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Original Article

Oral Health Status and Related Factors among Adult Patients Referred to Public Health Centers (Kerman-Iran)

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ABSTRACT

Background: Dental caries is a common diseases that imposes a big economic burden on individuals and the health care system. The aim of this study was to assess oral health status and its related factors in adults who referred to Kerman (Iran) health centers.

Methods: This descriptive cross-sectional study was performed on 195 patients who referred to Kerman health centers and selected by two-stage sampling method. Data were collected through a questionnaire consisted of demographic information and oral health behavior status, and assessment of DMFT index based on the criteria of the World Health Organization and dental plaque index. Data were analyzed using SPSS version 21 by ANOVA and t-test at a significant level of 0.05.

Results: In this study, 104 (52.8%) patients were male and 93 (47.2%) were female. The mean age was 36.99 ± 10.68 years. Dental plaque index was moderate in 94 patients (47.7%). The mean DMFT index was 7.27 ± 4.88. There was a statistically significant relationship between age and self-reported oral health, and general health with DMFT index. Older people and those who described their oral health status poor had higher DMFT.

Conclusion: The findings of the present study indicate the poor status of DMFT in the adult population of Kerman. It is recommended to hold training classes and oral health promotion programs.

Keywords: Dental Caries, Adults, Oral Health, Oral Health Behavior, DMFT

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Introduction

Oral diseases are the most common diseases globally with many socioeconomic impacts (1). Regarding the Global Burden of Disease study (2010), untreated decay in the permanent tooth has been the most common disease in all human societies (2). Dental treatments have been the most costly treatment of all chronic diseases (3) that impose an excessive economic burden on individuals and the health care system (4). Socioeconomic factors are accepted as one of the key factors of inequality in oral health in different countries (5).

Due to the substantial impact of oral health on people's daily lives, the World Health Organization (WHO) has announced oral health as one of the most important components of public health in the world (1). Tooth loss is an important symptom of oral health that indicates the lack of dental care and an increase in the degree of disease (6). In a study based on the global burden of disease in 2010 in Iran, the rate of dental caries in Iran increased from 1990 to 2010 (7).

The prevalence of toothlessness is reported to be 3% in Iranian people aged 35-44 years and 22% of these people had less than 20 teeth (8).

Since there are not enough studies on the oral health status of adults in Iran and due to the lack of study in Kerman, this study was performed to evaluate oral health indicators, and their relationship with health behavior, general health status, and socioeconomic status.

Materials and Methods

This descriptive cross-sectional study was conducted on adult clients over 18 years of age in public health centers in Kerman in 2020.

Based on the sample size formula, considering $z = 1.96$, $d = 0.07$, and $p = 0.5$, the sample size was determined as 195 people. The sampling method was as follows: First, the city was divided into 4 areas, a health center was selected and from each area, and in each center, several patients were selected by simple random sampling. The selection of patients continued until reaching the sample size. The inclusion criteria include literate adults aged over 18 years old who were and were willingness to participate in the study voluntarily.

The data collection tool was a questionnaire consisted of demographic characteristics and examination of individuals.

In the demographic information section, age, gender, level of education, occupation, history of systemic disease, status of oral health and general health, and body mass index (BMI) were logged.

In the second part of the questionnaire about oral health behaviors, the frequency of brushing and flossing and the last visit to the dentist were included.

Then, the patients were examined according to the WHO method with a flat dental mirror on a normal chair and under natural light without any dental surface prophylaxis and radiography (9). The DMFT index was used to evaluate decayed, filled, and decayed teeth. To assess the dental plaque status, the Loe and Silness plaque index is used. According to this index, a score of zero indicates that there is no plaque, a score of one indicates plaque in the free gingival area adjacent to the teeth, a score of 2 reveals plaque accumulation and soft deposits in the gums, teeth, and the margin of the gums, a score of 3 indicates a significant amount of soft deposits in the gums and teeth and the margin of the gums. Accordingly, a score of one and zero shows good health, a score of 2 shows moderate health, and a score of 3 shows poor health (10). Data were analyzed by SPSS version 20 using t-test and ANOVA at a significance level of 0.05.

The proposal was registered by Medical Ethics Committee of Kerman University of Medical Sciences (Ethical code: IR.KMU.REC.1399.229).

Results

In this study, 104 (52.8%) participants were male and the rest were female. The mean age was 36.99 ± 10.68 years. 65 people (33.0%) had high school education. 48 participants (24.4%) were employees. 148 people (75.1%) did not report any systemic disease. 79 participants (40.1%) had average oral health status and 107 people (54.3%) had good general health (Table 1).

Table 1. Frequency of participants' based on demographic variables, oral health behavior, and dental plaque index

Variable		Frequency	Percent (%)
Gender	Male	104	52.8
	Female	93	47.2
Education level	Elementary	10	5.1
	High school	26	13.2
	Diploma	65	33.0
	Associate	25	12.7
	BA	49	24.9
	Above BA	22	11.1
Occupation	Housewife	50	25.4
	Employer	48	24.4
	Worker	21	10.7
	Teacher	16	8.1
	Freelance	47	23.9
	Retired	6	3.0
	Military	9	4.6
History of systemic disease	Yes	49	24.9
	No	148	75.1
Oral health status	Very bad	4	2.0
	Bad	26	13.2
	Moderate	79	40.1
	Good	76	38.6
	Excellent	12	6.1
General health status	Very bad	0	0
	Bad	3	1.5
	Moderate	62	31.5
	Good	107	54.3
	Excellent	25	12.7
Tooth brushing frequency	Never	16	8.1
	Occasionally	63	32.0
	Once a day	92	46.7
	Twice a day	26	13.2
Dental floss frequency	Never	79	40.1
	Occasionally	64	32.5
	Once a day	45	22.8
	Twice a day	9	4.6
Dentist visit frequency	Do not remember	30	15.2
	2 years ago	49	24.9
	1 year ago	45	22.8
	6 months ago	67	34.1
	No response	6	3.0
Dental plaque index	Poor	35	17.8
	Moderate	94	47.7
	Good	68	34.5

In terms of oral hygiene, 92 people (46.2%) brushed their teeth once a day and 70 (40.1%) never used dental floss. Thirty people (15.2%) did not remember the last time they went to the dentist. Dental plaque was moderate in 94 patients (47.7%) (Table 2).

Table 2. Correlation between gender and general health status, oral health status and oral health behavior

Variable		Male		Female		P-value
		Frequency	Percent (%)	Frequency	Percent (%)	
General health status	Very bad	0	0	0	0	0.476
	Bad	1	1.0	2	2.2	
	Moderate	29	27.9	33	35.9	
	Good	59	56.7	48	52.2	
	Excellent	15	14.4	9	9.8	
Oral health status	Very bad	1	1.0	3	3.3	0.683
	Bad	16	15.5	10	10.8	
	Moderate	42	40.8	37	39.8	
	Good	38	36.9	38	40.9	
	Excellent	6	5.8	5	5.4	
Teeth brushing frequency	Never	10	9.6	6	6.5	0.032
	Occasionally	41	39.4	22	23.7	
	Once a day	44	42.3	48	51.6	
	Twice a day	9	8.7	17	18.3	
Dental floss frequency	Never	41	39.4	38	41.3	0.747
	Occasionally	37	35.9	27	29.8	
	Once a day	22	21.4	23	25.0	
	Twice a day	3	2.9	4	4.3	
Dentist visit frequency	Do not remember	17	16.8	13	14.4	0.230
	2 years ago	29	28.7	20	22.2	
	1 year ago	21	20.8	24	26.7	
	6 months ago	28	27.7	32	35.6	
Dental plaque index	Poor	21	21.6	14	15.9	0.524
	Moderate	46	47.4	48	54.4	
	Good	30	30.9	26	29.5	

The mean DMFT index of participants was 7.88 ± 4.27. The M component in this study was higher than that in the others. In this study, 4 patients (2.0%) were caries-free (Figure 1).

