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Evaluation of oral hygiene behaviors and teeth condition of students in oral and dental health nursing course

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ABSTRACT. Nursing students are role model related to health franchise play an important in oral health care and promotion. This study aim is assessment the caries and oral and dental health behaviors of nurse students who be able expected take upon the responsibility of oral health in future. This was descriptive observational study with cross-sectional approach, conducted at a state university in Mediterranean, Turkey. The study population was formed from 34 nursing students who voluntary select to course of oral and dental health nursing. Firstly, data were collected by socio-demographic form and then all students had been examined by dentist researcher. It was determined that 76.5% of the nursing students included in the study had at least one tooth decay, 70.6% needed treatment, and 67.6% had debris. It was determined that there was a relationship between gender, floss use, mouthwash, regular brushing teeth twice a day before the age of 6, smoking, and D, F, M, DMFS, DMFT indices in those who were breastfed for >=6 months. Increasing the awareness level of students will have a positive impact on the health of the patients they will care for.

Keywords: dental caries; debris; nursing students; turkey.

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Introduction

It is a worldwide phenomenon that oral and public health are separated. But oral health is part of total health and essential to quality of life. There is correlation between BMI and tooth decay. and intake of high carbohydrate foods is a risk factor for obesity and caries. According to World. Health Organization report; there are an increasing epidemic of obesity and caries in worldwide (Branca, Nikogosian, Lobsein, 2007; Weinberg,Westphal, & Segelnick, 2015). The hallmark of a synergistic epidemic is the presence of two or more disease states that adversely interact with each other, negatively affecting the mutual course of each disease Additionally, sugar foods sectors have quickly and fundamentally changed dietary patterns by increasing access to high calorie foods and processed carbohydrates, radically increasing the proportion of individuals with type 2 diabetes and oral health problems (Wening, Bramantoro, Palupi, Ramadhani, & Alvita, 2019).

Along with feeding habits, oral and dental practices are risk factors for dental caries. In Turkey, conducted in the studies related oral health behaviors, it was insufficiently determined that behaviors such as consuming toothpaste daily tooth brushing and going to a dentist (Toker, Ergün, Akben, & Göçebe, 2020). Dental caries prevalence is changed 40-99% between different age group in Turkey (Doğan & Gökalp, 2008; Karabekiroğlu & Ünlü, 2011). Dental practitioners are not only limited to maintaining the oral health of their patients, but also include promoting their overall health; oral health professionals can significantly contribute to improving their patients' overall health by taking on additional tasks, such as screening for and monitoring non communicable diseases. However, oral health is multi-professional working and role of dental hygienists, pharmacists, nutrients and other medical specialists, primary care physician, public health nurse. Nursing students are role model related to health franchise play an important in oral health care and promotion.

In Turkey, nursing education is 4 years (graduate level). Oral and dental health courses are included in the nursing curricula of many universities as an elective. With adequate education and training in oral health, the nurse workforce has the potential to have a major impact on improving access and quality of oral health care.

This study aim is assessment the caries and oral and dental health behaviors of nurse students who be able expected take upon the responsibility of oral health in future.

Methods

This was descriptive observational study with cross-sectional approach, conducted at a state university in Mediterranean, Turkey. The study population was formed from 34 nursing students who voluntary select to course of oral and dental health nursing. All nursing students who voluntary select to course of oral and dental health nursing were included in this study.

In turkey, the course duration in nursing departments is a total of 4 years, with the last 3 years including both theory and practical clinical applications. Oral and dental health course is included in second year and voluntary course.

