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# Dental caries prevalence in patients treated by dentistry students at a university dental clinic

**Abstract**

**Introduction.** Dental caries is a serious problem affecting numerous populations around the world. During the last decade, there was a significant increase of its prevalence in many countries. Hence, the dental epidemiological status requires some further analysis.

**Aim.** This study was designed to assess the prevalence of dental caries among adults of various age and gender groups treated by dental students of English Division at the Chair and Department of Conservative Dentistry and Endodontics of the Medical University of Lublin.

**Material and methods.** The authors collected and analyzed the dental history of patients who had been treated at the university dental clinic in Lublin throughout 2013 and 2014.

**Results and Conclusions.** The mean DMFT index of examined group of patients increases with age and it tends to be higher in women than men. Class I dental caries according to Black's classification was the most prevalent, followed by class II, class III, class V and class IV. Caries tends to affect molars and premolars most commonly. In addition, these teeth were most likely to be extracted and restored.

**Keywords:** dental caries, DMFT index, dentistry students.

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## INTRODUCTION

Dental caries is a pathological process, which encompasses signs and symptoms of localized chemical dissolution of the tooth surface caused by metabolic events taking place in the bacterial biofilm covering the affected area [1]. The disease development is dynamic (remineralization and demineralization) and it takes several months or even years for the decay to reach the level of cavitation [2].

Dental caries is a serious problem in numerous populations of the world, and during the last decade there was a significant increase of its prevalence in many countries [3]. Hence, the dental epidemiological status requires some further analysis. According to the WHO, Oral Health Data Bank in the year 2000, data were available for 184 countries as recorded in the WHO Oral Health Country/Area Profile Program [4].

According to the World Health Organization, the DMFT index is the tool most commonly used for epidemiological surveys [5]. Even though it has failed to meet the challenges of the 21st century, it is still being used as a well-established key for measuring caries experience in dental epidemiology. The DMFT index is applied to the permanent dentition and is expressed as the total number of teeth (DMFT) or surfaces (DMFS) that are decayed (D), missing (M), or filled (F) in an individual [1].

## AIM

In order to provide the most beneficial preventive treatment for adult patients, dentists must have the knowledge about caries prevalence and the distribution of caries within individual teeth. The study was conducted to show dental caries experienced by patients regularly visiting and being treated by dentistry students of English Division at the Chair and Department of Conservative Dentistry and Endodontics of the Medical University of Lublin.

## MATERIAL AND METHODS

The authors of this study looked at patients treated by the students of the third year at the Chair and Department of Conservative Dentistry and Endodontics at the Medical University of Lublin, Poland. The study was conducted in 2013 and 2014. The authors collected patients' files and handed out questionnaire forms to be filled at the end of treatment. The questionnaires included questions about one's age, sex, results of dental examination, class of caries according to Black's classification and DMFT index. Data were revised once again and converted into a digital form of spreadsheets. Patients were divided into five age groups (18-25, 26-35, 36-45, 46-60, and over 60 years) and each age group was also divided into gender groups. A value of the DMFT index was

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calculated for each patient based on their dental chart showing their dentition status. Moreover, the classes were also documented and the mean DMFT was calculated for each study group. Statistical charts and tables were provided to present the prevalence of dental caries in the different groups and its distribution in individual teeth. Finally, all the data was combined in one sheet to clarify the whole process.

## RESULTS

Overall, there were 253 patients examined and treated by dental students (147 females and 106 males). The results were ascribed to three different subgroups.

### Dental caries classes in both sexes

A statistical analysis of the results in Figure 1 and 2 showed that class I was the most common classification for both sexes (52% M, 48% F), followed by class II (33% M, 36% F), class III (11% M, 10% F), class V (3% M, 5% F) and finally class IV (1% M, 2% F), respectively. However, the percentage of class I and III was more likely to happen to males than females even though the number of the male patients who were examined was far lower than the female patients. Class I and II were the most prevalent, whilst class III, IV and V were less prevalent.

### The mean DMFT values for various age groups

The women participating in the study reported the mean DMFT index at a slightly higher level than men. The group of 18-25–year-olds was reported to have the mean DMFT index at 13, both in case of women and men. In other age groups, there were some differences though. The mean DMFT increases along with age, as shown in Figure 3.

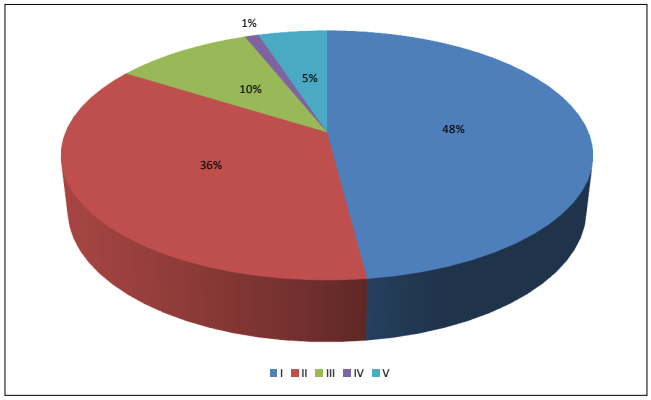


**FIGURE 1. Dental caries classes in female patients.**

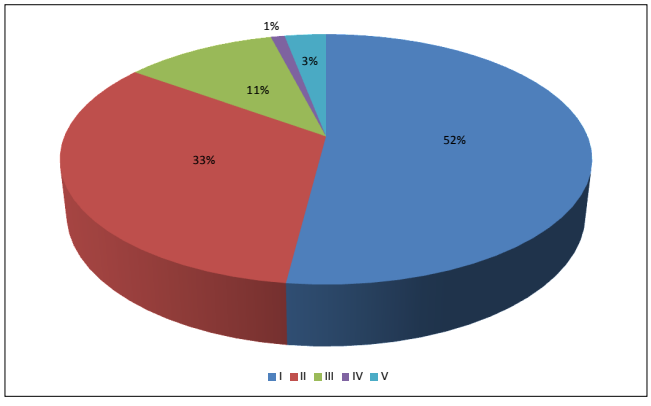


**FIGURE 2. Classes of dental caries in male patients.**

Female patients showed increased DMFT value compared with male patients (Figure 4). In addition, this figure shows that the mean DMFT value increases proportionally to age in case of both genders. Therefore, patients over 60 tend to show the highest DMFT values among all patients. Regarding the 36-45 age group, the mean values for both sexes are as follows: women (20) and men (18). The age group of 46-60 year-olds also shows a slight difference between the mean DMFT index.

### Distribution of dental caries in different teeth

Teeth were divided on the basis of their susceptibility to dental caries, restorations and extractions. Some significant differences between teeth (incisors, canines, premolars and molars) were noticed. It was mainly molars that were most significantly affected by dental caries, followed