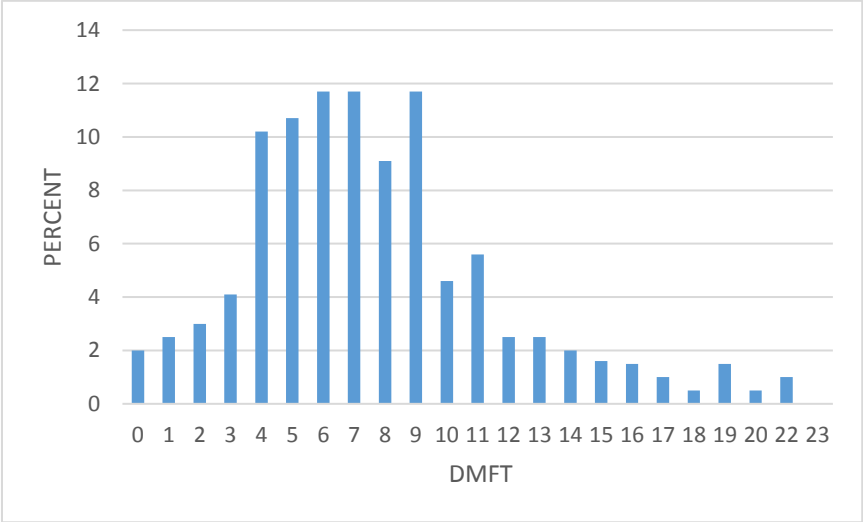

Figure 1. Frequency distribution of DMFT among the participants.

There was a statistically significant difference between tooth brushing frequency and gender (P=0.032). The relationship between gender and health behavior and dental plaque index is shown in Table 3.

Table 3. Correlation between DMFT index and demographic variables

Variable		Mean	Standard Deviation	P-value
Gender	Male	8.03	4.46	0.591
	Female	7.70	4.05	
Oral health status	Very bad	6.25	0.95	0.000
	Bad	9.42	4.70	
	Moderate	8.94	4.40	
	Good	6.90	3.71	
	Excellent	4.09	2.70	
General health status	Very bad	-	-	0.000
	Bad	17.66	5.50	
	Moderate	9.67	4.61	
	Good	7.00	3.56	
	Excellent	5.91	2.96	
Age (year)	< 20	2.80	2.16	0.000
	21-30	5.71	3.10	
	31-40	7.20	2.90	
	41-50	8.90	3.97	
	51-60	14.22	4.56	
	> 60	15.00	2.16	
Teeth brushing frequency	Never	13.37	5.81	0.000
	Occasionally	8.25	4.49	
	Once a day	7.13	2.95	
	Twice a day	6.19	4.06	
Dental floss frequency	Never	8.67	4.71	0.108
	Occasionally	7.68	3.93	
	Once a day	6.77	3.57	
	Twice a day	7.42	3.45	
Attendance to dentist	Do not remember	8.10	5.22	0.749
	2 years ago	7.83	4.11	
	1 year ago	8.37	4.27	
	6 months ago	7.56	4.23	
Dental plaque index	Poor	11.28	4.71	0.000
	Moderate	7.40	3.92	
	Good	6.35	3.15	
History of Systemic disease	Yes	7.63	3.81	0.175
	No	7.54	4.51	

The mean DMFT index in men and women was 7.70 ± 4.05 and 8.03 ± 4.46, respectively. There was no statistically significant difference between gender and DMFT index. There was a statistically significant relationship between self-reported status of oral health and general health and age with DMFT index. The highest rate of DMFT was in the people aged over 60 years old (Table 3). There was a significant and direct relationship between DMFT index and BMI.

Discussion

Due to the significant effect of oral health on people's daily lives, the WHO has defined oral health as one of the most important features of public health in the world (1).

