RESEARCH ARTICLE

Correlation of Sociodemographic Factors and Oral Health Knowledge among Residents in Riyadh City, Kingdom of Saudi Arabia

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ABSTRACT

Objective: First, to assess the basic oral health knowledge of residents attending shopping malls in Riyadh city, and second, to determine the correlation between sociodemographic factors and oral health knowledge.

Materials and methods: This descriptive cross-sectional study evaluated correlation between sociodemographic conditions and oral health knowledge among Saudi residents shopping in various malls of Riyadh city, Kingdom of Saudi Arabia. Structured, close-ended, self-administered questionnaire consisting of 20 items was distributed to 377 shoppers and 349 question-naires were filled and returned back. Collected data were analyzed by using Statistical Package for the Social Sciences (SPSS), version 21. Mean and standard deviation scores were calculated and compared between different sociodemographic groups. Pearson's correlation tests were applied.

Results: Overall mean knowledge score of 12.53 ± 3.38 was observed among the study subjects. Comparisons made between different age groups, gender, education, occupa-tion, marital status, and nationality have shown statistically significant difference in oral health knowledge. Moreover, oral health knowledge showed significant positive correlation with various sociodemographic variables.

Conclusion: Residents attending shopping malls in Riyadh city showed gaps in oral health knowledge. Sociodemographic factors, such as age, gender, education, occupation, national-ity, and marital status have shown significant differences and positive correlation with oral health knowledge.

Keywords: Correlation, Knowledge, Oral health, Sociode-mographic factors.

INTRODUCTION

New definition of oral health developed by the FDI World Dental Federation encompasses various func-tional aspects of the craniofacial complex without pain, discomfort, and disease. Apart from this, it includes other attributes that consider oral health as fundamental to health and quality of life influenced by the individual's changing experiences, perceptions, expectations, and ability to adapt to circumstances.[1]

Knowledge denotes the capability of an individual to acquire, preserve, and use information: A mixture of understanding, experience, judgment, and skill. However, health knowledge alone is not enough to influence the health of the individual and the society. Basic educational level and public knowledge play an equally important role in influencing health. As these factors help to affect level of awareness regarding self-care, personal hygiene, and understanding advise rendered by a health care worker.[2]

Dental caries is the most common disease, and major public health problem affecting children in Kingdom of Saudi Arabia.[3-6] Improper oral hygiene practices, limited use of preventive dental services, and low percentage of population seeking routine dental check-up despite having free access to dental care has pointed toward the lack of awareness about oral health.[7] Additionally, studies have reported influence of several sociodemographic factors on oral health of Saudi Arabian population.[8-10]

Shopping malls are common establishments of public places in Riyadh city. These malls are scattered all over the city providing an opportunity for shopping and recre-ational activities. Due to the hot climatic conditions, these malls are equipped with temperature control systems. Hence, many individuals and families frequently visit and enjoy various activities in these malls. Most of the people from various sociodemographic conditions visit

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these malls for one or the other reason. Thus, these malls provide an opportunity to reach many people for eliciting their opinions and perception regarding oral health.

It is important to establish the current status of oral health knowledge among general public before designing an effective oral health promotion program targeted toward public places. It is expected that preventive oral health education based on ground realities will enhance public's oral health knowledge, transforming knowledge into appropriate behaviors, and consequently resulting in better oral health. Moreover, the extent to which sociodemographic factors correlate with oral health knowledge of the Saudi residents needs to be studied thoroughly.

Hence, the objective of the study was to assess the basic oral health knowledge and to determine the correlation between sociodemographic factors and oral health knowledge among the residents attending shopping malls in Riyadh city, Kingdom of Saudi Arabia.

MATERIALS AND METHODS

Ethical Approval

Approval for the study was obtained from the research center of Riyadh Elm University. Informed consent to take part in the study was received from the participants.

Study Sample

Sample size of 377 was estimated (sample size calculator: http://www.raosoft.com/samplesize.html) based on acceptable margin of error of 5%, confidence level of 95%, considering 20,000 people visit shopping malls, and assuming correct response distribution of 50%.

