Dental Caries and Associated Socio-Demographic Factors in Adult People in Bulgaria

Boyko Bonev[1], Nadya Avramova[1], Krassimira Yaneva[1], Dimitar Filchev[2]

Medical University, Faculty of Dental Medicine,
[1]Department of Dental Public Health
[2]Department of Prosthetic Dentistry
Sofia, Bulgaria

SUMMARY

Objective: The study aimed to establish the mean DMFT of adults over the age of 20 years in Bulgaria. We also aimed to determine any association between demographic factors, such as age, gender, general health status etc, and dental caries.

Material and Methods: The study was conducted from 2006 to 2009. Data was collected from a randomly chosen representative sample of 1741 adults aged over 20 years, from 13 Bulgarian cities and villages. From these 1741 adults, 105 (6.03%) refused to complete the questionnaire. A total of 1636 (93.97%) were included in the survey, of which 766 (47%) lived in villages and small towns and 870 (53%) in the capital city Sofia and other cities. The average age of the sample was 39.6 years. 894 (54.6%) were male and 742 (45.4%) were female. Each participant completed a questionnaire about demographic and socio-demographic status. Afterwards, a clinical examination was carried out. Chi-square and one-way ANOVA were used to test for statistical significance of qualitative variables (p<0.05).

Results: For the whole study sample, mean DMFT was 17.8 (SD 7.98). There was a statistically significant association between DMFT and age. Women had higher DMFT values (18.6 ± 7.66)) than men (15.2 ± 7.91). There was a link between DMFT and general health too. People with excellent general health had DMFT 11.5 (SD 6.39), whereas people with bad general health had DMFT 21.4 (SD 8.16).

Conclusion: Mean DMFT score of adults in Bulgaria is 17.76 teeth. There is an association between some demographic factors and DMFT. Women, people with bad general health and older people have higher values of DMFT and need more care from dental health services.

Keywords: DMFT; Dental Caries; Socio-Demographic Factors

Introduction

Dental health care delivery systems and oral health status have improved in more European countries during the recent decades. A number of studies report a reduction of dental caries, not only in children and adolescents[1,2]. Unfortunately, in many Eastern European countries, the prevalence of caries disease in these age groups is still high[3].

A study conducted by Hugoson at all[4] in Sweden for a period of 30 years (from 1973 to 2003) showed that the number of decayed teeth declined with 90% in 15 year olds and 79% in 30 year olds. Slade et al[5] regarding the oral health in adult population showed the reduction of DMFT from 14.9 to 12.6 for the period 1987/88-2004/06 in all age groups. Considering the structure of DMFT index, in1987/88 the mean number of decayed (D) teeth was 1.5, missing (M) teeth - 5.7 and filled (F) teeth - 7.8. In 2006 the index components were significantly reduced - decayed teeth were only 0.6, missing teeth 4.6 and filled teeth 7.4[5].

In 2003-2004 a survey was conducted in Hungary with respect to adult oral health. 4606 persons (2923 female and 1683 male) were included in the study. There were considerable variations in the value of DMFT index - it was 11.79 in the youngest age group and 21.90 in elderly people (65-74 year olds). In all age groups M-component of the index had the highest value. In comparison to the results of older studies in Hungary (Madlen et al[6]) it was found that the number of people with 20 and more teeth increased. For the period 1985-1991 in the age group of 35-44 year olds, the mean value of DMFT index decreased from 15.8 to 15.0. For the next period (1991-2000) this value increased to 15.7 and in 2004 it decreased to 15.4. The structure of DMFT index in this age group (in 1991) was as follows: DT 3, MT 10.2, FT 2.6; in 2004, the structure was: DT 2.2, MT 8.9, FT 4.3[6].

In a number of studies it is shown that values of DMFT index tend to vary significantly between and within different countries. Furthermore, these variations, especially with respect to the structure of the index, are determined by a wide range of socio-demographic factors (age, gender, education, frequency of dental visits, oral health behaviour, etc.)[5,7-12]. The value of DMFT is higher in females. Rural residents and people with lower education are more likely to have missing teeth. Urban residents, higher education and better oral hygiene are associated with a lower chance of having decayed and missing teeth, but with a higher chance of having filled teeth[5,7,9-13].

The aim of this study was to establish the mean value of DMFT index in adults over the age of 20 years in Bulgaria. We also aimed to identify socio-demographic factors, such as age, gender and general health status, associated with decayed, missing and filled teeth. The following tasks were defined and executed for implementation of the aims above:

1. To determine the value of DMFT index in people over the age of 20 years in Bulgaria;
2. To determine the structure of DMFT index;
3. To identify some socio-demographic factors associated with DMFT index.

