Cross-sectional study of preventive dental knowledge among adult patients seeking dental care in Riyadh, Saudi Arabia

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Abstract Aim: To evaluate the current knowledge about oral health and preventive dentistry among adults seeking dental care in Riyadh, Saudi Arabia. Materials and methods: A cross-sectional descriptive study was conducted in which 900 questionnaires were randomly distributed to adults seeking dental care in all health settings in Riyadh; 450 questionnaires were distributed in each of the governmental and the private sectors. The questionnaire included questions regarding socio-demographic factors (age, education, occupation, etc) and others concerning the patient’s knowledge of preventive dental measures; the oral hygiene procedures, fluoride and sealant applications and the healthy dietary habits. Statistical analysis was performed using SPSS and simple descriptive statistics as means and frequency distributions were calculated for the study variables. Comparisons were performed using Chi-square test. Results: Eighty-six percent of the study subjects knew that dental caries could be prevented. Almost 59% were aware of the relation between frequency of sugar intake and dental caries. The prevalence of patients who knew that fluoride prevents dental caries was 50.3%, however, only 34.2% reported previous applications of topical fluoride in dental clinics. About 16% of the participants had received fissure sealants although 42.4% knew about them. The study sample’s dietary knowledge had statistically significant relations with education and occupation (p < 0.0001). Correct knowledge of visiting the dental clinic was statistically significantly related to education (p < 0.0001). Conclusion: It can be concluded that the

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majority of adults in Riyadh have the correct preventive dental knowledge, which is mostly related to the individuals’ educational level and occupation.

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1. Introduction

The prevalence of dental caries has remarkably declined in most of the developed countries as a direct result of the significant increase in the level of oral health awareness and knowledge among parents and children. However, caries incidence and prevalence have increased in the Middle East. Several studies were conducted to assess the caries incidence in Saudi Arabia. Two studies conducted in Riyadh, targeting 6-year-old children, reported that caries prevalence was 77.7% and 94.4% in 1992 and 2004, respectively. Another study was conducted in Jeddah in 2000, reported that caries prevalence was 83% among primary school children. Preventive dental knowledge is the precursor of the reduction of caries prevalence. It was noticed that young children’s oral health conditions were influenced by their parents’ knowledge of dental preventive measures. These included good oral hygiene, healthy and balanced diet and periodic dental clinic visits in which topical fluoride and pit and fissure sealant applications could be obtained.

Oral hygiene procedures are effective in controlling dental caries, especially if plaque removal is performed adequately and associated with fluoride. It was noticed that lack of oral hygiene, during 23 days, associated with a high sugar exposure, produced clinically detectable carious lesions. The reversal of the lesions was achieved when oral hygiene was performed associated with daily mouth rinses with fluoride solutions. Current oral hygiene measures, when appropriately used, and in conjunction with regular professional care, are capable of maintaining oral health and preventing dental caries and periodontal diseases.

Fluoride was introduced into dentistry over 70 years ago, and it is now recognized as the main factor responsible for the dramatic decline in caries prevalence. The reductions in decayed, missing and filled tooth surfaces (DMFS) among children and adolescents whose teeth were treated with fluoride varnish were 43% and 37% in permanent and primary teeth, respectively.

Scientific evidence showed that pit and fissure sealants effectively prevented dental caries. Fissure sealants placed on permanent molars in children and adolescents resulted in caries reduction up to 48 months. Decline in caries incidence in children and adolescents after fissure sealant placement ranged from 86% at one year to 78.6% at two years and 58.6% at four years. Although fissure sealants are safe and effective, they are not used widely in the prevention of dental caries in Saudi children.

Diet can affect teeth during the developing period or after their eruption; as it can be one of the risk factors of dental caries and enamel erosion. People’s knowledge of how to maintain a healthy balanced diet has a major role in reducing dental caries.

A study conducted in Madina, Saudi Arabia found that 62% of the mothers knew that frequent carbohydrate consumption and the presence of bacteria were the formative causes of dental caries. The mothers showed positive attitudes toward the dental preventive measures, however, 79% were not convinced that treatment of the child’s dental caries was necessary. The study also reported that 76% of the children seek professional help only upon feeling pain.

With the increased prevalence of dental caries and lack of proper use of preventive dental aids among Saudi children, more studies are needed to be conducted among the adults who are parents, guardians or even role models to these children. That is why working on enriching the dental knowledge among Saudi adults is considered to be the precursor of improving the oral hygiene measures among the whole population.

This study aims to evaluate the current knowledge of adults residing in Riyadh about oral health and preventive dentistry so that the results can be used in developing proper dental health educational programs for successfully reducing the caries prevalence in Saudi Arabia.

2. Materials and methods

This observational, descriptive, cross sectional study, was ethically approved by The College of Dentistry Research Center (CDRC), King Saud University, Riyadh, Saudi Arabia. The study was performed by distributing a questionnaire in Arabic language; (Originally written in English then translated to Arabic) to the adult patients seeking dental care in Riyadh.