A list of family malls was prepared and few shopping malls namely Hayat mall, Sahara mall, and Riyadh gallery were selected by employing convenience sampling methodology. Only aforementioned malls were selected because of their popularity, large size with many shops, and recreational facilities. Moreover, these are preferred by many people from different sociodemographic status. Consecutive men and women who fulfilled the inclusion criteria were selected into the study.

Inclusion criteria consisted of being a Saudi resident, aged above 15 years, able to read, and respond to the questionnaire.

Study Design

This was a descriptive cross-sectional study that collected the oral health information from the Saudi residents shopping at various malls of Riyadh city.

Study Instrument

Oral health knowledge assessment questionnaire was developed based on the World Health Organization publication series on school health as it contained basic information about oral health.

An initial draft of the questionnaire was designed in English and validated in following steps: First, the study instrument was sent to dental public health and periodontology specialists to give their expert opinion concerning its content and compressibility. Later on, English questionnaire was translated into local Arabic language by two bilingual experts in English and Arabic by forward and backward translation method. Second, a pilot study was carried out by selecting a sample of shoppers (n = 10) who gave their feedback on making questionnaire simpler and shorter. Changes suggested by the shoppers were implemented into the questionnaire without affecting consistency of published literature on oral health knowledge. Final version of the questionnaire was developed both in English and Arabic languages to facilitate Arabic and non-Arabic residents to understand the questionnaire items. Individuals aged above 15 years who have agreed to participate and fulfilled the inclusion criteria were considered in the study.

Questionnaire Design

Questionnaire utilized in the study consisted of two parts. First part included sociodemographic data (age, gender, occupation, education, nationality, marital status); second part included 20 questions to assess the oral health knowledge.

Oral Health Knowledge

The assessment of participant's oral health knowledge included 20 questions (items) on the number of sets of dentition, number of milk teeth, number of permanent teeth, purpose of toothbrushing, interval of change of toothbrush, meaning of plaque and its effect on dentition, meaning of gum bleeding and reasons for it, methods of preventing gum bleeding, effect of soft/fizzy drinks on teeth, effect of sweet retention on teeth, methods of prevention of tooth decay, effect of fluorides on teeth, causes of oral cancer, reasons of tooth loss in old age, impact of oral health on general health, effect of loss of teeth on speech, and possibility of alignment of teeth.

Questionnaire Distribution

A self-administered, close-ended questionnaire was distributed to the shoppers near the main entrance and waiting area of shopping malls. Total of 377 questionnaires were distributed and 349 questionnaires were filled and returned by the respondents to the investigators. Approximately 7 to 10 minutes was taken by each subject to answer all the questions.

Table 1: Sociodemographic factors of the study participants

Factors		Frequency	Percentage
Age (years)	15–24	281	80.5
	25–34	37	10.6
	35–44	21	6.0
	45–54	10	2.9
	Total	349	100.0
Gender	Male	101	28.9
	Female	248	71.1
	Total	349	100
Nationality	Saudi	311	89.1
	Non-Saudi	38	10.9
	Total	349	100.0
Marital status	Single	294	84.2
	Married	55	15.8
	Total	349	100.0
Education	Elementary	168	48.1
	High school	87	24.9
	Diploma	10	2.9
	Bachelors	84	24.1
	Total	349	100.0
Occupation	Student	262	75.1
	Homemaker	18	5.2
	Private service	48	13.7
	Government service	21	6.0
	Total	349	100.0

Table 2: Oral health knowledge-related questions and responses among study subjects

