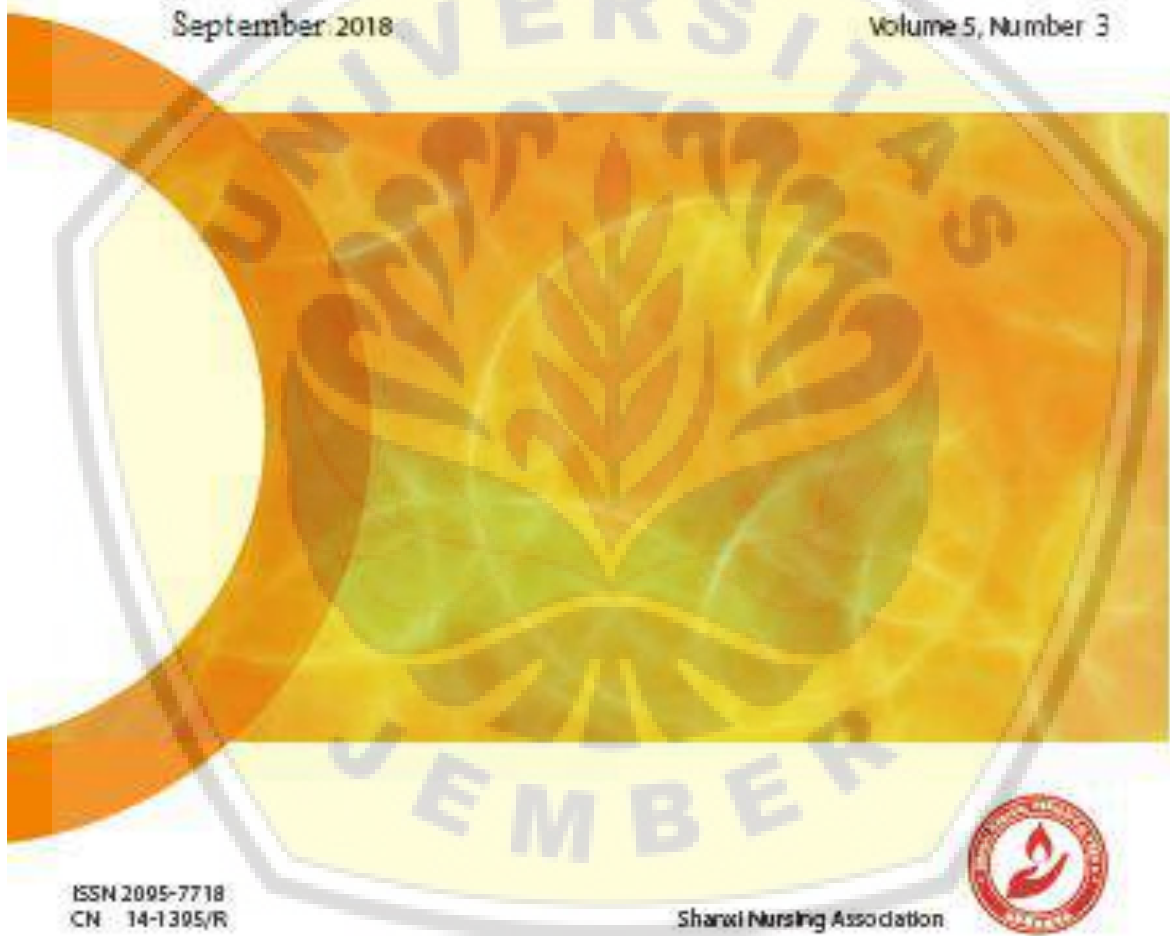




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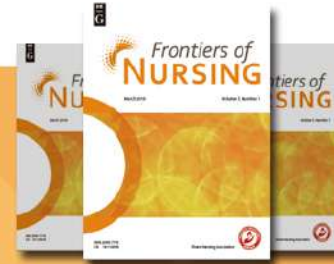
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Family characteristics on self-reported toothache among Indonesian children aged 12–14 years

Original article

Elyda Akhya Afida Misrohmasari^{a,*}, Hestieyonini Hadnyanawati^a, Kiswaluyo^a, Berlian Prihartiningrum^a, Dina Eka Putri^b

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Abstract: **Objective:** Toothache was reported as a reason for school absenteeism, sleeping difficulties, loss of appetite, and seeking dental treatment among children. These represented some impacts of dental problems on health, quality of life, and socioeconomic problems. The aims of this study were to describe the prevalence of toothache among 12–14-year-old children in Indonesia and their family characteristics and to analyze the associations of family characteristics on the toothache.

