RESEARCH ARTICLE

Influence of maternal attitudes and parenting style on children`s dental caries experience

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Abstract

Objective: To evaluate the effect parental attitudes have on the dental caries experience of children.

Method: The cross-sectional observational study was conducted at Yeditepe University, Istanbul, Turkey, from March to September 2019, and comprised mothers of children who came to the Department of Paediatric Dentistry for treatment of children. Multi-variable poisson regression model was run to predict prevalence of dental caries. Mothers' attitudes in family were measured using the parental attitude research instrument scores. Data was analysed using Stata 15.

Results: There were 258 mothers of as many children aged 6-15 years. Among the children, 150(58%) were boys and 108(42%) were girls. 'Rejection of traditional housewife role' and 'level of discipline' had a statistically negative correlation ($p<0.05$), while 'level of marital conflict' had a statistically positive correlation with the prevalence of caries.

Conclusion: Healthy family environment and empowering parental style had a positive effect on the oral health of children.

Keywords: Attitude, Dental caries, Maternal behaviour, Oral health. (JPMA 71: 2325; 2021)

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Introduction

Recent studies have expanded research on the causes of childhood caries from biological to psychological and social factors.[1] Being the smallest social unit that children interact with, families play a fundamental role in shaping the oral health behaviour of a child.[2]

A parent's psychosocial factors are major determinants of oral health behaviour of children. These factors affect a child's oral health through parent-child relations and is also a reflection of mother-father relations on a child's behaviour. For example, cognitive qualities of the mother, such as knowledge about and attitudes towards healthy oral behaviours, are significantly correlated with a child's propensity to establish oral hygiene routines.[3] Likewise, a positive family environment where a child feels safe and supported reinforce good oral hygiene behaviour of the child.[4] High levels of maternal stress[5] and poverty,[6] on the other hand, tend to increase sugar consumption and the practice of poor oral hygiene practice of a child. There is a need to develop a better understanding of social and emotional context in which a child's health behaviours develop, and specifically the need to identify which psychosocial factors in a family exacerbate or alleviate the risk of child caries.

Duijister et al.[7] defined a well-functioning family as one that is "able to manage daily life and crisis tasks in the context of warm and effective family interactions through clear communication and defined roles and boundaries." A poor-functioning family, on the other hand, suffers from weak, impersonal relationships often spiralling into protracted conflicts among its members due to poor behavioural control. Well-functioning families secure a healthy physical, social and emotional development for a child.[8] Similarly, good parenting will affect oral health through brushing education, motivation, diet, etc. Indeed, studies have repeatedly shown that good parenting positively influences the oral health of a child.[9-12] It, then, logically follows that different parenting styles may lead to different levels of caries prevalence among children.

Studies on paediatric dentistry have associated parental attitude research instrument (PARI) dimensions with oral hygiene behaviour[10] and dimensions of parental attitudes derived from other indices on caries formation.[11] Dursun et al. purported to correlate dimensions of PARI with incidence of caries in children, but the related statistical results were not presented in that study.[13] The use of Poisson regression estimator allows for point predictions for change in expected count of caries and to control for intervening variables, carrying the analytical power of a study beyond conventional correlational analyses.

The current study was planned to evaluate the effect parental attitudes have on the dental caries experience of children.

Subjects and Methods

The cross-sectional observational study was conducted at Yeditepe University, Istanbul, Turkey, from March to September 2019. After approval from the institutional ethics review committee, the sample size was calculated with $p=0.50$, confidence interval (CI) = 95%, and power = 80%. The sample was raised from among mothers who

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Appendix: Parental Attitude Research Instrument (PARI)

Parental Attitude Research Instrument (PARI)

Date: ..... Name: ..... Age: .....

DIRECTIONS: Read each of the statements below and then rate them as follows: (A) strongly agree; (a) mildly agree; (d) mildly disagree; (D) strongly disagree. Indicate your opinion by drawing a circle around the "A" if you strongly agree, around the "a" if you mildly agree, around the "d" if you mildly disagree, and around the "D" if you strongly disagree. There are no right or wrong answers, so answer according to your own opinion. It is very important to the study that all questions be answered. Many of the statements may seem alike, but answering each individually is necessary to capture slight differences of opinion.