Knowledge-related questions	Responses	Frequency	Percentage
Dental plaque	Soft deposit on teeth	97	27.8
	Hard deposit on teeth	68	19.5
	Discoloration of teeth	68	19.5
	White patch on teeth	32	9.2
	Do not know	84	24.1
Dental plaque lead to	Staining of teeth	124	35.5
	Tooth decay and gum disease	116	33.2
	Oral ulcers	14	4.0
	White patch on teeth	24	6.9
	Do not know	71	20.3
Reason for oral cancer	Improper brushing	14	4.0
	Tobacco chewing or smoking	258	73.9
	Vitamin C deficiency	17	4.9
	Excess sweet eating	9	2.6
	Do not know	51	14.6
Health mouth of and dentition impact health of the body	Yes	287	82.2
	No	33	9.5
	Do not know	29	8.3
Possible to move irregularly placed teeth into correct position	Yes	327	93.7
	No	8	2.3
	Do not know	14	4.0

Statistical Analysis

Descriptive statistics of frequency distribution were calculated for every question. Each correct answer in the knowledge section was given score of 1 and wrong answer was scored 0. A total knowledge score was obtained by adding the correct responses of all questions. Hence, a minimum score of zero and maximum score of 20 can be observed. Scores were categorized as poor (0–10), fair (11–15), and good (16–20). Analysis of variance and Scheffe's multiple comparison tests were performed to assess and compare the oral health knowledge among the different groups. Pearson's correlation coefficient tests were performed. A level of significance was set at 0.05. All the data were analyzed by using statistical software SPSS, version 21.

RESULTS

A total of 377 questionnaires were distributed among study subjects and 349 filled questionnaires were received, making a response rate of 93%.

Most of the study participants were females (71.1%) belonging to the age group of 15 to 24 years (80.5%), Saudi nationals (89.1%), single (84.2%), and students (75.1%) with elementary education level (48.1%) as shown in Table 1.

In the present study, very high percentage (93.7%) of participants were knowledgeable about possibility of moving irregularly placed teeth into correct position, impact of oral health on general health (82.2%), and reason for oral cancer (73.9%). However, their knowledge about dental plaque as soft deposit (27.8%) and role of dental plaque in causing tooth decay and gum disease (33.2%) was limited, as shown in Table 2.

When enquired about the basic knowledge of dentition and toothbrushing, very low correct responses for sets of dentition (13.8%), number of milk teeth (17.2%), and number of permanent teeth (32%) were observed. More than half of the respondents (57.6%) agreed that interval of change of toothbrush is 3 months, and 67% said that the purpose of toothbrushing is prevention of dental caries and gum disease, as shown in Graph 1.

Participants showed high knowledge (93.10%) toward the loss of teeth that can interfere with speech and (81.4%) bleeding gum indicates gum disease. Methods of preventing gum bleeding by regular brushing and flossing is known to three-fourths of the participants. On the contrary, 48.40% said that the reason for bleeding gums is improper toothbrushing, and 19.20% said that old age is the reason for tooth loss, as shown in Graph 2.

