Volume 10, Issue 10, October 2024,
Publish Date: 20-10-2024
Doi https://doi.org/10.55640/ijmsdh-10-10-09

International Journal of Medical Science and Dental Health (Open Access)

THE IMPACT OF PARENTING STYLES ON THE ENFORCEMENT OF ORAL HEALTH BEHAVIORS IN CHILDREN

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ABSTRACT

Objectives: The objective of this study was to investigate the correlation between parenting styles and children's oral health during their first dental visit. Specifically, it aimed to assess how different parenting styles—democratic, authoritarian, and permissive—relate to children's oral health behaviors, dental fear, and the occurrence of dental caries. **Methods:** This cross-sectional study was conducted at the Department of Pediatric Dentistry, Marmara University, between December 2023 and March 2024. The sample included 239 children aged 5-13 years and their parents. Parental data, including demographics, oral health behaviors, and parenting styles, were collected using the Parenting Styles and Dimensions Questionnaire (PSDQ). Children's oral health status was determined using DMFT (Decayed, Missing, and Filled Teeth), dmft, and ADMFT indices. Statistical analyses were performed using R software, with significance set at $p<0.05$. **Results:** Authoritarian and permissive parenting styles were significantly associated with higher levels of dental fear ($p=0.005$). However, no significant differences were observed between parenting styles in terms of dental caries prevalence, as indicated by the dmft ($p=0.511$), DMFT ($p=0.516$), and ADMFT ($p=0.701$) scores. ADMFT scores were significantly higher in children aged 9 years or younger, children whose fathers filled out the forms, and children who brushed their teeth themselves ($p<0.05$). **Conclusions:** Parenting styles did not significantly affect dental caries outcomes, but authoritarian parenting was linked to increased dental fear. Younger children and those brushing their own teeth had poorer dental health outcomes, highlighting the importance of parental involvement in oral hygiene practices.

KEYWORDS: parenting styles, children's dental health, oral health behaviors, oral hygiene.

INTRODUCTION

Dental caries is the most prevalent oral health-related disease among school aged children. [1,2,3,4,5,6] According to the World Health Organization (WHO), dental caries affects 60-90% of children

worldwide, with most of them living in developing countries. Unlike industrialized nations, where dental caries is often well-managed, its prevalence is increasing in low-income and middle-income countries.6 It is well established that biological, behavioral, or socioeconomic risk factors play a role in the caries process that results in childhood caries. [7]

The knowledge, attitudes, and preventive behaviors of parents regarding oral health are of utmost importance for their children, as they serve as the primary caregivers for their children.8 Baumrind categorizes parenting into three separate styles: authoritarian, democratic, and permissive.9,10 The authoritarian parenting style is distinguished by the enforcement of severe disciplinary measures, such as physical retribution, raised voices, and authoritative directives.[11] Children brought up in authoritarian environments frequently exhibit timidity and insecurity. The democratic parent establishes clear limits while yet demonstrating empathy and warmth. Furthermore, there is open communication within these households. [11] The permissive parent provides minimal or no authority or restriction on conduct and frequently enjoys the children. [11] Children raised in permissive households may have the ability to establish norms, but they may not have the corresponding obligations. [12]

Remarkably, parental attitudes affect the prevalence of dental caries in children and family oral health practices, which have substantial effects on children's oral health. [13,14] Research indicates that parents who employ an authoritative parenting style, unlike permissive or democratic approaches, have children with lower incidences of dental caries. Specifically, children are profoundly affected by their mothers' oral health behaviors, which play a crucial role in the acquisition and lifelong adherence to appropriate dental hygiene practices. Studies demonstrate that parents adhering to democratic or permissive parenting styles are less willing to emphasize the importance of establishing robust oral hygiene routines in their children. [15]

Furthermore, a child's diet plays a crucial role in their dental health. Studies have shown that children whose parents use an authoritarian parenting style take more responsibility for their food choices, leading to a healthier diet. [15] Additionally, these parents are more effective in supervising their children's dental check-ups, oral hygiene habits, and eating patterns. [12,16,17,18]

Pediatric dentists can develop targeted strategies to prevent parents of children with diverse parenting styles from engaging in these harmful oral health practices by understanding how parenting styles may influence these behaviors. There is still a need to be more studies on the relationship between parents' perceptions of their children's oral health and their opinions about it. [17,19,20,21] By increasing family awareness of oral health issues through pediatric dentistry, the aim is to contribute to the success of policies and initiatives that promote children's oral health.

Therefore, the purpose of this study was to investigate the correlation of parenting styles in with the child’s oral health at the child’s dental visit.

MATERIAL AND METHOD

Study Design and Setting

This observational and cross-sectional design research was carried out at Marmara University, Department of Pediatric Dentistry, Istanbul, Turkey. After approval from the institutional ethics review committee (SBE-EK-02). A power analysis was designed to have adequate power to apply a statistical

test of the null hypothesis that there is no difference between different tested groups regarding prevalence of dental caries. By adopting an alpha (α) level of (0.05), a beta (β) level of (0.05) (i.e. power=95%) and an effect size (ω) of (0.401) calculated; the minimum required total sample size (n) was found to be (96) cases. Sample size calculation was performed using G*Power version 3.1.9.7[1]. The study sample consisted of 239 patients, with an age range from 5 to 13 years and their parents. Data were collected on children and adolescents / parents who had their first dental visit in the department of Pediatric Dentistry between December 2023 and March 2024.

As the children and parents awaited their dental examination appointments in the waiting room, a research team member informed them of the study's objectives and inquired whether they would be willing to participate voluntarily and without any additional compensation. If parents agreed to participate and inclusion criteria were confirmed, these same investigators obtained informed consent, and the parent filled out the Parenting Styles and Dimensions Questionnaire (PSDQ) and an additional questionnaire. Children who had local or systemic diseases that had the potential to impact oral health, those who were taking chronic medications, participants with enamel and dentin structure defects, individuals whose native language was not Turkish, and those who failed to provide signed informed consent were not included in the study. Conversely, all children between the ages from 5 to 13 years who visited the dental clinic for an examination and did not meet any of the aforementioned exclusion criteria met the inclusion criteria.

Procedures

Children oral examination data were taken from the hospital daily uploaded records without clinical examination. Parental data collection was carried out firstly with a structured questionnaire answered by either father or mother. The questionnaire covered demographic variables included the child's age, gender, parents highest completed level of education, family income, dental fear, feeding habits, oral hygiene habits. Parenting style of both father and mother was assessed with Parenting Styles and Dimensions Questionnaire (PSDQ). This questionnaire consisted of 32 items used to measure characteristics of authoritative, authoritarian, and permissive parenting styles with fifteen, twelve, and five items each, respectively. Both father and mother were asked to complete the questionnaire, and the responses were based on a 5-point Likert scale. The parenting style with the highest mean determined particular parent's style. [20] The scoring key of the PSDQ was used to classify parents into one of the three specific parenting styles. [20,31] For the authoritative parenting style, there are 15 items with a potential range of scores from zero to 75. The authoritarian style includes 12 items with a potential range of zero to 60. The permissive style includes five items with a potential range of zero to 25. An overall mean score in each parenting style category was calculated, and this score determined the parent's particular style; the highest mean score placed the parent in the proper parenting category [17]

For caries status was conducted in the light of the 'Oral Health Surveys: Basic Methods', of the World Health Organisation (WHO).22 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. Also, a new index, The Ageless DMFT Index (A-DMFT) was used. The A-DMFT is defined simply from weighted means of the DMFT and dmft indices, with weights given by the number of natural teeth present (or that should be present) in the mouth (permanent and primary, respectively), and relativized according to the square root of the individual's age.

Statistics

Categorical data were presented as frequency and percentage values and were analyzed using Fisher's exact test. Numerical data were presented as means with 95% confidence intervals, standard deviations (SD), median and interquartile range (IQR), minimum (min.), and maximum (max.) values. They were analyzed using Kruskal-Wallis's test, followed by Dunn's post hoc test. Correlations were analyzed using Spearman's rank-order correlation coefficient. Statistical analysis was performed with R statistical analysis software version 4.3.3 for Windows.

RESULTS

Sociodemographic Characteristics

The questionnaire was distributed to 300 children and their parents. A total of 239 were returned (79.7 %), and dental examinations of these children recorded. The results of the survey on the demographic factors were as follows (Table 1). The children's gender distribution was balanced with 115 female participants (48.12%) and 124 male participants (51.88%). The children were almost equally divided between those aged nine years or younger (50.21%) and those over nine (49.79%). Regarding completing the study forms, it was found that mothers were the main contributors (70.72%), followed by fathers (29.29%). The educational attainment of parents exhibited considerable variation, with the largest proportion having achieved a high school diploma or less (52.30% of fathers and 42.26% of mothers), succeeded by those who completed only primary education or less (28.45% of fathers and 38.91% of mothers). A smaller segment possessed university degrees or higher qualifications (19.25% of fathers and 18.83% of mothers). Predominantly, household income levels fell within the middle range, accounting for 52.72% of the sample. Out of 350 parents, 70 fathers and 169 mothers filled the questionnaire. Two hundred and forty parents (77.82%; 54 fathers and 132 mothers) exhibited authoritative parenting style. Authoritarian parenting style was seen in 19 parents (7.95%; 15 fathers and 4 mothers). 34 parents (14.23%; 12 fathers and 22 mothers) depicted permissive parenting style. There was no significant difference in the parenting styles based on the gender of the parents.

When Parenting styles analysed with variables (Table 1);

Gender and Parenting Style

The gender distribution across the different parenting styles showed that 49.46% of girls and 50.54% of boys were raised in democratic households. In authoritarian households, 31.58% were girls and 68.42% were boys, whereas permissive households consisted of 50.00% girls and boys each. These differences were not statistically significant ($p = 0.325$).

Age Distribution and Parenting Style

Children were categorized into ≤9 years and >9 years. Differences in age distribution across parenting styles were not statistically significant ($p = 0.274$).

Most forms were filled out by mothers across all parenting styles, with fathers filling out fewer forms. Differences between styles were not statistically significant ($p = 0.540$).

Parents' Educational Level

Regarding fathers' education, the majority had high school education or less across all styles (48.92% democratic, 47.37% authoritarian, 73.53% permissive), with primary or less being less common, and university level or above being the least common. Mothers showed a similar trend, with no significant

differences in education level distribution across parenting styles (p = 0.302 for mothers; p = 0.058 for fathers).

Income Levels categorized into three levels: low, middle and high. No significant differences were noted across parenting styles (p = 0.508).

Dental fear among Parenting styles

Presence of Dental Fear showed significant differences with higher occurrences in authoritarian (73.68%) and permissive (79.41%) styles compared to democratic (53.23%) (p = 0.005).

Brushing Frequency and Responsibility

Brushing habits varied, with no significant differences found in terms of frequency (p = 0.117) or who did the brushing (p = 1.00). The majority of children brushed their teeth themselves across all parenting styles.

Dietary Habits

No significant differences were observed in the number of meals per day (p = 0.406) or sugar consumption habits (p = 1.00) across parenting styles

Table 1. *(Distribution of Demographic and Behavioral Attributes by Parenting Style.)*

Parameter (n=239)		**n (%)**			**p-value**
		Democratic	**Authoritarian**	**Permissive**	
Gender	**Girl**	92 (49.46%)	6 (31.58%)	17 (50.00%)	**0.325**
	Boy	94 (50.54%)	13 (68.42%)	17 (50.00%)	
Age	**≤9 years**	90 (48.39%)	13 (68.42%)	17 (50.00%)	**0.274**
	> 9 years	96 (51.61%)	6 (31.58%)	17 (50.00%)	

Parameter (n=239)		n (%)			p-value
		Democratic	Authoritarian	Permissive	
Form filler	Mother	132(70.97%)	15 (78.95%)	22(64.7%)	0.561
	Father	54 (29.03%)	4 (21.05%)	12 (35.29%)	
Fathers' educational level	Primary education graduates	54 (29.03%)	8 (42.11%)	6 (17.65%)	0.058
	High school graduate	91 (48.92%)	9 (47.37%)	25 (73.53%)	
	University graduate or above	41 (22.04%)	2 (10.53%)	3 (8.82%)	
Mothers' educational level	Primary education graduates	67 (36.02%)	9 (47.37%)	17 (50.00%)	0.302
	High school graduate	80 (43.01%)	9 (47.37%)	12 (35.29%)	
	University graduate or above	39 (20.97%)	1 (5.26%)	5 (14.71%)	

