Original Article

Parents' Behavior as an Indicator for Children's Oral Health

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Abstract

Objective: Children are exceptional imitators of the surrounding people in the early childhood period. They use imitation as a mechanism in cognitive development. This study was designed to assess the effect of parents' oral health Knowledge, Attitude, and Practice (KAP), socioeconomic status, occupational type, and educational level on their children`s oral health status in Sulaimani city.

Methods: A prospective cross-sectional study was conducted on a sample of 490 children at the mixed dentition stage. They were examined for oral health status with dmft and DMFT indices following WHO criteria at different Pedodontics clinics in the city. Oral Health Knowledge, Attitude, and Practice, in addition to the parent's socioeconomic status and educational level, were assessed through a structured questionnaire.

Results: Statistical analysis demonstrated that children's dmft/DMFT scores were strongly and positively associated with their parents` KAP, socioeconomic status, and educational level. Furthermore, the marital status of the parents had a direct impact on the children's oral health. Additionally, children of parents in the medical profession were presented with significantly better oral health.

Conclusions: Oral health of the children represented by dmft/DMFT scores were significantly affected by the KAP, educational level, profession type, and marital status of their parents. Therefore, it is of utmost importance to consider the parents in children's oral health improvements.

Keywords: *Parental knowledge, Attitude, Behavior, Children's oral health.*

Submitted: June 16, 2022, Accepted: July 19, 2022, Published: December 1, 2022.

Cite this article as: Saeed KO, Rauf AM. Parents' Behavior as an Indicator for Children's Oral Health. Sulaimani Dent J. 2022;9(2):1-10.

DOI: https://doi.org/10.17656/sdj.10152

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Introduction

Undoubtedly, the health and maintenance of the oral hard and soft tissues is the objective of every dentist, and such is even more essential in pediatric dentistry[1]. In addition, pathological diseases such as dental caries and gingivitis are complicated and multifactorial diseases that commence in infancy[2].

Moreover, a child's oral health is immensely influenced by the parents' knowledge, attitude, and behavior[3]. This knowledge includes knowledge of oral hygiene practices, food carcinogenicity, and the effects of fluoride, as well as a thorough comprehension of the overall importance of primary dentition[4]. Therefore, the more educated a parent is on oral health, the more likely the child will have good oral hygiene and habits[5]. Parents must know the relationship between oral hygiene and body health since the primary teeth' health significantly impacts bodily health[6]. Unfortunately, dentists encounter numerous caregivers that assume that primary teeth are not crucial since the teeth will eventually exfoliate and be replaced by permanent teeth[7]. This neglect of the primary dentition is because the parents lack knowledge of the main function of the primary teeth, which is mastication[8]. Following infancy, children require solid foods for proper development and growth. In severe dental diseases, malnutrition can occur; this malnutrition can impede the child's growth and make them more susceptible to other diseases due to a compromised immune system[9].

Not only knowledge but also the attitudes of caregivers can influence a child's teeth. Unfortunately, some parents/guardians negatively oppose their child's oral health and dental care. This negative attitude significantly increases the child's risk for various forms of dental and oral diseases due to negligence[10].

According to their knowledge and attitude, parents will behave in a certain manner toward their child's oral health and dental care needs[11]. For example, parental behavior can involve the child's daily sugar exposure, the age of their child's first dental visit and frequency of dental visits, several times the child brushes their teeth, and who does the process of brushing or parent supervision during brushing is done[12].

This study aimed to assess the impact of parents' knowledge, attitude, and behavior on their children's oral health, the Decayed, Missing, and Filled teeth index (dmft/DMFT indices) can be used to identify children who are at high risk according to the World Health Organization (WHO) scale for dmft/DMFT[13].

Patients and methods

The study protocol was submitted to the Ethical Committee of the College of Dentistry, University of Sulaimani, and approval was granted. This analytical prospective cross-sectional study sample consisted of two groups (Children and their parents); the leading target group was children in the mixed dentition stage (7-12 years old). The oral health of 490 children, including both genders, was assessed and recorded. The indices of the decayed, missing, filled teeth (dmft/DMFT) were used as assessment tools.