		AGREE		DISAGREE	
1	Children should be kept away from all hard jobs which might discourage them.	A	a	D	d
2	Parents who start a child talking about his/her worries don't realize that sometimes it's better to just leave them alone.	A	a	D	d
3	The sooner a child learns that a wasted minute is lost forever the better off s/he will be.	A	a	D	d
4	A mother should do her best to avoid any disappointment for her child.	A	a	D	d
5	The sooner a child learns to walk the better s/he's trained.	A	a	D	d
6	Raising children is a nerve-wracking job.	A	a	D	d
7	Parents should teach their children that the way to get ahead is to keep busy and not waste time.	A	a	D	d
8	Mothers would do their job better with the children if fathers were more kind.	A	a	D	d
9	One of the bad things about raising children is that you aren't free enough of the time to do just as you like.	A	a	D	d
10	Children who are held to firm rules grow up to be the best adults.	A	a	D	d
11	A mother must expect to give up her own happiness for that of her child.	A	a	D	d
12	A child who is "on the go" all the time will most likely be happy.	A	a	D	d
13	Laughing at children's jokes and telling children jokes makes things go more smoothly.	A	a	D	d
14	It is a mother's duty to make sure she knows her child's innermost thoughts.	A	a	D	d
15	More parents should teach their children to have unquestioning loyalty to their parents.	A	a	D	d
16	All young mothers are afraid of their awkwardness in handling and holding the baby	A	a	D	d
17	Children will get on any woman's nerves if she has to be with them all day.	A	a	D	d
18	Parents should adjust to the children a little bit rather than always expecting the children to adjust to the parents.	A	a	D	d
19	If mothers could get their wishes they would most often ask that their husband be more understanding.	A	a	D	d
20	A child should be taught to avoid fighting no matter what happens.	A	a	D	d
21	It's natural for a mother to "blow her top" when children are selfish and demanding.	A	a	D	d
22	Children should be encouraged to tell their parents whenever they feel family rules are unreasonable.	A	a	D	d
23	Mothers very often feel that they can't stand their children a moment longer.	A	a	D	d
24	Most children should have more discipline than they get.	A	a	D	d
25	A young child should be protected from hearing about sex.	A	a	D	d
26	A mother has a right to know everything going on in her child's life because her child is a part of her.	A	a	D	d
27	An alert parent should try to learn all her child's thoughts.	A	a	D	d
28	Children should realize how much parents have to give up for them.	A	a	D	d
29	If you let children talk about their troubles they end up complaining even more.	A	a	D	d
30	Strict discipline develops a fine, strong character.	A	a	D	d
31	A young mother feels "held down" because there are lots of things she wants to do while she is young.	A	a	D	d
32	Mothers sacrifice almost all their own fun for their children.	A	a	D	d
33	Husbands could do their part if they were less selfish.	A	a	D	d
34	A good mother should shelter her child from life's little difficulties.	A	a	D	d
35	The child should be taught to revere his parents above all other grown-ups.	A	a	D	d
36	A child should never keep a secret from his parent.	A	a	D	d
37	It is not right to expect from children to follow parents' rules.	A	a	D	d
38	Most mothers are fearful that they may hurt their babies when handling them.	A	a	D	d
39	A child should be taught to always come to his parents or teachers rather than fight when he is in trouble	A	a	D	d
40	There are some things which just can't be settled by a mild discussion.	A	a	D	d
41	One of the worst things about taking care of a home is that a woman feels that she can't get out.	A	a	D	d
42	Taking care of a small baby is something that no woman should be expected to do all by herself.	A	a	D	d
43	It is very important that young boys and girls not be allowed to see each other completely.	A	a	D	d
44	If you let children talk about their troubles they end up complaining even more.	A	a	D	d
45	If parents would have fun with their children, the children would be more apt to take their advice.	A	a	D	d
46	Children should be more considerate of their mothers since their mothers suffer so much for them.	A	a	D	d
47	A child soon learns that there is no greater wisdom than that of his/her parents.	A	a	D	d
48	When a mother doesn't do a good job with children it's probably because the father doesn't do his part at home.	A	a	D	d
49	It isn't fair that a woman has to bear just about all the burden of raising children by herself.	A	a	D	d
50	There is no good excuse for a child hitting another child.	A	a	D	d
51	Parents should teach their children that the way to get ahead is to keep busy and not waste time.	A	a	D	d
52	A wise woman will do anything to avoid being by herself before and after a new baby.	A	a	D	d
53	A mother has to do the planning because she is the one who knows what's going on at home.	A	a	D	d
54	Sometimes it's necessary for a wife to tell off her husband in order to get her rights.	A	a	D	d
55	Having to be with the children all the time gives a woman the feeling her wings have been clipped.	A	a	D	d
56	The whole family does fine if the mother puts her shoulders to the wheel and takes charge of things.	A	a	D	d
57	A child should be protected from jobs which might be too tiring or hard for him/her.	A	a	D	d
58	Children are actually happier under strict training.	A	a	D	d
59	Parents who are interested in hearing about their children's parties, dates and fun help them grow up right.	A	a	D	d
60	Loyalty to parents comes before anything else.	A	a	D	d

