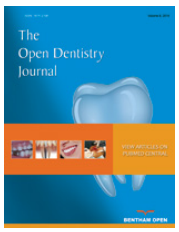

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RESEARCH ARTICLE

Parents Knowledge and Awareness of their Children's Oral Health in Riyadh, Saudi Arabia

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Abstract:

Objective:

To assess the parents' knowledge and awareness of their children's oral health in Riyadh, Saudi Arabia.

Methods:

The study was a cross-sectional analytical study of Saudi parents. A self-administered questionnaire was collected from 324 parents in public parks and malls. In addition to the demographic questions, parents' knowledge about the number of primary teeth, tooth brushing, best time of dental visits, the meaning of plaque and calculus, the importance of fluoride, the relationship between primary and permanent teeth and the effect of oral health on general health were questioned. Data analysis included descriptive statistics and one-way analysis of variance and Bonferroni tests to assess differences in the mean number of correct answers among demographic categories. A *p*-value of 0.05 was set at a significant level.

Results:

The percentages of correct answers ranged from 26% to 75% depending on the type of questions. Only 26-28% could identify the number of primary teeth and the duration of teeth brushing. About one-third of parents knew the time of the first dental visit and the definition of plaque and calculus. Between 63-75% of parents believed that primary teeth can affect permanent teeth and mouth problems can affect general health. On average, 59.2% of participants provide incorrect answers about their children's oral health. The numbers of correct answers were significantly increased by increasing education and income.

Conclusion:

Parents' knowledge and awareness of oral health among Saudi parents were poor. Special attention should be given to parents with low socioeconomic status who need to be educated about children oral health more.

Keywords: Parent, Knowledge, Awareness, Oral health, Saudi, Demographic questions.

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1. INTRODUCTION

The knowledge and awareness of parents of their children's oral health is a fundamental component that generates a preventive measure thus, leading to establishing a sound oral health status of their children [1]. Moreover, lack of parents' knowledge and awareness of their oral health will also affect their children future oral health attitudes and practices that they adopt which will be carried over into adulthood [2, 3]. It has been reported that a lack of parental awareness was an important indicator of children's poor oral hygiene [4].

Parents usually receive oral health care advices from their primary health care physicians, dentists, friends, and families. Parents usually ask specific questions about the time of teeth eruption, time of periodic visit for the dentist, time and frequency of tooth brushing, use of fluoride toothpaste and diet and sugar intake [5]. It had been reported that dental caries was higher among children whose parents lack awareness and knowledge of oral health [6].

Knowledge and awareness of children's oral health by

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parents were studied previously. In developing countries, many studies had reported poor parents' knowledge and awareness of oral health [2, 7 - 11]. However, other studies from industrialized countries revealed the opposite [12 - 14]. Searching the dental literature, no studies had evaluated the knowledge and awareness of Saudi parents related to their children's oral health. Therefore, this study was conducted to fill this knowledge gap. This study aims to assess parents' knowledge and awareness of their children's oral health in Riyadh, Saudi Arabia.

2. MATERIALS AND METHODS

The present study was a cross-sectional analytical study of Saudi parents who live in Riyadh City, Saudi Arabia. The proposal of this study was submitted to the Internal Review Board (IRB) committee of the King Abdullah International Medical Research Center, Saudi Arabia and an IRB for this research was obtained. The purpose of the study was explained to parents and consent forms were completed before answering the questions. The sampling procedure for this study was a convenient sampling of parents living in Riyadh city. Subjects were approached in the following public places: Alworood Park, Alrawdha Park, Panorama mall, and Altaawun Park. Inclusion criteria for this study comprised parents who had children. The exclusion criteria included non-Saudi individuals, children below 18 years of age, and adults with sons and daughters above 18 years of age.

A self-administered questionnaire was constructed in English and then translated to the Arabic Language as the population's formal language. Pilot samples of ten participants who were invited to answer the questionnaires were conducted one month before the commencement of the study. Participants comprehension of the questions and ambiguity related to their answers were discussed and cleared. Necessary corrections according to the outcome of the pilot study were accomplished before the start of the study.

The questionnaires were composed of 14 questions that were divided into two main subparts: **1**) demographics including education, income, employment and number of their children. **2**) Knowledge and awareness questions including a question about the number of primary teeth, tooth brushing, best time of dental visits, the meaning of plaque and calculus, the importance of fluoride, the relationship between primary and permanent teeth and the effect of oral health on general health (10 questions).