The study plan was set to include different public and private pediatric dental clinics selected from different geographical areas of Sulaimani City to represent the whole city accurately. Among all the attended pediatric patients, 258 males and 232 females were selected according to specific inclusion criteria. The children were underage; accordingly, a consent letter was presented to each child's parents for the agreement of their (children and parents) participation in the study. The children underwent clinical oral examinations on the dental chair using the dental operating light of the chair for illumination. The examination protocol was standardized according to the WHO procedure of oral examination for epidemiological purposes, starting from the upper right posterior region, forward, passing the midline to the upper left posterior region, then down to the left posterior region, continuing anteriorly to pass the lower midline and finally ending with the lower right posterior region. Any decayed tooth, missing and filled tooth secondary to caries (dmft/DMFT) were recorded and scored as an individual index for each child in a specially designed case sheet. Finally, the children's indices were calculated to determine the index of the total sample.

The parents were involved voluntarily in the project as well. The KAP of the parents regarding oral health was assessed through a structured questionnaire. The age, educational background, profession, marital status, and socioeconomic status of each participating parent were recorded in a specially designed case sheet for the parents. Socioeconomic status was assessed by asking the parents or guardians if they perceived their income adequate for the number of people in the family and following the type of job the parents had. Therefore, both parents' answers were considered to distinguish between different socioeconomic status classes. The oral health status of the children was correlated to their parents` oral health KAP in addition to the other characteristic features to find any possible association or impact on the children's oral health.

Personal protective equipment (PPE) was used to prevent cross-infection among the sample. Additionally,

disposable oral examination instruments were used to ensure the sterility of dmft and DMFT scores. These scores were assessed according to the number of decayed, missing, and filled teeth and then categorized into high, moderate, or low scores according to WHO indices[14], as demonstrated in appendix 1.

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 25 by IBM). The Chi-square association test was used to compare proportions, and Fisher's exact test was used when the expected frequency (value) was less than 5 of more than 20% of the table's cells. A p-value of ≤ 0.05 was considered statistically significant.

Results

In this study, the 490 children were categorized as having an either low, moderate, or high risk of dental decay in both dmft and DMFT scores according to WHO indices. In addition to this finding, the relationship between these scores and parental age, education, socioeconomic status, and marital status were assessed.in addition to knowledge, attitude, and behavior

The parents' mean age was 38.2 ±5.6 years, while the age range was 24 to 61. It is evident in Table 1 that most (93.7%) of the parents were not working in medical occupations, and around half (48%) were of high educational level. Around two-thirds (64.9%) of the parents had moderate income, and 89% were married (not divorced) at the time of the study, as shown in Table 1.

Regarding parental knowledge and attitude toward oral health, more than half of the parents had good knowledge (totally agreed or agreed) about the information presented in Table 2, except for a few areas. Regarding the 'Bacteria that causes caries is transmitted from mother to child, 5.7% agreed, and 21.2% agreed, while only 5.3% and 6.1% agreed or agreed, respectively, that 'Mouth breathing causes irregularity in teeth. Less than half of the parents believe brushing a child's teeth after every meal is essential, as shown in Table 2.

Furthermore, regarding the dental behavior of children, the results show that more than half (57.6%) of the children brush their teeth once daily, while 21.2% never or occasionally brush their teeth. Most (85.7%) of the children use toothbrushes and toothpaste to clean their teeth, while few use dental floss. The table also shows that 59% of the children visited the dentist when they had pain, and 28% visited the dentist regularly. All the parents were giving sweets to their children, and two-thirds of them gave the sweets at no particular time. The main reasons for not visiting the dentist were fear of the dentist (35.3%), shortage of time (24.3%), and high cost of treatment (16.7%), as presented in Table 3.

Moreover, regarding the dmft and DMFT scores, according to parental characteristics high dmft scores were associated with the following factors: older age of parents of $\geq$ 45 years ($p = 0.018$), non-medical occupations ($p < 0.001$), low educational levels ($p < 0.001$), low economic status ($p < 0.001$), and low knowledge scores ($p < 0.001$). No significant association was detected with marital status ($p = 0.261$), as presented in Table 4.

Also, there were significant associations between DMFT scores with the following parental characteristics: age of $\geq$ 45 years ($p < 0.001$), non-medical occupations ($p = 0.012$), low educational levels ($p < 0.001$), low economic status ($p < 0.001$), and low knowledge scores ($p < 0.001$). No significant association was detected with marital status ($p = 0.237$), as shown in Table 5.

Table 1: Shows the basic characteristics of parents involved in the study.

Parent's characteristics	No.	(%)
Age (years)		
< 35	129	(26.3)
35-44	308	(62.9)
≥ 45	53	(10.8)
Mean (SD)	38.2	(5.6)
Occupation		
Medical	31	(6.3)
Non-medical	459	(93.7)
Educational level		
Illiterate	51	(10.4)
Primary	115	(23.5)
Secondary	89	(18.2)
Higher education	235	(48.0)
Income		
Low	117	(23.9)
Moderate	318	(64.9)
High	55	(11.2)
Marital status		
Married	436	(89.0)
Divorced	47	(9.6)

Table 2: Demonstrates parental knowledge and attitude towards children's oral health.

