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The Relationship Between Parental Behavior in Maintaining Dental Health and Dental Caries Experience in Preschool Children

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ABSTRACT

Objective: *The high prevalence of dental caries among preschool children in Indonesia and the central role of parental behavior in maintaining children's oral health form the background of this study. The aim was to analyze the relationship between parents' oral health maintenance behavior and the experience of permanent dental caries (DMFT) in preschool children in Sidoarjo City.* ***Methods:*** *This research employed a descriptive analytic design with a cross-sectional approach involving 30 children aged 3–6 years and 30 parents selected through total sampling. Parental behavior was assessed using a questionnaire, while children's caries experience was evaluated using a DMFT index adapted for children. Data were analyzed univariately to describe respondents' characteristics and bivariately using Spearman's correlation test to examine the relationship between parental behavior and caries experience.* ***Results:*** *The results showed that most parents had a moderate level of oral health maintenance behavior, and most children's permanent dental caries experience was in the moderate category. Spearman's test revealed a strong and significant positive correlation between parental behavior and children's permanent dental caries experience (p=0.003; r=0.78), indicating that poorer parental oral health behavior is associated with higher caries levels in children.* ***Novelty:*** *The study concludes that there is a strong relationship between parents' oral health maintenance behavior and permanent dental caries experience in preschool children; therefore, educational interventions targeting parents need to be strengthened to reduce the burden of caries in children.*

INTRODUCTION

Dental caries is one of the most common chronic oral diseases experienced by children worldwide, particularly during the preschool years (Early Childhood Caries/ECC) [1]. ECC is defined as the presence of one or more caries lesions on the surface of primary teeth in children up to 71 months of age. This disease often develops rapidly due to the complex interaction between plaque biofilm, the consumption of fermentable carbohydrates, and other behavioral and environmental factors [2]. Globally, the prevalence of ECC is reported to be very high, especially in countries with limited access to dental care services. ECC not only affects dental health but also has wide-ranging implications for a child's quality of life, including pain, nutritional disturbances, learning difficulties, and increased healthcare costs [3].

In Indonesia, dental caries remains a serious public health problem. Based on data from the 2018 Basic Health Research (Riskesdas), the prevalence of dental caries across all age groups reached 88.8%, with the highest incidence among children aged 5–9 years at 92.6%. The prevalence was also high among children aged 3–4 years, at around 81.1%. The latest data from the 2023 Indonesian Health Survey (SKI) show that the prevalence of oral and dental health problems remains high in the population aged ≥3 years,

although there is a decreasing trend in DMFT (Decayed, Missing, Filled Teeth) compared to previous Riskesdas data. This illustrates that most Indonesian children still experience dental caries from an early age, far exceeding the caries-free target recommended by global health organizations [4]. Parents' knowledge of dental health and their behavior in caring for their children's dental health are important determinants in the prevention and control of caries in children [5]. Parental knowledge includes understanding the etiology of caries, the importance of regular tooth brushing habits, choosing low-carbohydrate foods, and recognizing dental health services from an early age. Adequate knowledge has the potential to improve positive behavioral practices, such as supervising toothbrushing, limiting the consumption of sugary foods, and making regular visits to dental health facilities [6]. Children's oral health is also closely linked to their parents' behavior in maintaining that health. Behavior is the result of human experience and interaction with the environment, which is reflected in knowledge, attitudes, and actions [7].

Previous research, such as that conducted by Ni Putu Chandra and Putu Ratna, has shown a relationship between mothers' knowledge and behavior in caring for their children's teeth and the occurrence of caries in children at Kindergarten (TK). This indicates that parental behavior, especially that of mothers, in caring for their children's teeth significantly influences the occurrence of caries in children [8]. Therefore, understanding the relationship between parental knowledge and their behavior in caring for their children's dental health is crucial in efforts to prevent dental caries in preschool-aged children [9].

With this background, this study aims to analyze the relationship between parents' knowledge and behavior in maintaining dental health and the experience of dental caries in preschool children. It is hoped that the results of this research can contribute to the development of more effective educational interventions at the family and community level, as well as improve oral health promotion strategies that are more appropriate for local conditions in Indonesia.