Parameter (n=239)		n (%)			p-value
		Democratic	Authoritarian	Permissive	
Family income	Low	55 (29.57%)	8 (42.11%)	8 (23.53%)	0.508
	Middle	97 (52.15%)	10 (52.63%)	19 (55.88%)	
	High	34 (18.28%)	1 (5.26%)	7 (20.59%)	
Dental fear of parents	Yes	99 (53.23%)[A]	14 (73.68%)[B]	27 (79.41%)[B]	0.005*
	No	87 (46.77%)[A]	5 (26.32%)[B]	7 (20.59%)[B]	
Brushing frequency	Never	4 (2.15%)	1 (5.26%)	2 (5.88%)	0.117
	Once	75 (40.32%)	7 (36.84%)	16 (47.06%)	
	Twice	82 (44.09%)	6 (31.58%)	8 (23.53%)	
	Three times or more	7 (3.76%)	1 (5.26%)	1 (2.94%)	
	Several times a week	18 (9.68%)	4 (21.05%)	7 (20.59%)	
Who does the brushing	Himself/Herself	174 (93.55%)	18 (94.74%)	32 (94.12%)	1

Parameter (n=239)		n (%)			p-value
		Democratic	Authoritarian	Permissive	
	Mother or father	12 (6.45%)	1 (5.26%)	2 (5.88%)	
Number of meals per day	1-2 meals	54 (29.03%)	4 (21.05%)	13 (38.24%)	0.406
	3-4 meals	132 (70.97%)	15 (78.95%)	21 (61.76%)	
Sugar consumption	Never	2 (1.08%)	0 (0.00%)	0 (0.00%)	1
	Once a day	84 (45.16%)	9 (47.37%)	15 (44.12%)	
	More than once a day	100 (53.76%)	10 (52.63%)	19 (55.88%)	
Number of siblings	One	10 (5.38%)	0 (0.00%)	3 (8.82%)	0.832
	Two	83 (44.62%)	7 (36.84%)	16 (47.06%)	
	Three	72 (38.71%)	9 (47.37%)	12 (35.29%)	
	More than three	21 (11.29%)	3 (15.79%)	3 (8.82%)	

There is no statistically significant difference between the three parenting styles (Democratic, Authoritarian, and Permissive) for any of the oral health indices (dmft, DMFT, and ADMFT) ($p>0.05$). All three p-values—dmft (0.511), DMFT (0.516), and ADMFT (0.701)—are higher than the accepted threshold point of 0.05. (Table 2)

Table 2 *(Comparison of Dental Health Indices Across Parenting Styles.)*

Dental index	Median (IQR)			Test statistic	p-value
	Democratic	Authoritarian	Permissive		
dmft	3.00 (5.00)	4.00 (3.00)	3.00 (3.75)	**1.34**	**0.511**
DMFT	2.00 (3.00)	3.00 (3.50)	3.00 (4.00)	**1.32**	**0.516**
ADMFT	1.15 (0.98)	1.30 (0.75)	1.15 (0.88)	**0.71**	**0.701**

Age

The ADMFT scores of children younger than nine years old and those older than nine years old differ significantly. The ADMFT scores of younger children (≤9 years) are higher (1.30) than those of older c hildren (>9 years), with a median score of 1.00. This implies that the dental health outcomes for younger children are often lower.

Form Filler

Depending on which parent completed the survey, the ADMFT ratings varied significantly. Compared to children whose moms filled out the form (1.10), children whose fathers filled out the form had higher median ADMFT scores (1.40).

Who Does the Brushing

Depending on who brushes, there is a notable variation in ADMFT scores. Compared to children whose parents brush their teeth, those who brush themselves had a higher median ADMFT score (1.90) (1.10). Accordingly, the analysis of ADMFT scores reveals significant differences based on age, form filler, and who does the brushing, indicating that younger children, those whose fathers fill out the survey, and those who brush their own teeth tend to have higher ADMFT scores, signifying poorer dental health. Other factors such as gender, parental education, family income, dental fear, brushing frequency, number of meals, sugar consumption, and number of siblings do not show significant differences in ADMFT scores. (Table 3)

Table 3. *(Analysis of ADMFT Scores Across Demographic and Behavioral Variables.)*

