

## Association between parental guilt and oral health problems in preschool children

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**Abstract:** Parents may feel guilty about their children's oral problems, which can affect their quality of life. The aim of this study was to assess the presence of parental guilt and its association with early childhood caries (ECC), traumatic dental injuries (TDI) and malocclusion (AMT) in preschool children. All 2 to 5 year-old children (N = 305), and their parents, seeking dental care at the University of São Paulo Dental School one-week Screening Programme, were asked to participate in the study, and 260 agreed. Children were examined by two calibrated dentists, and their parents answered a socioeconomic and ECOHIS questionnaire; the question on guilt was used as the dependent variable. Regression analyses examined the association between parental guilt and ECC, TDI, AMT and socioeconomic factors. A total of 35.8% of parents felt guilty. This was only associated with caries severity. No association was found between guilt and TDI, AMT or socioeconomic factors. ECC was present in 63.8% of the children; the mean ( $\pm$  sd) dmft score was 7.29 ( $\pm$  2.78). Thus, the number of parents feeling guilty increases with the increase of their children's dental caries severity. Parental guilt is related to caries but is not associated with TDI or AMT.

**Descriptors:** Guilt; Dental Caries; Tooth Injuries; Malocclusion; Quality of Life.

### Introduction

Early childhood caries (ECC) is a disease involving at least one decayed, missing or filled tooth (dmft  $\geq$  1) in children no older than 71 months.<sup>1</sup> ECC has been associated with children's diet and socioeconomic background, and although its incidence is decreasing, it is still common among preschool children.<sup>2</sup> Traumatic dental injuries (TDI) are also frequent in preschool children and are becoming a public health problem.<sup>3</sup> The prevalence of TDI has been associated with the child's age and the presence of malocclusion.<sup>4,5</sup> The latter factor is an anomaly usually caused by deleterious oral habits. In preschool children, the prevalence of malocclusion can be as high as 76% and is most frequent in the anterior teeth (Anterior Malocclusion Traits - AMT).<sup>6,7</sup>

It is believed that the above-mentioned conditions can be prevented, particularly when the children's parents and caregivers have access to information about how their children's oral health is their responsibility.<sup>8-10</sup> If parental knowledge about oral health is increased, there is a possibility

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that they will not feel guilty about their children's oral problems.<sup>11</sup> However, to the best of our knowledge, this is the first study to assess whether parents feel guilty about the presence of ECC, TDI or AMT in their children.<sup>11</sup> Moreover, socioeconomic factors should be investigated, as they are strong predictors of the prevalence of oral disease in children.<sup>12</sup> Hence, further studies on the subject are still considered necessary.

Accordingly, the aim of this study was to examine preschool children for the presence of ECC, TDI and AMT and to investigate possible association of these variables with parental guilt as well as socioeconomic factors.

## Methodology

This study was reviewed and approved by the Research Ethics Committee, School of Dentistry, USP (36/2009); all participants gave informed consent to participate in the study.

### Participants

All preschool children, aged 2 to 5 years, and their parents, who sought dental care during the Screening Program, were invited to participate in this study (N = 305). Children must not have been undergoing dental and orthodontic treatment. The children's age was categorised as: 2 < 3; 3 < 4; 4 < 5; 5 < 6, and labelled as: 2 years old (yo), 3 yo, 4 yo and 5 yo, respectively. The children could be of any gender, and their parents must have agreed to participate in the study.

A total of 260 parents and children agreed to participate in the study (response rate of 85.2%). Participation in this study was not a *sine qua non* condition to be treated at the dental clinic. Therefore, all non-participants were still enrolled for treatment at the clinic.

Two calibrated paediatric dentists examined the children while the children's parents answered questionnaires, in an interview format, on the socioeconomic conditions of the family and about whether they felt guilty about their children's oral problems.

### Children's oral examination

The examinations for ECC, TDI and AMT were

performed in a dental unit using an operating light, a 3-in-1 syringe, tongue depressors and WHO periodontal probes.

Before the study, intra-examiner agreements were calculated one week apart using primary teeth, pictures or model casts for ECC, TDI and AMT; kappa values were all > 0.8. For inter-examiner reliability, both examiners assessed 26 (10%) children, giving Cohen's kappa values of 0.8, 0.9 and 1.0 for ECC, TDI and AMT, respectively.

