

ASSESSMENT OF THE KNOWLEDGE AND AWARENESS AMONG EGYPTIAN PARENTS IN RELATION TO ORAL HEALTH STATUS OF THEIR CHILDREN

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ABSTRACT

Background: Good oral health is essential for the overall health and well-being of a child and is one of the important factors for a disease-free life. Parent/caregiver plays a major role in a child's life, so their knowledge and attitude about oral health will have a great influence on the child's oral health. Dental caries is multifactorial disease and many factors need to be considered for determining its severity.

Objective: The objective of this study was to evaluate oral health awareness among Egyptian parents and its relationship with the dental health status of their children.

Subjects and methods: one hundred and ten children aged 6–12 years selected from outpatients visiting the public dental clinic of October 6 university hospital, were included in the study. A comprehensive questionnaire with apparent validity was designed enclosing questions regarding views of parents on oral health knowledge for their children, caries prevention and role of diet, which was distributed to the parent.

Statistical analysis: Mann-Whitney U test was used to compare between caries indices for children of parents with unsatisfactory and satisfactory awareness levels. Spearman's correlation coefficient was used to determine the correlations between age, caries indices and parents' awareness scores.

Results: There was no statistically significant difference between DMFT and deft scores in children with the unsatisfactory and satisfactory awareness levels of their parents. DMFT showed positive significant correlation with age and total parental questionnaire score. On the other hand, there was a statistically significant inverse correlation between age and deft, also deft showed negative insignificant correlation with total parental questionnaire score. Finally, there was a statistically significant inverse correlation between DMFT and deft.

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

KEYWORDS: Parent, Knowledge, Oral health awareness, DMFT/def, School-going children, Demographic questions.

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INTRODUCTION

Oral health is a fundamental factor of good general health and plays a major role in the child's life span⁽¹⁾. Dental caries is a highly prevalent chronic and cumulative disease which affects 60% to 90% of school children, many adults and still the most common oral health problem affecting children worldwide⁽²⁾.

Cultural beliefs refers to the values as regards health and practices related to oral health habits that are rooted in a society e.g. use of home remedies and care seeking behaviors. It is important to understand the oral health beliefs of parents and changing the customs that are not consistent with scientific knowledge in order to promote good oral health in children and overcome sociocultural barriers⁽³⁾.

Parent/caregiver are role models for a child especially in early years of his life. Parental awareness and behaviors related to oral health and hygiene directly influences the child's oral health. It has been reported that lack of parental awareness was a major indicator of children's poor oral hygiene and dental caries was higher among those children⁽⁴⁾.

The prevention and management of dental health conditions require considerable self-knowledge and intervention. Most dental health education efforts are directed on informing and motivating parents and children to restrict frequent intake of sugar, brushing their teeth with fluoride toothpaste and to have more regular visits to the dentist⁽⁵⁾. The dental professionals may play an important role in educating parents and helping them to understand the importance of early dental care of their children⁽⁶⁾. The AAPD emphasizes on the importance of initiating regular professional oral health intervention in infancy and continuing through adolescence⁽⁷⁾.

In developing countries, many studies had reported poor parents' knowledge and awareness of oral health⁽⁸⁻⁹⁻¹⁰⁾. However, other studies from industrialized countries revealed the opposite⁽¹¹⁻¹²⁾.

Evaluation of the knowledge and attitude of parents using questionnaires helps to implement an effective oral health program. Therefore, a better understanding of the predominant knowledge and attitude of parents about oral health and their own oral hygiene practices is essential. Searching the dental literature, no previous studies had evaluated the knowledge and awareness of Egyptian parents related to their children's oral health. Therefore, the aim of this study is to collect the baseline data to assess the knowledge and attitude of Egyptian parents regarding oral health and its relationship with the prevalence of dental caries in their children.

SUBJECTS AND METHODS

Study Design

The present study was a cross-sectional study including 110 children aged 6-12 years. Children were selected from outpatients children visiting the public dental clinic of October 6 university hospital. The purpose of the study was explained to parents and written informed consent was signed by the parents/guardians of the children before data collection.

Sample size calculation: This power analysis used proportion of children with caries as the primary outcome. Based upon the results of Bamba et al (2019)⁽¹³⁾ where the proportion of children with caries whom parents have unsatisfactory knowledge was 54.8% while those with satisfactory knowledge was 28.3%. Using alpha (α) level of (5%) and Beta (β) level of (20%) i.e. power = 80%; the minimum estimated sample size was 106 children. Sample size calculation was performed using G*Power Version 3.1.9.2.

