Awareness, utilization, and determinants of using oral diseases prevention methods among Saudi adults – a clinic-based pilot study

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Abstract

Objectives: The present study was conducted to assess the level of awareness and utilization of methods to prevent oral diseases among a group of adult Saudis.

Methodology: An anonymous, self-administered questionnaire was distributed to patients visiting the clinics of the College of Dentistry, University of Dammam in 2015. The questionnaire assessed the background of the respondents, their dental history, awareness and use of a number of methods available to prevent oral diseases, sources of information about these methods and barriers against their use. Regression analysis was used to assess the factors affecting the use of these practices.

Results: Brushing was reported to be used by about 60% of respondents whereas fluoride and sealant were less prevalent (≤30%). Dentist was the most frequently reported source of information about preventive methods (60%) and about 40% cited cost and time as the main reasons why they did not use these preventive methods. Awareness and age were associated with using a greater number of the various preventive methods (odds regression coefficient ratio= 0.27 and 0.04).

Conclusions: Use of preventive methods is not prevalent among Saudi adults and it can be improved by more intensive efforts to increase the awareness of these methods, primarily through dentists.

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Introduction

Recent decades have witnessed improvement in the oral health status in developed countries attributable to changes in dietary habits, improved oral hygiene habits, and widespread availability and use of fluorides. [1, 2] In addition, improved awareness related to oral health has been reported in developed countries and is cited as being partly responsible for better oral health. [3, 4] Inadequate knowledge of available preventive methods is related to non-adoption of preventive practices. [5] Evidence exists to support the efficacy and effectiveness of several modalities available to prevent and control oral diseases. The strength of this evidence does not necessarily indicate that they are actually used either by dentists or patients. Whether these modalities are applied by dentists in the clinic or recommended for patients to use at home, patients' are the ultimate users and it is up to them if any of these modalities become regularly used or stays in trial/ initial phase stage.

Adoption of preventive practices and use of preventive modalities is a key message in most health education campaigns. [4] Collecting data about this aspect of oral health is also needed to plan oral health programs and anticipate levels of disease and rates of its progress along with treatment needs and manpower required to meet them. Inadequate data is available about use and awareness of modalities to prevent and control oral diseases in most Middle Eastern countries in general and in Saudi Arabia in particular. The present study was conducted to assess the awareness and utilization of modalities to prevent oral diseases among a group of Saudis visiting the clinics of the College of Dentistry, University of Dammam in the Eastern Province of Saudi Arabia. The study also assessed determinants of using these preventive modalities including sources of obtaining relevant information and barriers against their use.

Methodology

Study design

A cross sectional study was used after obtaining the approval of the Research Unit,

College of Dentistry, University of Dammam (#EA2014016).

Setting and Participants

The study was conducted in the clinics of the college of dentistry, university of Dammam. Participants were visitors to the clinics who were seeking care in the teaching staff's, interns' and students' clinics. A convenience sample was used where all visitors in the period February 15th to March 15th 2015 were invited to participate in the study.

Data collection tool

A questionnaire was developed in Arabic to collect data from the study participants. An invitation letter attached to the questionnaire explained the purpose of the study, and the time needed to complete the questionnaire (5 minutes) and assured the confidentiality of responses. The questionnaire consisted of four sections. The first section collected background information including age, gender, education, occupation, history of previous dental visit and when this visit was. The section asked the respondent if he/ she had heard before about thirteen preventive modalities that can be used to support oral health and prevent oral diseases and whether they had used these methods before. These modalities were health education, fluoride (including home use and professionally applied), pit and fissure sealant, brushing, professional tooth cleaning, flossing, mouth wash, miswak, periodic checkups, balanced healthy diet, sugar reduction, sugar substitutes and smoking cessation. The third section asked about sources from which the respondent obtained oral health information. Respondents were asked to indicate whether they used any of six sources such as the dentist, physician, friends and family, media, printed material and social media. In the last section, respondents were asked if they considered each of ten factors to be a barrier that prevented them from using the preventive modalities. These factors included cost, non-coverage by insurance, time, unavailability, methods not being recommended by a dentist, dentist being better able to deal with oral problems, method being not effective, belief that these methods cannot prevent oral diseases, no need due to

absence of oral problems and never hearing about the method before.

The questionnaire was pilot tested on 10 patients and their feedback indicated the absence of problems in the questionnaire. Two staff members not involved in the study indicated it had face and content validity.