Parameter (n=239)		ADMFT [median (IQR)]	Test statistic	p-value
Gender	**Girl**	1.10 (0.95)	**8056.50**	**0.082**
	Boy	1.30 (1.00)		
Age	**≤9 years**	1.30 (1.02)	**9473.00**	**<0.001***
	> 9 years	1.00 (0.90)		
Form filler	**Mother**	1.10 (0.80)	**7010.50**	**0.024***
	Father	1.40 (1.00)		
Fathers' educational level	**Primary education graduates or less**	1.10 (0.85)	**2.43**	**0.297**
	High school graduate or less	1.10 (0.90)		
	University graduate or above	1.25 (0.80)		
Mothers' educational level	**Primary education graduates or less**	1.10 (1.00)	**0.60**	**0.741**
	High school graduate or less	1.20 (0.90)		

Parameter (n=239)		ADMFT [median (IQR)]	Test statistic	p-value
	University graduate or above	1.20 (0.60)		
Family income	**Low income**	1.20 (1.35)	**0.05**	**0.976**
	Middle income	1.15 (0.90)		
	High income	1.20 (0.78)		
Dental fear of parents	**Yes**	1.20 (0.90)	**6767.50**	**0.758**
	No	1.10 (1.10)		
Brushing frequency	**Never**	1.30 (0.70)	**0.08**	**0.999**
	Once	1.10 (0.80)		
	Twice	1.20 (1.22)		
	Three times or more	1.10 (1.20)		
	Several times a week	1.20 (0.90)		
Who does the brushing	**Himself**	1.90 (0.95)	**2500.50**	**0.002***
	Mother or father	1.10 (0.90)		
Number of meals per day	**1-2 meals**	1.20 (1.20)	**6593.00**	**0.198**
	3-4 meals	1.10 (0.90)		

Parameter (n=239)		ADMFT [median (IQR)]	Test statistic	p-value
Sugar consumption	**Never**	1.15 (0.25)	**0.02**	**0.991**
	Once a day	1.10 (0.90)		
	More than once a day	1.20 (0.90)		
Number of siblings	**One**	0.80 (0.70)	**4.05**	**0.256**
	Two	1.10 (0.90)		
	Three	1.20 (0.90)		
	More than three	1.30 (0.75)		

DISCUSSION

The relationship between parenting styles and the enforcement of oral health behaviors in children is a crucial aspect of overall child development and well-being. This study examined the sociodemographic characteristics and parenting styles to explore their impact on children's oral health behaviors and dental caries status.

The distribution of parenting styles observed in this study, with a predominance of democratic parenting style (77.82%) which is similar to other studies (Dabawala et al. 2017; Ng et al. 2013)., followed by permissive (14.23%) and authoritarian (7.95%) styles. The sample in this study included a balanced distribution of gender and age among children, with a slight predominance of boys over girls and an almost equal split between those younger and older than nine years old. The demographic characteristics, particularly the high involvement of mothers in filling out the study forms, align with previous research indicating that mothers often take a more active role in child health-related activities (Baker et al., 2017). The educational levels of parents varied, with a significant proportion having only completed high school or less, which reflects the broader educational attainment in many populations. Household income was predominantly in the middle range, which may affect the generalizability of the findings to different socioeconomic groups. The distribution of the number of siblings among the study population indicates a predominance of larger families. This demographic characteristic implies that the population under study is predominantly composed of families with multiple children, which could have implications for resource allocation, parental attention, and the dynamics of health-related

behaviors within households. Children with lower socioeconomic status and large size families may experience financial, social, and material disadvantages that could compromise their home oral care and obtaining professional oral healthcare services. In addition to this, lower education among parents of lower socioeconomic groups could mean lower level of awareness and information about oral health practices. [23] However, number of siblings did not show significant differences in caries status in the current study.

The findings of this study indicate non-significant associations between parenting styles and the oral health behaviors of children during their first dental visit. However, the findings demonstrate that authoritarian is linked to increased dental fear levels, which may have a detrimental effect on kids' oral hygiene habits and willingness to visit the dentist. This result is consistent with other research showing that children are more likely to develop favorable health habits under democratic parenting, which is defined by warmth and structure.8,16 Authoritarian parenting involves a strict and rule-based approach that may neglect the emotional needs of children. This type of parenting can make it difficult for children to express their fears and anxieties, potentially leading to increased dental fear. [24] Baumrind (1991) reported that permissive parenting is associated with low self-regulation skills and high levels of anxiety in children, which can contribute to increased dental fear. Democratic parenting is characterized by a supportive, responsive, and communicative approach. This style encourages children to express their fears and develop coping strategies, which can reduce dental fear. [25]