A multiple-choice questionnaires comprised of 10 questions were used, focused on the level of awareness of parents about oral health knowledge, caries prevention, and role of diet⁽¹³⁾. A questionnaire was designed in English and translated in Arabic and back translated in English to check for language discrepancy. Demographic information was recorded in the same questionnaire. Pilot samples

of ten participants who were invited to answer the questionnaires were conducted before the beginning of the study. Participants understanding of the questions and doubts 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. Parent's knowledge was graded on a 2-point scale (satisfactory and unsatisfactory). Each satisfactory answer to the question was represented by (a) answer and scored 1 and the unsatisfactory answer represented by (b) or (C) answer and scored 0 so :

Score (0-5)= unsatisfactory.

Score (6-10)= satisfactory.

Clinical examination of children was performed according to WHO criteria by a single operator on a dental chair, in artificial light by using sterilized plain mouth mirror and a dental probe⁽¹⁴⁾. Caries severity had been detected according to the WHO criteria as deft/DMFT Index for primary and permanent dentition in mixed dentition. DMFT index for permanent teeth which records the number of D (decayed tooth), M (missing tooth) and F (filled tooth). For mixed dentition deft index was used; d (decayed tooth indicated for filling), e (decayed tooth indicated for extraction) and f (filled tooth)⁽¹⁵⁾.

RESULTS

TABLE (2) Descriptive statistics and results of Mann-Whitney U test for comparison between caries indices in males and females.

Caries index	Females (n = 52)	Males (n = 58)	P-value	Effect size (d)
DMF			0.893	0.022
Mean (SD)	0.75 (1.17)	0.74 (1.15)		
Median (Range)	0 (0 – 4)	0 (0 – 4)		
Def			0.821	0.043
Mean (SD)	5 (2.63)	5.02 (2.42)		
Median (Range)	5 (0 – 13)	5 (0 – 10)		

*: Significant at $P \leq 0.05$

Demographic data

The present study was conducted on 110 subjects, 58 males (52.7%) and 52 females (47.3%). The mean \pm standard deviation values for age were 7.7 ± 1.7 years with a minimum of 6 and a maximum of 12 years old (95% CI: 7.4 – 8 years old).

Caries indices:

Descriptive statistics for DMFT and deft caries indices are presented in Table 1.

TABLE (1) Descriptive statistics for DMF and def caries indices in the study sample.

Caries Index	Mean (SD)	Median (Range)	95% CI for the mean
DMF	0.75 (1.15)	0 (0-4)	0.53 – 0.96
Def	5.01 (2.51)	5 (0-13)	4.53 – 5.48

Responses to the questionnaire

Table 3 represents answers of all participants. The majority of respondents (80.9%) stated that tooth brush with paste is the best way to clean children teeth. Almost half of the participants believed that brushing teeth twice daily is the correct frequency of brushing. About 72.7% of the respondents agreed

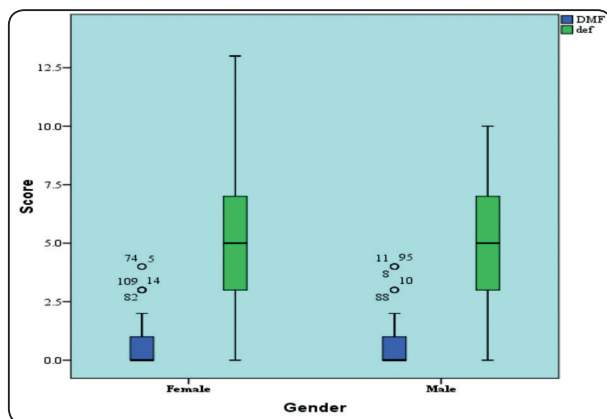


Fig. (1) Box plot representing median and range values for caries indices of female and male children (Circles represent outliers)

that tooth brush should be replaced every 3 months. However, only 39.1% thought that frequency of sugar consumption is the cause of tooth decay and 36.4% knew that sugar contained in diet/drink causes dental decay in children. About one third of the participants thought fluoride prevents decay and nearly half of the participants stated that daily brushing with fluoridated toothpaste reduces caries to some extent. Almost 70.9% of the participants didn't know about pit and fissure sealants and about 52.7% of the participants thought that a person should visit the dentist only when he has a dental problem.