Procedures

A dental assistant was assigned to distribute the questionnaire to patients visiting the clinics while they waited for their turn to receive treatment. The questionnaire was answered by the respondent without help or explanation by the researcher or the data collector. If a respondent was unable to read or understand the questionnaire, a family member/ friend accompanying him/ her explained and recorded the responses. There was no report that any of the participants required further explanation/ assistance. The dental assistant collected the questionnaire before the respondent left and it was sent for data entry. Handing back the questionnaire with the responses was considered an implicit consent to join the study.

The responses were entered into an Excel file and imported into SPSS version 17.0.

Analysis

The proportion of respondents reporting awareness and use of each of the preventive modalities was calculated. An awareness score was created by counting the number of modalities the respondent had heard about before. Similarly, a practice score was developed by counting the modalities the respondent reported previously using and the same was done for the various sources of information to develop the sources of information score. The internal reliability (measured by Cronbach alpha) of the preventive practices score, awareness score and number of sources of information score was 0.81, 0.72 and 0.51.

For each preventive modality, the odds ratio was calculated with use of modality as dependent variable and awareness as independent variable. Separate univariate regression models were created to assess the association between preventive practices score as dependent variable and each of gender, age, education, occupation, previous visits to the dentist, awareness score, and various reported barriers with calculation of odds regression coefficients ratios, confidence intervals and partial eta squared (as a measure of effect size). Variables with partial eta squared ≥ 0.01 in univariate regression were entered into multivariate regression with stepwise selection and calculation of odds regression coefficients ratios, confidence interval and partial eta squared.

Results

The response rate to the questionnaire was 96.7% (234/ 242 visiting the clinic in the period mid-February to mid-March 2015). Table 1 shows the description of the study sample. The mean age of the participants was 34.5 years. Most of the respondents were males (61.4%), with secondary or university level education (34.9% and 43.1%), working as semi-professionals or professionals (33% and 21%). Almost all of them had already visited the dentist prior to the visit when they received the questionnaire (91%), with 74.6% doing that within the last six months.

Table 1: Sample description

Age in years	Min- max	17-71
	Mean (SD)	34.5 (8.5)
Gender	Male: n (%)	143 (61.4)
	Female: n (%)	90 (38.6)
Education	Illiterate: n (%)	7 (3.2)
	Primary: n (%)	9 (4.1)
	Middle: n (%)	32 (14.7)
	Secondary: n (%)	76 (34.9)
	University: n (%)	94 (43.1)
Occupation	Not working (housewife/ retired): n (%)	39 (19.5)
	Student: n (%)	45 (22.5)

	Manual laborer: n (%)	8 (4)
	Semi-professional: n (%)	66 (33)
	Professional: n (%)	42 (21)
Visited the dentist before	No: n (%)	20 (9)
	Yes: n (%)	201 (91)
Time in months since last visit to dentist	within one month	79 (40.1)
	2-6 months	68 (34.5)
	7-12 months	34 (17.3)
	13 and more month	16 (8.1)

Figure 1 shows the proportion of respondents who reported being aware of and using various preventive modalities. Out of the thirteen various preventive options investigated, >90% of respondents were aware of nine of them. Fluorides and pit and fissure sealants were the two options respondents were least aware of (74% and 51%), with only 24% and 9% of respondents reporting using them before. The methods the respondents reported mostly using were self-applied; brushing, mouth wash and miswak (61%, 53% and 53%). Preventive modalities that > 90% of respondents reported being aware of were used by at least one third of them. Being aware of a preventive modality increased the odds that it will be used. However, this was statistically significant only in the case of mouth wash, professional cleaning, flossing, use of fluorides, using sugar substitutes and pit and fissure sealants. The practice score (number of preventive modalities used) had a mean (SD) = 3.86 (3.09) whereas the mean (SD) of the awareness score= 11.39 (1.90).
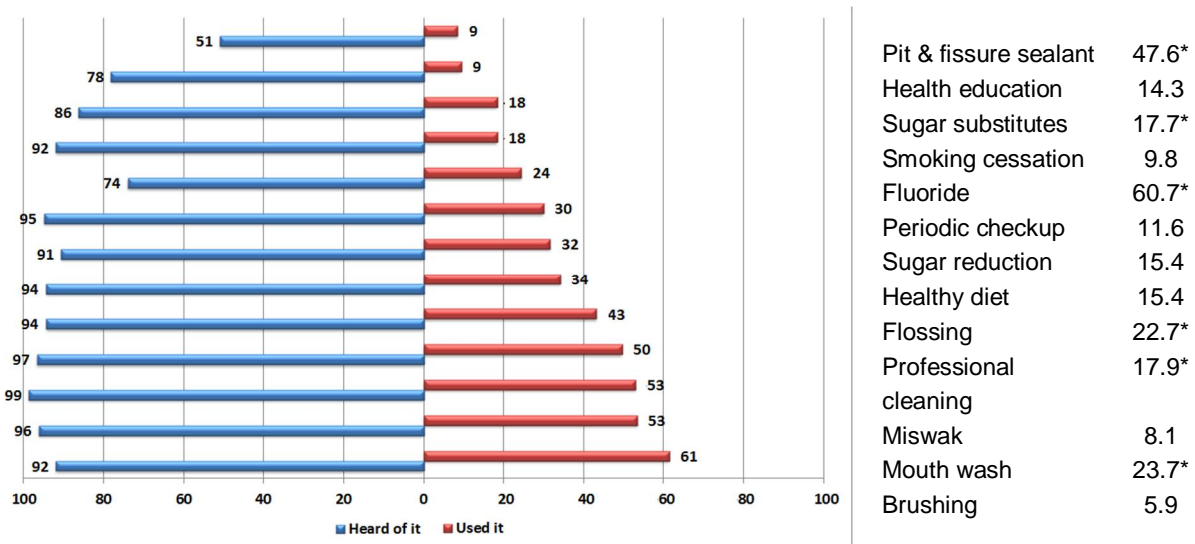

