

Research Paper: Assessment of Dental Student' Knowledge of Tooth Wear: Diagnosis, Prevalence and Treatment: A Randomized Questionnaire-based Cross-sectional Study



Meisam Malekzadeh¹, Mahsa Nosrati², Dina Maleki^{3*}

1. Assistant Professor, Department of Periodontology, School of Dental, Guilan University of Medical Sciences, Rasht, Iran.

2. DDS Dentist.

3. Dentistry Student, Student Research Committee, School of Dentistry, Guilan University of Medical Sciences, Rasht, Iran.



Citation: Malekzadeh M, Nosrati M, Maleki D. Assessment of Dental Student' Knowledge of Tooth Wear: Diagnosis, Prevalence and Treatment: A Randomized Questionnaire-Based Cross-Sectional Study. Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2018; 7(3):123-128. <http://dx.doi.org/10.32598/3dj.7.3.123>

<http://dx.doi.org/10.32598/3dj.7.3.123>



Article info:

Received: 23 Jan 2018

Accepted: 12 Jul 2018

Available Online: 01 Sep 2018

Keywords:

Knowledge, Preventive dentistry, Tooth wear

ABSTRACT

Introduction: A sizable increase in the outbreak of tooth attrition and especially dental erosion has been observed. Detection of tooth wear procedure, adequate prevention, and effective interference in the early stage will avoid the adverse effect on teeth performance and elegance. Thus, the current study aimed to determine the level of awareness of senior dental students (general dentists) on the prevalence, prevention, and treatment of tooth wear.

Materials and Methods: Materials and Methods: In this cross-sectional descriptive study, 122 senior students of dental school in Rasht, Bandar-e Anzali, Pardis, Iran, were examined through census method in 2016. The data collection tools were construction questionnaire consists of 25 questions which their validity and reliability have been approved. The obtained data were entered into SPSS V. 21 and descriptive statistics, mean, standard deviation and inferential statistics, independent t-test at the significant level of $P < 0.05$ was used to analyze the data.

Results: The results of the present study showed that the majority of students had moderate awareness level. Test results showed that the students had authentic awareness only in three areas of the facet occlusion ($P = 0.001$), in the early signs of tooth wear ($P < 0.001$), and in occlusal loading ($P = 0.014$).

Conclusion: The results of this study showed that students had average information about prevalence, prevention, and treatment of various tooth wear stages. In this regard, it seems necessary to pay attention to teaching and learning content related to tooth wear.

* Corresponding Author:

Dina Maleki, Dentistry Student.

Address: Student Research Committee, School of Dentistry, Guilan University of Medical Sciences, Rasht, Iran.

Tel: +98 (912) 8998663

E-mail: dinamaleki74@gmail.com

1. Introduction

Dental erosion is a normal physiological process that occurs with aging. However, when the structure of the tooth is destroyed, it can cause tenderness, malfunction, and tooth disfiguration. Thus, dental erosion should be considered as a pathogenic process because of chemical agents (acidic foods and carbonated soft drinks) and or biological and behavioral agents (unhealthy lifestyle and Lack of oral hygiene) [1, 2].

Erosion or chemical abrasion of teeth is defined as the destruction and pathological loss of hard dental tissue (enamel and dentin). It is due to a chemical, acidic process, and the bacteria and dental plaque are not involved. The leading causes of erosion are categorized as internal origin which is caused internally by acid reflux to the oral cavity or externally by consumption of acidic foods and drinks [3].

Abrasion is a pathologic loss of tooth structure affected by biomechanical forces. These forces may include improper brushing, gum declination, or some habits such as smoking, holding nail or needle between the teeth, nail-biting, tearing of teeth thread, using tooth sticks, and even the presence of ill-fitted or incompatible clasp and removable denture prosthesis, and so on [4]. Mechanical wear of teeth can also cause severe bruxism or diseases such as dentinogenesis imperfecta [5].

Abfraction includes losing tooth tissue due to tensile and compressive forces along the longitudinal flexural axis of the teeth [6]. In recent decades, the rate of dental abrasions, especially erosion, has been increased, particularly in developed countries [7]. In a survey conducted in Yazd City, Iran, in 2013, the prevalence of erosion was 21.1% [8]. Studies have shown that people with dental wear lesions have better oral hygiene than those without dental wear because lesions caused by erosion on dental surfaces are caused by plaques. Proximal surfaces are rarely free of plaque, and this is why we see a low erosion rate at these surfaces [9-11].

The most important way to keep your teeth healthy is to take preventive measures [12]. Avoiding or reducing direct contact with acidic material through behavioral and clinical interventions, increasing tooth hard tissue against acid through fluoride therapy, adding resistance to hydroxyapatite dissolution through calcium and phosphate taking, reducing mechanical erosion through proper brushing instructions are among the preventive strategies against dental wear [12, 13].

Detection of lesions in the early stages is essential, but their clinical symptoms easily remain hidden. In other words, there is no change in color or being stuck when examining with a catheter, and usually there are no or few symptoms. If no effective intervention is taken in the early stages of these lesions, dental abrasion leads to shorter limits, emphasizing restorations versus eroded dental surface, loss of central contacts, change in the vertical height of the face, functional shift during chewing or muscle fatigue, and ultimately, undesirable effects on the function and beauty of the teeth [14, 3].

This study tries to investigate the knowledge about diagnosis, prevalence, prevention, and treatment of tooth wear of dental students' of School of Dentistry of Rasht, Guilan University of Medical Sciences.

2. Materials and Methods

This study is a cross-sectional descriptive study. The study population was all senior general dentistry students of Guilan University of Medical Sciences, including supplementary exam students and the International Campus students in 2016. The inclusion criteria were all students in semesters 11 and 12 at Lakan College and Anzali Campus. The exclusion criteria were those who were not satisfied with the study, subjects who did not complete the questionnaire, and subjects who did not want to participate in the study.

In the study, a researcher-made questionnaire developed based on a reference overview was used. The questionnaire had 25 items, including 4 items for demographic characteristics of subjects and 21 items to measure subjects' knowledge about the outbreak, prevention, and treatment of dental wear (including erosion, abrasion, attrition, and abfraction). Score one for each correct answer and score zero for each wrong answer was determined. The total score was obtained based on the level of knowledge of the subjects. For qualification, the scores below 33.33% were considered as poor, scores between 33.33% and 66.66% were considered as medium, and above 66.66% were considered as good knowledge.

The content validity of the questionnaire was approved by 8 experts, and its Content Validity Rate (CVR) and Content Validity Index (CVI) were determined. CVR coefficient of every single question was in the range of 0.78-1. This range indicates acceptable validity in terms of necessity based on the minimum value of CVR in Lawshe table (Lawshe, 1975). The minimum acceptable CVR is 0.75. To evaluate the validity, the CVI coefficient was used. CVI obtained for each question in the above

Table 1. The dental students' knowledge of dental wear types, prevalence, prevention, and treatment

Row	Phrases	%	
		Correct	Incorrect
1	Knowledge of the signs of the early stages of wear	62.3	37.7
2	Knowledge about the name of the tooth decay in the cervical area due to occlusal stress	27.9	72.1
3	Knowledge about the occlusal facet	64.8	35.2
4	Knowledge about the name of the wear effect caused by the habit of holding the pin and the nail between the teeth	19.7	80.3
5	Knowledge about the prevalence of erosive lesions in men and women	31.1	68.9
6	Knowledge about dental erosion in children and adults	18.9	81.1
7	Knowledge about the outbreak of erosion on anterior and posterior teeth	14.8	85.2
8	Knowledge on the area of most considerable erosion based on gastric secretions	24.6	75.4
9	Knowledge about the frequency of the teeth most commonly affected by erosion	20.5	79.5
10	Knowledge in the field that which type of abrasion is caused by removable prosthesis clasps	59.0	41.0
11	Knowledge about the field in which brushing methods causes the most significant amount of dental abrasion	50.0	50.0
12	Knowledge about the signs of circular or v-shaped grooves in the cervical area of the teeth as a result of horizontal brushing	16.4	83.6
13	Knowledge about erosive drug groups	59.0	41.0
14	knowledge about occlusal Loading correction	61.5	38.5
15	Knowledge about the effect of treatment on decreasing the adverse effects of dental abrasions on temporomandibular joint	53.3	46.7
16	Knowledge about the combination of attrition, abrasion and erosion in the patient	47.5	52.5
17	Knowledge about dental wear on the occlusal surfaces (attrition) which increases the level of decay in these surfaces	56.6	43.4
18	Knowledge about the fact that gum consumption can be used as an anti-erosive preventive instruction for acid-induced dental wear	59.0	41.0
19	Knowledge about the most common cause of erosive wear, i.e. carbonated beverages and acid juices	54.9	45.1
20	Knowledge about the field of the most important cause of dental attrition and creation of occlusal facets of bruxism	45.9	54.1
21	Knowledge about abrasion in the cervical area in the form of ditching often seen in the cementum	54.1	45.9



dimensions was in the range of 0.72 to 1. The questions with a CVI between 0.7 and 0.8 were reviewed seriously; the questions with CVI between 0.8 and 0.9 were discussed briefly, and the questions with a CVI over 0.9 remained unchanged in the questionnaire. Richardson coefficient was used to determine the internal consistency of the questionnaire by conducting a pilot study on 20 dentistry students. The coefficient was equal to 0.79. A parallel questionnaire was used to determine the external reliability and the reliability coefficient of two questionnaires which was found to be 0.92. Correlation of scores was statistically significant based on Pearson correlation coefficient ($r=0.67$, $P<0.005$).

After explaining the study goals, an anonymous questionnaire was provided to students to collect information. The questionnaire was completed in the presence of the corresponding author. In cases where filling was not possible at the time of provision, the questionnaires were collected on the next coming days.

3. Results

A total of 122 senior students of the Dental School participated in this study. The Mean±SD age of the subjects was 25.0±2.6 years. The majority of the subjects were women (52.5%) and studied in the 12th semester (58.2%). Also, 82% of the study subjects were studying

Table 2. The dental students' knowledge of tooth wear prevalence, prevention, and treatment according

Variable	Statistical Index	Knowledge Score on Dental Wear	
		Mean±SD	P
Place of study	Shool of Dentistry, Gilan University of Medical Sciences	9.21±1.68	0.228
	Shool of Dentistry International Campus, Gilan University of Medical Sciences	8.79±2.08	
Semester	Semester 11	9.02±1.78	0.987
	Semester 12	9.01±1.95	
Age group	Less than 25 years old	8.91±1.92	0.274
	More than 25 years	9.36±1.68	
Gender	Female	9.06±2.01	0.780
	Man	8.97±1.73	



in dental college, and 18% on the International Campus of the Guilan University of Medical Sciences. The subjects were asked to answer all the questions of the questionnaire (Table 1).

In general, the Mean±SD of students' knowledge score was 9.01±1.87. Only 8% of subjects had a good knowledge, that is, scored above 66.6% (the highest score was 14). The majority of students (8.19%) had a moderate level of knowledge (between 7-14), and about 7.4% had a very low knowledge (scored below 7 out of maximum 21 scores (the lowest scores was 2). Table 2 shows the result of the independent t-test. The subjects' knowledge score, according to sex, age group, semester, and college, was the same, and there was no statistically significant difference ($P < 0.05$).

4. Discussion

In the present study, we obtained the knowledge score of the dental students regarding sex, age group, Grade Point Average (GPA), and location of education, which was not statistically significant and agreed with the results of similar studies. Therefore, it is necessary to promote knowledge-based programs to inform dental students of the factors and methods for reducing and preventing tooth erosion and training patients.

The results of this study indicate that dental students have moderate and weak information about various types of dental wear (erosion, abrasion, attrition, and abfraction) prevalence, prevention, and treatment based on the scores obtained from the questionnaire. The knowl-

edge of students was desirable only in the awareness of the signs of the early moments of wear in occlusal facet and occlusal loading.

Most studies conducted in this area dealt more with the type of dental wear, epidemiology of dental wear, complications, prevalence, and symptoms. Few studies paid attention to the knowledge of the dentistry community regarding the prevalence, prevention, and treatment of dental wear. The results of most studies indicate that the awareness of the study population is low compared to the findings of our research.

Hermont et al. in a cross-sectional study investigated the knowledge and attitude of 298 students, patients, and Shool members of the Brazilian Minas Gerais Federal Dental College about dental wear [15]. In their study, like our study, the study population was divided into five groups of students in the second year of dentistry, the fourth-year students in dentistry, Shool members, patients of junior dental students, and patients of the fourth semester dental students. Findings of this study showed that most students and Shool members heard about dental erosion, while only 20% of the patients were aware of it.

The majority of respondents had vague information on the causes of erosion and confused it with tooth decay. For example, 75% of people who heard about tooth erosion believed that sugar contributed to dental erosion. It might be said that the students' lack of awareness can be due to the inadequacy of training courses; hence, the

need for better understanding and communication is required in the area of oral health care.

Similar to our study, Al-Ashtal et al. researched the knowledge of Yemeni dentists and dental students. They considered the effective factors, methods of diagnosis, use or nonuse of dental wear grading indexes, and dental erosion prevention strategies. Their results showed that 61% of the respondents obtained their information regarding dental wear at the dental college, 27% from personal studies and the rest got information from continuous training courses and the media [16].

About 46% of respondents reported dental erosion the central teeth and 24% in premolar and molar teeth. Around 48% of the respondents mentioned that dental wear is more prevalent in men, while 20% did not report the difference between genders. Also, 90% of respondents believed that it is essential to record the patient's diet during the diagnosis of dental erosion, and more than 40% of dentists and 52% of dental students considered acidic drinks to be the cause of dental wear. Half of the respondents mentioned reducing the consumption of acidic beverages as a preventive measure of dental wear, and only 37% of them recommended the use of fluoride-containing toothpaste to their patients.

The results of their study are in line with the results of our research expressing the point that deep knowledge and information about the causes, methods of diagnosis, and prevention in respondents were not enough. Therefore, it seems that increasing knowledge and awareness about dental erosion is an urgent need in the dental community.

In another study conducted in Norway by Mulic et al. on 1262 subjects in 2012, most Norwegian dentists recorded patient's dental wear, of which 50% had a dental abrasive scoring system [12]. In general, this Norwegian study showed that dentists were relatively up to date regarding recording, diagnosis, and treatments of dental erosion. However, they lack information concerning the diet, analysis of saliva, and its effects on dental erosion prevention. The results of their study, albeit was generally consistent with results of our research on the prevention and impact of nutrition on dental wear, but in terms of recording, having scoring systems, and having up to date information about dental wear, their results were somewhat inconsistent with the results of our study. In this regard, it requires more attention from the dental community. The small sample size was the limitation of this study.

5. Conclusion

Majority of subjects in the current study had moderate knowledge about dental wear and had good knowledge about early signs of occlusal facet and occlusal loading. It is necessary to promote knowledge-based programs to train dental students more effectively in field of dental wear.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article. The participants were informed about the purpose of the research and its implementation stages; they were also assured about the confidentiality of their information; Moreover, They were allowed to leave the study whenever they wish, and if desired, the results of the research would be available to them.

Funding

The present paper was extracted from the MD. thesis of the Mahsa Nosrati in Department of Dentistry, School of Dentistry, Guilan University of Medical Sciences.

Authors contribution's

All authors contributed in preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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