TABLE (3) Frequencies (n) and percentages (%) of parents' awareness questionnaire (correct answer in bold)

Questions	n	%
1. Best way to clean your child's teeth:		
a. Toothbrush with paste	89/110	80.9
b. Toothbrush with powder	15/110	13.6
c. Miswak	6/110	5.5
2. Frequency of brushing teeth in a day		
a. Twice a day	52/110	47.3
b. Once a day	40/110	36.4

Questions	n	%
c. I don't know	18/110	16.4
3. Should tooth brush be replaced every 3 months?		
a. Yes	80/110	72.7
b. No	30/110	27.3
4. What causes tooth decay more?		
a. Frequency of consumption of sugar	43/110	39.1
b. Quantity of sugar	67/110	60.9
5. Does sugar contained in diet/drink cause dental decay in children?		
a. Yes	40/110	36.4
b. No	23/110	20.9
c. I don't know	47/110	42.7
6. Do you think fluoride prevents decay?		
a. Yes	32/110	29.1
b. No	17/110	15.5
c. I don't know	61/110	55.5
7. Brushing with fluoride toothpaste daily:		
a. Reduces caries to some extent	45/110	40.9
b. Eliminates decay	4/110	3.6
c. Has no effect on caries	61/110	55.5
8. Have you heard about pit and fissure sealants?		
a. Yes	21/110	19.1
b. No	11/110	10
c. I don't know	78/110	70.9
9. Is sealant effective in prevention of pit and fissure caries in newly erupted tooth?		
a. Yes	19/21	
b. No	2/21	
c. I don't know	0/21	
10. How often do you think a person should visit a dentist?		
a. 6 months	12/110	10.9
b. Yearly	40/110	36.4
c. When a person has any problem	58/110	52.7

Parents awareness level

The results showed that 24 parents (21.8%) had satisfactory level while 86 parents (78.2%) had unsatisfactory level (Figure 1). The mean and (standard deviation) values of awareness scores were 3.9 (2.4) with a minimum of 0 and a maximum of 10 (Figure2).

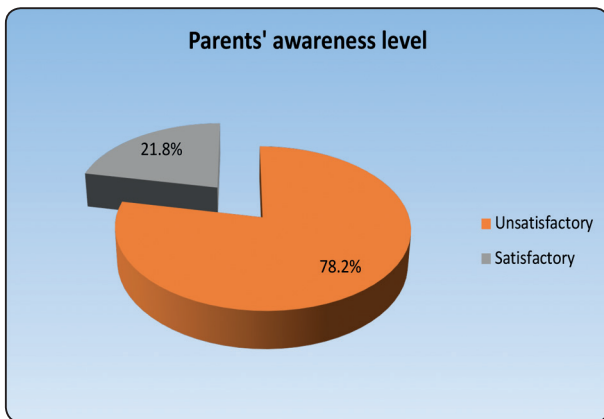


Fig. (2) Pie chart representing parents' awareness level

Comparisons between parents with unsatisfactory and satisfactory awareness levels

There was no statistically significant difference between DMF and def caries indices scores in children of parents with unsatisfactory and satisfactory awareness levels (P -value = 0.097, Effect size = 0.278) and (P -value = 0.086, Effect size = 0.329), respectively.

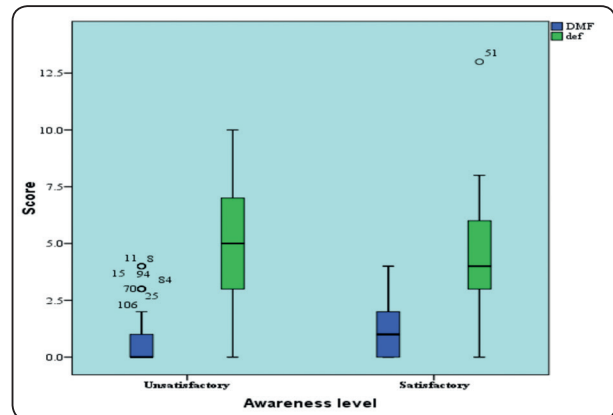


Fig. (3) Box plot representing median and range values of caries indices for children of parents with unsatisfactory and satisfactory awareness levels (Circles represent outliers)

Correlation analysis

There was a statistically significant direct correlation between age and DMFT ($\rho = 0.587$, P -value <0.001). An increase in age is associated with an increase in DMFT score and vice versa. There was a statistically significant inverse correlation between age and deft ($\rho = -0.467$, P -value <0.001). An increase in age is associated with a decrease in deft score and vice versa. There was no statistically significant correlation between child age and total parents' questionnaire score ($\rho = 0.159$, P -value = 0.098).

