Oral Health Status and Treatment Needs among Twelve Year Old School Children in Babylon Governorate – IRAQ

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Abstract

Background:
This study regarding twelve - year - old students in Babylon Governorate Republic of Iraq , in order to increase knowledge concerning oral health status of this target group of population .Data gained may be used for planning of preventive programs for oral health problems in Babylon Governorate.

Materials and Methods :
The sample consisted of 390 students (twelve - year - old students) ; it was examined between September 2009 and the March 2010. The study examines the present situation which causes caries experiences, periodontal conditions and oral hygiene.

Results :
The prevalence of dental caries in 12 – year- old children was (55.4%) and (73.3%) of the samples examined were affected with some kind of periodontal diseases or in need for any kind of treatment either scaling and/or oral health education . The prevalence of caries free children in rural area was higher than that in urban and periurban area.

Conclusions :
Students instructions are considered as important factor for planning good oral hygiene.

Keywords :

Introduction

The two major oral health problems( dental caries and periodontal diseases) are a cause of considerable distress for many persons. They may contribute towards loss of productivity at work and school, and the quality of human life is enhanced considerably when these diseases can be prevented (FDI, 1984). The two major oral health problems namely, dental caries and periodontal diseases are today and probably have always been the wide spread diseases of mankind (WHO, 1997). Dental caries is in a state of flux; in developed first world communities the prevalence is declining, while in developing or underdeveloped third world communities the disease prevalence is increasing (Barmes, 1986; WHO, 1997).

The reduction of caries in many industrialized countries is believed to be an effect of the use of fluoride, especially in tooth pastes , improved oral hygiene, dental education and preventive programs may have contributed, too (Birkhed et al., 1989). Longitudinal as well as cross sectional studies indicated that the prevalence and
severity of gingival disease gradually increase from infancy to adulthood (Merchant.
et al., 2002).

Materials and Methods
The Sample
The sample in this study (Fig: 1) consist of 390 school students at the age of 12-
years -old was considered according to the last birth day , giving an age from 12-
years (0) month to 12- years (11) month WHO, (1997). There are (447,024) Babylon
Governorate students. The estimated number of 12-year-old students living in urban ,
periurban and rural of Babylon Governorate , middle central of Republic of Iraq are
(35,002) including (18,336) males and (16,666) females of the above mentioned index
age.

Instruments and supplies
- Plane mouth mirrors No 4 (Derfla, West Germany) were used for examination
  along with brand new.
- CPI probes (WHO probe), (WHO, 1997).
- A rubber air syringe.
- Several pairs of tweezers.
- Portable chair and stools.
- Kidney dishes.
- Drums for placing the sterile instruments, cotton rolls and gauze.
- Cotton and cloth towels and paper hand towels.
- Portable light connected to 12V battery.

Methods
The Examination
Age:
The age for the participants (12-year-old students) in the study was calculated
according to criteria mentioned by WHO, (1997), which was according to the last
birth day, giving an age from 12-year, (0) month to 12-year, (11) month. If this
was not possible, school records were used to determine the students age.

Examination Position
The subjects examined were seated in a chair with a high back rest. The
examiner standing in front of the chair WHO, (1997). The examination area was
partitioned or arranged in such away that students were not permitted to crowd
around the examiner. The chair was made by the investigator after a serial trials until
the requirements recommended by the WHO, (1997) were obtained. The portable
chair is easy to handle, not heavy, and it is comfortable in seating prior to the
examination, Figure: (2).

Lighting
Natural day light was utilized as the light source for the examination, a portable
angle poise light was used to supplement natural day light during examination. In
absence of electricity the portable light was connected to 12V battery. Figure: (2).

Oral examination:
Dental Caries and Treatment Needs:
Decayed, Missing, Filled Teeth (DMFT/dmft):
Recording of dental caries was carried out according to the criteria suggested by
the WHO, (1997). The clinical examination for dental caries was conducted using a
plane mouth mirrors and community periodontal index (CPI) probe, (WHO, 1997).

