

The Relationship of Parental Socioeconomic Status with Children's Dental Caries Incidence

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ABSTRACT

Background: Dental caries is a multifactorial disease characterized by the destruction of the hard tissues of the teeth. Various age groups can experience dental caries and are more vulnerable in children, especially in elementary school. One of the factors that influence the occurrence of dental caries is the socioeconomic status of parents. Parents' socioeconomic status can be measured by education, occupation, and income. Several studies have shown that dental caries is more common in people with low socioeconomic status. **Objectives:** This study aimed to determine the relationship between parents' socioeconomic status and dental caries in children aged 11-12 years at SDN 03 Pakan Kurai Bukittinggi. **Material and Methods:** This study used a cross-sectional design. The number of research samples was 56 children. The sample selection used the Simple Random Sampling method. The instrument used was a questionnaire to measure the parent's socioeconomic status and the dental caries assessment based on the DMF-T/def-t index. Data analysis used a Chi-Square statistical test with $p < 0.05$. **Results:** The results showed that the prevalence of dental caries in children was 83.9%, the DMF-T+def-t index was 2.46, and the socioeconomic status of the respondents' parents was primarily low. The results of statistical analysis between parents' socioeconomic status and children's dental caries obtained p value = 0.000. **Conclusion:** There was a relationship between parents' socioeconomic status and dental caries in children aged 11-12 at SDN 03 Pakan Kurai Bukittinggi.

Keywords: Children, Dental caries, Socioeconomic status

ABSTRAK

Latar belakang: Karies gigi merupakan penyakit multifaktorial yang ditandai dengan rusaknya jaringan keras gigi. Karies gigi dapat dialami oleh berbagai kelompok umur dan lebih rentan terjadi pada anak-anak, terutama pada anak usia sekolah dasar. Salah satu faktor yang mempengaruhi terjadinya karies gigi adalah status sosial ekonomi orang tua. Status sosial ekonomi orang tua dapat diukur dari pendidikan orang tua, pekerjaan orang tua, dan pendapatan orang tua. Beberapa penelitian menunjukkan bahwa karies gigi lebih banyak terjadi pada masyarakat dengan status sosial ekonomi rendah. **Tujuan:** Penelitian ini bertujuan untuk mengetahui hubungan status sosial ekonomi orang tua dengan karies gigi pada anak usia 11-12 tahun di SDN 03 Pakan Kurai Bukittinggi. **Metode:** Penelitian ini menggunakan desain cross sectional. Jumlah sampel penelitian sebanyak 56 anak. Pemilihan sampel menggunakan metode Simple Random Sampling. Instrumen yang digunakan adalah kuesioner untuk mengukur status sosial ekonomi orang tua dan penilaian karies gigi berdasarkan indeks DMF-T/def-t. Analisis data menggunakan uji statistik Chi-Square dengan $p < 0,05$. **Hasil:** Penelitian menunjukkan prevalensi karies gigi pada anak sebesar 83,9%, indeks DMF-T+def-t sebesar 2,46, dan status sosial ekonomi orang tua responden sebagian besar rendah. Hasil analisis statistik antara status sosial ekonomi orang tua dengan karies gigi anak diperoleh p value = 0,000. **Kesimpulan:** Terdapat hubungan antara status sosial ekonomi orang tua dengan karies gigi pada anak usia 11-12 tahun di SDN 03 Pakan Kurai Bukittinggi.

Kata kunci: Anak, Karies gigi, Stastus sosial ekonomi

1. Introduction

The age of 11-12 years is the age when children are in the mixed dentition period because, at that age, the deciduous and permanent teeth are replaced, so they are significantly at risk of experiencing dental and oral health problems.¹ In Indonesia, according to Riset Kesehatan Dasar (Riskesdas) in 2018, the prevalence of caries children aged 10-14 years amounted to 73.4%. Andini et

al.'s research in Pekanbaru City (2018) reported a caries prevalence in children aged 6-12 years of 76.9%.² In West Sumatra, caries prevalence in children aged 10-14 was 41.74%.³

Dental caries is a multifactorial disease caused by plaque bacteria, which can produce acid through carbohydrate fermentation. The acid produced causes demineralization of the complicated tissue structure of the teeth, which begins with the formation of white spots on the surface of the teeth, which will turn brown and form a cavity over time. The four main factors that cause dental caries are host, substrate, microorganisms, and time.⁴ Other factors that play a role in the occurrence of dental caries are community, individual, and family factors. One of the family factors that play a role in dental caries is socioeconomic status.⁵ Socioeconomic status is one factor that can indirectly influence dental and oral health. Socioeconomic status describes a person's position from a social and economic perspective. The socioeconomic status of parents can be determined from their level of education, employment, and income.⁶

Socioeconomic status can influence lifestyle, knowledge, and access to information and health services.⁷ Parents with low socioeconomic levels tend to have low awareness of the importance of health, including dental and oral health, which can influence parenting and eating patterns in children, such as children consuming more cariogenic foods less fiber-rich foods, and rarely taking their children to the dentist regularly for treatment. This impacts the child's teeth and mouth health, so the child is at risk of experiencing dental caries.⁸

Several studies show that the prevalence of dental caries is higher in children with parents with low socioeconomic status – Ghasemianpour et al.'s research. In 2019, Iran reported that parents' socioeconomic status is prominent in children's dental caries experience.⁹ Research by Ellakany et al. in 2021 in Saudi Arabia said that parents with low education and low monthly income influenced the higher prevalence of dental caries in their children.¹⁰ Research by Fatmasari et al. in 2017 in South Banjarmasin District reported a significant relationship. There is a substantial relationship between the socioeconomic status of students' parents and dental caries, where students who have parents with low socioeconomic status have more dental caries than students who have parents with high socioeconomic status.¹¹

According to the 2018 West Sumatra Province Basic Health Research (Riskesdas), it was reported that Bukittinggi had a high prevalence of dental caries, namely 43.23%. Based on the 2020 Bukittinggi Health Service report, of the seven community health centers in Bukittinggi, elementary schools in the Guguk Panjang Community Health Center working area received the highest figures for the category of children who need dental care. Based on the health screening report of students for the 2019 – 2020 academic year carried out by the Guguk Panjang Community Health Center, the highest caries rate was found at SDN 03 Pakan Kurai Bukittinggi. Based on the description above, researchers are interested in researching the relationship between parents' socioeconomic status and dental caries in children aged 11-12 at SDN 03 Pakan Kurai Bukittinggi.

2. Material and Methods

The type of research used in this research is analytical observational with a cross-sectional design. This research will be conducted in May at SDN 03 Pakan Kurai Bukit Tinggi, in Pakan Kurai Village, Guguk Panjang District, Bukittinggi. The sample in this research is children aged 11-12 years at SDN 03 Pakan Kurai Bukittinggi, with the inclusion criteria being that the respondent's parents were willing to permit by an informed consent sheet. The respondents were cooperative, and the exclusion criteria were respondents who were sick at the time of the research. In this study, the sample size was calculated using the Lemeshow sample formula to obtain a sample size of 56 children. Data were analyzed using the Chi-Square test. The relationship between the two variables is known through the p-value obtained. The two variables are significant if the p-value is <0.05.

3. Result and Discussion

The research was conducted at SDN 03 Pakan Kurai, Pakan Kurai Village, Guguk Panjang District, Bukittinggi, from May to June 2022. The population of this research was students aged 11-12 years at SDN Pakan Kurai Bukittinggi. The number of samples in this study was 56 samples.

Table 1. Frequency Distribution of Characteristics Based on Gender (n=56)

Variables	Total (n)	Percentage (%)
Gender		
Boys	25	44,6
Girls	31	55,4
Age		
11 years old	26	46,4
12 years old	30	53,6
Total	56	100

Based on Table 1, it is known that the majority of respondents were female, namely 31 people (55.4%), and the remaining 25 people were male (44.6%). Respondents aged 12 were 30 (53.6%) and 11 years old were 26 people (46.4%).

Table 2. Frequency Distribution of Respondents Based on Parent's Level of Knowledge (n=56)

Level of Knowledge	Total (n)	Percentage (%)
Father		
Low	21	37,5
Middle	20	35,7
High	15	26,8
Mother		
Low	17	30,4
Middle	21	37,5
High	18	32,1
Total	56	100

Table 2 shows that the highest level of education for fathers and mothers is low education for fathers, namely 21 respondents (37.5%), and secondary education for mothers, namely 21 respondents (37.5%).

Table 3. Frequency Distribution of Respondents Based on Parent's Employment Level (n=56)

Employment Level	Total (n)	Percentage (%)
Father		
Low	9	16,1
Middle	34	60,7
High	13	23,2
Mother		
Low	30	53,6
Middle	19	33,9
High	7	12,5
Total	56	100

Characteristics of respondents based on parents' employment level showed that the most frequent father's job category was medium work with 34 respondents (60.7%), and the mother's most common job category was low work with 30 respondents (53.6%).

Table 4. Distribution of respondents based on parent's income level

Income Level	Total (n)	Percentage (%)
Low	11	19,6
Middle	27	48,2
High	18	32,1
Total	56	100

The characteristics of respondents based on parents' income level mainly were middle income, namely 27 respondents (48.2%).

Table 5. Distribution of respondent DMF-T+ def-t Index

Value	DMF-T + def-t Index
Minimum	0
Maximum	7
Mean	2,46
Std. Deviasi	1,76
95% CI	1,99-2,93

Based on Table 5, the average value of the DMF T+def-t index is 2.46 with interval estimation. It can be concluded that it is 95% believed to be the average DMF T+def-t index for children aged 11-12 years at SDN 03 Pakan. Kurai Bukittinggi is between 1.99 - 2.93.

Table 6. Distribution of respondents based on dental caries categories

Dental Caries	Total (n)	Percentage (%)
Low	29	51,8
High	27	48,2
Total	56	100

Table 6 shows that the most common caries category is low caries, with 29 respondents (51.8%).

Table 7. Distribution of respondents' dental caries based on parent's education level

Education Level	Dental Caries Category				Total	
	Low		High		n	%
	n	%	n	%		
Father						
Low	6	28,6	15	71,4	21	100
Middle	11	55,0	9	45,0	20	100
High	12	80,0	3	20,0	15	100
Mother						
Low	5	29,4	12	70,6	17	100
Middle	8	38,1	13	61,9	21	100
High	16	88,9	2	11,1	18	100

Based on Table 7, the high caries category is most common among respondents with a low father's education, 15 respondents (71.4%), and the high caries category is most common among respondents with a medium mother's education, 13 respondents (61.9%).

Table 8. Distribution of respondents' dental caries based on parent's employment level

Employment level	Dental caries category				Total	
	Low		High		n	%
	n	%	n	%		
Father						
Low	3	33,3	6	66,7	9	100
Middle	16	47,1	18	52,9	34	100
High	10	76,9	3	23,1	13	100
Mother						
Low	13	43,3	17	56,7	30	100
Middle	11	57,9	8	42,1	19	100
High	5	71,4	2	28,6	7	100

Table 8 shows that the high caries category is most common in respondents with medium father's employment, namely 18 respondents (52.9%), and the high caries category is most common in respondents with low mothers' employment, 17 respondents (56.7%).

Table 9. Distribution of respondents' dental caries based on parent's income levels

Income Level	Caries dental category				Total	
	Low		High		n	%
	n	%	n	%		
Low	5	45,5	6	54,5	11	100
Middle	9	33,3	18	66,7	18	100
High	15	83,3	3	16,7	3	100
Total	29	51,8	27	48,2	56	100

Table 9 shows that the high caries category is highest among respondents with middle income, namely 18 respondents (66.7%).

Table 10. Distribution of respondents based on parents' socioeconomic status (n=56)

Parents' socioeconomic status	Total (n)	Percentage (%)
Low	27	48,2
Middle	11	19,6
High	18	32,1
Total	56	100

Table 10 shows that the highest socioeconomic status category of respondents is low socioeconomic status, namely 27 respondents (48.2%).

Table 11. Analysis of the relationship between parents' socioeconomic status and dental caries

Parent's Socioeconomic Status	Dental Caries Category				Total		<i>p-value</i>
	Low		High		n	%	
	n	%	n	%			
Low	7	25,9	20	74,1	27	100	0,000
Middle	6	54,5	5	45,5	11	100	
High	16	88,9	2	11,1	18	100	
Total	29	37,0	27	100	56	100	

Based on Table 11, it is known that dental caries is higher in children with parents who have low socioeconomic status compared to children with parents who have high socioeconomic status. Based on the results of the Chi-Square statistical test, it is known that the *p*-value is 0.000 where $p < 0.05$, so it can be concluded that there is a relationship between parents' socioeconomic status and dental caries in children aged 11-12 years at SDN 03 Pakan Kurai Bukittinggi.

In this study, the characteristics of respondents were based on the parents' education level. Most respondents had low and medium education levels (37.5%). Bukit Tinggi Education Information Data for 2018 states that the highest level of education completed by residents aged ten years and over is SMA, SMK, MA (37.3%) for women and SMP (32.14%) for men.¹² Low levels of education can be caused by constraints on educational costs and low academic ability of a person in adapting to a higher level of education.¹²

Based on dental examinations of 56 respondents, it was found that the prevalence of dental caries was 83.9%. These results are higher than the prevalence of caries in children aged 10-14 years in West Sumatra, namely 41.74%. The high prevalence of dental caries can be caused by elementary school-age children liking sweet and sticky foods such as cakes, bread, candy, chocolate, and other soft foods and drinks that are packaged in attractive packaging, sold at low prices, and readily available in the environment. School and place of residence can increase the risk of caries in children.¹³ The results of this study are the same as the research by Maldupa et al. in Latvia, Northern

Europe, in 2021, which states that the prevalence of dental caries in children aged 11-12 years is 71.9%, which is higher than the average prevalence in European countries, namely 52%.¹⁴

The research results showed that the average DMF-T+def-t index was 2.46, included in the low caries category. This could be because the respondents in this study were in the mixed dentition period, so dental caries could occur in both permanent and primary teeth in children, thereby increasing the DMF-T and def-t index in children. The results of this study are in line with research conducted by Andegiorgish et al. in 2017 in Eritrea, East Africa, where the DMF-T index in children aged 11-12 years was 2.50, which was included in the low category.¹⁵

Based on the level of parental education, it was found that the high caries category was most common in parents with low fathers' education and middle mothers' education. Parents with a high level of education will find it easier to absorb information and implement it in their daily behavior and lifestyle, including maintaining dental and oral health to improve their children's dental and oral health.⁸ The results of this research align with Harsyaf and Yandi's research in Padang City in 2018 where it was found that children with lower levels of parental education had higher dental caries compared to children with parents with higher education, namely 89.5%.¹⁶ The results of another study by Purwati and Almujiadi in 2017 found a significant influence between parental education and students' dental caries.¹⁷

Based on the level of parental employment, it is known that the high caries category is most common in respondents with medium fathers' employment and low mother's employment. This can be caused by the fact that the higher the parents' occupation, the higher the level of knowledge about health because they have a social environment that supports knowledgeable parents, so parents have a higher awareness of the importance of dental and oral health.¹⁸ Employment is also a source of income to fulfill life's needs, including health needs, so the better the employment parents have, the more concerned their children's health.¹⁹ The results of this study align with research conducted by Kato et al. in 2017 in Japan, where it was found that students with parents who had medium jobs had a high incidence of caries.²⁰

Based on parental income, it was found that the high caries category was most elevated in respondents with middle parental income. Parental income will influence children's opportunities to obtain health services. Parents with low incomes will find it challenging to meet their daily needs, so they will pay very little attention to the health of all family members because they prioritize their basic needs first compared to the need for health.⁶

The parents' socioeconomic status in this study was measured by the level of education, employment, and income of the respondent's parents. The socioeconomic status category of the respondents' parents was obtained from the sum of the scores for each indicator from the questionnaire filled out by the respondent's parents. The socioeconomic status category is divided into three categories: low, middle, and high. The low socioeconomic status category is if the total score is 0-3, medium socioeconomic status is if the total score is 4-6, and high socioeconomic status is if the total score is 7-10. Based on the research results, it was found that the socioeconomic status of the respondents' parents was mainly socioeconomic status. low, namely 27 respondents (74.1%). The high number of parents with low socioeconomic status in this study was due to the majority of respondents' parents having medium to low levels of education, the majority of jobs as laborers and traders, and medium to low incomes.

Based on research that has been conducted, it was found that dental caries is higher in children with parents who have low socioeconomic status compared to children with parents who have high socioeconomic status. This is known from the frequency of children with the highest caries category being children with parents who have low socioeconomic status. Based on the results of the Chi-Square statistical test, a p-value of 0.000 was obtained, where the p-value <0.05, so it can be concluded that there is a relationship between parents' socioeconomic status and dental caries in children aged 11-12 years at SDN 03 Pakan Kurai Bukittinggi. The results of this research align with research by Heriasti et al. in 2015 in Depok where the results showed a relationship between parents' socioeconomic status and children's dental caries.²¹ Another research by Fithriyana in 2021 in Kuok Village stated that there was a significant relationship between parents' socioeconomic status and the incidence of dental caries in children.²²

Dental caries is high in children with parents who have low socioeconomic status because parents with low socioeconomic status have difficulty meeting their basic needs, so it will also be difficult to provide health services for their children.²³ Parents' socioeconomic status can influence

their children's diet and lifestyle.²⁴ Parents with low socioeconomic status find it more difficult to obtain healthy food and cannot choose food according to their wishes.²⁵ Saldūnaite et al., in 2014 in his research stated that families with low socioeconomic status consume less fruit because the price of fruit is more expensive. Consuming fruit can play a role in reducing plaque accumulation and is high in nutrition, so it can improve children's health status and prevent dental caries.²⁶ Socioeconomic status can also influence awareness of maintaining dental and oral health, including the desire to regularly visit dental and oral health services.²⁷ People with low socioeconomic status have low awareness and motivation to visit existing dental health services even though they have registered for health insurance. This is associated with a strong interest in healthy living, which will influence healthy living behavior to increase susceptibility to dental and oral problems, including dental caries.²⁸

4. Conclusion

The research results found a statistically significant relationship between parents' socioeconomic status and the caries index of children aged 11 - 12 years. It is hoped that future research can have samples with a more extensive age range.

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Authors Contribution

Contribution	Sovira GDJ	Nismal H	, Kasuma N	Fitri H	Najla Q
Concepts or ideas	√	√	√	√	√
Design	√	√	√	√	√
Definition of intellectual content	√				
Literature search	√	√	√	√	√
Experimental studies	√				
Data acquisition	√	√		√	√
Data analysis	√	√		√	√
Statistical analysis	√		√	√	√
Manuscript preparation	√		√	√	√
Manuscript editing	√	√			√
Manuscript review	√	√			√



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