Materials and Methods

A cross-sectional epidemiological study was organized and done. Data for this study was collected between 2006 and 2009 from a randomly chosen representative sample of 1741 adults aged 20 years and over. The participants in the survey were residents of 13 Bulgarian cities and villages. Each participant completed a self-administrated questionnaire consisting of 13 questions. The items were about age, gender, level of education, occupational status, general health status, oral hygiene and other oral health behaviours. Afterwards, a clinical examination was carried out. All oral examinations were done by 1 calibrated examiner in natural light using a mirror and a dental probe, with the subject seated in an ordinary chair.

Of the target subjects in this cross-sectional survey (1741 adults) 105 (6.03%) refused to complete the questionnaire. A total of 1636 (93.97%) were included in the study. Of these, 766 (47%) lived in villages and small towns and 870 (53%) in the capital city Sofia and other urban centres. The average age of the sample was 39.6 years. 894 (54.6%) were males and 742 (45.4%) were females. The Ethical Committee of the Medical University-Sofia approved the study (number 299/15.05.2007). The research was carried out in compliance with the Helsinki Declaration. Verbal consent was obtained from each subject prior to data collection.

Chi- square and one-way ANOVA were used to test for statistical significance of qualitative variables ($p<0.05$). The data of the present study was processed and analyzed with statistical software R.

Results

In present survey the mean value of DMFT index was assessed for the whole study sample. It was 17.76 ± 7.98 (Fig. 1). The structure of DMFT index showed that everyone had 1.96 decayed teeth (DT), 7.41 filled teeth (FT) and 7.56 missing teeth (MT) on average.

Figure 1. Mean value and structure of DMFT-index

Considering the age structure of the study sample, it was found that DMFT index had the highest level in the adults aged 60 years and over (Tab. 1; Fig. 2). The level of the index was lower in the age group of 50-59 year olds, and it was the lowest in the youngest age group of 20-29 year olds. The values of the index were statistically significantly associated with age ($p<0.05$).

Table 1. Mean value ± SD of DMFT-index according to the age of the respondents

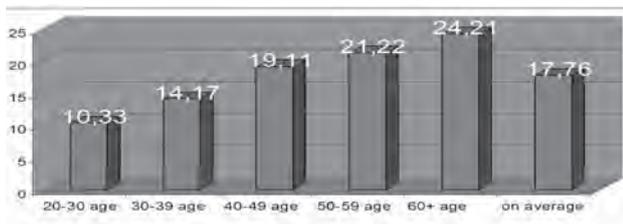| Age group / DMF-T Index	20-29	30-39	40-49	50-59	≥60	Total
Mean ±SD	10.33±5.30	14.17±6.59	19.11±6.93	21.22±7.17	24.21±7.11	17.76±7.98

Figure 2. Mean value of DMFT-index according to the age structure of the study sample

There was a statistically significant association between the value of DMFT index and the gender of the dentate subjects in the study sample (p<0.05). Generally, females showed more decayed, missing and filled teeth than males (Fig. 3).
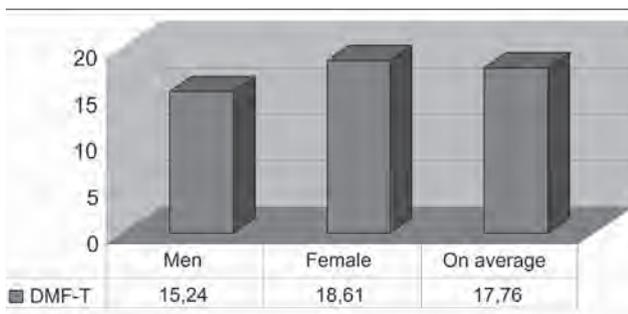
General health status was determined by means of self-assessment during the questionnaire survey. The respondents were asked to indicate 1 of possible assessments using a 5-point scale - poor, satisfactory, good, very good and excellent. Persons with excellent general health had the lowest value of DMFT index - 11.52. People with very good general health status showed higher value of the index - 12.27 and those with good health status – 17.53. Persons that indicated their health status as satisfactory had DMFT index 20.84. The level of DMFT index had the highest value in people with poor general health status - 21.44. There was a statistically significant association between the value of DMFT index and the general health status of the respondents (Tab. 2; Fig. 4).
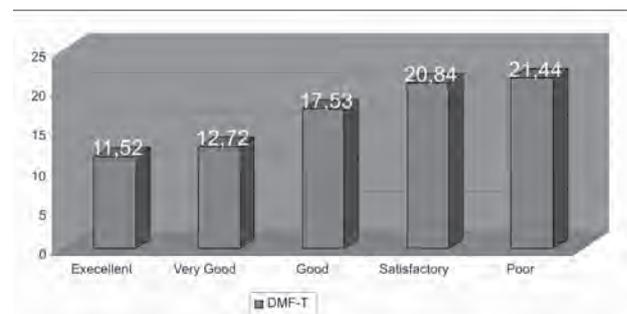