A systematic approach of the examination for dental caries was followed,
starting from the last upper right molar proceeding in an orderly manner from one
tooth or tooth space to the adjacent tooth or tooth space reached upper left last molar, then going to the lower left last molar and passing to the lower right last molar. A tooth should be considered present in the mouth when any part of it is present. If a permanent and primary tooth occupy the same tooth space, the status of the permanent tooth only was recorded. An alphabetical coding system was used for recording the status of the primary teeth, while a numerical coding system was used for the permanent teeth. Codes for the dentition status of primary and permanent teeth are given in the Table (2).

**Periodontal Status and Treatment Needs:**

**Community Periodontal Index (CPI):**

There are three indicators of periodontal status for this assessment; gingival bleeding, calculus and periodontal pockets. A specially designed light weight CPI probe with a 0.5mm ball tip is used, with a black band between 3.5 and 5.5mm. and rings at 8.5 and 11.5 mm from the ball tip (Figure: 2).

**Sextants:**

- The mouth is divided into sextants defined by the teeth numbers: 18-14, 13-23, 24-28, 38-34, 33-43 and 44-48.
- A sextant should be examined only if there are two or more teeth present which are not indicated for extraction.

**Note:** This replaces the former instruction to include single remaining teeth in the adjacent sextant. Index teeth, for subjects under 20 years only six teeth (16, 11, 26, 36, 31 and 46) were examined. For adults aged 20 years and over the index teeth to be examined are: {17, 16, 11, 26, 27, 37, 36, 31, 46 and 47}.

The modification in examination of subjects under the age of 20 years is made in order to avoid scoring the deepened sulci associated with eruption as periodontal pockets. For the same reason when children under the age of 15 years are examined, Pockets should not be recorded, i.e. only bleeding and calculus should be considered (WHO, 1997).

**Examination and Recording:**

- The index teeth, or all remaining teeth in a sextant where there is no index tooth, should be probed and the highest score recorded in the appropriate box.

**The Codes are; (Figure :4):**

- 0 – Healthy.
- 1 – Bleeding observed, directly or by a mouth mirror, after probing.
- 2 – Calculus detected during probing, with all of the black band on the probe visible.
- 3 – Pocket 4-5 mm (gingival margin within the black band on the probe).
- 4 – Pocket 6 mm or more (black band on the probe not visible).
- X – Excluded sextant (less than two teeth present).

**The Treatment Needs (TN):**

They are scores determined from examination and based on the most severe and the highest CPI code in the dentition as follows:

- TN0: No need for periodontal treatment (code 0+x).
- TN1: Need for oral hygiene education (code 1).
- TN2: Need for scaling and/or removal of overhangs in addition to oral hygiene instructions (code 2+3).
Statistical Analysis:

Statistical analysis of data were carried out by using statistical package using of social science {SPSS , Version 10} This includes the followings:
1. Descriptive statistic includes : Frequencies, Mean and Standard Error, and Number Percentage.
2. Statistical analysis data by using independent t-test , Chi-square test($\chi^2$) and ANOVA test.* Confidence level was accepted at a level, 5%.

Results:
The Sample:

A sample of 390 twelve year-old students was included in this study Figure: (1) and Table: (1) illustrate the sample was equally stratified by residency (urban, periurban and rural) and gender (male and female) to yield (65) subjects in each strata.

Dental Caries:

Dental Caries Prevalence:

Out of the 390 students examined, 44.6% were found to be caries free at 12-year-old of age, 46.2%, 36.2% and 51.1% were caries free in urban, periurban and rural children respectively, Table (3).

There were statistically significant differences between periurban and rural (p<0.05). Concerning gender, there was statistically no significant difference between total males and total females in caries free at 12-year-old of age.

Teeth Susceptibility:

Among 12-year-olds the results indicate that the first primary molars were mostly affected, followed in order by primary second molar.

Surfaces Susceptibility:

Concerning dmfs in 12-year-old children it has been shown that the proximal surfaces had the higher values, followed in order by occlusal, lingual and finally buccal surfaces. Concerning DMFS among 12-year-olds, also it has been shown that occlusal surfaces had the higher values, followed in order by proximal, buccal and finally lingual surfaces.

