# Relation between DMFT and Socioeconomic Status in Females Attending Taibah University Clinics

**Ebtehal Alhusaini[1*], Sara Alraddadi[1], Abrar Almatrfi[1], Shrouq Alrwitai[1], Roa'a Alrefai[1] and May Gamar Elanbya[2]**

[1]*School of Dentistry, Taibah University, Saudi Arabia.*
[2]*Department of Dental Public Health, Health Care Quality and Infection Control, College of Dentistry, Taibah University, Saudi Arabia.*

*Authors' contributions*

*This work was carried out in collaboration with all authors. Authors EA and MGE designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors SA and AA managed the analyses of the study. Authors SA and RA managed the literature searches. All authors read and approved the final manuscript.*

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## ABSTRACT

**Aim:** To assess the decayed, missing and filled tooth (DMFT) index of adult female patients attending dental clinics in the College of Dentistry Taibah University. And to link the socioeconomic factors that may influence the DMFT.
**Study Design:** A Cross-sectional analytical study.
Place and Duration of Study: Conducted in Taibah University Dental Clinics, Female campus between January 2016 and May 2016.
**Methodology:** The sample included 110 newly registered adult female patients (>18 years) attended dental clinics for screening. Dental examination for the patient using an explorer and dental mirror was done. Decayed, missing and filled tooth (DMFT) index used by the World Health Organization for the evaluation of dental caries was used. The SPSS software was used for data analysis.
**Results:** Low DMFT presented in 49.0% of educated and 50.0% of not educated subjects. The highest percent of subjects with moderate-income ranging from 4000 to 5999 S.R/month have

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*Corresponding author: E-mail: ebtehal.ms@gmail.com;*

moderate DMFT (58.8%). The highest percent (47.4%-61.5%) of the other groups have low DMFT. Statistically, the difference is not significant.

**Conclusion:** The study demonstrates that DMFT is independent of socioeconomic status.

## 1. INTRODUCTION

Dental caries is the most common disease worldwide affecting the calcified tissues of the teeth. It causes cavitation of the tooth through demineralizing the inorganic portion of the tooth and destruction of the organic substance [1]. Decayed, missing and filled tooth (DMFT) index used by the World Health Organization for the evaluation of dental caries. The Country/Area Profile Project (CAPP) database showed that dental caries is a worldwide−distributed disease affecting oral health [2]. Scientific reports approved the increase in the global prevalence of dental caries in the past decade. This increase will negatively affect future oral health and quality of life, as well, of the global community [3]. The literature review shows a high prevalence of dental caries in various age groups of the Saudi population. Caries prevalence for adults with a mean age of 30−45 is 98% and DMFT is 14.53 [4].

Dental caries is a disease with multifactorial etiology [5]. It is also influenced by sociobehavioural and sociodemographic status [6]. It is noticeable in middle-income countries where high levels of dental caries occur as a result of high sugars consumption. From another point of view, in most cases of dental caries, it goes untreated and frequently extracted in low-income countries [7]. The latest data collected between 1999 − 2004 from The National Health and Nutrition Examination Survey (NHANES) in the US showed differences in the prevalence of DMFT by selected characteristics such as age group, poverty status and level of education. Regarding the age group, 95.62% of adults 50 to 64 years had dental caries in their permanent teeth, the highest percent comparing to other age groups. Regarding poverty status 93.05% of people with greater than 200% income compared to the Federal Poverty Level had dental caries in their permanent teeth, the highest percent comparing to other groups. Regarding the level of education, 92.91% of people with more than high school had dental caries in their permanent teeth, the highest percent comparing to other groups [8].

A study conducted in Taibah University Dental Clinics, Female campus to determine the decayed, missing and filled teeth (DMFT index), among a sample of young women living in Al Madinah in the central-western region of Saudi Arabia shows a very high prevalence of dental caries 85.6% and the mean DMFT was 9.2 [9]. However, the study did not address the possible risk factors related to the results.

It is the rationale of this study to find the factors that may influence the DMFT, hence, educate the community to modify these factors, as much as possible, aiming towards the low prevalence of DMFT.

### 1.1 Aim and Objectives

The purpose of this study is to assess the DMFT index of adult female patients attending dental clinics in the dental college of Taibah University in relation to their level of education and income.

## 2. MATERIALS AND METHODS

This study is an analytical cross−sectional study. Conducted at the female section of dental clinics in the dental college of Taibah University. The sample included the newly registered adult female patients (>18 years) attending dental clinics for screening. And excluded the previously registered patients, children, and male. The sample is convenient, for the availability of patients attending dental clinics in Taibah University from 31/1/2016 to 10/3/2016. The examiner in the screening unit did the dental examination for the patient using an explorer and dental mirror and recorded the dental chart of the patient's digital file at the system. Data was collected by retrieving electronic clinical files stored on the software system CS R4 Clinical+ Practice Management Software (Carestream Dental Ltd.), to access patients' dental charts that were done by screening unit in the dental clinics. Decayed, missing and filled tooth (DMFT) index used by the World Health Organization for the evaluation of dental caries. The severity of dental caries considered high if DMFT > 13.9, moderate if DMFT 13.9-9.0, and low if DMFT <8.9. A questionnaire composed of both open and close−ended questions consisted of socioeconomic items including the level of education and income. The questionnaire

administered to the reception of the clinics to give to patients with their file number daily, each day of the study duration and collected by the end of the day. Subjects considered educated if entered into any governmental or private school and got a certification. Uneducated subjects who did not have any degree of education. Regarding economic status, the subjects were asked to fill the questionnaire to determine their monthly income into one of five categories. First one is less than 3000 S.R (800$), the second one is range from 3000 to 3999 S.R(800-1066$), the third one from 4000 to 5999 S.R(1066-1600$), fourth one from 6000 to 9999 S.R(1600-2666$), and the last one is more than 10,000 S.R(2666$). Data collected, coded and entered in Statistical Package for Social Science (SPSS) software. Descriptive statistics analysis used to calculate means. The chi-squared test ($x2$) was used to evaluate the interdependence of qualitative variables and ANOVA to compare quantitative variables ($p<0.05$). The SPSS software was used for data analysis. P-value of 0.05 as the level of significance will be chosen to assess the statistical hypotheses.

**Importance of the research:** It is the rationale of this study to find the factors that may influence the DMFT, hence, educate the community to modify these factors, as much as possible, aiming towards the low prevalence of DMFT.

**Parties that may benefit from this research:** Community, dental college, ministry of health and dentists.

## 3. RESULTS

Children and those who did not complete the questionnaire were excluded from the study. The total of subjects is 110. Patients were examined for caries incidences, the mean DMFT is 10.30.

The severity of the disease is low in 49.1% of cases, 40.1% is moderate and 10.0% is high (Table 1).

**Table 1. DMFT index and caries severity prevalence**

| Mean | 10.30 | |
|---|---|---|
| Std. Deviation | 6.156 | |
| Category | Frequency | Percent |
| High | 11 | 10.0 |
| Low | 54 | 49.1 |
| Moderate | 45 | 40.1 |
| Total | 110 | 100.0 |

### 3.1 Social Status

**Education level:**

Most of the sample are educated (87.3%). Table 2 shows proximity in the severity of the disease. Low DMFT presented in 49.0% of educated and 50.0% of not educated subjects. The difference is not statistically significant (Table 3).

### 3.2 Economic Status

**Income:**

The mean value of DMFT for subjects with respect to the monthly income is within a range from 9.36 to 13.53. The highest value (13.53) recorded for the group with moderate-income ranging from 4000 to 5999 S.R/month. And the lowest value recorded for the group with lower income (less than 3000 S.R/month). The highest percent of subjects with moderate-income have moderate DMFT (58.8%). The highest percent of the other groups have low DMFT. ANOVA test shows that there is no statistically significant difference between the mean DMFT for groups (sig. 0.199) (Table 4,5,6 ).

**Table 2. Caries severity with respect to education**

| Education | DMFT index | | | Total |
|---|---|---|---|---|
| | **High** | **Low** | **Moderate** | |
| Educated Count | 9 | 47 | 40 | 96 (87.3%) |
| % within Education | 9.4% | 49.0% | 41.7% | 100.0% |
| Not educate Count | 2 | 7 | 5 | 14 (12.7%) |
| % within Education | 14.3% | 50.0% | 35.7% | 100.0% |

**Table 3. Relation between education and caries severity Chi-Square Tests**

| | Value | df | Asymp. Sig. (2- sided) |
|---|---|---|---|
| Pearson Chi-Square | .403[a] | 2 | .817 |
| Likelihood Ratio | .378 | 2 | .828 |
| N of Valid Cases | 110 | | |

**Table 4. DMFT index with respect to monthly income**

| Monthly income | N | DMFT Index | |
|---|---|---|---|
| | | **Mean** | **Std. Deviation** |
| less than 3000 S.R | 53 (48.2%) | 9.36 | 5.684 |
| From 3000 to 3999 S.R | 8 (7.3%) | 10.12 | 5.055 |
| From 4000 to 5999 S.R | 17 (15.5%) | 13.53 | 6.256 |
| From 6000 to 9999 S.R | 13 (11.8%) | 9.85 | 7.592 |
| More than 10,000 S.R | 19 (17.3%) | 10.42 | 6.354 |
| Total | 110 | 10.30 | 6.156 |

**Table 5. Prevalence of caries severity for each group**

| How much is your monthly income? | | DMFT index | | | Total |
|---|---|---|---|---|---|
| | | **High** | **Low** | **Moderate** | |
| less than 3000 S.R | Count | 4 | 29 | 20 | 53 |
| | % within How much is your monthly income? | 7.5% | 54.7% | 37.7% | 100.0% |
| From 3000 to 3999 S.R | Count | 1 | 4 | 3 | 8 |
| | % within How much is your monthly income? | 12.5% | 50.0% | 37.5% | 100.0% |
| From 4000 to 5999 S.R | Count | 3 | 4 | 10 | 17 |
| | % within How much is your monthly income? | 17.6% | 23.5% | 58.8% | 100.0% |
| From 6000 to 9999 S.R | Count | 2 | 8 | 3 | 13 |
| | % within How much is your monthly income? | 15.4% | 61.5% | 23.1% | 100.0% |
| More than 10,000 S.R | Count | 1 | 9 | 9 | 19 |
| | % within How much is your monthly income? | 5.3% | 47.4% | 47.4% | 100.0% |

**Table 6. ANOVA DMFT index**

| | Sum of squares | df | Mean square | F | Sig. |
|---|---|---|---|---|---|
| Between groups | 227.477 | 4 | 56.869 | 1.530 | .199 |
| Within groups | 3903.623 | 105 | 37.177 | | |
| **Total** | **4131.100** | **109** | | | |

## 4. DISCUSSION

Data obtained from The National Health and Nutrition Examination Survey (NHANES) shows the prevalence of caries in permanent teeth (DMFT) among females 20 to 64 years of age is 92.66% and the mean number of DMFT is 10.70 [8]. Similar result founded among females in Taibah University the mean DMFT is 10.30. Meanwhile, the prevalence of DMFT is higher 100%. Most studies identified the association between socioeconomic status and the prevalence of DMFT. Low socioeconomic status was associated with a high prevalence of DMFT and a high prevalence of severe caries. Poorest and least educated individuals showed high rates of dental caries [10-13]. As well, we found that the highest percentage of educated individuals have low DMFT the same as uneducated subjects. As shown earlier most of the subjects (87.3%) are educated which leads to a decrease in the presence of dental caries. Though, many educated patients (41.7%) have moderate DMFT which must be addressed. The association between income inequalities and caries prevalence is evident in the literature [14]. Cost-free treatment provided by students at Taibah University Dental Clinics encourages patients with low-income to seek treatment. As a result, most of the sample (48.2%) have low incomes. Hence, less sugar consumption and fewer caries. On the other hand, cost-free treatment give rise to ignorance of instructions and missing appointments.

 Not a few numbers of subjects (40.1%) have moderate DMFT that must be controlled. Increase demand for esthetic among female patients makes them more concerned about anterior teeth and smile appearance. Less concern about posterior teeth and the function of teeth may lead to neglection of oral health. More effort is needed by specialists to educate and motivate patients to frequently visit the dental clinic and follow the instructions of oral hygiene.

The study has some limitations. It is a cross-sectional study. A well-known limitation of this design is determining causal relationships, due to its inability to establish temporal relationships between causes and effects.

## 5. CONCLUSION

Most of the female patients attending Taibah University Dental Clinics have low DMFT. Furthermore, many of the rest of them (40.1%) have moderate DMFT. The close percent of low and moderate DMFT subjects regarding education level conclude that it is an independent factor. Respecting the monthly income high percent of female patients have low-income. And a lot of them have low DMFT. However, statistically, the difference in DMFT index is not significant.

## CONSENT AND ETHICAL APPROVAL

This study is approved by the Research Ethics Committee (TUCD-REC) at Taibah University. All participants in the study provided written informed consent.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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