Most of the study subjects (90.5%) said that decayed teeth affect the appearance, and 89.1% subjects agreed that fizzy drinks affect teeth adversely. Nearly 79.70% of the study subjects said that sweet retention on dentition can lead to decayed tooth. However, 70.8% of the study participants knew about the effect of fluorides on teeth in prevention of dental decay. Less than half of the study
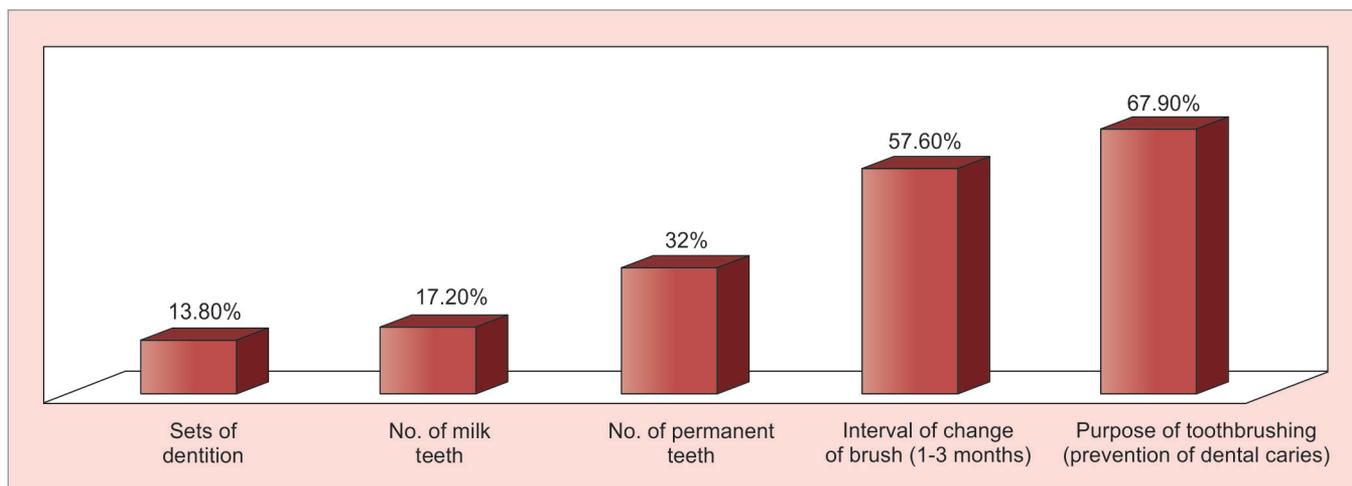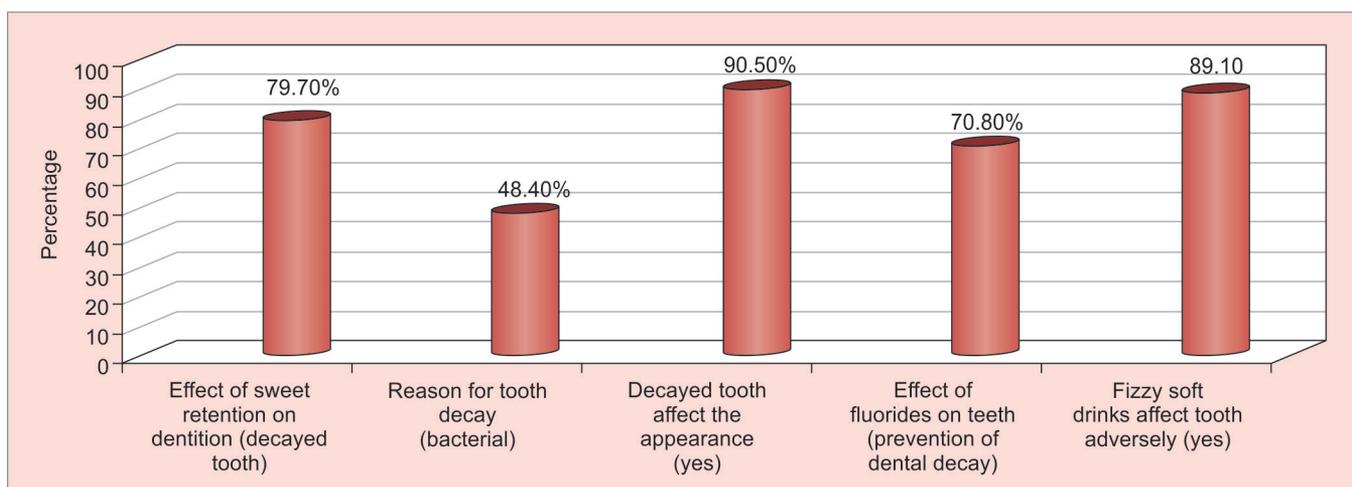
Graph 1: Basic knowledge of dentition and toothbrushing
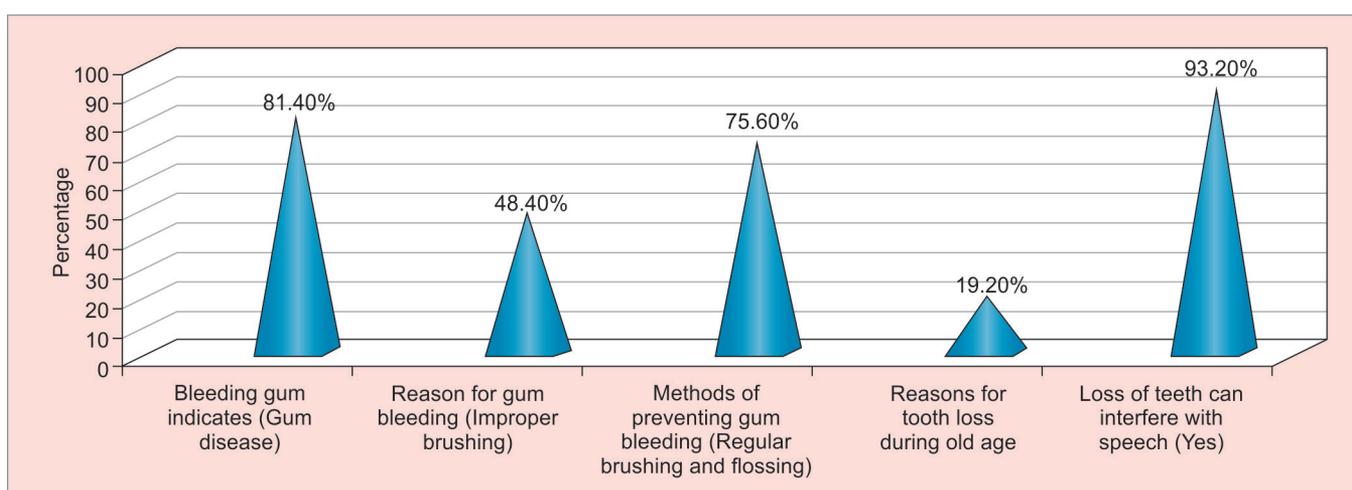
Graph 2: Knowledge of gingival and periodontal disease