The questionnaire began with a brief explanation of the aim of the study then a statement indicating to the participants that their answers would be stored and transmitted securely for protecting confidentiality. It was composed of two parts. The first part was concerning the patient’s socio-demographic data [age, gender, nationality, occupation, education and area of residence]. The second part was related to the patient’s knowledge regarding preventive dental measures; the oral hygiene procedures, fluoride and sealant applications and the healthy dietary habits. The questionnaire validity was accomplished through the revision of the questionnaire by two senior experts in preventive dentistry and modifying it according to their comments. A pilot study was conducted on 5% of the sample to assess the feasibility and the practicality of the study.

The sample was randomly selected so that 450 questionnaires were distributed in the governmental sector (300 in the 10 governmental hospitals; 30 in each hospital, and 150 in College of Dentistry, King Saud University) and 450 questionnaires were distributed in the private sector (300 in private hospitals and clinics and 150 in the private dental colleges).

The governmental hospitals included: Al Iman Hospital, King Abdulaziz and King Khalid University Hospitals, King Fahad and King Saud Medical Cities, King Faisal Specialist Hospital, Prince Sultan Military Medical City, National Guard Hospital, Security Forces Hospital and Yamamah Hospital. The private hospitals included: Al-Hammadi Hospital,
Sulaiman Alhabib Medical Group and Specialized Medical Center Hospital and the private dental colleges included: AlFarabi Dental College and Riyadh College of Dentistry.

2.1. Statistical analysis

Statistical analysis was performed using the MS Office Excel and the Statistical Package for the Social Sciences (SPSS) version 16. Simple descriptive statistics as means and frequency distributions was calculated for the study variables. Prevalence of correct preventive dental knowledge among adults in Riyadh was calculated. Relation of socio-demographic factors to correct oral hygiene, dietary knowledge and the correct knowledge of visiting the dental clinic was determined using Chi-square test at 95% confidence (p < 0.05).

3. Results

A total of 683 out of 900 questionnaires were returned back from adult patients seeking dental care in Riyadh giving a response rate of 75.9%. The sample included 488 (71.4%) female patients. Over half of the study subjects were within the group of 20–30 years, and 15.6% were within the 41–50 years-age-group. Socio-demographic characteristics and health setting of the study sample are presented in Table 1.

The prevalence of correct preventive dental knowledge among the study sample is presented in Table 2. Eighty-six percent of the respondents knew that caries could be prevented. About 83% agreed that there is a relation between oral hygiene and dental caries. Almost 59% were aware of the relation between the frequency of sugar intake and dental caries. The prevalence of patients who knew that fluoride prevents dental caries was 50.3%. However, only 34.2% reported previous applications of topical fluoride in dental clinics. About 42% of the sample knew about fissure sealants which were reported to be applied to only 15.7% of the sample.

Relation of socio-demographic characteristics to correct oral hygiene and dietary knowledge is presented in Table 3. A statistically significant relation was found between occupation and the correct knowledge concerning the relation between diet and dental caries (P = 0.005). Education and occupation were found to be statistically related to the correct knowledge concerning the relation between the frequency of sugar intake and dental caries (P < 0.0001).

Regarding dietary knowledge, 70% of the study sample selected “toffee” as the most cariogenic food followed by “chocolate” which was selected by 32%. Distribution of responses to the most cariogenic food among the study sample is presented in Fig. 1. Almost 59% of the respondents agreed that the frequency of sugar intake had more influence on caries occurrence in comparison to sugar amount.

Concerning the question of the frequency of dental visits, 64.6% gave the answer of “twice a year”. For the question of the time of the first child’s dental visit, 40.5% answered with “only when there is pain or symptoms”. Relation between socio-demographic characteristics and the correct knowledge of visiting the dental clinic is presented in Table 4. Statistically significant relations were found between the level of education and the correct knowledge concerning the frequency of visiting the dental clinic and the time of the child’s first dental visit (P < 0.0001).

Around two thirds of the participants had received information about oral health care and preventive dentistry. The main source of this information was from dentists (49.3%),...
television (36.3%) and books (15%). (Fig. 2) Almost 88% of the research subjects agreed upon their need for more dental health educational programs.

4. Discussion

This cross sectional study assessed preventive dental knowledge among adults seeking dental care in Riyadh. Data were collected from patients in academic, governmental and private hospitals and clinics distributed in Riyadh. The response rate was about 76%; half of the respondents were young adults (20–30 years). This reflects the self-care of health in general and of oral health in particular at this stage of every one’s life. Regarding gender, responses of the female participants were higher than those of the male participants. This might be because females are known to be keener for their oral hygiene than males; and mothers may spend more time with their children at home supervising their oral health care than fathers do. Also, mothers are the most likely persons to accompany children to the dental clinic.