Pit & fissure sealant	47.6*
Health education	14.3
Sugar substitutes	17.7*
Smoking cessation	9.8
Fluoride	60.7*
Periodic checkup	11.6
Sugar reduction	15.4
Healthy diet	15.4
Flossing	22.7*
Professional cleaning	17.9*
Miswak	8.1
Mouth wash	23.7*
Brushing	5.9

Figure 1: Awareness and use of various preventive methods reported by the study sample with odds ratios and their significance

Figure 2 shows the sources that the respondents reported using to get information about preventive methods for oral health. Dentists, media and friends and family represented the most common sources (62%, 45% and 36%). Only 15% reported receiving information from physicians and 1% reported getting no information.
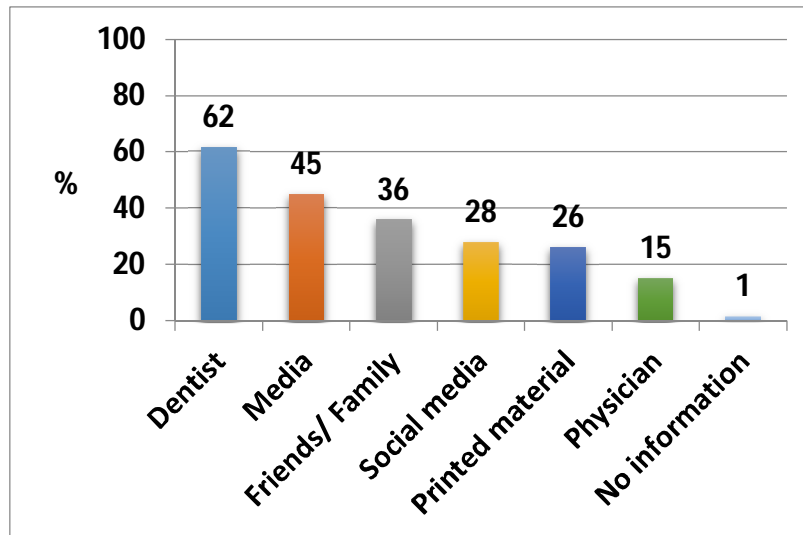
Figure 2: Sources of information about preventive methods for oral health