TABLE (4) Descriptive statistics and results of Mann-Whitney U test for comparison between caries indices for children of parents with unsatisfactory and satisfactory awareness levels

Caries index	Unsatisfactory level (n = 86)	Satisfactory level (n = 24)	P-value	Effect size (d)
DMF				
Mean (SD)	0.67 (1.14)	1 (1.18)	0.097	0.278
Median (Range)	0 (0 – 4)	1 (0 – 4)		
def				
Mean (SD)	5.21 (2.38)	4.29 (2.88)	0.086	0.329
Median (Range)	5 (0 – 10)	4 (0 – 13)		

*: Significant at $P \leq 0.05$

TABLE (5) Correlation matrix for the results of Spearman's correlation coefficient for the correlation between age, DMF, def and total scores of the questionnaire

Parameters	Age	DMF	def	Total parents' questionnaire score
Age				
Correlation coefficient (ρ)		0.587	-0.467	0.159
<i>P</i> -value		<0.001*	<0.001*	0.098
DMF				
Correlation coefficient (ρ)			-0.312	0.289
<i>P</i> -value			0.001*	0.002*
def				
Correlation coefficient (ρ)				-0.075
<i>P</i> -value				0.438

*: Significant at $P \leq 0.05$

There was a statistically significant inverse correlation between DMFT and def ($\rho = -0.312$, P -value = 0.001). There was a statistically significant direct correlation between DMFT and total parents' questionnaire score ($\rho = 0.289$, P -value = 0.002). An increase in total parents' questionnaire score is associated with an increase in DMF score and vice versa. There was no statistically significant correlation between def and total parents' questionnaire score ($\rho = -0.075$, P -value = 0.438).

Statistical analysis

Qualitative data were presented as frequencies and percentages. Numerical data were explored for normality by checking the distribution of data and using tests of normality (Kolmogorov-Smirnov and Shapiro-Wilk tests). Caries indices data showed non-parametric distribution. Numerical data were presented as median, range, mean, standard deviation (SD) and 95% Confidence interval for the mean values. Mann-Whitney U test was used to compare between caries indices for children of parents with unsatisfactory and satisfactory awareness levels. Spearman's correlation coefficient

was used to determine the correlations between age, caries indices and parents' awareness scores. The significance level was set at $P \leq 0.05$. Statistical analysis was performed with IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

DISCUSSION

Oral health is a crucial component of general health and is considered a determinant of good quality of a child's life⁽¹⁶⁾.

Dental caries is one of the major widespread health issues that continues to negatively affect the oral health of children globally⁽¹⁷⁾. The present study demonstrated the amount of knowledge and awareness that Egyptian parents had in respect to oral health status of their children. It was conducted on 110 children, 58 males (52.7%) and 52 females (47.3%). The mean \pm standard deviation values for age were 7.7 ± 1.7 years with a minimum of 6 and a maximum of 12 years old. Children were selected from outpatients visiting the public dental clinic of October 6 University to standardize the socioeconomic level in the study, where all

participants were belonging to low socioeconomic population.

Our study results showed an over all mean DMFT 0.75, the mean DMFT was 0.74 for males while it was 0.75 for females. Also it showed 5.01 as a total mean def, where the def for males was 5.02 and for females it was 5. These findings were in accordance with the DMFT and def results of **Abbass et al., 2019**⁽¹⁸⁾. Also, agreed with the results of a study conducted in Tehran, revealed that the DMFT index in 12-year-old students was 0.77⁽¹⁹⁾. However it was in contrast with a cross-sectional study in India that showed a higher mean of DMFT (2.41) and with the findings of **Bamba et al., 2019**⁽¹⁹⁾, And **Kalra et al., 2011**⁽²⁰⁾ Who showed lower mean of def scores.