RESEARCH METHOD

This study uses a descriptive analytic approach with a cross-sectional design, aiming to analyze the relationship between parents' knowledge and behavior in maintaining dental health and the experience of dental caries in preschool-aged children. This design was chosen because it allows for data collection at a single point in time, which is suitable for assessing the relationship between these variables within a specific population.

Population and Sample

The population in this study consists of preschool children aged 3–6 years in the Sidoarjo City area, Indonesia, along with their parents. The study sample was selected using total sampling, totaling 60 people, comprising 30 kindergarten students and 30 parents. Inclusion criteria were children aged 3–6 years who lived with their parents and

were willing to participate, while exclusion criteria were children with a history of health disorders affecting tooth growth (e.g., metabolic or genetic disorders).

The instruments used in this study consist of two main parts: a parent knowledge questionnaire to measure parents' knowledge level regarding their children's dental health and a parent behavior questionnaire to evaluate parents' behavior in maintaining their children's dental health. Additionally, data on dental caries experience in children were measured using criteria based on the DMFT (Decayed, Missing, Filled Teeth) system, adapted for children.

Data Analysis

The collected data will be analyzed using univariate and bivariate methods. Univariate analysis was used to describe the demographic distribution, knowledge, and behavior of parents, as well as the prevalence of dental caries in children. Bivariate analysis was performed to test the relationship between parental knowledge and behavior and children's dental caries experience using the Chi-square test for categorical variables and Spearman's rank correlation for the relationship between behavior and the incidence of dental caries in preschool children. A p-value less than 0.05 is considered the statistical significance threshold [10].

RESULTS AND DISCUSSION

Results

Table 1. Distribution of Student Characteristics.

Characteristics	Frequency	Percentage (%)
Age		
3–4 years	4	13.33
4–5 years	14	46.67
5–6 years	12	40.00
Gender		
Male	16	53.33
Female	14	46.67
Total	30	100

Table 1 shows that half of the students are aged 4-5 years (46.67%) and most are male (53.3%).

Table 2. Distribution of Student Parents' Characteristics.

Characteristics	Frequency	Percentage (%)
Gender		
Male	5	16.67
Female	25	83.33
Total	30	100
Age		
18–25 years	8	26.67
26–35 years	12	40.00
36–45 years	6	20.00

46–55 years	4	13.33
Total	30	100
Education		
Low	0	0
Medium	10	33.33
High	20	66.67
Total	30	100
Occupation		
Civil Servant/Military/Police	5	16.67
Private Sector	15	50.00
Self-Employed	10	33.33
Total	30	100

Table 2 shows that the characteristics of the students' parents are entirely female (83.3%), half are aged 26-35 years (40%), the parents' education is almost entirely higher education (66.67%), and most are employed in the private sector (50%).

Table 3. Frequency Distribution of Student Parents' Behavior Regarding Oral and Dental Health Maintenance.

Criteria	Frequency	Percentage (100%)
Good	10	33.33
Moderate	12	40.00
Poor	8	26.67
Total	30	100

Based on Table 3, it shows that half (40%) of the students' parents' behavior regarding oral and dental health maintenance has moderate criteria.

Table 4. Frequency Distribution of Permanent Tooth Caries Experience (DMFT) in Students.

DMF-T Criteria	Frequency	Percentage (100%)
Very Low	6	20.00
Low	8	26.67
Moderate	10	33.33
High	4	13.33
Very High	2	6.67
Total	30	100

Based on Table 4, the frequency of permanent tooth decay experience (DMFT) among students shows that half of them have moderate criteria, totaling 10 students (33.33%).

Table 5. Results of Spearman Correlation Test on Parental Behavior and Permanent Tooth Decay Experience (DMFT) in Students.

Variable	p-value	Correlation Coefficient
Parental Behavior and Students' Dental Caries Experience (DMFT)	0.003	0.78

Table 5 shows that the p-value is 0.003 (<0.05) and the Spearman correlation coefficient, which measures the strength and direction of the relationship between two variables, is 0.78, indicating a fairly strong positive correlation between parental behavior and students' permanent tooth caries experience. Therefore, it can be concluded that there is a strong relationship between parental behavior and students' caries experience (DMF-T).

