

## Self-Medication for Toothache and its Associated Factors in Children and Adolescents

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### Abstract

**Objective:** To evaluate self-medication for toothache and its associated factors in children and adolescents. **Material and Methods:** A cross-sectional study was carried out with 252 children/adolescents aged 6-16 years. A questionnaire was applied with questions related to demographic and socioeconomic characteristics; experience of, and self-medication for, toothache; as well as aspects related to the condition. Descriptive and inferential statistical analyses (Pearson's Chi-square test and Fisher's exact test) were performed, with a 5% significance level. **Results:** The prevalence of toothache was 41.7%. In 96 cases analyzed, there was prevalence of 69.8% of self-medication for toothache. There were no statistically significant associations between self-medication for toothache and variables related to the children/adolescents (gender and age), their parents or guardians (age and schooling), socioeconomic characteristics (family income and number of people in the household) and aspects related to toothache (fever, crying and school absenteeism) ( $p>0.05$ ). The most commonly used drug was paracetamol (60.7%), whose choice was based to its previous use by the study population for conditions not related to toothache (47.8%). **Conclusion:** There was a high prevalence of self-medication for toothache in the study population. No independent variable was associated with self-medication practice.

**Keywords:** Therapeutics; Self Medication; Prescriptions; Absenteeism.

## Introduction

According to the World Health Organization, self-medication is the act of medicating oneself, either on their own initiative or on the advice of a close person, to treat self-recognized conditions or symptoms without supervision by a healthcare professional [1]. The growth and dissemination of self-medication practice represents a serious global public health issue, with increased risks of adverse drug reactions, non-beneficial drug interactions, drug abuse, and the emergence of drug-resistant pathogens [2-4].

Studies have identified a relatively high prevalence of self-medication practice in several countries, including Brazil [5-11]. Factors contributing to this high prevalence include the wide variety of over-the-counter drugs and advertising campaigns that use the strategy of overemphasizing benefits and hiding the risks of medicines [12,13]. In addition, the difficulties of access to the public healthcare system and the high costs of healthcare insurance and medical consultations have also contributed to the dissemination of self-medication practice [14].

In the context of oral health, one of the most common reasons for one's self-medication is toothache, which can have varying causes such as dental eruption and tooth decay. Since it is a process characterized by painful symptoms, analgesic and anti-inflammatory drugs are most commonly used by patients presenting with toothache, in order to avoid or postpone visits to the dentist [15,16]. In schoolchildren, parent/caregiver anxiety and fear of dental care may be the leading reasons for the practice of self-medication for toothache [17-19].

Despite the significant adverse effects of self-medication, many of which having a significant impact on general health; studies of self-medication for toothache in children and adolescents remain scarce [12,20-22].

The present study aimed to identify the prevalence of self-medication for toothache among children and adolescents, as well as to analyze its possible association with demographic, socioeconomic and toothache-related characteristics (fever, crying and school absenteeism).

## Material and Methods

### Study Design and Sample Selection

A cross-sectional, descriptive and analytical study was carried out. The sample was selected from a universe of 462 children and adolescents enrolled in the 1st to the 9th grade in a school in the city of João Pessoa, Paraíba, Brazil.

The OpenEpi software, version 2.3.1 was used for sample calculation [23], which was based on an estimated prevalence of toothache of 50%, a confidence limit of 5% and a study design effect value of 1. Considering a 95% confidence interval, based on the estimate of proportions calculation, a sample of 210 children and adolescents was obtained. To compensate for possible sample losses, an additional 20% was included, resulting in a total sample of 252 children and adolescents.

### Pilot Study and Data Collection

A pilot study was carried out with 15 schoolchildren, enrolled in the 1st to the 3rd grade, to evaluate the understanding, adequate language interpretation, and validity of the study questionnaire. A total of 14 questionnaires were returned. The necessary adjustments were made accordingly and the data obtained at this stage of the study were not included in the final analysis.

A structured questionnaire was used for data collection, through which information concerning the child/adolescent and parents/guardians, socioeconomic characteristics (number of people in the household and monthly family income) and experience of toothache (fever, crying, school absenteeism and drug use), were obtained.

The questionnaires were given to teachers and annexed to the school schedule or delivered directly to the children/adolescents to be given to their parents/guardians, with the request that the questionnaire should be returned to the school via students. The questionnaires were collected by the teachers after three weeks and none were accepted afterwards.

#### Data Analysis

The data were submitted to statistical analysis in IBM SPSS Statistics Software, version 21 (IBM Corp., Armonk, NY, USA). To characterize the sample, descriptive statistical procedures were used. Pearson's Chi-square tests and Fisher's exact tests were used to determine possible associations between independent variables (demographic, socioeconomic and toothache-related experience) and dependent variable (self-medication for toothache), with a 5% significance level ( $p < 0.05$ ).