The prevalence of dental caries was found equal in both sexes in the current study which was similar to the results of previous studies by **Bamba et al., 2019**⁽¹³⁾ and **Al- Malik and Rehbini, 2006**⁽²¹⁾ who found no significant difference in the caries prevalence between both sexes, while it disagreed with a study carried on 10-11 years old Italians, where DFT of boys was higher with significant difference than girls⁽²²⁾ and with other studies showing that women and girls are at higher risk and experience more carious lesions than do men and boys⁽²³⁾

In this study, on comparing dental caries in children with the level of awareness of their parents, although it wasn't statistically significant but the satisfactory level of awareness was higher regarding DMF. On the other hand, the unsatisfactory level of awareness was higher when compared to def. Also, upon correlating DMF and total parents' questionnaire score a positive significant correlation was found (P -value = 0.002) while a negative correlation was found between def and total parental questionnaire, however that was not statistically significant which could be justified that

parents and children participating in the study were belonging to same low socioeconomic status which affected the degree of knowledge and awareness of parents that varied according to the type of question asked and appeared to be subjective and somehow not consistent, which was represented by the satisfactory level of awareness that appeared to be poor (21.8%) and found to be in accordance with many studies in developing countries who had reported poor parents' knowledge and awareness oral health^(24,25).

Dental caries is multifactorial disease and many factors need to be considered for determining its severity. Major factors include the following: frequency of sugar intake, insufficient exposure to fluoride, and limited knowledge concerning oral hygiene and regular dental checkups. Sucrose as an important etiological factor in caries has been discussed since centuries. Easy accessibility of sugar containing food and high consumption of sweets has exposed children to continuous risk of developing dental caries.

In our study, more than half of the parents (60.9%) were unaware about the cariogenicity of sugary food, which was in accordance with a study among urban Mexican American and immigrant Latino mothers reported limited depth of knowledge on frequency of sugar consumption⁽²⁶⁾. Also, agreed with the findings of **Kalsbeek and Verrips, 1994**⁽²⁷⁾. On the other hand, it was in contrast with **Bamba et al., 2019**⁽¹³⁾ who found high proportion of parents were aware of the fact that increased frequency of taking snacks and sticky diet can cause tooth decay and also it disagreed with other previous studies in Kuwait⁽²⁸⁾, Saudi Arabia⁽²⁹⁾, India⁽³⁰⁾. and Malaysia⁽³¹⁾.

Oral hygiene maintenance is a major variable to keep low caries rate, although (80.9%) of parents in our study were aware of brushing teeth with toothbrush and toothpaste and (72.7%) agreed that

tooth brush should be replaced every 3 months however, more than half (53%) of the parents were unaware that brushing should be twice a day. Also, 55.5% of parents in this study did not know the role of fluoride in prevention dental caries which agreed with the findings of **Bamba et al., 2019**⁽¹³⁾ and disagreed with **Elena et al., 2004**⁽³²⁾ who reported 84.7% of awareness about the importance of fluoride in preventing decay. Moreover 70.9% of the parents were unaware of the word fissure sealant. Finally, more than half of the parents in this study did not prefer taking their children to dentist until they have a problem such as pain or difficulties on eating, and that could be correlated to the culture beliefs among patients with low socioeconomic level, which was in accordance with **Bamba et al., 2019**⁽¹³⁾ who reported that parents prefer to take their children to the dentist only when they observe any visible symptoms like swelling, discharge of pus, lack of eating, or impairment in speech.

In the current study, a significant positive correlation was found between DMF and age; on the other hand, age was inversely correlated to deft with significance difference. The possible reason could be the standard of living of the parents and children changes with the progress of years. According to **Prakash et al., 2012**⁽³³⁾ caries prevalence increased significantly with age as with increasing in age, the number of erupted teeth is increased and more exposed to oral environment and cariogenic challenge. Also as in mixed dentition period, the maintenance of proper oral hygiene is difficult due to shedding of primary teeth and pubertal changes which was found in accordance with several studies that showed the child's increasing age can increase the risk of dental caries^(34, 35); however in contrast with **Goenka et al., 2018**⁽³⁶⁾ who observed that the prevalence of dental caries decreased as the age advanced.

CONCLUSION

Parent's awareness appeared to be poor related to many factors affecting oral health, as prevention is always preferable than cure, parent's knowledge can be one of the main factors in preventing oral diseases and promoting the oral health of their children, through encouraging dental health education programs, focusing on parents of school children, to permit early stage prevention of dental caries. Educational programs through social media or campaigns might be a powerful tool to enhance parents' awareness.

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