Methods: We analyzed the data from the Indonesian Family Life Survey 5 in 2014–2015. A total of 2,377 children aged 12–14 years were included in this survey. This age is the early stage of eruption of all permanent teeth. Children were asked about their experience on toothache in the last 4 weeks as a dependent variable. The independent variables were the family socioeconomic characteristics including father's and mother's highest educational level, family income, and the number of children in the family. A logistic regression was applied to analyze the relationship of family characteristics with toothache experience of children.

Results: Toothache experience was reported from 13.9% of the respondents. Descriptive statistics showed that higher percentages of toothache were experienced by male children and children from family with lower parental education and economic position as well as from bigger family. However, logistic regression showed that only the number of children in the family had a statistically positive association with self-reported toothache of the children. Children living in the family with more than four children were more likely reported toothache than living in the family with one or two children ($P=0.012$; odds ratio [OR]=1.53). Children living with more siblings may experience less attention from their parents on oral health hygiene. Poor oral health habits could result in dental pain.

Conclusions: Descriptive statistics showed that a higher percentage of toothache was experienced by children from lower socioeconomic families, although the only significant association was the number of children in the family.

Keywords: toothache • children • family characteristics

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1. Introduction


Toothache is one of the health problems that affect people in all age groups. It has substantial impact not only on health but also on mental, social, economic, and quality-of-life factors. National Economic and Social Survey (SUSENAS) in 2003 showed that in average 62.4% of people in Indonesia lost 3.86 days in a year of work productivity, school absenteeism, and daily activities due to oral health problems.¹ Toothache in children

affects the growth because of the rejection of some food and digestive problems.^{2,3} Dental pain is also a reason for school absenteeism and difficulty in sleeping among children.⁴ Furthermore, students with dental pain are more likely to have a low grade point average on their academic performances.⁵

Oral health outcomes such as dental pain are affected by broader social determinants of health.² Based on the social determination model of toothache proposed by Bastos et al.,⁶ oral health is linked to

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psychosocial factors and material and behavioral factors. Previous studies highlighted that parental socioeconomic characteristics were associated with oral health outcomes among children and adolescents.^{7,8}

Moreover, dental pain has been suggested as a useful indicator of treatment need.⁹ However, data on caries are regularly collected in Indonesia but data on toothache are lacking. Furthermore, there is limited research investigating the relationship between family socioeconomic characteristics and oral pain among children. Since the age of 12 years is the early stage of eruption of all permanent teeth, it is important to monitor dental health at the early period in the age group of 12–14 years. Therefore, the aims of the current study were to estimate the prevalence of self-reported toothache in the last 4 weeks and its association with family socioeconomic characteristics of 12–14-year-old children from the data of Indonesian Family Life Survey (IFLS) 5.

2. Methods

The data utilized in this study were from the IFLS wave 5,¹⁰ which was conducted by (RAND Corporation (<https://www.rand.org/>) and Survey Meter in 2014–2015. This survey was a large-scale community and household survey with a wide range of topics including toothache. The multiple topics and information provided in the IFLS5 offered the opportunity to explore factors that may contribute to dental pain in children.

The target population for the IFLS5 household survey was household members in Indonesia who had been participated in the previous IFLS1–4. This survey was held in 13 major provinces containing 83% of the Indonesian population. The provinces were as follows: four provinces in Sumatra (North Sumatra, West Sumatra, South Sumatra, and Lampung), all five of the Javanese provinces (DKI Jakarta, West Java, Central Java, DI Yogyakarta, and East Java), and four provinces covering the remaining major island groups (Bali, West Nusa Tenggara, South Kalimantan, and South Sulawesi). In total, there were 58,325 household members participated in the IFLS5 which included 16,195 children aged 0–14 years.¹¹

Questionnaires as survey instruments were divided into nine books for every household. Book 5 was a set of questionnaires for respondents aged <15 years. One of the questions was used as an outcome variable in this study which was located in section Morbiditas Akut Anak (MAA) (acute morbidity). The question was “whether the children experience toothache in the last 4 weeks”? Information about family characteristics as independent variables was obtained from book K as a control book. Questions in book K were asked to the adults in the same household.