Questionnaires were distributed to participants and were instructed to answer all questions up to their best abilities. Members of the research team were presented with parents during filling questionnaires, so they are ready to answer any raised questions or concerns.

Data were entered and analyzed using the SPSS software version 23 (IBM Inc., Chicago, IL, USA). Data analysis included frequency distribution with numbers, percentages, means and standard deviations. In addition, one-way analysis of variance and Bonferroni tests to assess differences in the mean number of correct answers among demographic categories. A *p*-value of 0.05 was set at a significant level.

3. RESULTS

Of the 400 distributed questionnaires, a total number of 338 responses were received from participants. Of those, 14 questionnaires were excluded because of incomplete answers for the main knowledge and awareness questions. The final sample was 324 parents with an overall response rate of 81%.

Table **1** presented the demographic characteristics of the study participants. About 44% of participants exhibited a college education or above and 21% of the sample were from the high-income category (Above Saudi Riyal (SR)20000). About half of the participants were employed by the government and only 9% were unemployed. Most families had one to three children, and about a third had more than three children.

Table 1. presented demographic characteristics of study participants.

Variable	Category	No.	%	Correct Answers*	*P* Value**
Level of education	Primary school	28	8.6	2.5357	0.000
	Intermediate school	50	15.4	3.3000	–
	High school	105	32.4	3.7429	–
	College and above	141	43.5	4.9078	–
Monthly income	< SR4000	66	20.4	3.3939	0.021
	SR4000 - SR10,000	101	32.2	4.2376	–
	SR10,000 - SR20,000	88	27.2	4.2955	–
	More than SR20,000	69	21.3	4.2174	–
Occupation	Government employee	173	53.4	4.3006	0.119
	Private employee	88	27.2	3.6932	–
	Self-employed	33	10.2	4.1515	–
	Unemployed	30	9.3	3.8333	–
Total number of children in the family	One child	80	24.7	4.0375	0.350
	Two children	89	27.5	3.9438	–
	Three children	57	17.6	4.5088	–
	More than 3 children	98	30.2	3.9796	–

* Mean number of correct answers out of 10 questions
** using a one-way analysis of variance.

Table **2** showed the frequency distribution of answers to the knowledge and awareness questions (10 questions). Only 26% could identify the number of primary teeth when all erupted. The ideal duration of brushing teeth as recommended by the American Dental Association (ADA [15] (2 minutes) was recognized by only 28% of participants and 43% answered the question about the regularity of changing toothbrush by individuals. About 33% of parents thought that the first dental visit of their children should be from six months to one year of age, however, about 42% described a dental visit to be at the age of six years and 14% believed that dental visits should be related to the children's complaints of pain. About 36% and 29% of participants could identify the definition of plaque and calculus, respectively. Moreover, more than 50% of parents believed that fluoride in toothpaste was not added for caries prevention and only 28% believed that plaque could cause

gingivitis. Finally, about 63% of participants understood the effect of primary teeth problems on permanent teeth, and 75% believed that the oral health of the children had an effect on their general health.

Table **3** demonstrated the percentage of correct answers of 10 knowledge and awareness questions among participants. The percentages of correct answers ranged from 26% to 75% depending on the type of questions. On average, for the 10 questions, about 59.2% of participants provide incorrect answers about their children oral health.

Table 2. The frequency distribution of answers to the knowledge and awareness questions (10 questions).