Figure 3 shows the barriers respondents cited for not using various preventive modalities. Cost, time constraints, unavailability and non-coverage by insurance were the barriers most frequently cited (43%, 43%, 28% and 22%).
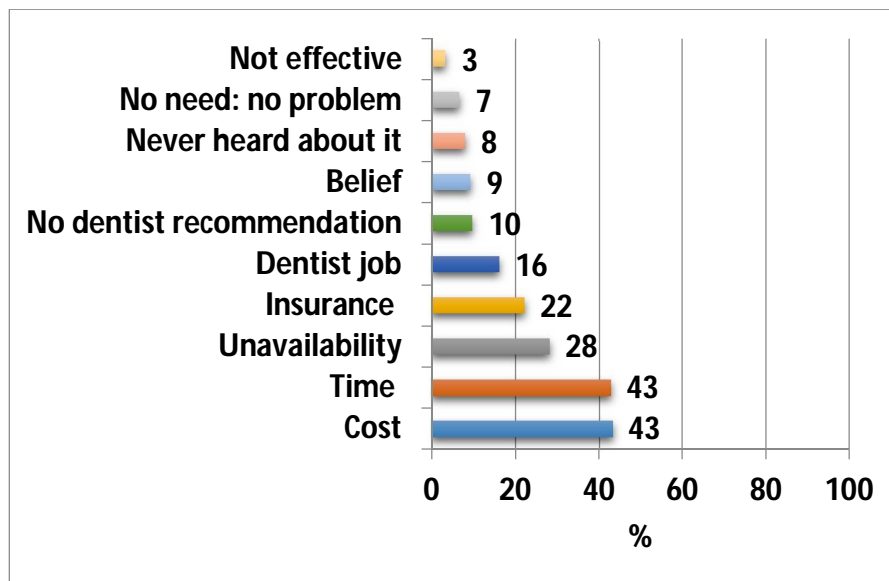
Figure 3: Obstacles for adopting preventive practices for oral health

Table 2 shows the factors associated with increased use of preventive modalities by the respondents. In univariate regression, being educated at a level less than the university was significantly associated with using one less preventive modality (regression coefficient= -1.39). Not visiting the dentist ever prior to the current visit was significantly associated with using about 2 less preventive modalities (regression coefficient= -1.70). Being aware of about 4 more preventive methods was associated with using one more of these methods (regression coefficient= 0.27). In univariate regression, the greatest effect was observed for education, previous visits to the dentist and awareness of preventive methods (partial eta squared= 0.05, 0.03 and 0.03). Other factors had smaller effects such as occupation, the belief that these methods cannot prevent diseases and age (partial eta squared= 0.02, 0.01 and 0.01). In multivariate regression, higher awareness score was associated with greater use of preventive methods (regression coefficient= 0.27) and so was age (regression coefficient= 0.04). The effect of awareness score was slightly greater than age although the two factors explained a small portion of the variation in the use of preventive methods to support oral health (partial eta squatted= 0.03 and 0.02).

Table 2: Factors associated with preventive practices (prevention score)

Variables	Univariate		Multivariate	
	Regression coefficient (95% C.I.)	Partial eta squared	Regression coefficient (95% C.I.)	Partial eta squared
Age	0.03 (-0.003, 0.06)	0.01	0.04 (0.0003, 0.08)*	0.02
Male vs female	-0.15 (-0.97, 0.67)	0.001		
Educated at level <university vs university educated	-1.39 (-2.21, -0.57)*	0.05	-0.85 (-1.83, 0.14)	0.02
Not working as a professional vs working as a professional	-0.98 (-2.07, 0.11)	0.02	-0.16 (-1.31, 1.00)	0
Not visiting the dentist ever vs previously visiting the dentist	-1.70 (-3.11, -0.28)*	0.03	-0.59 (-2.28, 1.10)	0.003
Preventive awareness score	0.27 (0.07, 0.48)*	0.03	0.27 (0.02, 0.52)*	0.03
Obstacle: time	-0.32 (-1.12, 0.49)	0.003		
Obstacle: cost	0.26 (-0.55, 1.06)	0.002		
Obstacle: availability	-0.30 (-1.19, 0.58)	0.002		
Obstacle: insurance coverage	0.09 (-0.87, 1.05)	0		
Obstacle: dentist better able to deal with it	-0.26 (-1.34, 0.82)	0.001		
Obstacle: dentist did not recommend it	-0.64 (-1.98, 0.70)	0.004		
Obstacle: belief	1.20 (-0.16, 2.56)	0.01	1.16 (-0.49, 2.81)	0.01
Obstacle: never heard of it	-0.09 (-1.56, 1.36)	0		

Adjusted R^2= 0.07. C.I.: confidence interval. *: Statistically significant at P ≤0.05

Discussion

The present study reports on an important aspect of oral health which is the use of modalities to prevent oral diseases by adults, an area where data is rather scarce, especially in Saudi Arabia. The strength of the study lies in filling this gap and in assessing the relation between preventive practices and awareness so that health education campaigns can be properly aligned to include relevant messages. One of the limitations of the study is that it uses a sample of patients visiting the college clinics which involves some selection bias. These patients are systematically different from the general population in already having oral diseases and contact dentists with both factors being probably associated with overestimate of awareness and use of these modalities compared to the general population. This should be taken into consideration when interpreting the estimates obtained in the current study. The sample also over represents subjects from higher socio-economic status as seen in their education level and occupation which is to be expected since they are mostly affiliated to the university and using its health care services. Although a convenience sample was used, it is safe to assume that Saudi adults with generally high socio-economic status who are visiting their dentist would have the same level of awareness and use of modalities to prevent oral diseases. The results of the present study should only be generalized to groups similar to the sample used to avoid invalid conditions. The results therefore apply to Saudi adults with generally high socioeconomic status and with previous / concurrent experience of dental visits.