The study did not find significant differences in dental health indices based on parental education levels or family income. This could be due to the homogeneity of the sample or the potential influence of other confounding variables not accounted for in this study. Previous research has shown that higher parental education and income levels are generally associated with better oral health outcomes in children. [7] The ADMFT scores were significantly higher in younger children (≤9 years) compared to older children, indicating poorer dental health outcomes in younger children. This finding underscores the importance of early preventive care and parental involvement in maintaining children's oral health. Younger children are more dependent on their parents for oral hygiene practices, making parental supervision and guidance crucial. [3]

Interestingly, while our study did not find significant differences in dietary habits across parenting styles, previous research has indicated that authoritarian parenting can sometimes lead to healthier dietary choices due to stricter control over food intake.18 This discrepancy suggests that the impact of parenting styles on different health behaviors may vary, necessitating further investigation into the contextual factors influencing these outcomes.

ADMFT (Decayed, Missing, and Filled Teeth) is a commonly used index in dental epidemiology to measure dental caries prevalence in populations. It provides a count of decayed, missing due to decay, and filled teeth, serving as an important indicator of oral health status. The ADMFT score is particularly valuable in pediatric dentistry as it helps in assessing the oral health of children. The present study highlights a significant variation in ADMFT (Decayed, Missing, and Filled Teeth) scores based on who is responsible for brushing the children's teeth. Our findings indicate that children who brush their teeth themselves have a notably higher median ADMFT score (1.90) compared to those whose parents brush their teeth (1.10). This disparity suggests that parental involvement in tooth brushing may play a crucial role in achieving better dental health outcomes in children. These results align with existing literature

that underscores the importance of parental supervision in maintaining children's oral hygiene. Previous studies have shown that young children often lack the manual dexterity and understanding necessary to brush their teeth effectively, which can lead to inadequate plaque removal and a higher incidence of dental caries. Therefore, parental assistance can ensure thorough brushing, reducing the risk of decay and other dental issues. [26,27] Moreover, our findings suggest a need for public health interventions that encourage parental involvement in children's daily oral hygiene routines. Educational programs aimed at parents could emphasize the benefits of their participation in brushing their children's teeth, particularly for younger age groups who are most vulnerable to dental caries. Such initiatives could be implemented through pediatric dental clinics, schools, and community health programs to reach a broader audience. It is also important to consider the potential long-term benefits of establishing good oral hygiene practices early in life. When parents actively participate in their children's tooth brushing, they not only help prevent immediate dental problems but also instill lifelong habits that promote oral health.

Understanding the influence of parenting styles on children's oral health behaviors can help pediatric dentists develop targeted strategies to support parents in fostering better oral health practices in their children. Educational programs and interventions tailored to different parenting styles could be effective in promoting optimal oral hygiene and preventive care. For example, authoritarian parents might benefit from guidance on reducing anxiety and fear during dental visits, while permissive parents could receive support in establishing and maintaining consistent oral hygiene routines for their children. [19, 20]

Despite the insightful findings, this study has several limitations. First, the cross-sectional design limits the ability to establish causality between parenting styles, sociodemographic factors, and dental health outcomes. Longitudinal studies are needed to better understand these relationships over time. Second, the reliance on self-reported data for some variables, such as brushing frequency and sugar consumption, may introduce bias due to social desirability or recall inaccuracies. Future research should incorporate objective measures to validate these self-reported behaviors. Furthermore, the study's sample was drawn from a specific population, which may limit the generalizability of the findings to other settings or populations. Efforts should be made to include more diverse samples in future research to enhance the external validity of the results. Finally, the lack of significant associations between certain variables and dental health indices suggests that additional factors, such as genetic predispositions, dietary habits, and access to dental care, should be considered in future studies to provide a more comprehensive understanding of the determinants of children's dental health.

CONCLUSION

While our study did not find significant differences in dental health indices across parenting styles, the association between dental fear and parenting style highlights the psychological impact of parenting on children's health behaviors. The findings emphasize the importance of parental involvement and supervision in maintaining children's oral health, particularly in younger children. Further research with larger and more diverse samples is needed to explore these relationships more comprehensively and to develop effective strategies for promoting children's oral health across different parenting styles.

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