Dental Treatment Needs:

Treatment Need in 12-Year-Old Children:

Figure (5) illustrates among overall students in the three different areas, out of the total sample (88.2%) were in need for preventive measures followed by (58.7%) in need for fissure sealant, students in need for one surface restoration and in need for other care formed (29%), followed by (20.5%) in need for two or more surface restoration, students in need for pulp care and restoration, and those in need for extraction formed (12.8%) and (7.2%) respectively.

Periodontal condition and Treatment Needs according to CPI:

Prevalence in 12-Year-Old children:

Table (4) illustrates the number and percentage of 12-year-old children distributed according to the maximum CPITN code by geographical location and gender. Out of the total children examined, 26.7% appear to have a healthy gingiva (code 0), while 12.1% showed signs of gingival bleeding upon gentle probing (code 1), calculus (code 2) was recorded among 61.3%, with no significant difference between females and males.

Urban children appeared to have healthier gingiva (33.8%) than that recorded for periurban and rural which were (16.2% and 30%) respectively, i.e. the proportion of students needing any treatment including scaling and-or oral health instruction were found higher among periurban students (83.9%) than that found among urban and rural students which were 66.1% and 70% respectively. These differences were
found statistically highly significant between periurban and rural students, and significant between urban and periurban students and not significant between urban and rural students.

**Discussion:**

This study is the first Iraqi study conducted in Babylon Governorate that dealing with both dental caries and periodontal health status and also dental and periodontal treatment needs in different areas (Urban, Periurban and Rural) among 12-year-old school children, and following the same criteria of basic methods of surveys recommended by the WHO, 1997, therefore, results of the present study act as a base line data, and it is one of the aims of the present study. The importance of selecting this age, twelve – years old, it is the end of primary school during which we can evaluate if any treatment and preventive program provided to them through school health services, also there are more data on this age group in WHO Global Data Bank, so it is regarded as the global monitoring of disease trends.

**Caries Prevalence:**

The present study showed that the percentage of caries free children were (44.6%) for 12-years-old, that means the prevalence of dental caries for 12-year-olds was (55.4%), the prevalence of dental caries in this study is higher than that reported by other studies (Petersen and Kaka 1999; Pinto et al., 1999) while it is lower than (Mahmood 1995; Hussein et al., 1996; Ali 2001; khamrco and Al-Mitres 2004). The finding of this study is relatively similar to that found in Wales (Downer, 1993).

It is very difficult to find a responsible assessment for the fluctuation percentage of caries free. However, many health and social factors (Oral hygiene, carbohydrates consumption, fluoride application, dental education, socio-economic status, preventive programmes and social habits), in addition to the criteria used in diagnosis of dental caries, play an important rule in the determination of such a percentage.

According to geographical location, the prevalence of caries free children in sample of rural area was higher than that in urban and periurban among 12-year-olds, with significant difference between rural and periurban area. This study showed that there is an effect of geographical location on caries free prevalence, and this is in agreement with other studies (Ali, 2001; Khamrco, 2001). According to gender variation, the prevalence of caries free children was slightly higher in boys than girls for 12-years-old children with statistical no significant differences between them, this finding is in accordance with other study conducted in Iraq (Al-Azawi, 2000).

Results of this study showed that the decay component for both primary and permanent teeth was the most prominent component, this mean high percentage of carious teeth not treated and a very low proportion of filled teeth. This result was in accordance with other studies (Khamrco and Al-Mitres, 2004). While in contrast to the results reported in developed countries, when majority of the DMFT/dmft index was formed of filled teeth (Pitts and Palmer, 1994).

**The Periodontal Health Conditions and Treatment:**

This study showed that 26.7% of the children examined at 12 - years - old had healthy gingiva with no signs of periodontal disease, this means that 73.3% of the samples examined at 12-years-old are affected with some kind of periodontal diseases or in need for any kind of treatment either scaling and/or oral health education.

Unfortunately, no previous study concerned with periodontal conditions has been conducted among this age group (12-years-old) in Babylon Governorate to allow a comparison of findings of this study. Therefore, the findings of this study will be
compared with studies in other countries and Iraqi cities. The percentage of children showed periodontal conditions (gingival bleeding or dental calculus) in this study are lower than that reported by other studies (Adegbembo and El-Nadeef, 1995; Mengel et al., 1996; Al-Azawi, 2000). While, it was relatively similar to that found in Bahrain (WHO, 1991).