Discussion

Based on the research results, data was obtained from 30 students, consisting of 53.33% male and 46.67% female, who were accompanied by 30 parents, 83.33% of whom were female. The most common age for students was 4-5 years old (46.67%), while the most common age for parents was 26-35 years old (40%). The majority of parents were in the moderate category of oral and dental health maintenance behavior (40%). The Spearman correlation test showed a strong and significant relationship between parental behavior and the experience of permanent tooth decay in children, with a correlation coefficient of 0.78 and a p-value of 0.003 ($p<0.05$), indicating that the worse the parents' oral health behavior, the higher the experience of tooth decay in their children. Clinically, these results support the understanding that parental behaviors that are less supportive of dental health (e.g., not guiding toothbrushing, allowing high sugar consumption, rarely taking the child to the dentist) will contribute to increased susceptibility to dental caries in preschool children [11].

Parental behavior plays an important role in shaping children's behavior, either supporting or hindering their oral hygiene. Parental involvement in maintaining oral health has a significant impact on children's dental health [12]. From a health behavior perspective, children have a close relationship with their parents, and maintaining a child's health usually depends on their parents. The highest DMFT (Decayed, Missing, Filled Teeth) experience among students was in the moderate category (33.33%), which did not meet the DMF-T target expected by Riskesdas 2018. The national prevalence of the DMF-T index was 4.6, which is higher than the WHO standard of 3.5 [13]. The results of this study are in line with health behavior theory, which states that a person's behavior is formed from a combination of knowledge, attitudes, and actions influenced by the social and family environment, making parental behavior a model for children in forming health habits, including oral hygiene [14]. Previous research (Abdat et al., 2020) has shown that positive parental attitudes and practices toward oral health are associated with a decrease in the prevalence of Early Childhood Caries (ECC) in children, through

regular tooth brushing habits, parental supervision during tooth brushing, limiting the consumption of cariogenic foods/drinks, and regular visits to dental health facilities. Additionally, research by Zaborskis et al. (2025) states that authoritative parenting styles and parental behavior, with clear rules about dental hygiene and diet, are associated with lower DMFT scores compared to permissive styles that tend to let children determine their own tooth-brushing habits and consumption of sugary foods [15].

Knowledge and behavior are inseparable. Starting good oral health habits is crucial for building the right culture and behaviors. Tang et al.'s research found a significant relationship between mothers' knowledge and behavior toward their children's oral health status ($p < 0.05$). Parents may overlook the importance of baby teeth and view primary teeth as merely transitional. Therefore, damage to primary teeth will not affect permanent teeth, and primary teeth do not need to be treated. Errors in understanding oral health knowledge were found in the elderly or their caregivers.

CONCLUSION

Fundamental Finding : This study demonstrates a clear and statistically significant association between parental oral health maintenance behavior and permanent dental caries experience among preschool children in Sidoarjo City. Based on this research, it can be concluded that there is a strong relationship between parental behavior and the experience of permanent tooth caries in students in Sidoarjo City. These findings confirm that parental behavior plays a decisive role in shaping children's oral health status at an early age. **Implication :** The results highlight the importance of positioning parents as central actors in oral health promotion for preschool children. Strengthening parental education and daily oral health practices may serve as an effective preventive strategy to reduce the burden of permanent dental caries, particularly through community-based and school-oriented oral health programs. **Limitation :** The study is subject to limitations related to its cross-sectional design and relatively small sample size, which limit causal interpretation and broader generalizability. Additionally, parental behavior was measured using self-reported questionnaires, which may introduce response bias and affect the precision of behavioral assessment. **Future Research :** Future research should adopt longitudinal or intervention-based designs to better explore causal mechanisms between parental behavior and children's dental caries. Expanding the study population and evaluating structured parental oral health education programs would provide stronger evidence for developing sustainable caries prevention strategies in early childhood.

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