Figure 3. Mean value of DMFT-index according to the gender of the respondents

Figure 4. Mean value of DMFT-index according to respondents' self-assessment of general health status

Table 2. Mean value ± SD of DMFT-index according to the respondents' self-assessment of general health status

General health status / DMF-T Index	Excellent	Very good	Good	Satisfactory	Poor
Mean ±SD	11.52±6.39	12.72±6.87	17.53±7.65	20.84±7.39	21.44±8.16

It was found that DMFT index was not statistically significantly associated with the level of education of the persons included in the study (p>0.05). However, with increasing level of education, the mean number of decayed, missing and filled teeth decreased (Tab. 3; Fig. 5).

Table 3. Mean value ± SD of DMFT-index according to respondents' education

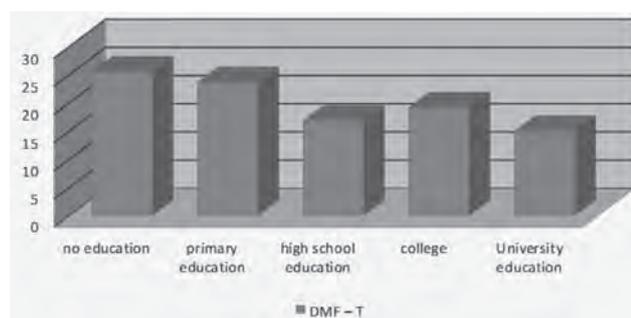| Education DMF-T Index	Unknown education	Primary School	High school	College	University
Mean ± SD	25.50±9.19	23.63±7.53	16.79±7.85	19.14±8.66	14.93±7.26

Figure 5. Mean value of DMFT-index according to respondents' level of education

Discussion

DMFT index is main indicator of the caries severity and its components represent different dimension of the disease process. For the last decades, the oral health status of the population in most of the developed European countries has been improved. This tendency is related to increasing needs of dental care, as a result of increased number of natural teeth. This statement is proven by a number of studies demonstrating reduction in the value of DMFT index[4,5]. The present findings show that there is a lack of similar tendency in dental health status of the adults in Bulgaria. For the whole study sample, it was found that the value of the index was very high (17.76). Furthermore, this value is higher than the level of the index in previous studies in Bulgaria[7,9].

According to the results of the current survey, everyone had on average 1.96 decayed teeth. The structure of the index was mainly constituted by filled and missing teeth. These results compared to the findings in other studies are very similar[6]. However, the mean value of 1.96 decayed teeth is still a high level of untreated teeth. These facts indicate main needs of dental care, which are related to treatment of dental caries and tooth extraction as a result of caries disease.

The present findings demonstrate variations in dental health status among adults in the study sample. Differences in the dental health status were associated with a number of socio-demographic factors - age, gender, educational background and general health status. Generally, younger people had lower values of DMFT index than older ones. Females had higher values of DMFT index than males. Adults with poor general health had worse dental health status than these with excellent general health. Also, the results showed that level of education could be a prerequisite for good dental health. People with higher education had a lower chance of having decayed, missing and filled teeth than these with lower education. Although direct comparison of the present outcomes with previous studies is hindered by differences in the study designs, the results of the current study comply with previous suggestions that DMFT index is associated with different socio-demographic factors[7,9,10,12].

Conclusion

From the current study it can be concluded that:
1. The mean value of DMFT index in adults aged 20 years and over, living in Bulgaria, was high - 17.76;
2. The structure of DMFT index indicated that everyone had on average 2 decayed teeth;
3. DMFT index was statistically significantly associated with age, gender and general health status.

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Correspondence and request for offprints to:

Boyko Bonev
Medical University, Sofia
Faculty of Dental Medicine
Department of Dental Public Health
1 G. Sofiiski Str, 1431 Sofia
Bulgaria
E-mail: boiko_bonev@abv.bg