KAP Questions	Totally agree	Agree	Disagree	Totally disagree
	No. (%)	No. (%)	No. (%)	No. (%)
Primary teeth are very important.	88 (18.0)	230 (46.9)	161 (32.9)	11 (2.2)
A problem in primary teeth affects permanent teeth.	81 (16.5)	226 (46.1)	165 (33.7)	18 (3.7)
Oral health affects general health.	98 (20.0)	375 (76.5)	17 (3.5)	0 (0.0)
Bacteria that cause caries are transmitted from parent to child	28 (5.7)	104 (21.2)	247 (50.4)	111 (22.7)
Frequent intake of chocolate & sweets cause cavity.	401 (81.8)	88 (18.0)	1 (0.2)	0 (0.0)
Frequent intake of soft drinks causes a cavity.	389 (79.4)	100 (20.4)	1 (0.2)	0 (0.0)
Irregular teeth can be aligned in the correct position.	179 (36.5)	299 (61.0)	10 (2.0)	2 (0.4)
Digit sucking causes irregularity in teeth.	143 (29.2)	204 (41.6)	110 (22.4)	33 (6.7)
Mouth breathing causes irregularity in teeth.	26 (5.3)	30 (6.1)	247 (50.4)	187 (38.2)
Genetics has an impact on irregularity in teeth.	110 (22.4)	221 (45.1)	104 (21.2)	55 (11.2)
The best time to seek orthodontic treatment is at a young age.	38 (7.8)	270 (55.1)	170 (34.7)	12 (2.4)
It is important to take the child to regular dental checkups.	69 (14.1)	360 (73.5)	60 (12.2)	1 (0.2)
It is important to brush a child's teeth after every meal.	62 (12.7)	165 (33.7)	249 (50.8)	14 (2.9)

Table 3: Shows the oral health behavior of children as mentioned by parents.

Parent`s perspectives on children`s oral health	No.	(%)
How many times does your child brush his/her		
Once-daily	282	(57.6)
Twice daily	103	(21.0)
More than twice	1	(0.2)
Occasionally or never	104	(21.2)
What does your child use for cleaning his/her teeth?		
Toothbrush + toothpaste	420	(85.7)
Tooth brush + tooth paste + mouth wash	27	(5.5)
Tooth brush + tooth paste + floss	12	(2.4)
Tooth brush + tooth paste + mouth wash + floss	4	(0.8)
Nothing	27	(5.5)
How frequently do you/your child visit the dentist?		
Regularly	137	(28.0)
When having pain	289	(59.0)
Sometimes or never	64	(13.1)
When do you give sweets to your child?		
With meal	4	(0.8)
In between meals	154	(31.4)
Before going to bed	7	(1.4)
No particular time	325	(66.3)
Difficulties for not visiting the dentist		
Fear from dentist	173	(35.3)
High cost of treatment	82	(16.7)
The difficulty of accessibility to the clinic	11	(2.2)
Shortage of time	119	(24.3)
Corona (COVID-19)	47	(9.6)
No specific reason	58	(11.8)

Table 4: Demonstrates dmft scores of children according to parental characteristics.

		dmft			
Parents'	N	Low No. (%)	Moderate No. (%)	High No. (%)	P value
Age (years)					
< 35	129	26 (20.2)	18 (14.0)	85 (65.9)	
35-44	308	50 (16.2)	89 (28.9)	169 (54.9)	
≥ 45	53	12 (22.6)	12 (22.6)	29 (54.7)	0.018
Occupation					
Medical	31	20 (64.5)	9 (29.0)	2 (6.5)	
Non-medical	459	68 (14.8)	110 (24.0)	281 (61.2)	< 0.001
Educational level					
Illiterate	51	0 (0.0)	4 (7.8)	47 (92.2)	
Primary	115	8 (7.0)	20 (17.4)	87 (75.7)	
Secondary	89	10 (11.2)	23 (25.8)	56 (62.9)	
Higher education	235	70 (29.8)	72 (30.6)	93 (39.6)	< 0.001
Economic status					
Low	117	4 (3.4)	20 (17.1)	93 (79.5)	
Moderate	318	64 (20.1)	82 (25.8)	172 (54.1)	
High	55	20 (36.4)	17 (30.9)	18 (32.7)	< 0.001
Marital status					
Married	436	84 (19.3)	103 (23.6)	249 (57.1)	
Divorced	47	4 (8.5)	14 (29.8)	29 (61.7)	
Widowed	7	0 (0.0)	2 (28.6)	5 (71.4)	0.261*
Knowledge scores					
Low (1-13)	4	0 (0.0)	0 (0.0)	4 (100.0)	
Moderate (14-26)	328	36 (11.0)	66 (20.1)	226 (68.9)	
Good (27-39)	157	52 (33.1)	53 (33.8)	52 (33.1)	< 0.001*