The present study reported that the percentages of children show bleeding upon gentle probing as the worst condition or in need for oral health instruction or education in 12-years- old is 12.1%. These percentage is lower than that recorded in other studies (Plančak and Aurer-Koželj, 1992; Mahmood, 1995). While higher than others (Adegbembo and El-Nadeef, 1995).

This study reported that the percentages of children with dental calculus as the worst condition, or in need for scaling and oral health instruction (prophylaxis) were 61.3% among 12-years-olds. These percentage is higher than that reported in other studies (Miyazaki et al., 1989; Plančak and Aurer-Koželj, 1992), while lower than others (Mengel et al., 1991; Mahmood, 1995; Peng et al., 1996). These variations between different studies may be due to the differences in examination and methodology, in addition to many health and social factors.

**Conclusion**

A sample of 390 twelve-year-old students (males and females) were chosen from urban, peri urban and rural of Babylon Governorate -IRAQ. This study presents:

**Dental caries:**
1. The prevalence of dental caries was found to be (55.4%) 12-year-olds. Prevalence and severity of dental caries vary according to area of residency. While, no significant differences were found concerning gender.
2. The first primary and permanent molars seemed to be the most susceptible teeth to dental caries, followed in order by second primary and permanent molars. The occlusal surfaces seemed to be the most susceptible surfaces to dental caries in permanent dentition, followed in order by the approximal surfaces. On the other hand, the approximal surfaces seemed to be the most susceptible surfaces to dental caries in primary dentition, followed in order by the occlusal surfaces.
3. The most frequently required restorative dental treatment was the one surface restoration was the most restorative treatment required at 12-years-old, i.e. restorative treatment required were of simple types and not complicated. At the same time, most of children (88.2% at 12-years-old) were in need for preventive measures or caries arresting care.

**Periodontal Health Conditions:**
1. Old Gingival bleeding and at most calculus was the only observed periodontal conditions in the study sample. The prevalence of periodontal conditions was found to be higher among 12-year-olds (73.3%).
2. The periodontal health condition and treatment required were found to vary according to area of residency. While no differences were found concerning gender.
3. Regarding treatment needed, 12.1% of 12-year-old of children needed oral health education, while 61.3% of children needed prophylaxis, this means improve the oral hygiene should be given the priority in this age group (12-years).
Table (1): Distribution of Total Sample of 6-year-old children in Babylon Governorate – Iraq by Gender and Residency

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Urban</td>
<td>65</td>
<td>50.0</td>
<td>65</td>
<td>50.0</td>
<td>195</td>
<td>50.0</td>
</tr>
<tr>
<td>Periurban</td>
<td>65</td>
<td>50.0</td>
<td>65</td>
<td>50.0</td>
<td>195</td>
<td>50.0</td>
</tr>
<tr>
<td>Rural</td>
<td>65</td>
<td>50.0</td>
<td>65</td>
<td>50.0</td>
<td>195</td>
<td>50.0</td>
</tr>
<tr>
<td>Total</td>
<td>130</td>
<td>100</td>
<td>130</td>
<td>100</td>
<td>390</td>
<td>100</td>
</tr>
</tbody>
</table>

Table (2): Codes for the dentition status of primary and permanent teeth.

<table>
<thead>
<tr>
<th>Code</th>
<th>Condition / status</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0 Sound</td>
</tr>
<tr>
<td>B</td>
<td>1 Decayed</td>
</tr>
<tr>
<td>C</td>
<td>2 Filled, with decay</td>
</tr>
<tr>
<td>D</td>
<td>3 Filled, no decay</td>
</tr>
<tr>
<td>E</td>
<td>4 Missing, as a result of caries</td>
</tr>
<tr>
<td>_____</td>
<td>5 Missing, any other reason</td>
</tr>
<tr>
<td>F</td>
<td>6 Fissure sealant</td>
</tr>
<tr>
<td>G</td>
<td>7 Bridge abutment, special crown or veneer / implant</td>
</tr>
<tr>
<td>_____</td>
<td>8 Un erupted tooth (crown)</td>
</tr>
<tr>
<td>T</td>
<td>T Trauma (fracture)</td>
</tr>
<tr>
<td>_____</td>
<td>9 Not recorded</td>
</tr>
</tbody>
</table>

Table (3): The prevalence of caries free subjects at 6-year-old stratified by geographical location and gender.