We selected the data of children aged 12–14 years, because this age is an early stage of eruption of all permanent teeth. This period was used to monitor the stage of dental problems.² In total, there were 2,337 children with complete information of all variable interests in this study.

The dependent variable of this study was a toothache experience in the last 4 weeks, which was a binary variable that contained yes and no answers. The explanatory variables were the indicators of children's socioeconomic status, namely mother's education, father's education, household income, and the number of children in the family. Parental education was simplified into three categories based on the highest educational level attended as follows: primary education or less, high schools, and university. The household income was estimated using parental total earning in the last 12 months. In this study, the income was divided into two categories based on the Indonesian per-capita national income in 2013 at the average of Rp. 36.5 million/year as a border line.¹²

Data were analyzed using the IBM SPSS Statistics 19. Descriptive statistics were used to describe the study samples and the family characteristics on toothache experience. To obtain the association of every independent variable on toothache, a logistic regression was performed with <0.05 for the level of statistical significance and was presented as odds ratios (ORs).

3. Results

A total of 2,377 children aged 12–14 years were involved in this survey. As presented in Table 1, age distribution was as follows: 783 (33.0%) 12-year-olds, 771 (32.4%) 13-year-olds, and 823 (34.6%) 14-year-olds. Table 1 presents the distribution of the sample based on the independent variables investigated and its association using logistic regression model. The proportion of gender was almost equal, with 1,231 (51.8%) male and 1,146 (48.2%) female children. In terms of parental education, the highest proportion of father's and mother's education was high school graduated with 47.5% for mothers and 49.2% for fathers. As presented in Table 1, there was a gap in the education of mother and father. The percentage of mothers with primary education was 5% higher than fathers. In contrast, the percentage of mothers with university education was lower than fathers. In this study, almost 80% of the children lived in the family with household income below the national average. Moreover, there were 44.0% of children in this study lived in family with three to four children and 15.9% have more than four children.

Table 2 presents the descriptive statistics of toothache experience according to the independent variables

Variable	N (%)
Sex	
Male	1,231 (51.8)
Female	1,146 (48.2)
Age	
12 years	783 (33.0)
13 years	771 (32.4)
14 years	823 (34.6)
Mother's highest education	
≤Primary education	1,043 (43.9)
High schools	1,129 (47.5)
University	205 (8.6)
Father's highest education	
≤Primary education	935 (39.3)
High school	1,169 (49.2)
University	237 (11.5)
Household income	
≤Rp. 36.5 million/year	1,889 (79.5)
>Rp. 36.5 million/year	488 (20.5)
Number of children in the family	
≤2 children	952 (40.0)
3–4 children	1,048 (44.1)
≥5 children	377 (15.9)
Total	2,377 (100)

Table 1. Characteristics of the respondents ($n=2,377$).

Variables	Toothache		Logistic regression	
	Yes	No	OR	Significance
Sex				
Male	176 (14.3%)	1,055 (85.7%)	0.931	0.548
Female	155 (13.5%)	991 (86.5%)		
Mother's highest education				
≤Primary education (Ref)	156 (15.0%)	887 (85.0%)	0.905	0.567
High schools	152 (13.5%)	977 (86.5%)	0.739	0.490
University	23 (11.2%)	182 (88.8%)		0.305
Father's highest education				
≤Primary education (Ref)	135 (14.4%)	800 (85.6%)	1.055	0.814
High school	160 (13.7%)	1,009 (86.3%)	1.175	0.712
University	36 (13.2%)	237 (86.8%)		0.525
Household income				
≤Rp. 36.5 million/year (Ref)	270 (14.3%)	1,619 (85.7%)	0.892	0.491
>Rp. 36.5 million/year	61 (12.5%)	427 (87.5%)		
Number of children in the family				
2 children (Ref)	117 (12.3%)	835 (87.7%)	1.156	0.043
3–4 children	146 (13.9%)	902 (86.1%)	1.531	0.278
≥5 children	68 (18.0%)	309 (82.0%)		0.012
Total	331 (13.9%)	2,046 (86.1%)		

Table 2. Association between toothache in the last 4 weeks and socioeconomic characteristics using logistic regression model ($n=2,377$).
Note: OR, odds ratio.

and multivariate analysis using logistic regression model. This study found that 13.9% of children aged 12–14 years experienced toothache in the last 4 weeks. There was a variation in the frequency of dental pain in the last 4 weeks based on the categories of the independent variables. Descriptive statistics showed that the percentage of reported toothache in male children was 14.3% and slightly higher than female children (13.5%).

The toothache's prevalence of children decreased as the mother's education was higher based on descriptive statistic result. Fifteen percentage of children with mother's highest education had no education and primary school, while only 11% of children with mother's highest education had university-reported toothaches. The similar figure was shown for the proportion of toothache experience and father's highest education. The toothache's prevalence of children decreased as the father's education was higher, although the gap in each educational level was narrower compared to mother's educational background. With regard to household income, children lived in the lower economic status experienced higher percentage (14.3%) of toothache compared to their counterparts lived in higher household income (12.5%). The proportion of self-reported dental pain in the last 4 weeks was highest in the children of family with more than four children (18%).

Multivariate analysis of the association between toothache experience in the last 4 weeks in children aged

12–14 years and their family characteristics was conducted with logistic regression model. The result showed that the only independent variable which statistically had significant association with self-reported toothache was the number of children in the family. Respondents from the family with more than four children were 1.5 times more likely to report toothache in the last 4 weeks than their counterparts from the family of ≤ 2 children.

4. Discussion

The prevalence of self-reported toothache for the last 4 weeks in this study was 13.9%. Slade's¹³ review found that the prevalence of dental pain among children and adolescents in developed countries was from 5% to 33%. This result was higher than observed in Brazilian children aged 12 years (11%)⁹ but lower than the prevalence of 37.4% in children aged 12 years who examined in Greek¹⁴ and children in Los Angeles with 19% experienced toothache in the last 6 months.⁵

The differences in the prevalence of toothache demonstrated in this study with some previous researches may be attributed to numerous factors. Variation of the questions concerning dental pain could have contributed to these differences. Some studies asked for the toothache experience in life. Bastos et al.⁹ requested information on lifetime prevalence of toothache, whereas in the current study this information was collected for the last 4 weeks. Whether this question type overestimated or underestimated the prevalence of toothache, it is difficult to confirm although its use probably affected comparability with the findings. Furthermore, it is important to take into account precisely who is the respondent in the study.

In this study, descriptive statistics showed that male children had higher percentage of toothache, but this result was statistically insignificant on the regression model. The relationship of sex on oral health outcomes was found inconsistent pattern in previous studies.⁷

In terms of parental education, this study found a higher percentage of children who experienced toothache in the family of parents with lower education. This difference was higher for the mothers with highest educational background. However, logistic regression model showed that this relation was insignificant. This finding was inconsistent with some literature which showed significant association of parental education with oral health

outcomes.^{7,15} Parental education may influence through behavioral pathways which reflected knowledge and skills to support the oral hygiene of the children.^{7,15}

In this study, even though the percentage of children from lower household income reported more dental pain, statistical analysis showed insignificant result. Some previous studies also have similar insignificance on the multivariate model of association.^{2,16} It may be due to the problem that income information is not as easily as identifiable, especially in a single interview.² However, it has been found that the family income is associated with oral health outcomes in children.^{6,7} Family income may affect through the power of controlling access to oral health facilities and promotion resources.⁷

Among the study variables, the number of children in the family was a significant independent variable in explaining the occurrence of toothache in the last 4 weeks in children aged 12–14 years. Children born in a larger family may experience less attention from their parents because they may have overload of activities to take care of more children. Parents with more children may not be effective in assisting their children to teach good health behavior.¹⁷ This could also result in poor oral health habits and conditions such as dental pain. The size of the family can also influence the level of resources available to siblings to get better health care.^{6,15}

Recent studies have reported variations in association between family structure and oral conditions in children and adolescents. Pain is often considered a complex and subjective outcome related to emotional distress and linked to biological, cultural, psychological factors and reflects the adversity of the context where the individual lives.^{14,18}

5. Conclusions

Having many children in the family was identified as associated factor for self-reported toothache among children aged 12–14 years in Indonesia. These findings suggest that family characteristics should be considered when dental care is planned and implemented.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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