visited the Department of Paediatric Dentistry for treatment of their children aged 6-15 years. One child per mother was set as the baseline criterion.

The data was collected via surveys from mothers after taking informed consent from all the respondents. Those who did not volunteer were excluded. Due to the socioeconomic structure of Turkey, it is often the mothers who take their children for routine medical treatments, and, following Perera et al.[14] and Abiola et al.[9] data only from the mothers were collected. Since the sample would not offer meaningful variation otherwise, confining the sample to mothers allowed the researchers to control the gender dimension of the parent.

The children underwent intraoral examination while seated in a dental chair. The teeth were air-dried and examined using a dental mirror by a single examiner. The dental examination was conducted in the light of the 'Oral Health Surveys: Basic Methods', of the World Health Organisation (WHO).[15] The total number of decayed (D), missing (M), or filled (F) teeth (T) in a patient is called the DMFT count and refers to the total number of caries in permanent teeth, while the total number of caries in the primary teeth is referred to as 'dmft' in small letters.[15] The DMFT and dmft scores were calculated by adding the number of decayed, missing and filled teeth. A missing tooth was counted only if records indicated an extraction was due to caries. Missing teeth due to dental trauma, hypo-mineralisation, agenesis or routine exfoliation were not included in the DMFT or dmft scores. Enamel caries lesions were also excluded.

A self-administered questionnaire comprising PARI and sociodemographic data was handed out to the mothers. PARI was used to identify a parent's attitudes in his or her interactions with family.[16] The scale was later adapted to Turkish language.[17] The instrument consists of 60 items and allows the construction of scores on five sub-dimensions; the extent of mothering or overprotection, democratic-/egalitarian-orientation, attitudes towards rejection of homemaking role, the presence of marital conflict, and the level of discipline (Appendix). The scores for these sub-dimensions are derived by adding individual points from each question belonging to that sub-category.[16] The questions used for the subgroups are mutually exclusive and totally exhaustive. Higher scores indicate stronger inclinations for each dimension. The survey was administered immediately at the end of the dental examination.

Sociodemographic variables included the child's age, gender, the mother's highest completed level of education, marital status and birth order of the child. The mother's level of education was coded according to the highest level of diploma earned: 1= middle school diploma or less, 2= high-school diploma, and 3= university diploma.

Multi-variable Poisson regression model was used to assess the effect five different dimensions of PARI had on the number of caries a child had. Poisson regression, which uses maximum likelihood estimation, is appropriate when the dependent variable is a discrete count variable. Poisson regression Model 1 regresses the number of total caries on separate dimensions of PARI. Model 2 relaxes this model by adding conventional control variables as further independent variables.[18]

Data was analysed using Stata 15, with the Poisson command. Marginal effects were calculated using the S-Post post-estimation package. To address potential multi-collinearity, separate regressions were also run with one PARI dimension per model. The results from these additional regressions remained substantially the same.

Results

Of the 267 mothers approached, 258(96.6%) completed the study. Among the 258 children, 150(58%) were boys and 108(42%) were girls. Overall, 109(44%) had one or more caries, with a mean of 3.1±4.3 total caries per patient. The

Table-1: Descriptive statistics (n=258).

Descriptive Statistics		n (%)	mean±SD	min	max
Total Number of Caries (DMFT+dmft) for Child			3.10±4.27	0	20
Dimension of PARI Scores for Mother					
(1) Over Protection			39.82±8.14	16	56
(2) Democratic Attitudes			11.67±3.27	-5	20
(3) Rejection of Traditional House-Wife Role			29.65±7.68	13	51
(4) Level of Marital Conflict			14.68±4.28	2	24
(5) Level of Discipline			38.77±9.44	17	63
Child patient's age			9.34±2.60	6	15
Child patient's gender					
	1=Female	108 (42)		0	1
	0=Male	150 (58)			
Mother's level of education	1= Middle Sch. diploma or less	42 (17)	2.07±0.63	1	3
	2=High Sch. Diploma	156 (60)			
	3=Univ. Diploma	60 (23)			
Mother's marital status	0=Married	247 (96)		0	1
	1=Single/Divorced	11 (4)			
Child patient's birth order	1= First child	131(51)	1.62±0.75	1	4
	2= Second child	102 (40)			
	3=Third child	17 (6)			
	4= Fourth child or younger	8 (3)			

DMFT: Decayed, missing or filled teeth in a patient; dmft: Total number of caries in primary teeth; PARI: Parental attitude research instrument.

Table-2: The effect of PARI scores on the frequency of child caries. Multivariable Poisson regression model. Dependent Variable: total number of caries (DMFT+dmft). Standard errors in parentheses. Positive coefficients are associated with higher counts of expected caries.

PARI Dimensions	Model 1 (n=258)	Model2 (n=258)
(1) Over-protection	0.0071 (0.0064)	0.0090 (0.0073)
(2) Democratic Attitudes	0.0062 (0.011)	0.0016 (0.011)
(3) Rejection of Traditional House-Wife Role	-0.022*** (0.0067)	-0.023*** (0.0070)
(4) Level of Marital Conflict	0.048*** (0.011)	0.051*** (0.012)
(5) Level of Discipline	-0.010 (0.21)	-0.012* (0.0071)
Other Parent Variables		
Education Level of Parent		-0.27*** (0.06)
Is the Parent Single/Divorced?		0.65*** (0.16)
Patient Variables		
Age		-0.12*** (0.015)
Gender		-0.30*** (0.079)
Birth Order		-0.18*** (0.05)
Constant		3.24*** (0.33)

* $p<0.10$, ** $p<0.05$, *** $p<0.01$; two-tailed.

PARI: Parental attitude research instrument; DMFT: Decayed, missing or filled teeth in a patient; dmft: Total number of caries in primary teeth.

Table-3: Marginal change in expected number of caries when a PARI dimension score moves from the 25th to 75th percentile. The rest if the variables are held at their median. Dimensions in bold indicate statistically significant results. Calculations based on Model 2.

PARI DIMENSIONS	p25		p75		
	Expected Number of Caries	CI (95%)	Expected Number of Caries	CI (95%)	Expected Δ
(1) Over-protection	3.71	(3.22-4.20)	4.06	(3.53-4.60)	0.35
(2) Democratic and Egalitarian Attitudes	3.91	(3.44-4.37)	3.93	(3.46-4.41)	0.02
(3) Rejection of Traditional Housewife Role	4.50	(3.86-5.15)	3.41	(2.95-3.87)	-1.09
(4) Level of Marital Conflict	3.37	(2.91-3.82)	4.56	(3.97-5.16)	1.19
(5) Level of Discipline	4.21	(3.60-4.83)	3.60	(3.10-4.11)	-0.61

PARI: Parental attitude research instrument; CI: Confidence interval.

mean age of the children was 9.3±2.6 years. Younger children, boys and first children in families displayed more caries (Table 1).

Three of the five PARI dimensions had significant coefficients in Poisson regression Model 2 (Table 2).

Among the five PARI dimensions, 'rejection of traditional housewife role' and 'level of discipline' had a statistically negative correlation, while 'level of marital conflict' had a statistically positive correlation with the prevalence of caries (Table 3).

Discussion

The adoption of good oral health habits in childhood leads to better health and quality of life later in life.[9] The relationship between parenting and oral health of children is a burgeoning field of research.[9-13] The main findings of the current study is that certain parental attitudes and prevalence of caries in children are significantly correlated.

The results indicated that the psychological attitudes of a mother were correlated with prevalence of caries. Among the five factors of PARI scores, PARI Factor 3 'rejection of traditional housewife role', and Factor 5 'level of discipline' had a statistically negative correlation with the prevalence of DMFT+dmft. Factor 4 'level of marital conflict' had a statistically positive correlation with caries experience. These three psychological traits can be linked to stress, and, hence, we can tentatively posit that having a more stressful mother leads to a higher caries experience for the child.

Children of women rejecting traditional housewife roles tended to have less number of caries. In Turkey, mothers are given immense responsibilities as housewives, in addition to being a partner, a parent and a professional. Daily chores, such as cooking, cleaning and a child's everyday needs, can easily overwhelm a mother, and takes a significant toll on a mother's social life and emotional well-being. Instilling healthy habits in a child, such as good oral hygiene practices, or table manners, on the other hand, requires healthy commitment from a mother. Further research is needed to explore the exact mechanism underlying this finding.

The results also suggested that mothers who exerted more discipline tended to obtain better oral health for their children. This finding is in line with studies that argue disciplined approaches do not necessarily lead to negative effects in oral health.[19,20]

Higher levels of marital conflict in the family significantly increased caries prevalence in children, which is in agreement with an earlier study.[12] Some studies reported that children exposed to destructive parental conflict are at risk for a range of other health difficulties, such as digestive problems, fatigue, reduced physical growth, headaches, abdominal pains, and sleep problem.[21] The current findings added prevalence of caries to this growing list of symptoms.

Parents with a democratic and egalitarian style exercise child rights in the family, sharing tasks and responsibilities while adopting a friendly approach.[17] Supervision and love are both present in the democratic parenting style, promoting self-reliance.[22] Such self-reliance, in turn, is more likely to translate into sustained oral hygiene behaviour and positive oral health outcomes in children. The results of the current study, however, did not support this line of argument. The final dimension of parenting style is overprotective mothering. Overprotective mothers are more sensitive to maintain the child's ego, hence, filter outside factors that may challenge a child emotionally.

Such parenting philosophy may potentially erode coping strategies of the child, which may result in poor oral hygiene behaviour and increased sugar consumption.[23] Again, the findings of the current study did not show any significant correlation between overprotective mothering and prevalence of caries.

Low parental education is considered one of the predisposing factors leading to poor child health, including oral health. Rajab et al.[24] reported that highly educated parents cared more about their children's oral health. Low levels of parental education and socioeconomic status contribute to poor dietary habits and unhealthy lifestyles.[25] The current study showed that patients whose mothers had higher levels of education tended to have less dental caries. In addition, family structure is associated with dental attendance patterns and that single mothers with children are at particular risk for failing to monitor their oral health appropriately.[26] The current study exhibited similar findings.

Conclusion

Healthy family environment and empowering parental style had a positive effect on the oral health of children. Examining how the attitudes of immediate family members other than the mothers affect oral health of a child will further professional understanding of the relationship between social environment and paediatric oral health.

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