Firstly, data were collected by socio-demographic form and then all students had been examined by dentist researcher. The severity of caries was measured using the DMFS, DMFT index and ICDAS to observe whether or not an index was used to show the number of subjects affected by caries, the number of teeth that needed treatment, and the number of teeth that had been treated. In addition, dentist researcher was compared their dental examination with their dental biofilm. The measurement results showed a score of 0.0-1.1 for very low DMFT, score of 1.2-2.6 for low DMFT, score of 2.7-4.4 for moderate DMFT, score of 4.5-6.5 for high DMFT, and score of >6.6 for very high DMFT (Gilli & Schumann, 2011). The nursing students were examined clinically and radiographically. Dental caries lesions were scored according to ICDAS (International Caries Detection and Assessment System) (Enamel lesions graded to ICDAS level 1-3; lesions penetrating in to dentine graded to ICDAS level 4-6). The introduction of the ICDAS provided and evidence-based method for comprehensive caries classification for dental practitioners and educators. For the analyses, ICDAS scores 1–3 represented enamel caries lesions (ICDAS1–3) and scores 4-6 dentin caries lesions (ICDAS4–6).

Data analyzed

The data were analyzed statistically using SPSS version 22.0 software. Results were stated as mean ± standard deviation (SD) values. Data were analyzed in a 95% confidence interval (CI). A value of $p < 0.05$ was accepted as statistically significant and were used independent student t test, correlation, bivariate regression.

Ethical approved

The ethics committee approval of this research was received from the non-interventional Clinical Research Ethics Committee (Approval Number: 234 Dated: 02.12.2015). The procedures of the study were in accordance with the Declaration of Helsinki, as well as local laws and regulations. Prior to study participation, participants were asked for informed consent so as to include the risks and benefits of the research, limits of confidentiality, and their rights to withdraw from the research.

Funding

There was no funding in this study. The all students were examined clinically by dental researcher and radiology of the all students was taken free charge at the oral dental health hospital within the scope of primary health care.

Results

Among the 34 nurse students, 55.9% were women, 44.1% were men. The mean age of the students was 22.5 ± 1.2.It showed dental condition variables of nursing students who voluntary select to course of oral and dental health nursing in Table 1.

In this study, according to examined 76.5% of nurse students have a one decayed teeth, 70.6% of students have need treatment and 67.6% of students have debris. More half of students visit dentist because of decayed teeth and one fifth of students visit dentist because of pain. However, 70.6% of students visited dentist once last year. The reasons for visit to dentist in the last year is often pain, control and cleaning. It was determined low rate of use floss and mouthwash (Table1).

It was presented mean of DMFS and DMFT indexes in Table 2.

In examination, 61.8% of the students have decayed teeth and 38.2% have filled teeth. The DMFT was 2.04 ± 2.31 with a mean of 1.70±1.94 decayed teeth, a mean of 0.29 ± 0.71 missing teeth and a mean of 1.41 ± 2.36 filled teeth. According to DMFT classification, 85.3% of students have very low risk, 11.8% moderate risk and 2.9% very high (Table 2).

It is presented status of students' teeth according to ICDAS code in Table 3.

Table 1. Some variables and dental condition of Nursing Students.

Variables	n	%	Variables	n	%
Teeth Condition			Status of go to the dentist in last one year		
Healthy	8	23.5	Yes	24	70.6
Decay	26	76.5	No	10	29.4
Treatment Condition			The reasons to go to the Dentist in last one year		
No	10	29.4	Never gone	10	29.4
Yes	24	70.6	Pain	6	17.6
Debris Condition			Decay	2	5.9
No	11	32.4	Control	6	17.6
Yes	23	67.6	Treatment	3	8.8
Use of Floss Condition			For cleaning	5	14.7
No	22	64.7	In this study	2	5.9
Yes	12	35.3	Breastfeeding Time(month)		
Use of Gargle Condition			<6 month	15	44.1
No	26	76.5	>=6month	19	55.9
Yes	8	23.5			
Age of Tooth Brushing > 2 Times Per Day			Smoking		
<6 age	9	26.5	Yes	14	41.2
>=6 age	25	73.5	No	20	58.8
Total	34	100.0	Total	34	100.0

Table 2. Frequency and Mean of DMFS, DMFT Indexes.

Index	X±S.D	n (%)
Decay teeth	1.70±1.94	21(61.8)
Missing teeth	0.29±0.71	6 (17.6)
Filling teeth	1.41±2.36	13 (38.2)
DMFT	2.04±2.31	24 (70.5)*
DMFS	0.04±0.05	20 (58.8)*
DMFT classification		
Very Low (0.0–1.1)	1.32±1.51	29 (85.3)
Moderate (2.7-4.4)	5.40±0.48	4 (11.8)
Very High (<6.6)	9.23±0.01	1 (2.9)

* Percentage of DMFT and DMFS index values (excluding "0").