Table 5: Demonstrates DMFT scores of children according to parental characteristics.

		DMFT			
Parents' characteristics	N	Low No. (%)	Moderate No. (%)	High No. (%)	p
Age (years)					
< 35	129	100 (77.5)	24 (18.6)	5 (3.9)	
35-44	308	164 (53.2)	103 (33.4)	41 (13.3)	
≥ 45	53	23 (43.4)	19 (35.8)	11 (20.8)	< 0.001
Occupation					
Medical	31	26 (83.9)	4 (12.9)	1 (3.2)	
Non-medical	459	261 (56.9)	142 (30.9)	56 (12.2)	0.012
Educational level					
Illiterate	51	18 (35.3)	16 (31.4)	17 (33.3)	
Primary	115	48 (41.7)	45 (39.1)	22 (19.1)	
Secondary	89	45 (50.6)	34 (38.2)	10 (11.2)	
Higher education	235	176 (74.9)	51 (21.7)	8 (3.4)	< 0.001
Economic status					
Low	117	52 (44.4)	35 (29.9)	30 (25.6)	
Moderate	318	194 (61.0)	99 (31.1)	25 (7.9)	
High	55	41 (74.5)	12 (21.8)	2 (3.6)	< 0.001
Marital status					
Married	436	255 (58.5)	128 (29.4)	53 (12.2)	
Divorced	47	30 (63.8)	13 (27.7)	4 (8.5)	
Widowed	7	2 (28.6)	5 (71.4)	0 (0.0)	0.237*
Knowledge scores					
Low (1-13)	4	0 (0.0)	2 (50.0)	2 (50.0)	
Moderate (14-26)	328	176 (53.7)	107 (32.6)	45 (13.7)	
Good (27-39)	157	111 (70.7)	36 (22.9)	10 (6.4)	< 0.001

Discussion

The main goal of this study was to investigate and assess the impact of parents' KAP regarding oral and dental health, age, socioeconomic status, level of education, and marital status on the dmft/DMFT scores of their children in Sulaimani city.

It was noticed that most of the parents had considerably good knowledge and attitude towards their children's oral health as most of the parents either agreed or agreed about the importance of oral health and diet and their relationship to caries index scores. This finding reflects the positive awareness of society about the role of oral health in overall human well-being. However, a deficient percent (less than 10%) of the parents were working in the medical field, which explains why only 25% believed that 'Bacteria that causes caries is transmitted from mother to child. Also, less than half of the parents believe brushing a child's teeth after every meal is important. These results are in agreement with investigations done in Kuwait[15]. However, these results disagree with investigations done in Bangalore, India, during the pandemic in 2021[16]. Even though almost half of the parents were highly educated, a lack of knowledge regarding oral hygiene measures was observable among them, which indicates that qualification can not necessarily improve oral health knowledge in contrast to Marquez-Arrico et al. in Spain in 2019[17].

In agreement with a study in Brazil[18], only 21 percent of the children brushed twice a day, 21 percent never brushed their teeth, and only 0.8 percent used floss. However, different results were found in South Africa[3].

Fear of the dentist by the children, shortage of time by parents, and high cost of treatment were reported in the study by the parents to be the main barriers to not visiting the dentist on a regular base. Approximately 60 percent of parents said they do not take their child to the dentist except for pain experiences. At the same time, only 28 percent of parents said they regularly visit the dentist. Turkish parents in Istanbul stated comparable answers several years ago[19], unlike Saudi parents[20].

Also, the dmft scores of the sample were affected by the type of dental clinic the child visits. Approximately 69 percent of the sample who visited public dental hospitals were at high risk, while only 41 percent of children who visited private clinics were at high risk. The relationship between socioeconomic status and oral health can be noted in these results since parents of higher status can afford the better quality materials and resources available in private clinics.