The majority of the sample was found to have the correct knowledge regarding the relation of dental caries to oral hygiene and diet. However, it was reported that dental caries prevalence was still increasing in Riyadh.22,23 Wyne, 2008 found that the caries prevalence among preschool children in Riyadh was 74.8%. 22 A more recent study conducted by Farsi et al, 2013 concluded that most of the Saudi children (89%) were at high risk of developing dental caries.23 So, not only knowledge needs to be enriched but also attitude and behavior have to be modified. Togoo et al. (2012) reported that over half of the dentists in Saudi Arabia agreed that parents needed to improve their attitudes toward dental preventive care. 24

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Relation of socio-demographic factors to correct oral hygiene and dietary knowledge.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Can dental caries be prevented $\chi^2$ ($P$ value)</td>
</tr>
<tr>
<td>Age</td>
<td>18.729(0.016)$^{*}$</td>
</tr>
<tr>
<td>Gender</td>
<td>0.564(0.754)</td>
</tr>
<tr>
<td>Education</td>
<td>17.785(0.059)</td>
</tr>
<tr>
<td>Occupation</td>
<td>15.736(0.107)</td>
</tr>
<tr>
<td>Area of living</td>
<td>11.088(0.351)</td>
</tr>
</tbody>
</table>

$\chi^2 =$ Chi square test.
$*$ Statistically significant.

Figure 1  Distribution of responses to the most cariogenic food among the study sample.

Table 4  Relation between socio-demographic characteristics and the correct knowledge of visiting the dental clinic.

<table>
<thead>
<tr>
<th></th>
<th>Frequency of visiting the dental clinic $\chi^2$ ($P$ value)</th>
<th>Time of child’s first dental visit $\chi^2$ ($P$ value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>8.416(0.394)</td>
<td>7.902(0.095)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.188(0.910)</td>
<td>2.716(0.099)</td>
</tr>
<tr>
<td>Education</td>
<td>34.316(&lt; 0.0001)$^{*}$</td>
<td>23.877(&lt; 0.0001)$^{*}$</td>
</tr>
<tr>
<td>Occupation</td>
<td>11.694(0.306)</td>
<td>12.256(0.031)</td>
</tr>
<tr>
<td>Area of living</td>
<td>20.600(0.024)$^{*}$</td>
<td>10.628(0.059)</td>
</tr>
<tr>
<td>Health setting</td>
<td>4.627(0.592)</td>
<td>2.964(0.397)</td>
</tr>
</tbody>
</table>

$\chi^2 =$ Chi square test.
$*$ Statistically significant.

Figure 2  Distribution of sources of dental preventive knowledge among the study sample.
Most of the participants in this study knew that the time of the child’s first dental visit should be at 6 months of age, while about one-third of the sample declared that visiting the dentist should be only upon feeling pain. A study conducted to assess the parents’ response to the first dental visit concluded that parents saw that early dental visits were inconvenient due to the young age of children and difficulties to control their behavior at this stage. 25

Most of the research subjects knew that the frequency of visiting the dental clinic should be twice per year. However, Al-Shalan et al. (2002) concluded that only 40% of the population visited the dental clinic regularly. 25

According to the recent guidelines of the American Academy of Pediatric Dentistry (AAPD) 26, professional fluoride application is an effective method in preventing dental caries. This study showed that about half of the participating adults knew that topical fluoride application helps in caries prevention, however, only one third of the sample reported previous fluoride applications. This may be because topical fluoride application is costly in some dental clinics, it may not be offered in some dental health services and usually, some patients prefer treatment rather than prevention.

Study subjects who had previously received fissure sealants were only one third of those who knew about fissure sealants. Togoo, 2010 found that 76% of the dentists knew the role of pit and fissure sealants in caries prevention and 71% of them had already received training in topical fluoride and fissure sealant applications. 27 This may indicate that there is no relation between the dentists’ knowledge about pits and fissure sealant and the percentage of patients who receive it.

There was a statistically significant relation between correct dietary knowledge and the educational level and occupation of the study sample which agrees with many previous studies. 28–31 Knowledge of the importance of visiting the dental clinic had a significant statistical relation to the educational level of the participants. This relation was previously proved by Ronis et al. (1993). 32

Almost half of the adults selected the dentist as being their main source of preventive dental knowledge. This agrees with the findings of other studies. 33,34 About one third of the research subjects selected the web and television to be their source of dental knowledge. Other studies found that media were the main source of dental preventive knowledge among adults. 35

In this study, family income was not included in the sociodemographic factors as in the Arab community this is considered to be a sensitive issue and people are usually conservative in providing information regarding it. The study was cross-sectional which does not allow the examination of cause-and-effect relations. So further analytical studies are recommended to be conducted to ensure the association of the correct dental preventive knowledge and the factors found through this study.

It can be concluded that the majority of adults in Riyadh have correct preventive dental knowledge, which is mostly related to the individuals’ educational level and occupation. However, there may be a gap between knowledge, and the motivation and application of this knowledge. The majority of the study subjects declared their need for more dental health educational programs.

Accordingly, every dentist should play an active role in dental health education at the level of either the office or the community. Dental health educational programs should be actively conducted in all health sectors of Saudi Arabia to increase not only the population’s awareness of preventive dentistry but also their motivation to use the available preventive procedures that can help in reducing the prevalence of dental caries.

Conflict of interest

None declared.

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References