Table 3. Evaluation of students according to ICDAS codes.

ICDAS CODES	Yesn*(%)	Non*(%)	Number of teeth
ICDAS 0	0(0.0)	34(100.0)	0
ICDAS 1	3(8.8)	31(91.2)	5
ICDAS 2	9(26.5)	25(73.5)	16
ICDAS 3	2(2.9)	33(97.1)	2
ICDAS 4	3(8.8)	31(91.2)	4
ICDAS 5	7(20.6)	27(79.4)	10
ICDAS 6	7(20.6)	27(79.4)	10
ICDAS Classification			
ICDAS1-3(Enamel Lesions)	10(29.4)	(24)70.6	23
ICDAS4-6(Dentin Lesions)	13(38.2)	21(61.8)	24

*n= number and frequency of students.

Teeth status of students' 8.8% was in ICDAS 1 (First visual change in the enamel; seen only after prolonged air drying restricted to within the confines pit or fissure), 26.5% of students had ICDAS 2 (Distinct visual change in enamel visible when wet, lesion must be visible when dry). Only one student had ICDAS3 (Localized enamel breakdown seen when wet and after prolonged drying) and 8.8% of students examined as ICDAS4 (underlying dark shadow from dentine) and 20.6% of students ICDAS5 (Distinct cavity with visible dentine), ICDAS6 (Extensive distinct cavity with visible dentine).

In Table 4, Male students had more missing teeth and mean of DMFS index. Decayed, missing filling and DMFS index were significantly lower in students who <6 years started the brush teeth regularly twice a day. However, the use of dental floss and mouthwash is related also low decayed, missing, filling, mean of DMFT and DMFS index. In additional, students who are breastfed <6 month had significantly low decayed, missing, filling and mean of DMFT index. It has been determined that the mean of missing teeth is high to smokers' students.

Table 4. Comparison some variables and mean of decayed, missing, filling and DMFT, DMFS index.

Variables	Decayed X(S.D)	Missing X(S.D)	Filling X(S.D)	DMFT X(S.D)	DMFS X(S.D)
Gender					
Female	1.72(1.87)	0.16(0.51)	1.44(2.47)	1.93(2.12)	0.03(0.03)
Male	1.68(2.08)	0.43(0.89)	1.37(2.30)	2.16(2.57)	0.05(0.06)
t/p*	0.05/0.950	1.10/0.04	0.84/0.840	0.290/0.890	1.23/0.04
Age of Tooth brushing > 2 times per day					
<6 age	1.16(1.51)	0.55(1.13)	0.84(1.40)	1.38(1.63)	0.07(0.07)
>6 age	3.22(2.27)	0.20(0.50)	3.00(3.64)	3.86(2.99)	0.03(0.01)
t/p*	3.04/011	1.28/0.006	2.53/0.000	3.09/0.330	2.38/0.03
Use of Floss					
Yes	1.36(1.94)	0.08(2.28)	0.50(1.16)	1.82(2.49)	0.05(0.04)
No	2.33(1.87)	0.40(0.85)	1.90(2.70)	2.34(1.99)	0.03(0.05)
t/p*	1.40/0.94	1.27/0.08	1.70/0.07	0.72/0.570	0.80/0.43
Use of Mouthwash					
Yes	1.12(1.35)	0.00(0.00)	0.62(1.40)	1.14(1.36)	0.04(0.04)
No	1.88(2.08)	0.38(0.80)	1.65(2.56)	2.31(2.41)	0.04(0.05)
t/p*	0.960/0.04	1.34/0.04	1.08/0.074	1.26/0.037	0.06/0.75
Breastfed Time					
<6 month	0.63(1.06)	0.52(0.22)	0.57(1.16)	0.70(1.06)	0.20(0.30)
>6 month	3.06(1.98)	0.60(0.98)	2.46(3.04)	3.73(2.37)	0.60(0.60)
t/p*	4.59/0.000	2.35/0.000	2.48/0.000	4.99/0.006	2.20/0174
Smoking					
Yes	1.57(1.74)	0.50(0.94)	1.28(2.33)	2.10(2.38)	1.57(2.33)
No	1.80(2.11)	0.15(0.48)	1.50(2.43)	1.99(2.32)	1.30(1.55)
t/p*	0.33/0.119	1.418/0.013	0.257/0.799	0.141/0.889	0.429/0.671