<table>
<thead>
<tr>
<th>6 years old</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Caries free individuals)</td>
<td>12</td>
<td>18.5</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>18.5</td>
<td>65</td>
</tr>
<tr>
<td>Peri urban</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Caries free individuals)</td>
<td>11</td>
<td>16.9</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>16.9</td>
<td>65</td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Caries free individuals)</td>
<td>26</td>
<td>40</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>40</td>
<td>65</td>
</tr>
<tr>
<td>Groups total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Caries free individuals)</td>
<td>49</td>
<td>25.1</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>195</td>
<td>25.1</td>
<td>195</td>
</tr>
</tbody>
</table>
### Table: (4); Number and percentage of 6- year- old children distributed according to maximum CPITN code by geographical location and gender.

Healthy (code 0)= No treatment needed ,Bleeding (code 1) = Health instructions,
Calculus (code 2) = Scaling + Health instructions.

<table>
<thead>
<tr>
<th></th>
<th>6 years old</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
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<tr>
<td></td>
<td>Maximum CPITN</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Urban</td>
<td>* Healthy (code 0)</td>
<td>53</td>
<td>88.3</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>* Bleeding (code 1)</td>
<td>4</td>
<td>6.7</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>* Calculus (code 2)</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total valid</td>
<td>60</td>
<td>100</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Excluded sextant</td>
<td>5</td>
<td>7.7</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>65</td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>Periurban</td>
<td>* Healthy (code 0)</td>
<td>28</td>
<td>49.1</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>* Bleeding (code 1)</td>
<td>13</td>
<td>22.8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>* Calculus (code 2)</td>
<td>16</td>
<td>28.1</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total valid</td>
<td>57</td>
<td>100</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Excluded sextant</td>
<td>8</td>
<td>12.3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>65</td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>Rural</td>
<td>* Healthy (code 0)</td>
<td>53</td>
<td>86.9</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>* Bleeding (code 1)</td>
<td>5</td>
<td>8.2</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>* Calculus (code 2)</td>
<td>3</td>
<td>4.9</td>
<td>7</td>
</tr>
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<td></td>
<td>Total valid</td>
<td>61</td>
<td>100</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Excluded sextant</td>
<td>4</td>
<td>6.2</td>
<td>8</td>
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<tr>
<td></td>
<td>Total</td>
<td>65</td>
<td>100</td>
<td>65</td>
</tr>
<tr>
<td>Groups total</td>
<td>* Healthy (code 0)</td>
<td>134</td>
<td>75.3</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>* Bleeding (code 1)</td>
<td>22</td>
<td>12.4</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>* Calculus (code 2)</td>
<td>22</td>
<td>12.4</td>
<td>19</td>
</tr>
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<td>Total valid</td>
<td>178</td>
<td>100</td>
<td>179</td>
</tr>
<tr>
<td></td>
<td>Excluded sextant</td>
<td>17</td>
<td>8.7</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>195</td>
<td>100</td>
<td>195</td>
</tr>
</tbody>
</table>

**Figure: (1); The Sample Distribution**

٦٥٠١
Figure: (2) The chair used during examination and light substitutes

Figure: (3) WHO, 1978, Technical Report Series 621, pp:37
Figure: (4): The use of the WHO Periodontal Probe for Determination of Periodontal Treatment Needs, Ainamo et al., (1982).

Figure: (5); Bar chart showing the relative frequency of each type of treatment needs by residence in students 6- years of age.

1=One surface filling  2=Two or more surface fillings  3=Pulp care and restoration  6=Extraction 7=Need for other care P=Preventive, caries arresting care  F=Fissure sealant
References:


