

Oral health knowledge and sources of information of fluoride among Saudi parents in Riyadh

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الهدف: هدفت الدراسة إلى تقييم مدى الامام بوقاية الأسنان بالنخر السني بين السعوديين ورايهم حول الوقاية منه ومصدر معلوماتهم الصحية. الطرق: شملت هذه الدراسة المستعرضة ٥٥٠ من الأفراد السعوديين. وقد أعد استبيان خاص لذلك مؤلفا من ٢٠ عنصرا. تم تحليل الحقائق وصفيًا باستعمال الجدولة المتكررة وجرى تقييم أهمية الجدولة المستعرضة باستعمال اختبار فيشر الدقيق. النتائج: حوالي ٨٢% من الذين سمعوا عن الفلور، ومنهم ٧٣% علموا أن الفلور يمكن إضافته إلى مياه الشرب. ومن بين الذين سمعوا عن فلورة مياه الشرب، حوالي ١٩% لديهم معلومات صحيحة عن القصد من ذلك. واعتبرت وسائل الاعلام المصدر الأساسي للمعلومات حول الفلور. ٦٤% من الذين سمعوا عن الفلور تلقوا المعلومات من وسائل الاعلام مثل التلفاز أو الجرائد. وعند السؤال حول المصدر الأولي للمعلومات المتعلقة بصحة الفم، ٤٨% أوردوا أطيب الأسنان ثم وسائل الاعلام. ٣٥% اعتبروا أن عملية تفريش الأسنان تعتبر الأفضل للمحافظة على صحة فموية جيدة ومن ثم الزيارات لطبيب الأسنان. الاستنتاج: تشير النتائج إلى وجود مستوى منخفض نسبيا من المعلومات حول المعرفة الدقيقة لدور الفلور في الوقاية من النخور السنية بين السعوديين. أورد غالبية المشاركون أنهم حصلوا على المعلومات حول الفلور من مختلف وسائل الاعلام، بينما اعتبر طبيب الأسنان المصدر الأولي للمعلومات المتعلقة بالصحة الفموية.

The aim of this study was to assess the knowledge, opinions and practices of caries prevention and the sources of oral health and fluoride information among the parents of Saudis children. A cross-sectional epidemiological study was carried out in a sample of 550 Saudi parents. The information about oral health and fluoride knowledge was obtained through a self-administered questionnaire. The overall response rate was 64%. From 82% of the respondents who have heard about fluoride, 73% were aware that fluoride could be added to community water supplies. Among those respondents who reported hearing about community water fluoridation, only 19% had precise information about its purpose. Sixty-four percent of respondents who had heard about fluoride learned the information from media such as television or newspapers. Dentists (48%) were the primary source of health information followed by the media (32%). Thirty-five percent of the respondents reported that tooth brushing is the best way to maintain good oral health. It can be concluded that media was the major source of information about fluoride to the parents of Saudi children while the dentists are their main source of oral health information.

Introduction

At the global level, rapid changes in the pattern of oral disease have been observed during the past decade. A dramatic reduction in the level of dental caries in children has been observed in most industrialized countries.^{1,2} There is general agreement that the various uses of fluoride has been the main reason for the decline of caries.³ Changes in sugar consumption, preventive dental treatment, and improvements in oral hygiene care are other possible contributing factors for the decline of caries prevalence in those countries.³

Contrary to what is observed in many Western countries, data from developing countries indicate that the caries prevalence among children is rising.⁴⁻⁶ The reasons of this development are complex, but may be ascribed to the dietary changes, principally increased availability and consumption of refined carbohydrates, relatively poor oral health care standards, and in addition that community-based preventive oral health care and oral health promotion have not been implemented systematically. Several studies⁷⁻¹³ reporting on the prevalence of the dental caries among Saudi children have indicated that the caries experience is increasing. Saudi Arabia is a developing country with a population of 23

million, with approximately half of the population under the age of 18 years¹⁴ and with no available water fluoridation for communities nationwide.

To plan and implement an appropriate preventive program in any community, one needs in addition to defining health problem(s), data regarding knowledge, attitudes, opinions and practices of the population are needed. Although knowledge alone is insufficient to prevent oral diseases, it usually is necessary for individuals to make decisions upon which to act.¹⁵ Children and parents should have the knowledge to be able to identify the principal risk factors related to dental caries and be aware of measures in controlling the disease. For young children, parents and family represent the primary source of information about oral health. Previous studies^{16,17} have shown that parents exert a powerful influence on the dental health of their children. One way to raise children's oral health awareness would be to give accurate information to parents.

Knowledge of effective preventive measures for dental caries has been available in the dental literature for many years. Fluoride from both

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fluoridated water supplies and toothpastes containing fluoride, provides greater caries protection for smooth tooth surfaces than for pitted tooth surfaces where the use of fissure sealants is effective.¹⁸ Studies¹⁸⁻²⁰ have repeatedly found that water fluoridation forms the basis of caries prevention and maintains the decline in dental caries rates which has been achieved. Water fluoridation remains the most efficient public health measure in caries prevention.²¹ The purpose of this study was to assess the knowledge, opinions and practices regarding fluoride and oral health care among Saudi parents.

Materials and Methods

The study focused on female schools for reason associated with the Saudi culture. The urban region of Riyadh has 352 female public primary schools. These schools are distributed in five precincts (north, south, east, west, and center). A list of all female public primary schools in Riyadh was provided by the Presidency of Girl's education.²² Together, with each school was included the name of the precinct where the school was located, the number of first grade classes, the number of the corresponding students, and a school identification number. One school was chosen at random per precinct and was included in the study if the school administration agreed to participate. The total number of first grade classes was 5971 and these consisted of a total of 27,331 first grade schoolchildren. The selection of schools within the five precincts was random, and then within selected schools all first grade schoolchildren were recruited for the study.

The study population consisted of Saudi parents of students in the first grade of the selected schools. Consent was obtained from school authorities to distribute the questionnaires to parents of the students. To determine levels of oral health knowledge and source of information, a questionnaire was developed. Pre-testing early draft of the questionnaire on a group of parents, who were not included in the study, was conducted and resulted in adjustments of wording and phrasing of the questions. The questionnaire included demographic information such as age, sex, educational level, number of children in the family, oral health knowledge and source of

information. A cover page was included explaining the study, the objective of soliciting cooperation and ensuring confidentiality.

A total of 550 questionnaires were distributed to the students to give to their parents for completion by one of the parents. The questionnaires were collected on two occasions following their distribution to increase the response rate. Data were analyzed descriptively using frequency tabulation and significance of cross tabulation was evaluated using Fisher's exact test.

Results

The overall response to this survey was a 350 out of 550 distributed questionnaires yielding a response rate of 64%. A description of the sample with respect to age, sex and education is given in Table 1. The data in this report were analyzed descriptively by those demographic variables.

Table 1. Distribution by sex, age and education of participating of parents.

Characteristic	Number	Percent
Sex	245	70
Male	105	30
Female		
Age	1	0.3
< 20	33	9.4
20 - 29	136	38.9
30 - 39	157	44.9
40 - 49	23	6.5
> 50		
Education		
Illiterate	18	5.1
Primary	56	16.0
Intermediate	52	14.9
High School	93	26.6
College	112	31.0
Graduate	17	4.9
Total	350	100

Awareness and Knowledge of Fluoride

Eighty eight percent of respondents stated that they had heard of fluoride, and 73.5% were aware that fluoride could be added to community water supplies.

From among those who reported hearing about community water fluoridation, 249 respondents mentioned its purpose as well as the source of their information. Only 19.4% had precise information about its purpose, namely that fluoride prevents tooth decay (Table 2). No

statistical difference ($P=0.0748$) was found between males and females. An overall 64.7% of the respondents reported that mass media (TV, newspaper, radio, magazines) was their main source of information about fluoride. The second most frequent source of information was the dentist at 22.1% (Table 3).

Table 2. Parents awareness of the purpose of community water fluoridation.

Purpose	Gender		Total
	Male	Female	
Disinfects water	54.7	53.3	38.5
Prevents tooth decay	28.5	24.7	19.4
Provides dental health	8.1	11.7	6.9
Makes teeth healthy	8.7	10.4	6.6
Total	172	77	249

$P=0.0748$

Table 3. Parents primary source of health, community water fluoridation information.

Source of Information	Gender		Total
	Male	Female	
TV, newspaper, radio & magazines	62.2	70.1	64.7
Dentist	23.8	18.2	22.1
Family/friends	13.4	10.4	12.4
Others	0.6	1.3	0.2
Total	172	77	249

Non-significant

Source of Information About Oral Health

Results indicated that dentists (48%) were the primary source of oral health information followed by media (32%) (Table 4). When the primary source of oral health information was compared between male and female respondents, the result indicated that a larger percentage of females reported learning about oral health from the media (42.3%) compared to male respondents (28.3%). Male respondents tended to receive more information from advertisements or meetings than females ($P=0.007$). Almost equal numbers of both sexes obtain their information from the dentist.

The source of information about oral health was analyzed by age (Table 4). Age was dichotomized as less than 40 and over because of the small numbers in cells. Results suggested that the younger age groups probably utilized media as the primary source of information while for the older ones with the dentist was the primary source ($P=0.068$).

Oral Hygiene Practices

Thirty-five percent of the respondents reported that tooth brushing was the best way to maintain good oral health. In comparing males and females in reporting their opinions of the best way to maintain good oral health, no statistical significance was found ($P=0.198$). When analyzed by age, it was found that a higher percentage of the older subjects regarded visiting dentists as the best care compared to the younger subjects who placed more emphasis on home care related responses (Table 5).

The results regarding the type of preventive procedures provided by parents for their children presented in Table 6 indicated that tooth brushing instruction and oral health education were the preventive procedures most often provided by parents for their children.

Table 4. Respondents' primary source of oral health by gender and age

Source	Gender		Age	
	Male	Female	<40	>40
Dentist	49.2	47.1	46.7	50.3
Media	28.3	42.3*	37.3	27.9**
Advertisements	11.5	5.8	7.7	11.7
Meeting or symposium	6.6	1.0*	4.1	5.6
Family	4.1	3.8	4.1	3.9
Others	0.4	0.0	0.0	0.6
Total	244	104	169	179

* $P<0.05$ ** $P<0.10$

Table 5. Respondents' opinions about the best way to maintain good oral health by gender and age.

Methods	Gender*		Age*	
	Male	Female	<40	>40
Brush teeth	37.1	31.4	36.5	34.4
Regular dental visit Use good toothpaste	31.0	23.8	25.3	32.2
Reduce sugar intake	15.1	19.0	17.6	15.0
Eat balanced diet	11.8	19.0	14.1	13.9
Others	4.1	6.7	5.9	3.9
Total	245	105	170	180

*Non-significant

**Non-significant

Table 6. Preventive procedures provided by parents for their children.

Preventive Procedures	Often	Sometimes	Never
Tooth brushing instruction	55.7	41.7	2.6
Oral health education	62.9	34.9	2.3
Sugar restriction	24.6	65.1	10.3
Regular dental visit	20.0	74.3	5.7

*Number of parents respondents = 350

Discussion

This study was conducted to assess the knowledge regarding fluoride and oral health care among Saudi parents. There are some methodological issues, which may limit interpretation of the above findings. A self-completed, structured questionnaire was used to collect information. Whilst a satisfactory response rate of 64% was achieved, it should be noted that the sample consisted of respondents, and should therefore be regarded as compliant respondents, perhaps more interested in dental health than the remaining sample. It is thought that this possible response bias towards dentally interested persons would tend to over-estimate the knowledge of appropriate preventive measures. Also, it should be recognized that the use of this method of data collection imposes constraints upon the type of question to be asked and wording used. Close-response questions are usually recommended as being more practical, whilst the wording should be straightforward and simple allowing no opportunity for misinterpretation by the respondent.²³

The major oral disease among Saudi children is dental caries, which can be prevented or controlled by using appropriate preventive measures such as fluoride. Since appropriate use of fluoride is the cornerstone of caries prevention, education about its role in preventing tooth decay is important.²⁴⁻²⁶ In the declaration of Alma, adopted by WHO, primary health care was defined as including "at least: education concerning prevailing health problems and the methods of preventing and controlling them".²⁷ Knowledge is usually necessary to make intelligent decisions upon which to act. One may say that oral health knowledge and opinion influence the individual's oral health practices. This study indicated that only 19% of respondents had precise knowledge on water fluoridation. This figure is lower than the one reported by Chohan *et al.*²⁸ who assessed oral health knowledge of fathers accompanying their children to the dental clinic. They showed that 54.9% of fathers knew the role of fluoride in community water. This difference could be the result of the difference in education level between the two samples. Chohan *et al.*²⁸ reported that 22.5% of the study sample had graduate educational level compared to 4.9% in this study. Paik *et al.*²⁹ in their study, assessing the knowledge and opinions of caries prevention among Koreans, found that among those

respondents who reported hearing about community water fluoridation, only 30% had precise information about its purpose. A mail survey conducted in Australia³⁰ reported that only 56% of respondents rated drinking water with fluoride as definitely or probably important for preventing dental caries, and only half (50.2%) identified the main purpose of water fluoridation as the prevention of decay. Further evidence in this direction, an opinion study³¹ comparing attitudes about dental health among dental researchers, practitioners, and the public found that the public thinks about fluoride infrequently and in limited situations. Another study³² conducted in the US in 1985, revealed that only 45% of adults surveyed perceived drinking water to be "definitely important" in preventing decay. This lack of appreciation for the critical importance of fluorides in preventing dental caries is of concern at three levels: firstly, that parents lacking oral health knowledge can have a detrimental effect on the oral health and habits of their children;^{17,33} secondly, that public support for community water fluoridation may be jeopardized by lack of knowledge of the purpose and effectiveness of water fluoridation; and thirdly, that this low level of knowledge may be the result of the limited emphasis placed on the prevention methods by dental professionals and that if dentists wish to promote preventive measures, must know and communicate the preventive methods to the appropriate target in the community.

Regarding the primary source of information about fluoride the data revealed that the majority of respondents reported learning information from the mass media. Similar results were found in an Australian study²⁷ where respondents reported that mass media was the source of information for their knowledge of preventive behaviors. Respondents' acknowledgement of the importance of mass media as a source of information should alert those involved in oral health promotion to the importance of accurate information in the media and to utilize it.

When source of oral health information was investigated in this study, it was found that the most frequently reported source was the dentist. This finding is in agreement with the result of O'Neill's study³¹ who found that in a national probability sample of 1,003 persons, 64% of respondents used their dentists as a source of information about oral health, but is in contrast with the Korean's study, where the public claimed

that media was their main source of oral health information. When primary source of oral health information was compared between males and females in this study, a large percentage of female respondents indicated that their sources of information were the media. This finding is in agreement with the results of previous study¹¹ assessing knowledge, attitudes, and practices among children and mothers in Saudi Arabia where the majority of mothers reported having received information about dental health from the mass media.

The majority of respondents indicated that proper tooth brushing is the best method of maintaining oral health, a concept shared by others.^{32,33} Further, providing tooth brushing instruction was identified by parents as the preventive practice they most often provided to their children. These results likely reflect the emphasis placed on tooth brushing in health education, in the mass media, and as well as by dental professionals. Little emphasis was placed by respondents on the role of sugar restriction in preventing dental caries. Similar findings were reported by Peterson *et al.*³³ who assessed the level of oral health knowledge and attitudes among Romanian mothers, and found that relatively few of the mothers were aware of the harmful effect of hidden sugar. Information given to parents should aim at improving knowledge about the negative effect of sugar in the development of dental caries.

The low level of knowledge about community water fluoridation found among respondents might be the result of the limited emphasis placed on this preventive method by dental professionals. Gift *et al.*³⁴ have found that dentists overemphasize oral hygiene measures relative to the use of fluorides. Given the detrimental health consequences for the population in the absence of fluoridation, the lack of understanding in the community of the crucial role of water fluoridation is worrying. Every effort needs to be made to promote the importance of fluoride and in particular, water fluoridation. Dental professionals and public health workers must continue to emphasize the risk factors related to dental diseases and the importance of community water fluoridation in controlling dental caries. It is through these efforts that progress toward future national health objectives can be achieved.

One may conclude that there is a relatively low level of accurate knowledge about the role of fluoride in dental caries prevention among Saudis.

Mass media were reported to be a major source for oral health information. Therefore, correct information about oral health should be provided to the public to enable individuals to pursue appropriate preventive behavior, and this should be emphasized through mass media.

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