)		27 (45)	38 (63.3)	
Clorohexidine mouthwash use						
No	26 (78.8)	32 (54.2)	0.034*	26 (86.7)	27 (54)	0.006*
Yes	7 (21.2)	27 (45.8)		4 (13.3)	23 (46)	
Smoking habits						
<1	56 (81.2)	59 (84.3)	0.792	52 (86.7)	40 (66.7)	0.018*
>1	13 (18.8)	11 (15.7)		8 (13.3)	20 (33.3)	
Frequency of daily meals						
<4	34 (49.3)	40 (57.1)	0.448	58 (96.7)	56 (93.3)	0.679
>4	35 (50.7)	30 (42.9)		2 (3.3)	4 (6.7)	
Frequency of daily sweet						
<1	18 (26.1)	13 (18.6)	0.390	16 (26.7)	22 (36.7)	0.326
>1	51 (73.9)	57 (81.4)		44 (73.3)	38 (63.3)	

*Differences statistically significant (P<0.05).

Discussion

The evaluation of oral health attitudes and behaviors in dentistry students throughout their educational years can be important in order to better understand the impact of academic formation on oral health of these students [17]. It has been stated that the educational experience acquired during dental programs influences in a positive way oral health related behaviors [5, 12].

According to data collected, both Portuguese and Turkish Dental students in general presented a good oral health status, and reported suitable oral health related behaviors. It is important to state, that besides there is an overall improvement in DMFT-I and OHI-S throughout dental program evolution, already in 2nd academic year, dental students from both countries presented good oral health scores.

Considering that CI-S, DI-S and OHI-S presented were low (<1) it is possible to conclude that dental students take care of their oral hygiene. The general decreasing trend of DI-S, CI-S and OHI-S in both countries from 2nd to 5th academic year can be related to their dental education experience, and revealing an increase concern regarding their oral health.

In our sample, Turkish students presented a superior median of decay teeth when compared to Portuguese. Portuguese students showed a superior score of filled teeth. These results can indicate a higher concern of Portuguese students to search for dental treatments. In addition, the higher fissure sealants application in Portugal can justify the inferior quantity of decay teeth among Portuguese. When considering dental program evolution, Portuguese show different DMFT-I values, supported by an increasing amount of filled teeth. In the Turkish samples, despite no differences were found in DMFT-I values, an important decrease was observed in decay teeth. Cortes and Colleagues [5], in a sample of dental students at the University of Barcelona, evidenced a similar result, showing that the final year dental students had different DMFT-I comparing to 3rd year students, supporting this fact by an increasing amount of filled and missing teeth, and a decreasing value of decay teeth. This is a relevant fact to notice, because more important than knowing how overall DMFT-I values evolve throughout dental program, it is important to know how their components progress in the same period of time. These results reveal a positive evolution in oral health status throughout dental education. This fact can be explained by a growing concern in dental students in search for dental health care during the dentistry program, motivated for their increasing knowledge or concern about their oral health. The awareness and crescent clinical training of the students, particularly in final academic year, can motivate them to search for dental treatments, or lead them to develop treatments between pairs during clinical training, especially preventive treatments such as dental

fissure sealants. This can also explain the increasing tendency of fissure sealants application in both countries from 2nd to 5th academic year.

Regarding oral health behaviors, preventive behaviors such as tooth brushing duration, daily dental floss usage and daily brush of oral structures should improve in both Portuguese and Turkish students' population. Nevertheless, oral health behaviors routines were maintained or improved throughout dental program evolution. In agreement, Rong and colleagues [10] show that studying clinical dentistry has allowed the dentistry students in their final year to have a significantly better oral hygiene practice, positive attitude and to be confident to their oral health practice.

Visiting the dentist at least one time per year after the 1st tooth eruption is recommended in order to prevent dental and oral diseases. The highest proportion of Portuguese dental students visiting their dentist more than 1 time per year, comparing to Turkish students, could be related to a superior search for preventive treatments in Portuguese students. It is important to state that the proportion of Turkish students visiting the dentist more than 1 time per year increased from 2nd to 5th academic year, which can be associated to their increasing knowledge and concern related to their oral health. In addition, low rate of regular dental visit among Turkish dental students can be explain by the fact that restorative dentistry is more commonly provided than preventive dentistry following the Turkish governmental dental health policy [1]. This fact can also explain the low quantity of dental fissure sealants in Turkish comparing to Portuguese students.

In order to improve dental plaque control, twice daily tooth brushing (manual or electric), for at least 2 minutes, complementing it with daily usage of dental floss, is suggested by most dentist [18]. In this study, the majority of Turkish (89.2%) and Portuguese (98.6%) students brushed twice daily, being these results in agreement with Cortes and Colleagues [5], that recorded an 88.6% of dental students brushing their teeth twice daily. Also in this study, 53.2 % of dental students spend more than 2 minutes brushing daily their teeth, being these results far superior to the ones registered for Turkish (25%) and Portuguese (6.5%) students.

Tongue, gums, cheeks and palate cleaning are a component of oral hygiene measures, as these oral surfaces are relevant reservoirs for oral microbiota, especially the tongue, where coating is known to be the predominantly implicated cause of halitosis [3]. In this study, only gum brushing was performed by the majority of Turkish students, while the generally of Portuguese students brushed their tongue and gums. Interestingly, Portuguese students show a general tendency to increase brushing in all oral structures throughout curricular years (tongue,

checks, gums, palate), whereas Turkish students show a tend to decrease the brushing of tongue, checks, gums and palate throughout the dental degree. However no explanation was found for this behavior among Turkish students.

Regarding to dental floss use, in both countries the percentage of students that don`t use dental floss in a daily basis tend to decrease from 2nd to 5th academic year, being only statistically significant in Portuguese student population. On the other side, the study registered an increasing number of students using dental floss daily throughout academics years. This fact can translate an improvement of personal oral health among dental students linked to their dental education experience and increasing oral health attitudes and behaviors in the final year of education. Despite the increasing tendency in daily flossing behavior during dental program education in both countries, the overall percentage performing it was low (<40%). In one population of 486 preclinical and 278 clinical students from 3 public dental faculties in Turkey, the percentage of preclinical students using dental floss daily rounded 19%, increasing this value to 31% among students in clinical years [9]. Our study, registered the same increasing tendency in daily dental floss use from preclinical to clinical years, although the percentage of clinical users was slightly superior (18.3% to 37.7% in Portuguese students, and 21.7% to 38.3% in Turkish students).

Smoking affects whole oral and systemic health [19]. Dentists are important models for their patients, and those using tobacco probably are less likely to counsel their patients to quite [9]. In the European Union, an estimated of 26% of people aged 15 years or older are current daily smokers [20]. According to WHO Report on the Global Tobacco Epidemic – 2011 [21], 18.7% of Portuguese and 27.4 % Turkish over 15 years old smoked daily. In the present study 17.3 % of the Portuguese and 23.3% of Turkish students smoked at least one cigarette a day, being these results in agreement to those reported by WHO for general population in both countries. The prevalence of daily smoking habits in our population of Portuguese students was similar of that reported in a sample of Portuguese Medical students, 18.04% [22]. Also the prevalence of smoking habits in Turkish students were consistent with those related in two samples of Turkish students, with 22% [4] and 26 % [9] claiming to smoke in a daily basis. In our study no relationship was found between smokers and mouthwash users as reported in other studies where smokers used more mouthwash when compared to the non-smokers [4, 9]. No relation was found to explain the higher proportion of Portuguese students using mouthwash comparing with Turkish.

In the present study, the students of 2nd and 5th academic years were different. A longitudinal study should be performed in order to compare the evolution of oral health status and behaviors in the same group of dental students throughout their dental program evolution.

Conclusions

In light of these results it can be concluded that:

1- Portuguese and Turkish dental students from both academic years show good oral health status (DMFT-I and OHI-S).

2- The oral health of either Portuguese and Turkish dental students is significantly improved over the progression of their academic life (from 2nd to 5th year), suggesting that dental educational enhances awareness about personal oral health as well as their initiative in seeking and obtaining dental treatments.

3- Portuguese dental students have significant higher amount of dental fissure sealants than Turkish students, suggesting a preventive oral health strategy among Portuguese population.

4- Oral health behaviors are generally in agreement with professional recommendation, nevertheless, preventive behaviors such as tooth brushing duration; daily dental floss usage and daily brush of oral structures should improve in dental students from both countries.

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Annexes

Annex 1

DECLARAÇÃO

Monografia de Investigação/ Relatório de Atividade Clínica

Declaro que o presente trabalho, no âmbito da Monografia de Investigação/ Relatório de Atividade Clínica, integrado no MIMD, da FMDUP, é da minha autoria e todas as fontes foram devidamente referenciadas.

03/06/2013

O investigador

Annex 2

PARECER

(Entrega do trabalho final de Monografia)

Informo que o Trabalho de Monografia desenvolvido pelo Estudante Diogo Ribeiro Castro Pereira com o título: *Oral health and related behaviors among Dentistry students in Portugal and Turkey*, está de acordo com as regras estipuladas na FMDUP, foi por mim conferido e encontra-se em condições de ser apresentado em provas públicas.

03/06/13

A Orientadora

Annex 3

PARECER

(Entrega do trabalho final de Monografia)

Informo que o Trabalho de Monografia desenvolvido pelo Estudante Diogo Ribeiro Castro Pereira com o título: *Oral health and related behaviors among Dentistry students in Portugal and Turkey* está de acordo com as regras estipuladas na FMDUP, foi por mim conferido e encontra-se em condições de ser apresentado em provas públicas.

03/06/13

A Coorientadora

_____

Annex 4 - Statement of Informed Consent

I, _____ (Full name), understood the explanation that was given, in writing and verbally, about the investigation entitled
 "Oral health and related behaviors in dental students from Portugal and Turkey" conducted by the student Diogo Ribeiro Castro Pereira, student from the School of Dental Medicine, University of Porto, for which it is requested their participation. It was given to me the opportunity to ask the questions that I thought necessary, and for all I got a satisfactory response.

I am aware that, in accordance with the recommendations of the Helsinki Declaration, the information given to me versed objectives, methods, anticipated benefits, potential risks and possible discomfort. Furthermore, it was saying that I have the right to decide freely accept or refuse at any time to participate in the study. I know I can leave the study and I will not have to endure any penalty or any expenses for participation in this study.

It was given to me all the time he needed to reflect on this proposal for participation.

Under these circumstances, I consent to participate in this research project, as it was was presented by the researcher in charge for knowing the confidentiality of participants and data relating thereto is assured.

Furthermore, I authorize that the study data are used to this and other scientific works, since irreversibly anonymised.

Signature of the participant

_____

Student in charge:

Diogo Ribeiro Castro Pereira

Mobile Phone: +351914938167

E-mail: diogoribeiroup@gmail.com

Adress: Faculdade de Medicina Dentária da Universidade do Porto, Rua Dr. Manuel Pereira da Silva, 4200-393 Porto

Supervisors:

Professor Maria de Lurdes Ferreira Lobo Pereira,

mpereira@fmd.up.pt

Professor Maria Benedita Almeida Garrett de Sampaio Maia Marques,

bmaia@fmd.up.pt

Annex 5 - Study explanation

"Oral health and related behaviors among Dentistry students in Portugal and Turkey"

1.1 Type and characterization of the study

This study focus on the oral health and hygiene quality in the students from the 2nd and 5th years of the "Faculdade Medicina Dentária Universidade do Porto" (Portugal) and "EGE Üniversitesi Diş Hekimliği" (Turkey).

1.2 Objective

With this study we aim to evaluate if there are differences in oral health and related behaviors between dentistry students from the 2nd and 5th years of the "Faculdade Medicina Dentária Universidade do Porto" (Portugal) and "EGE Üniversitesi Diş Hekimliği" (Turkey).

1.3 Materials and Methods

Each participant will have to answer a survey related to the health care and oral hygiene habits, as well as to evaluate the DMFT-I (decayed, missing and filled teeth) and oral hygiene indexes (OHI-S).

1.4 Expected outcomes

This study aims to characterize the oral health and hygiene in dentistry students from Portugal and Turkey.

1.5 Risk / Discomfort

There are no risks or discomfort to participants beyond those inherent to a noninvasive oral evaluation (determination of DMFT-I and OHI-S).

1.6 Ethical Opinion

For the execution of this research project it was requested the opinion of the Ethics Committee of EGE Üniversitesi Diş Hekimliğ and "Faculdade Medicina Dentária Universidade do Porto" about its feasibility. During its implementation, there will be considered all rules described in bioethical legislation, particularly regarding data processing and storage, which will be guaranteed the confidentiality of all information.

I declare that I have received, read and understood the explanation of the study.

_____
The participant

Annex 6 - Informed consent from FMDUP Ethics Committee

U.PORTO
FACULDADE DE
MEDICINA DENTÁRIA
UNIVERSIDADE DO PORTO

Exmo. Senhor
Estudante Diogo Ribeiro Castro Pereira
Curso de Mestrado Integrado em
Medicina Dentária da
Faculdade de Medicina Dentária da U. Porto

0079   30 JAN. 2013

Assunto: Avaliação pela Comissão de Ética da Faculdade de Medicina Dentária da Universidade do Porto do Plano de Atividades a realizar no âmbito da unidade curricular "Monografia de Investigação/Relatório de Atividade Clínica" do Mestrado Integrado em Medicina Dentária e cujo título é: "Saúde Oral e fatores de risco em estudantes de Medicina Dentária de Portugal e da Turquia".

Informo V. Exa. que o projeto supra citado foi:

- **Aprovado** na reunião da Comissão de Ética do dia 23 de janeiro de 2013.

Com os melhores cumprimentos,

O Presidente da Comissão de Ética

António Felino
(Professor Catedrático)

Annex 7 - Informed consent from EUDHF Ethics Committee

Diş Hekimliği EGE Üniversitesi

We declare that Diogo Ribeiro Castro Pereira, 5th class student - Master in Dental Medicine - at Faculdade Medicina Dentária Universidade do Porto, Portugal and actual Erasmus student (September 2012 – January 2013), at Diş Hekimliği EGE Üniversitesi, Izmir, Turkey, has proposed his monographic research "Oral health and risk factors in Dentistry students in Portugal and Turkey / Saúde oral e fatores de risco em estudantes de Medicina Dentária de Portugal e da Turquia" to the Etical Comitte of Diş Hekimliği EGE Üniversitesi, and he is developing his work under our supervision.

Best regards;
Izmir, 9th January 2013,

The supervisors at Diş Hekimliği EGE Üniversitesi

Professor Dr. Riza Alpöz   Assintant Professor Asli Topaloglu-Ak

Annex 8 - Questionnaire for oral health related behaviors

The main aim of this survey is to collect information about oral health related behaviours of Dentistry Students. The survey has <u>55 questions</u> distributed along <u>7 pages</u>. In each question, please, choose only one answer placing a cross (X) in the space designated for that purpose ☐.
This survey is anonymous and all information will be properly preserved.

ID Code ☐☐☐☐

1 - Gender
☐ Male
☐ Female

2 – Birthday Year
☐☐☐☐

3- Do you use oral corticosteroid inhalers?
☐ Never
☐ Ocasionaly
☐ Regularly

4- Are you immunosupressed?
☐ No
☐ Yes

5- Do you often perform voluntarily or involuntarily gastric regurgitation?
☐ No
☐ Yes

6 – Do you have mycoses in your nails or skin?
☐ No
☐ Yes

7- Do you use any hormonal contraceptive method?
☐ No
☐ Yes

8 - Have you ever had oral manifestations of Herpes?
☐ No
☐ Yes

9 - How often do you perform hands hygiene in a day?
☐ 1 time or less
☐ 2 to 3 times
☐ 4 to 7 times
☐ 8 to 12 times
☐ 13 or more times

10 - How often do you visit your dentist?
- [ ] Never
- [ ] Rarely
- [ ] Anually
- [ ] Semiannually
- [ ] Every fifhteen days
- [ ] Monthly

11 - How many tooth brushings do you perform daily?
- [ ] Less than 1time/day
- [ ] 1 time/day
- [ ] 2 time/day
- [ ] 3 time/day
- [ ] 4 time/day
- [ ] More than 4 times/day

12 – For how long you brush your teeth (in seconds)?
- [ ] 0-30
- [ ] 31-60
- [ ] 61-90
- [ ] 91-120
- [ ] 121-150
- [ ] More than 150

13 - In your daily oral hygiene, do you brush the dorsum of the tongue?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

14 - In your daily oral hygiene, do you brush your cheeks mucosa?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

15 - In your daily oral hygiene, do you brush your gums?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

16 - In your daily oral hygiene, do you brush your palate?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

17- Do you use electric toothbrush?
- ☐ No
- ☐ Yes

18- How regularly do you change your toothbrush?
- ☐ Almost never
- ☐ Annually
- ☐ Semesterly
- ☐ Trimesterly

19- Your toothpaste is:
- ☐ Without specification
- ☐ Whitenning
- ☐ Anti-tartar
- ☐ For sensitive teeth
- ☐ Anticaries
- ☐ Other

20 – Do you use dental floss?
- ☐ Never
- ☐ Annually
- ☐ Monthly
- ☐ Weekly
- ☐ Daily

21 – Do you use fluoride reinforcements?
- ☐ Never
- ☐ Annually
- ☐ Monthly
- ☐ Weekly
- ☐ Daily

22 – Do you use a mouthwash?
- ☐ Never
- ☐ Rarely
- ☐ Annually
- ☐ Semesterly
- ☐ Every fifteen days
- ☐ Monthly

23 – Does your mouthwash contain chlorohexidine?
- ☐ No
- ☐ Yes
- ☐ Don`t know

24 - Have you done any preventive treatment (sealants)?
- ☐ No
- ☐ Yes
- ☐ Don`t know