*Independent t test, p<0.05

A model was established with some variables and then analyzed using correlation and backward stepwise logistic regression test. The result of the correlation and logistic regression test are presented in Table 5.

Table 5. Associations between included factors and DMTS and DMFS Index.

Variable	r*	OR(CI)	CI	p
Age of Tooth brushing > 2 times per day (reference: <6 age)				
DMFT Index	-,374**	1.35	(1.15-1.58)	0.001
DMFS Index	-,579	0.60	(0.36-1.00)	0.989
Breastfeeding Time (reference: =>6 month)				
DMFT Index	,666**	1.34	(0.69-1.37)	0.003
DMFS Index	,292	0.59	(0.35-1.01)	0.056

*Pearson correlation r ** p<0.00, OR: Odds Ratio, CI: Confidence Interval

There was negatively correlation between DMFT index and student who did<6 years started the brush teeth regularly twice a day (r:-0,374 p:0.001) and those students had low DMFT index (OR; 1,35). In additionally, there was positive correlation (r:0,666, p:0.003) between students who are breastfed =>6 month and DMFT index. Students who are breastfed <6 month had lower DMFT index (OR;1.34).

Discussion

Oral health is an integral part of overall health. It is important to prevent oral diseases by protective methods and increase the level of awareness in maintaining and improving the overall level of Health. Oral health is known to be associated with many chronic diseases, but is ignored (Ullman, Long, & Lewis, 2011; Haresaku et al., 2018). It is known that deterioration of the structure of teeth and decays are associated with many factors such as, carbohydrate consumption, eating style, frequency of intermediate meals, oral hygiene habits, and enamel structure of teeth. It has also been determined that there are decreases in the incidence of oral health problems with preventive health practices. But in Turkey and the world, the necessary attention is still not given to oral and dental health practices. Dental caries and oral health problems are common in many countries around the World (GBD 2016 Disease and Injury Incidence and Prevalence Collaborators, 2017).

The prevalence of oral and dental health problems among health professionals who are role models indicates that the level of oral health awareness is low. In this study, it was determined that two thirds of the nursing students had decayed teeth.The rates of using dental floss and mouthwash are also very low.The age

to start brushing is less than 6, and those who brush their teeth regularly at least twice a day are only one third of the students.In America, the rate of tooth decay between the ages of 2 and 19 is 43.1% and it has been determined that nearly half of this has started before the age of 6.It is known that many factors such as inadequate dentist control, insufficient fluoride, carbohydrate nutrition, poor oral hygiene are associated with dental caries (Haresaku et al., 2018). In another study, it was reported that the rate of brushing teeth twice a day was 58% in children with an average age of 21 months (Martin et al., 2019). In a study conducted with school children, 75% of 100 children between the ages of 12-14 reported that they brush their teeth twice a day, only 35% use moothwash and 10% use dental floss (Harrita, Priya, & Gayathri, 2019). In this study, 29.4% of the students did not go to a dentist in the last year, and the majority of those who did report that they went to the dentist for decay, pain, cleaning and treatment.Because of this study, the number of students who had a dentist examination for the first time was two. It has been observed that the students do not go to the dentist unless there is any problem.