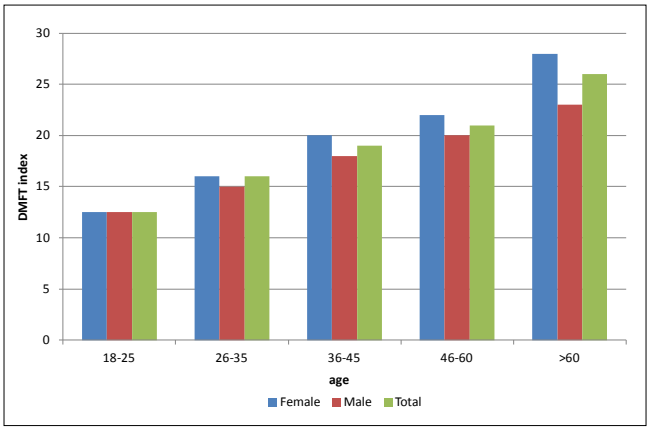


**FIGURE 3. DMFT index for both sexes – the trend increases with age.**

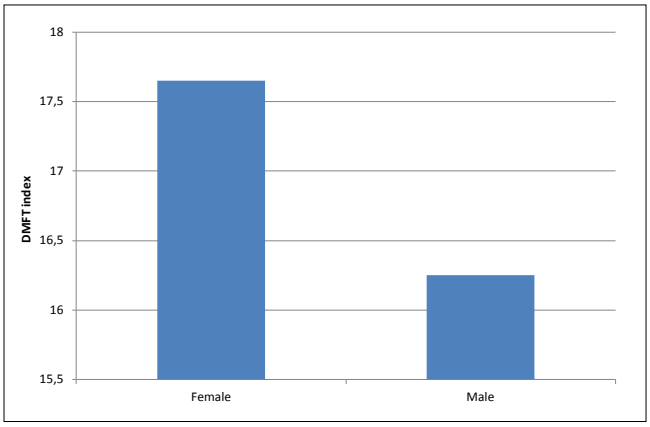


**FIGURE 4. DMFT index of both genders.**

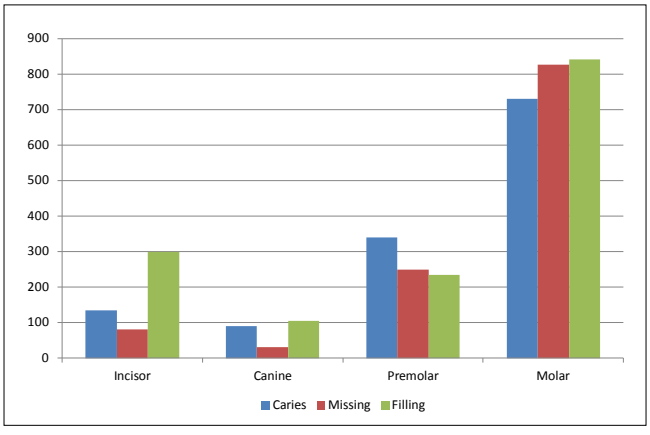


**FIGURE 5. Distribution of caries prevalence and fillings in teeth.**

by premolars (Figure 5). Moreover, molars were the most frequently restored teeth. There were 827 molars restored with different filling materials. Among all teeth, molars were the most often extracted teeth. Premolars were the second most commonly extracted teeth. There were 260 premolars extracted. On the other hand, the lowest prevalence of caries was in the canines. Only 89 canine teeth had dental caries. In comparison, there were 753 molars affected by caries. Furthermore, canines were in the least number of all teeth indicated for extraction. Incisors were the second most common restored teeth among all teeth.

## DISCUSSION

This study determined the mean DMFT index values in different age and sex groups of patients treated by dentistry students. The study also determined the prevalence of the different classes of dental caries. The study was conducted on patients who were treated at the Department of Conservative Dentistry and Endodontics. Most of them were residents of Lublin and surrounding towns or villages. Dental students treat patients while supervised by the academic staff, taking responsibility for the students' actions, according to the rules of the department and university. Furthermore, patients are provided with full conservative treatment or root canal treatment, if necessary. The university dental center provides students with well-equipped clinic rooms, so that they can provide patients with the best treatment available. Students perform dental examination and take care of the main complaints that patients have. In case the patients needs to be treated by a different department, a referral form is prepared and the patient is referred to that department.

In our study, the analysis of the results revealed that the mean DMFT index among examined group of patients was relatively high. This is largely due to factors like low socioeconomic status, systemic diseases and their medications, little dental knowledge, poor oral hygiene habits and the place of residence [6]. Most patients treated by students cannot afford to cover the private treatment expenses so that they prefer to be treated by students at the dental center at the university. Various studies show that one's socioeconomic status is one of the risk factors for dental caries [7].

The mean DMFT index in women and men was another thing that the authors looked at. Women demonstrated slightly higher values in all study groups. This might be due to the fact that there were more female participants in the study. Other than that, some other authors also noticed that caries are more prevalent in women than men [8]. These studies have shown that women are more exposed to caries because of their different flow rate of saliva and hormone fluctuations [8].

The age of patients was another factor discussed in the study. The results showed that the mean DMFT was 26 for elderly patients (patients over 60), 21 in the age group 40-60 and 19 in the age group 36-45. This shows that the mean DMFT score increases with age, therefore dental caries has to be viewed as a lifetime disease [1]. Thus, the prevention of dental caries should be a priority in any age, with special care given to the predisposing factors that lead to dental caries [9].

The authors of the study also looked at the distribution of dental caries. The findings show that the prevalence in different dental caries classes was different, and class I was the most frequent followed by class II and then class III. However, class IV was not as prevalent as the previously mentioned classes. It is believed that pits and fissures (occlusal surfaces) are most susceptible to dental caries, especially in case of molars [10,11]. Here, the morphology of molars causes that, since it increases the risk of caries. In the present study, pits and fissures (class I), appeared to be the most common class of dental caries. Pits and fissures affect teeth in both sexes and its prevalence is as follows: 53% in males and 48% in females looked at in this study. For this reason, Dr. Michael Buonocore and the group of dental scientists at the Eastman Dental Center in Rochaster, New York, developed fissure sealants. This approach in conservative dentistry has been shown to prevent caries in the long term, especially in molars. A Cochrane systematic review of 16 trials found that first permanent molar teeth sealed with resin-based sealant had 78% less caries on occlusal surfaces after 2 years and 60% less caries after 4-4.5 years compared to unsealed molars [12].

Regarding the distribution of caries within individual teeth, posterior teeth were significantly affected with dental caries, with 735 molars and 341 premolars having dental caries. However, incisors and canines were least likely to be affected, with 141 incisors and only 89 canines affected by caries. A similar study conducted at the Dental Department of the Faculty of Dentistry at Istanbul University found that molars were most frequently affected (at the rate of 45%) and central incisors were least susceptible, especially lower incisors, (at 1.7%). In the same study, caries distribution was higher in the maxilla (62.4%) than in the mandible (37.6%) [13].

## CONCLUSION

The mean DMFT index of examined group tends to be higher in women and its value increases with age. Dental caries usually affects molars and premolars, with the anterior teeth rarely affected.

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