#### Ethical Aspects

This study was approved by the Research Ethics Committee of the Paraíba State Health Department (CEP/SES-PB), under CAAE No. 1506.0.000.349-11. All minors' parents/legal guardians signed an Informed Consent Form authorizing participation in the study.

#### Results

Among the 252 children and adolescents, 105 (41.7%) had experienced toothache and 96 of them were considered in this study. The sample loss ( $n = 9$ ) was due to incompleteness of the questionnaire. There was a higher frequency of toothache history among females (63.5%) and among those aged 13 years (21.9%), as shown in Table 1. Most parents/guardians were aged 31 to 40 years (62.5%) and had high school education (50%). The majority of families had an income below three Brazilian minimum wages (71.9%) and were composed of up to four people (57.3%). The prevalence of self-medication was 69.8% (Table 1).

Table 2 shows the association between self-medication practice and demographic, socioeconomic and toothache-related (fever, crying and school absenteeism) variables. There was no statistically significant association between the practice of self-medication and the other variables analyzed in this study ( $p > 0.05$ ).

**Table 1. Demographic and socioeconomic variables, experience of toothache and prevalence of self-medication.**

Variables	Frequency	
	N	%
Gender of the Child/Adolescent		
Male	35	36.5
Female	61	63.5
Age of the Child/Adolescent (in Years)		
6	1	1.0
7	3	3.1
8	10	10.4
9	13	13.5
10	12	12.5
11	11	11.5
12	12	12.5
13	21	21.9
14	9	9.4
15	2	2.1
16	2	2.1
Age of Parents/Guardians (in Years)		
21 to 30	11	11.5
31 to 40	60	62.5
41 to 50	20	20.8
51 to 60	5	5.2
Schooling of Parents/Guardians		
Elementary School	11	11.5
High School	48	50.0
Higher Education	37	38.5
Family Income		
Up to 3 Minimum Wages	69	71.9
> 3 Minimum Wages	27	28.1
Number of People in Household		
Up to 4 People	55	57.3
> 4 People	41	42.7
Self-Medication Practice		
Yes	67	69.8
No	29	30.2

**Table 2. Association of self-medication practice with demographic, socioeconomic and toothache-related variables.**

Variables	Self-Medication		p-value	(95% CI)
	Yes N (%)	No N (%)		
Gender of the Child/Adolescent				
Male	24 (68.6)	11 (31.4)	0.844*	1.095 (0.445-2.696)
Female	43 (70.5)	18 (29.5)		
Age of the Child/Adolescent				
Up to 11 Years	37 (74.0)	13 (26.0)	0.349*	1.518 (0.632-3.645)
> 11 Years	30 (65.2)	16 (34.8)		
Age of Parents/Guardians				
Up to 40 Years	52 (73.2)	19 (26.8)	0.215*	1.825 (0.701-4.752)
> 40 Years Old	15 (60.0)	10 (40.0)		

Schooling of Parents/Guardians				
Elementary / High School	42 (71.2)	17 (28.8)	0.707*	1.186 (0.487-2.886)
Higher Education	25 (67.6)	12 (32.4)		
Family Income				
Up to 3 Minimum Wages	64 (68.8)	29 (31.2)	0.551**	1.453 (1.267-1.666)
> 3 Minimum Wages	3 (100.0)	0 (0.0)		
Number of People in Household				
Up to 4 People	39 (70.9)	16 (29.1)	0.782*	1.132 (0.470-2.724)
> 4 People	28 (68.3)	13 (31.7)		
Fever				
No	64 (69.6)	28 (30.4)	1.000**	1.313 (0.131-13.174)
Yes	3 (75.0)	1 (25.0)		
Crying				
No	29 (64.4)	16 (35.6)	0.284*	1.613 (0.671-3.877)
Yes	38 (74.5)	13 (25.5)		
School Absenteeism				
No	52 (70.3)	22 (29.7)	0.851*	1.103 (0.395-3.078)
Yes	15 (68.2)	7 (31.8)		

\*Pearson's Chi-square test; \*\*Fisher's exact test.

Paracetamol (acetaminophen) was the drug most frequently used for toothache relief (60.7%), followed by dipyron (44.3%). There was a less frequent use of diclofenac (3.3%), nimesulide (1.6%) and scopolamine butylbromide (1.6%). Of note, topical anesthetics (3.3%) were also used for toothache relief, although at a lower frequency than the other drugs. Among the reasons underlying the choice for a specific drug for toothache relief, the most frequent one was previous use of the drug to relieve pain not related to toothache (47.8%), followed by prescription by a dentist in a previous episode of toothache (40.3%) (Table 3).

**Table 3. Absolute and relative frequency of the drugs used for toothache relief and the reasons underlying the choice in cases of self-medication.**

Variables	Frequency	
	N	%
Drugs Used		
Paracetamol	37	60.7
Dipyron	27	44.3
Ibuprofen	7	11.5
Diclofenac	2	3.3
Topical anesthetic	2	3.3
Nimesulide	1	1.6
Scopolamine butylbromide	1	1.6
Reasons for Choosing the Drug		
Already used for pain not related to toothache	32	47.8
Prescribed by the dentist in a previous episode of toothache	27	40.3
Indicated by relative/friend	7	10.4
Advertisement	1	1.5

## Discussion

Despite the health-related risks associated with the unsupervised use of drugs, little is known about self-medication for toothache among children and adolescents. A study with 300

parents/guardians of children with toothache treated at the emergency dental clinic of a tertiary care hospital revealed that 76% of them were self-medicated with at least one dose of over-the-counter painkillers [20]. Another study with 476 parents/guardians of children aged 2 to 9 years treated at a dental specialty center in northern Brazil reported that most of them (67.2%) self-medicate in cases of dental emergency [21]. In agreement with these findings, the present study identified a high prevalence (69.8%) of self-medication for toothache in children and adolescents.

In contrast, other studies [12,22] have reported lower prevalence rates of self-medication for resolution of dental issues as compared to those observed herein. A previous study investigated self-medication practice in cases of dental infection with 150 parents/caregivers of children and adolescents treated at a university dental service in southern Brazil. The authors observed a prevalence of self-medication of 21.7% [12], which is in contrast with the findings observed in our study. Such inconsistency in the findings may be related to the regional differences influencing the practice of self-medication in Brazil [24].

A population-based study carried out in southern India revealed that 49.6% of the individuals who performed self-care in cases of toothache had used over-the-counter medicines for pain relief [22]. In particular, only 10.6% of the individuals under the age of 18 reported self-care in cases of toothache [22]. Although such findings disagree with those observed in the present study, it should be emphasized that the survey performed in southern India examined a population with low socioeconomic status residing in a rural region [22].

Self-medication can be influenced by factors such as age, gender, family, society, income, education level, previous medical knowledge, previous experience with the same or similar diseases, attitude and perception of one's own health [25-27]. For some authors, a high education level and the nature of the profession (e.g. health-related professions) are predictive factors for self-medication, as it is believed that parents/guardians feel safer using specific drugs when they have greater information about them [26]. In the present study, however, none of the characteristics related to parents/guardians (age and schooling) and socioeconomic conditions (family income and number of people in the household) exhibited a significant association with self-medication practice. Similarly, in a survey with 150 parents/guardians of children and adolescents with a history of dental infection, no statistically significant association was observed between the practice of self-medication and the mother's age or education level [27].

The practice of self-medication for rapid relief of pain, fever or crying symptoms associated with toothache, can result in financial savings with consultations, examinations and treatments, and less time dedicated to child or adolescent care. It has been reported that in economically disadvantaged communities, where the level of schooling is lower, most episodes of pain are treated by self-medication [16,25]. Consistent with these reports, a study carried out with a low socioeconomic status population, residing in a rural area of India, showed that the most common form of self-care in cases of toothache was the use of over-the-counter medicines [22]. Despite these findings, no statistically significant associations between socioeconomic variables and self-medication

for toothache were observed in our study. Similar results were reported by a previous study on the practice of self-medication in cases of dental infection in children and adolescents [12].

Analgesics (paracetamol/acetaminophen and dipyrone) were described as the main drugs used for self-medication in this study, which may be related to their wide availability and low cost [12,19,28]. These drugs can temporarily relieve toothache or any other discomfort reported by children [18,20]. In a significant percentage of cases (40.3%), the reason for choosing the drug consisted of its previous prescription by the dentist to relieve another toothache episode, which suggests the need for a more rational use of the over-the-counter medicines. Results from a study performed in a dental emergency service revealed that 62.2% of admitted patients exceed the maximum daily dose of analgesics and that even prior medical advice was not able to significantly reduce overdose rates [29].

Despite the important findings of this study, there are also some limitations that should be addressed. One limitation is related to the cross-sectional study design, which does not allow for causal inferences. The sample was non-probabilistic and may not represent the child/adolescent student population of João Pessoa, Brazil, thus limiting the external validity of the study. Another limitation is the “recall bias”. Since parents/guardians had to rely on their memory to answer the questionnaire, and some questions refer to the whole life of the child/adolescent, the answer was susceptible to forgetfulness.

With the popularization of access to information, there has been an increasing tendency for self-care and self-medication. While there are many potential benefits of self-care, an accurate knowledge on the medicines is required to promote their rational use [30]. Thus, the evolution of self-medication needs to be regulated, and dentists should instruct parents/guardians and other patients to always use medications following a dental or medical prescription, in order to prevent undesirable drug reactions and avoid possible side effects.

## Conclusion

There was a high prevalence of self-medication for toothache in the study population. None of the independent variables were associated with self-medication. Self-medication without adequate instruction should be discouraged to prevent undesirable drug reactions and avoid possible harmful effects.

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**Conflict of Interest:** The authors declare no conflicts of interest.

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