Question No.	Question Text	Category	No.	%	Answer
1	What is the number of primary teeth when all erupted?	12	123	38.0	Incorrect
		16	116	35.8	Incorrect
		20	85	26.2	Correct
2	What is the ideal duration of brushing teeth?	Few Seconds	42	13.0	Incorrect
		1 minute	116	35.8	Incorrect
		2 minutes	91	28.1	Correct
		3 minutes	75	23.1	Incorrect
3	How often do you change your child toothbrush	Every 1 month	65	20.1	Incorrect
		Every 3 months	138	42.6	Correct
		Every 1 year	95	29.3	Incorrect
		No need to change it	26	8.0	Incorrect
4	What is the best age for the first dental visit of your child?	At birth	36	11.1	Incorrect
		6 months -1 year of age	106	32.7	Correct
		After 6 years of age	136	42.0	Incorrect
		When feeling pain	46	14.2	Incorrect
5	What does plaque mean	Soft deposits	118	36.4	Correct
		Hard deposits	89	27.5	Incorrect
		I don't know	117	36.1	Incorrect
6	What does calculus mean?	Soft deposits	140	43.2	Incorrect
		Hard deposits	94	29.0	Correct
		I don’t Know	90	27.8	Incorrect
7	What is the importance of adding fluoride to toothpaste	Prevent caries	150	46.3	Correct
		Whiten the teeth	72	22.2	Incorrect
		Clean the mouth	39	12.0	Incorrect
		I don’t know	63	19.4	Incorrect
8	How does the plaque affect the mouth?	It causes gum disease	91	28.1	Correct
		It causes bad breath	67	20.7	Incorrect
		It causes discoloration	66	20.4	Incorrect
		I don’t know	100	30.9	Incorrect
9	Do primary teeth problems have an effect on permanent teeth	Yes	204	63.0	Correct
		No	48	14.8	Incorrect
		I don't know	72	22.2	Incorrect
10	Do you think that the oral health of the child affects his general health?	Yes	244	75.3	Correct
		No	32	9.9	Incorrect
		I don’t Know	48	14.8	Incorrect

Table 3. The percentage of correct answers of 10 knowledge and awareness questions among participants.

No.	Questions	Correct Answer		Incorrect Answer	
		No.	%	No.	%
1	The number of primary teeth	85	26.2	239	73.8
2	Ideal duration of tooth brushing	91	28.1	233	71.9
3	The regularity of changing the toothbrush	138	42.6	186	57.4
4	The best age for the first dental visit	106	32.7	218	67.3
5	Meaning of plaque	118	36.4	206	63.6
6	Meaning of calculus	94	29.0	230	71.0

(Table 3) contd.....

No.	Questions	Correct Answer		Incorrect Answer	
		No.	%	No.	%
7	Importance of adding fluoride to toothpaste	150	46.3	174	53.7
8	How Plaque effect gingiva	91	28.1	233	71.9
9	Primary teeth affect permanent teeth	204	63.0	120	37.0
10	Oral health affects general health	244	75.3	80	24.7
Total	Total correct answers	1321	40.8	1919	59.2

Table 4. Post-hoc analysis of multiple comparisons of demographic characteristics against the dependent Variable: the total number of correct answers.

Variable	Level of Comparisons	Mean Difference	*p*-value	95% Confidence Interval	
				Lower	Upper
Level of education	Primary with intermediate	-.76429	.486	-1.9236	.3950
	Primary with High school	-1.20714*	.014	-2.2518	-.1625
	Primary with College	-2.37209*	.000	-3.3883	-1.3559
	Intermediate with High school	-.44286	.987	-1.2868	.4011
	Intermediate with College	-1.60780*	.000	-2.4162	-.7994
	High school with College	-1.16494*	.000	-1.7981	-.5318
Monthly income (SR)	Less than 4000 with 4000-10000	-.84368*	.046	-1.6782	-.0092
	Less than 4000 with10000-20000	-.90152*	.034	-1.7600	-.0430
	Less than 4000 with 20000 or more	-.82345	.100	-1.7312	.0843
	4000-10000 with 10000-20000	-.05783	1.000	-.8267	.7110
	4000-10000 with 20000 or more	.02023	1.000	-.8032	.8437
	10000-20000 with 20000 or more	.07806	1.000	-.7697	.9258
Occupation	Government employee with Private employee	.60740	.125	-.0871	1.3019
	Government employee with Self-employed	.14906	1.000	-.8585	1.1567
	Government employee with Unemployed	.46724	1.000	-.5818	1.5163
	Private employee with Self-employed	-.45833	1.000	-1.5411	.6244
	Private employee with Unemployed	-.14015	1.000	-1.2616	.9813
	Unemployed with Self-employed	-.31818	1.000	-1.6563	1.0199
Number of children	1 with 2	.09368	1.000	-.7268	.9142
	1 with 3	-.47127	1.000	-1.3944	.4518
	1 with more than 3	.05791	1.000	-.7446	.8604
	2 with 3	-.56495	.587	-1.4684	.3385
	2 with more than 3	-.03577	1.000	-.8156	.7440
	3 with more than 3	.52918	.686	-.3580	1.4163

The mean number of correct answers and a p-value of the 10 knowledge and awareness questions among different demographic categories was presented in the right two columns of Table **1**. The number of correct answers is significantly increased by increasing education from primary school (2.5 out of 10) to college education (4.9 out of 10) ($p \leq 0.001$). Similarly, the number of correct answers was increased significantly by increasing income ($p = 0.021$). No significant association was found been knowledge and awareness of oral health and neither occupation nor the number of children in the family. Table **4** presented Post-hoc analysis of multiple comparisons of demographic characteristics against the dependent variable: the total number of correct answers. The total number of correct answers varies significantly from having primary education compared to having a high school or a college education. Also, it varies significantly from intermediate education *vs*. college education or high school *vs*. college education. The number of correct answers was significantly different from those with less than SR4000 and those with either SR4000-SR10000 or SR10000-SR20000 as monthly income.

4. DISCUSSION

The present study demonstrated the amount of knowledge and awareness that Saudi parents had in respect of their children oral health. However, the degree of knowledge and awareness of Saudi parents varied according to the type of questions asked. Less than 30% of parents could identify the number of primary teeth, the ideal duration of tooth brushing, the meaning of calculus and how plaque can affect the gingiva. Moreover, about two-thirds of parents could not provide an answer to the best age for the first dental visit and the meaning of plaque accumulated on teeth. However, two-thirds to three-quarters of participants knew that their children's primary teeth can affect their permanent teeth, as well as oral health of children had an effect on children's general health. All over,

only 40.8% could answer the given 10 questions correctly.

The sampling technique of this study was a convenient sampling procedure. There were difficulties in obtaining a random sampling procedure since there is no national listing of adults that can be reached, in addition, parents do not normally welcome research teams in their homes and do not have active participation in clubs or community centers. The best places parents and families can be approached in Riyadh city were either in public parks or malls. Therefore, we have chosen three public parks and one of the biggest malls in the city.

The knowledge and awareness about oral health among Saudi parents appeared to be poor. However, it is not different than many published studies [2, 7 - 11]. This indicated a need for an effective oral health educational program to be employed by parents. Educational programs through social media or campaigns might be an effective tool to enhance parents' awareness.

In the present study, we included parents' education and their socioeconomic status as factors affecting parental knowledge and awareness of oral health. These factors were reported by the previous studies [16, 17]. Our study revealed that a lower level of education and low monthly income can affect parents' knowledge and awareness of their children's oral health negatively. In the present study, a significant association between the education levels of parents and their knowledge and awareness was observed. Therefore, parents' education might have a major impact on their children's oral health. Our results are in agreement with the findings in other studies the literature [2, 17 - 20].

In this study, about 46% of parents could identify the importance of adding fluoride to toothpaste. These results were similar to a study by Sehrawat *et al.* (2016) [2] from India, who found that only 43% of the mothers knew that their toothpaste had fluoride. This result was contrasted by a study conducted by Jain *et al*. (2014) [20]. In our study, the appropriate interval of changing toothbrush (every 3 months) was answered correctly by only 43% of Saudi parents. These results are consistent with another study [21].

Many Saudi parents believed that the dental check-ups are not needed for children before six years of age (42%), and only 33% answered the question of best age for the first dental visit correctly. These results were consistent with results obtained from dental patients who attended a Saudi dental college [8]. Other studies revealed similar results indicating that most parents were ignorant of the age of the first dental visit [9, 22].

CONCLUSION

Parents' knowledge and awareness of oral health among Saudi parents were relatively poor. Therefore, increasing the knowledge and awareness of parents about their children oral health can benefit the oral health status of their children. Special attention should be paid to parents' education and income which had a direct relationship to their awareness of their children oral health.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the IRB committee of King Abdullah Medical Research Center Saudi Arabia (SP18/4770/R).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013 (http://ethics.iit.edu/ecodes/node/3931)?

CONSENT FOR PUBLICATION

All participants signed the study consent before answering the questions.

AVAILABILITY OF DATA AND MATERIALS

The data sets analyzed during the current study are available from the corresponding author (Abed A-H. Hamasha) on request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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