Graph 3: Knowledge of dental hard tissue diseases

subjects said that bacteria are the main culprit in causing tooth decay, as shown in Graph 3.

An overall mean knowledge score of 12.53 ± 3.38 was observed among the study subjects. A comparison made between different age groups, gender, education, occupa-

tion, marital status, and nationality has shown statistically significant difference in oral health knowledge. Study subjects aged 35 to 44 years showed higher mean knowledge score as compared with the 15- to 24-year-olds, and the difference was statistically significant (p<0.05). Similarly,

Table 3: Comparison of mean knowledge scores between different groups

Variables		n	Mean	SD	95% Confidence interval for mean		f-value	p-value
					LB	UB		
Gender	Male	101	11.58	3.06	10.98	12.19	11.374	0.001
	Female	248	12.91	3.44	12.48	13.34		
	Total	349	12.53	3.38	12.17	12.88		
Nationality	Saudi	311	12.40	3.31	12.03	12.77	3.951	0.048
	Non-Saudi	38	13.55	3.81	12.30	14.81		
	Total	349	12.53	3.38	12.17	12.88		
Marital status	Single	294	12.26	3.27	11.88	12.63	12.147	0.001
	Married	55	13.96	3.66	12.98	14.95		
	Total	349	12.53	3.38	12.17	12.88		
Age	15–24 years*	281	12.22	3.31	11.83	12.61	4.957	0.002
	25–34 years	37	13.57	3.25	12.49	14.65		
	35–44 years*	21	14.67	3.45	13.09	16.24		
	45–54 years	10	12.90	3.90	10.11	15.69		
	Total	349	12.53	3.38	12.17	12.88		
Education	Elementary*	168	11.58	3.092	11.11	12.06	20.580	<0.001
	High school	87	12.03	2.696	11.46	12.60		
	Diploma	10	13.80	1.989	12.37	15.22		
	University*	84	14.76	3.675	13.96	15.56		
	Total	349	12.53	3.383	12.17	12.88		
Occupation	Student*	261	12.16	3.44	11.74	12.58	4.758	0.003
	Home maker*	18	14.44	3.13	12.89	16.00		
	Private service	49	13.33	2.41	12.63	14.02		
	Government service	21	13.62	3.87	11.86	15.38		
	Total	349	12.53	3.38	12.17	12.88		

Overall mean: 12.53 ± 3.38; SD: Standard deviation; LB: Lower bound; UB: Upper bound *p < 0.05

study subjects with university degree showed higher mean knowledge score as compared with the elementary and high school level educated study subjects, and the difference was statistically significant (p < 0.05). Furthermore, females, non-Saudis, and married subjects showed higher mean knowledge score as compared with their counterparts, and the difference was statistically significant (p < 0.05; Table 3).