Among the group of adult Saudis investigated in the present studies, more awareness of modalities to prevent oral diseases was observed than actual use of these modalities. Although awareness increased the odds that subjects use these modalities, this association was not always statistically significant and different effect sizes were observed. There seemed to be a threshold of awareness that has to be reached among the group so that a considerable portion of subjects use these modalities. Awareness was also significantly associated with using more preventive modalities in univariate regression and emerged in multivariate regression as one of two factors with significant association and

the one with the greatest effect size. Adequate awareness is a necessary enabling factor for self-care which can prevent and/ or control many oral diseases. [6]

At most, about two thirds of the respondents reported practicing basic oral hygiene practices (brushing, flossing and use of miswak). A study conducted among Chinese subjects [4] reported higher percentage of brushing (86%) other studies reported better self-care practices among western countries. [7]

Fewer respondents in the present study reported seeking professional help for various preventive modalities. The effectiveness of the different preventive modalities that are professionally applied is widely documented. [8-10] A study conducted among Chinese subjects [4] reported that a lower proportion of respondents had reported regular checkups, scaling or received caries preventive services (6%, 10% and 8%). Part of the reason for the less widespread use of professionally applied preventive modalities is variation among dentists themselves. In addition to the patient's condition, an Australian study found that topically applied fluoride was more likely to be prescribed to patients if they were of higher socioeconomic status, as opposed to age, gender and insurance status [11] whereas other studies found that some dentists prefer some modalities than others. [11, 12]

Health education which aims mostly to increase the awareness of preventive modalities (among other oral health issues) was used by 9% only. This means that only this portion of the patients already visiting dentists had participated in health education programs. This emphasizes the inadequate level of awareness produced by this method used by professionals and professional organization in Saudi Arabia. Isolated efforts conducted by educational institutions such as the college or professional organizations such as the Saudi Dental Society have lower chances of increasing the awareness at the general population level. This was also reported in another study conducted in India where the sporadic efforts by isolated agencies were less likely to impact the population's level of awareness. [5] Combining the efforts of these bodies into national or regional campaigns may potentially increase their effectiveness and efficiency. Health education was proved by a systematic review to have a consistent positive

effect on knowledge levels [13] without which subjects are uninformed and cannot be expected to select appropriate preventive modalities.

Dentist was the most commonly cited source of information about modalities to prevent oral diseases. However, when combined together, more respondents reported they used media and social media (73%). This emphasizes the importance of informal sources of information in the age of media and internet. Mass media are effective in disseminating basic knowledge and increasing the awareness of the public regarding useful health practices needed to prevent oral diseases. [14]

The factors reported by the greatest portion of respondents as barriers to using modalities to prevent oral diseases were mostly related to the health care system (cost, unavailability and non-coverage by insurance). This can be attributed to the perception of respondents that the health care system is therapy rather than prevention oriented which is true of the Saudi health care system. [15] Addressing these barriers require changes in the strategy of the system and its orientation which can only happen by policy makers who have the power to direct part of the resources to provide preventive services through the public health care system and/ or reimburse services offered by dentists in private practice through insurance. [15]

In the present study, lower education was associated with using less number of preventive modalities in univariate regression although the relation was not significant when other factors were accounted for. Other studies also reported a link between awareness, education and oral health practices. [16, 17] Better education allows individuals to seek oral health knowledge from many sources and utilize this knowledge to make use of the preventive modalities available. [5] The association between awareness and practice seems to be more pronounced in groups with higher education. [18]

Conclusion and Recommendations

The majority (>50%) of respondents brushed, used mouthwash and miswak and the great majority heard about them, mostly through dentists. Using more modalities to prevent oral diseases was associated with older age and being aware of them. It is recommended to conduct further studies to be conducted

including larger samples, randomly selected from the general population. In addition, stratifying the sample by age, socio-economic status and whether the respondents had history of previous dental visits would make it possible to study the association between these variables and the use of preventive modalities.

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