In the present study, there was no statistically significant relationship between underlying disease and DMFT index. Khazaei *et al.* (11) revealed that hypertension and diabetes were meaningfully associated with the number of missing teeth. The loss of all teeth was associated with systolic pressure in Brazilian adults (12). This difference could be due to the type of study because, in the present study,

participants generally were asked to self-report systemic disease.

In this study, the mean DMFT was meaningfully associated with the self-report general health status of individuals. People with better general health had lower DMFT. The reason may be the ability of more healthy people to better maintain oral health.

In the present study, a direct and significant statistical relationship was found between the BMI of participants with DMFT. The reason for this may be that people with decayed teeth or fewer teeth are more inclined to use softer and prepared foods that cause weight gain. The results are consistent with a study by Abbass *et al.* (13) in Egypt and inconsistent with a study by Idrees *et al.* (14) in Saudi Arabia. However, additional studies should be done on the relationship between tooth decay and tooth loss with metabolic diseases and BMI. In the present study, a statistically significant relationship was observed between participants' self-report of oral health status and DMFT. Participants who described their health status better had a lower mean DMFT, which is consistent with the results of the study of Afshar *et al.* (15).

In the present study, the mean DMFT index was 7.88 ± 4.27. The DMFT index was 7.33 ± 3.0 (16) in people aged 15-45 years in Kurdistan (Iran) and 9.6 ± 5.6 (17) in the nomads of Isfahan (Iran). In a survey in 2021, it has been reported as 18.06 ± 8.7 in adults aged 40-70 years (18). The DMFT index has been reported 14 (19) in Japanese people aged 40-74 years, 6.09 ± 5.7 in the age group of 18-74 years in Egypt (13), and 13.3 ± 3.8 in Saudi Arabia (14).

As can be seen, the mean DMFT index in this study is consistent with that reported by Moradi *et al*. (16) and inconsistent with the results of studies in other countries. This difference, as can be seen, is due to the type of study and age groups under study. In the present study, the examination of individuals was in the age group of 18 years and above.

In the present study, the M component was the highest component of the DMFT index, which is consistent with the results of the study of Tahani and Mousavi (17) and is inconsistent with the results of some other studies, in which the F component was the highest component (16,6). It has been shown that tooth loss is the 36th most common condition in the world and a public health problem (20).

In the present study, there was no statistically significant difference between gender and DMFT index. The results are consistent with the results of studies conducted in Iran (16-18).

Likewise, a statistically significant relationship was observed between the mean DMFT index and tooth brushing frequency, which is consistent with the results of the study of Moradi *et al*. (16).

There was a statistically significant difference between brushing technique and gender. In the study of Abu-Gharbieh *et al*. (21) in the UAE, a statistically significant difference was observed between the score of oral hygiene and gender.

In this study, no statistical relationship was observed between dentist visit frequency and flossing with the DMFT index, which is consistent with the results of the study of Tahani *et al*. (17) who indicated that referring to a dentist has no significant relationship with the mean DMFT. Failure to visit a dentist was one of the causes of toothlessness in Brazil (22) and a significant relationship has been reported between tooth loss and oral health behavior (23).

In this study, a significant relationship was observed between age and DMFT index. The amount of DMFT increased with age, which is consistent with the results of other studies (24, 16, 17). As the number of decayed, filled, and extracted teeth increases with age, so the WHO has set a higher DMFT index for higher age groups (9).

Some studies have reported an association between higher ages and poorer oral hygiene (25, 26).

In the present study, a statistically significant relationship was observed between dental plaque index and DMFT index. Numerous studies have shown a positive relationship between good health habits and dental health (25, 23, 27, 28).

Limitations of the study

One of the limitations of this study is that as this study was conducted on clients of public health centers, therefore, the results cannot be generalized to all adults in Kerman.

Another limitation is that the questionnaire used in this study was self-reportedly completed by the participants, therefore, some of the responses may not be real, which were beyond the control of the researcher.

Conclusion

The findings of the present study reveal that there is a statistical relationship between the mean DMFT index with age, oral health status

and general health of individuals, and dental plaque index. There is no statistical relationship between occupation and gender with DMFT index.

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