Oral health knowledge showed significant positive correlation with various sociodemographic variables, such as age (p = 0.002), gender (p = 0.001), nationality (p = 0.048), education (p < 0.001), occupation (p = 0.002), and marital status (p = 0.001). Educational level of the subject was the only factor that showed significantly higher correlation with oral health knowledge compared with other factors, as shown in Table 4.

Table 4: Correlation between oral health knowledge and sociodemographic factors

Variables	Pearson correlation	Significance (two-tailed)
Age	0.166**	0.002
Gender	0.178**	0.001
Nationality	0.106*	0.048
Education	0.382**	<0.001
Occupation	0.163**	0.002
Marital status	0.184**	0.001

*Correlation is significant at the 0.05 level; **Correlation is significant at the 0.01 level

DISCUSSION

Oral health knowledge plays an important role in developing positive attitudes and healthy behaviors. Previous reports have shown that increased knowledge has an association with better oral health.[11,12] Additionally, individuals are more likely to consider optimum health-related practices if there is better comprehension of etiology and pathogenesis of the disease.[13] Oral health awareness among the people can be increased by transmitting knowledge that leads to positive attitude and good health-related behaviors.[14] Thus, oral health education empowers individuals with accurate information to take actions toward their own health.[15]

Present study explored the oral health knowledge of residents attending shopping malls in Riyadh city and attempted to find correlation between oral health knowledge and sociodemographic factors. This information is important to design effective oral health educational programs targeted toward public places, such as family shopping malls which attract large number of residents from various sociodemographic backgrounds.

This study highlighted the poor knowledge of sets of dentition, number of milk teeth, reason for tooth loss during old age, meaning of dental plaque, number of permanent teeth, plaque-related diseases, reasons for tooth decay, and reason for gum bleeding. On the contrary, their

knowledge on interval of change of toothbrush, purpose of toothbrushing, effect of fluorides on teeth, reason for oral cancer, methods of preventing gum bleeding, effect of sweet retention on dentition, and bleeding gum indicates gum disease, impact of oral health on general health, and adverse effect of fizzy soft drinks on the tooth was found to be adequate. However, study subjects showed higher knowledge with regards to decayed tooth affecting the appearance, loss of teeth can interfere with speech, and possibility of correcting irregular teeth into correct position.

Study subject's knowledge of gum disease was adequate in terms of recognizing its symptoms and ways of prevention. This finding is similar to the previous studies conducted by Wyne et al[16] among secondary schoolchildren in Riyadh city. Similar study showed lower knowledge of role of fluorides in prevention of dental caries as compared with the present study.

In general, oral health knowledge of the residents was found to be inadequate, and this finding is similar to the study reported by Ahmad et al[17] among administrative staff in Madina University.

Cumulated scientific literature presents differing results on the effect of oral health knowledge, attitude, and oral health behavior on the oral disease. But collection and organization of such data is helpful in identifying knowledge gaps in oral health knowledge of the population. There is a dearth of oral health information among general public in Riyadh city. To develop a strong strategy for improving oral health knowledge, a more representative data should be made available. Sample size considered in the present study was not adequate to represent the residents of Riyadh city. Further studies are required with larger sample and proper sampling technique before the study results being generalized.

CONCLUSION

Residents attending shopping malls in Riyadh city showed gaps in oral health knowledge. Various sociodemographic factors, such as age, gender, education, occupation, nationality, and marital status showed significant differences and positive correlation with oral health knowledge. Findings of this study help to develop oral health promotion strategies toward general public attending shopping malls to improve their oral health knowledge.

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