25 – Do you use or have used orthodontic braces?
- ☐ No
- ☐ Yes

26 – Do you use dental braces of retention?
- ☐ No
- ☐ Yes

27 – Do you use aligner?
- ☐ No
- ☐ Yes

28 – Do you use dental prostheses?
- ☐ No
- ☐ Yes

29 – Do you have gingivitis?
- ☐ No
- ☐ Yes
- ☐ Don`t know

30 – Do you have periodontal disease?
- ☐ No
- ☐ Yes
- ☐ Don`t know

31 - Do you suffer from xerostomy (low salivary flow)?
- ☐ No
- ☐ Yes
- ☐ Don`t know

32 - Do you suffer or have suffered from onychophagia (habit of nail biting)?
- ☐ No
- ☐ Yes

33 – Do you usually breath through your mouth?
- ☐ No
- ☐ Yes

34- Do you have the habit to bite objects? (Like pens or pencils)
- ☐ No
- ☐ Yes

35 - Do you have the habit of flipping through books using your wet fingers in saliva?
- ☐ No
- ☐ Yes

36 – Have you ever practiced oral sex in women?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

37- Do you live or frequently coexist with people over 70 years?
- [ ] No
- [ ] Yes

38- How often do you smoke?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] 1 to 5 cigarettes/day
- [ ] 6 to 10 cigarettes /day
- [ ] 11 to 20 cigarettes /day
- [ ] >21 cigarettes /day

39 – How often do you drink beer?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

40 – How often do you drink wine?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

41 – How often do you drink spiritual drinks (exp. raki)?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] Weekly
- [ ] Daily

42 – How often do you drink coffee?
- [ ] Never
- [ ] Annually
- [ ] Monthly
- [ ] 1 to 2 times a week
- [ ] 3 to 5 times a week
- [ ] Over 2 times a day

43 - How often do you use soft drugs (cannabis, hashish)?
- ☐ Never
- ☐ Annually
- ☐ Monthly
- ☐ Weekly
- ☐ Daily

44 -How often do you use acid / LSD?
- ☐ Never
- ☐ Annually
- ☐ Monthly
- ☐ Weekly
- ☐ Daily

45 - How often do you use hard drugs (cocaine / heroin)?
- ☐ Never
- ☐ Annually
- ☐ Monthly
- ☐ Weekly
- ☐ Daily

46 - How often do you chew gum?
- ☐ Never
- ☐ Annually
- ☐ Monthly
- ☐ Weekly
- ☐ 1 time a day
- ☐ Several times a day

47 – Your chewing gum has sugar?
- ☐ Never
- ☐ Always
- ☐ Sometimes
- ☐ Don`t know

48 - Your chewing gum has xilitol?
- ☐ Never
- ☐ Always
- ☐ Sometimes
- ☐ Don`t know

49 - Throughout the day, what do you usually drink?
- ☐ Water
- ☐ Soda
- ☐ Alcoholic beverages

50 – How many meals do you do in a day (Average)?
- ☐ (Indicate the number)

51– Per day, how many pieces of fruit do you eat?
☐ (Indicate the number)

52 –Per day, how many sweets do you eat?
☐ (Indicate the number)

53 – Do you eat regularly spicy food?
☐ No
☐ Yes

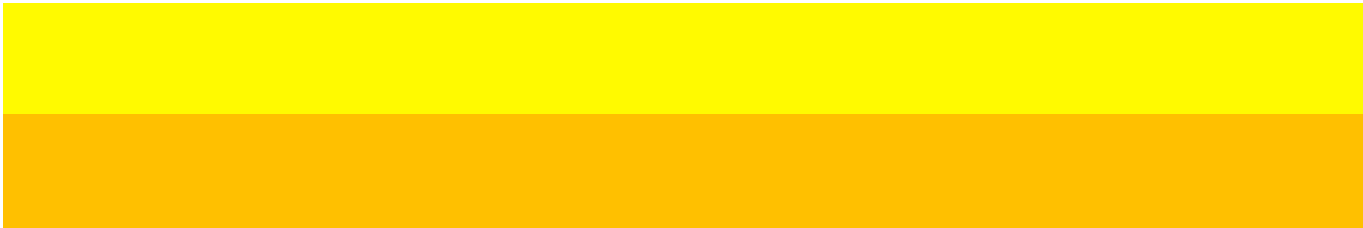**54 – From where does the water you usually drink come from?**
☐ Bottled
☐ Companionship
☐ Mixed (bottled and companionship)

55- Do you use or have used tongue piercings?
☐ No
☐ Yes