The youngest group of parents (< 35 years) had the greatest prevalence of children with a high risk of dmft in primary teeth, but only 3.9 percent of children were diagnosed with a high risk of DMFT in permanent dentition. The reason was the younger parents' less child-rearing and childcare experience. Only 2 percent of children from parents with medical careers had a high dmft score, and only 1 percent of children had a high DMFT score. Parents with a medical occupation are more concerned about their families healthcare. These results agree with investigations done in Iran[21] and disagree with others[22].

Children of Illiterate parents have the most significant prevalence of caries in both primary and permanent teeth dmft =47% and DMFT= 33%). Studies in Hong Kong and Italy showed the same outcome, respectively[23,24].

Low-income parents cannot afford all kinds of health services for their children, especially dental ones, which are considered high-cost. Therefore, children in this country are parents dependent. This case illustrated the most significant prevalence of high dmft and DMFT scores in children with low-income parents. These results agree with an investigation done in Jordan as a neighboring country[25] and Saudia Arabia [26].

In addition to all the above mentioned, parent`s with low levels of knowledge had the most significant prevalence of high dmft scores and DMFT scores in their children's teeth and vice versa. Parents with greater knowledge of oral health ensure correct oral hygiene measures and practices of the children, resulting in less dental decay[27]. The impact of parental oral health knowledge was positively described by researchers from Indonesia and Nepal[28,29].

Conclusions

In conclusion, the primary relationships between the selected parent`s characteristic features and their children's oral health can be concluded as follows:

1. The dmft and DMFT scores of the children were inversely related to tooth brushing: the less tooth brushing frequency and irregularly, the higher the dmft and DMFT scores.
2. The dmft and DMFT scores related to parent education, parent knowledge, and attitude on dental/oral health were affected inversely: the greater the parent's knowledge, the lower the child's dmft and DMFT scores.
3. The dmft and DMFT scores related to parents' economic status were affected inversely: the lower

the economic status of parents, the higher the dmft and DMFT scores of children.

Acknowledgment

Special thanks to all the participating parents and their children. The staff of all the involved dental clinics for their support and contribution to achieving this work.

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Appendix 1: Parental Questionnaire

Parental motives on child's oral health

1. Parent /guardian code: _____

2. Parent / guardian age: _____

3. Parent / guardian occupation: _____

4. Parent / guardian education:

5. Parent / guardian socioeconomic status:

6. Parent's marital status:

7. Primary teeth is important:

8. Problem in primary teeth affect permanent teeth:

9. Oral health affects general health:

☐ Totally agree
☐ Agree
☐ Disagree
☐ Totally disagree

☐ Totally agree
☐ Agree
☐ Disagree
☐ Totally disagree

☐ Totally agree
☐ Agree
☐ Disagree
☐ Totally disagree

☐ Totally agree
☐ Agree
☐ Disagree
☐ Totally disagree

☐ Totally agree
☐ Agree
☐ Disagree
☐ Totally disagree

☐ Totally agree
☐ Agree
☐ Disagree
☐ Totally disagree

☐ Totally agree
☐ Agree
☐ Disagree
☐ Totally disagree

10. Bacteria that can cause decay can be transmitted from parents to children:

11. Frequent intake of chocolate & sweets leads to tooth decay:

12. Frequently consumption of soft drinks leads to tooth decay:

13. Irregular teeth can be aligned to the correct position:

14. Thumb sucking can lead to irregular teeth:

15. Mouth breathing can lead to irregular teeth:

☐ Totally agree
☐ Agree
☐ Disagree

☐ Totally disagree

☐ Totally agree

☐ Agree

☐ Disagree

☐ Totally disagree

☐ Totally agree

☐ Agree

☐ Disagree

☐ Totally disagree

☐ Totally agree

☐ Agree

☐ Disagree

☐ Totally disagree

☐ Once daily

☐ Twice daily

☐ More than twice

☐ Occasionally or never

☐ Toothbrush + toothpaste

☐ Mouth wash

☐ Floss

☐ Toothpick

16. Genetic has impact on irregularity in teeth:

17. younger age is the best time to seek orthodontic treatment:

18. It is necessary to take child to regular dental visits:

19. It is necessary to brush child's teeth after every meal:

20. How often, a day does your child brush his/her teeth?

21. What does he/she use for cleaning his/her teeth?

☐ Regularly

☐ When having pain

☐ Sometimes or never

☐ With meal

☐ In between meal

☐ Before going to bed

☐ Not a particular time

☐ Fear from dentist

☐ High cost of treatment

☐ Difficulty of accessibility to clinic

☐ Shortage of time

☐ Corona (COVID-19)

☐ No specific reason