World Health Organization has recommended the use of the DMFT index in the evaluation of dental caries. It has been observed in the literature that DMFT and DMFS indexes are used in many oral health evaluations.In a study conducted in Iran, the mean (SD) values of DT, MT, and FT indices in the participants were 2.85 ± 1.7, 1.15 ± 1.8, and 3.3 ± 1.7, respectively. The mean (SD) value of total DMFT index was 7.3 ± 3.0 in all the participants, 6.9 ± 2.8 in people aged 15-19 years old, and 7.8 ± 3.2 in people aged 35 to 45 yrs. old (Moradi et al., 2019). In our study, the mean DT is 1.70 ± 1.94, the mean MT; 0.29 ± 0.71, FT mean; It is 1.41 ± 2.36. DMFT index average 2.04 ± 2.31; The DMFS index average was determined as 0.04 ± 0.05. According to the DMFT classification, 85.3% of the students were determined to be very low, 11.8% medium and 2.9% very high. It was determined that 8.8% of the students had the first visual change in the enamel with the ICDAS1 code and three quarters of them had a distinctive visual change in the enamel. One fifth of the students were evaluated as ICDAS5, ICDAS6. As a result of the ICDAS evaluation, it was seen that one third of the students were in the high-risk group. It was determined that almost all of the students needed good dental care and one third had minimal invasive restoration. In the literature, it has been determined that ICDAS evaluation is made by different examiners and decisions requiring more intervention (Qudeimat, Altarakemah, Alomari, Alshawaf, & Honkala, 2019). In another study, it has been determined that the high prevalence of ICDAS1-3 lesions is associated with having more than 20% visible plaque and more than 13 restored teeth (Laajala et al., 2019). In the same study, it was reported that the frequency of tooth brushing was associated with caries (Laajala et al., 2019).

In this study, age of tooth brushing, use of dental floss, use of mouthwash, and duration of breastfeeding were found to be significant factors in oral health assessment ($p < 0.05$).Similar to our study, Laajala et al. (2019) reported that regular brushing at least twice a day protects from tooth decay and is associated with plaque formation.

As a result of the systematic review, it has been shown that the use of mouthwash and fluorinated products significantly affect gum infections and plaque formation (Takenaka, Ohsumi, &.Noiri, 2019). In addition to studies reporting a negative relationship with dental caries in young children, there are studies reporting the reduction of dental caries (Sambunjak et al., 2011; Poklepovic et al., 2013; Oliveira et al., 2017; Vernon & Seacat, 2017).

In our study, DMFT and DMFS indexes were found to be significantly lower in those who used mouthwash and floss. In another study, it was determined that there is a relationship between socioeconomic level and oral health behaviors, and it was recommended to provide special oral health packages and training especially for children and young people (Ghasemianpour et al., 2019). It has been reported that there is a significant relationship between breast milk and the duration of feeding and dental caries in the first age period, and those who are over-fed (> 24 months) have more tooth decay than those who are never breastfed (Haag et al., 2019).In the literature, there are studies reporting that there is a relationship between breastfeeding time, night breastfeeding and early childhood dental caries, but randomized controlled studies are needed (Perera, Fernando, Warnakulasooriya, & Ranathunga, 2014; Ha et al., 2019; Hartwig, Romano, & Azevedo, 2019). On the other hand, another study recommends that nutritional practices in early childhood are not associated with dental caries and breastfeeding is recommended (Devenish et al., 2020). In our study, it was observed that DMFS and DMFT indexes were significantly higher in those who were fed with breast milk for =>6 months. Although this finding is similar to some studies in the literature, it is interesting. However, reasons for why children who are fed breast milk for a long-time switch to additional food are cited as; not having enough breast milk, not gaining weight and cannot eating adequately balanced (Bülbül, Özcan, & Hatipoğlu, 2012). It can be thought that this situation negatively affects dental health.

Conclusion

In conclusion, in our study, it was determined that the awareness level of nursing students as role models about oral and dental health was insufficient, their oral health status was poor, and oral health indicators changed significantly in those who brush their teeth regularly at an early age, use mouthwash and dental floss.

In addition, it was determined that those who fed with breast milk for less time had less dental caries than those who fed longer. It has been determined that smoking is effective in tooth loss. Nursing students should be educated about oral hygiene and the importance of oral dental health, and they should be motivated to develop positive behaviors. Increasing the awareness level of the students will have a positive effect on the health of the patients they will care for. In addition, it may be recommended to conduct randomized controlled and follow-up studies on oral and dental health.

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