ECC was assessed according to the dmft World Health Organization (WHO) criteria<sup>13</sup> and categorised according to severity:<sup>1,14</sup>

- dmft 0 = caries-free;
- dmft 1–5 = low severity; or
- dmft ≥ 6 = high severity.

The types of TDI were classified according to the system adopted by the WHO.<sup>15</sup> As the upper front teeth are more prone to any type of traumatic dental injury,<sup>5,16</sup> the present study assessed TDI from the upper canine to the opposite upper canine. Injuries to the hard dental tissues, the pulp and the alveolar process as well as injuries to the periodontal tissues were assessed. This variable was analysed according to the presence or absence (tooth present and sound) of TDI.

Anterior Malocclusion Traits (AMT) included anterior open bite, overjet greater than or equal to 4 mm and anterior cross bite. Children were categorised as either having, or not, AMT.<sup>17</sup>

### Socioeconomic questionnaire and parental guilt

Two interviewers, who were blinded to the oral examinations, were trained in the reading and intonation of the questions from the questionnaire. They conducted the interviews with a questionnaire on the family socioeconomic conditions<sup>18</sup> and the ECOHIS questionnaire for Oral Health Impact on the Quality of Life of preschool children. This study focused on one of the questions from the family section of the questionnaire that showed a good internal consistency and test-retest reliability.<sup>19</sup> The parent was asked how often he/she, or any other family member, felt guilty because of their child's dental

problems. This question had the following response options:

- never,
- hardly ever,
- occasionally,
- often and
- very often.

To analyse the data, the answers about parental guilt were changed to a dichotomous binomial variable—either the absence (including only the “never” response option) or the presence of guilt (including the remaining response options).

### Data analysis

The question on feeling guilty was taken from the ECOHIS questionnaire, and the answer to this question was used as dependent variable. Forward stepwise Poisson regression analysis with robust variance was performed to observe the association between parental guilt (outcome) with each oral problem (ECC, TDI, AMT) and with each socioeconomic factor. Additionally, the oral problems (ECC, TDI and AMT) were considered as outcomes and were tested for association with the socioeconomic factors. Covariates with  $p < 0.20$  on the univariate analysis were considered for each of the final models. The order of including the variables in the multivariate regression model was based on biological plausibility. Variables with  $p < 0.05$  were kept in the multivariate model. The Poisson regression analysis should be interpreted using the Rate Ratio (RR) score. If RR is less than 1, the analysed variable decreases the possibility that the outcome will occur. If RR is greater than 1, the analysed variable increases the possibility that the outcome will occur. The outcome event was either parental guilt or ECC, and the individual subject (child) was considered as a unit of analysis. Spearman correlation was performed between ECC and parental guilt; the statistical software used was STATA 8.0 (Stata Corp., College Station, USA).

### Results

The general characteristics of the children and their socioeconomic status are expressed in Tables

1 and 2. ECC was present in 63.8% of the children, and the mean ( $\pm$  sd) dmf-t score was 7.3 ( $\pm$  2.8). TDI and AMT were present in 30.0% and 24.2% of the children, respectively.

Parental guilt was correlated to dental caries (coefficient of 0.333,  $p < 0.001$ ); a total of 35.8% of the

**Table 1** - Univariate analyses of the association between parental guilt, oral conditions and socioeconomic factors. (continued on next page)

Oral and Socio-economic conditions	n (%)	Robust RR (95% CI)	P value *
ECC			
No caries	94 (36.2)		
1 to 5 teeth affected	87 (33.4)	1.90 (1.13–3.20)	
6 or more teeth affected	79 (30.4)	3.57 (2.23–5.72)	<b>&lt; 0.001</b>
TDI			
No	182 (70.0)		
Yes	78 (30.0)	0.99 (0.68–1.43)	0.950
AMT			
No	197 (75.8)		
Yes	63 (24.2)	0.95 (0.72–1.26)	0.727
Child's sex			
Male	137 (52.7)		
Female	123 (47.3)	1.01 (0.71–1.43)	0.962
Child's age			
2 years old	46 (17.7)		
3 years old	60 (23.1)	1.44 (0.78–1.65)	
4 years old	66 (25.4)	1.76 (1.00–3.12)	
5 years old	88 (33.8)	1.13 (0.62–2.04)	0.107
Marital status of the parents			
Married parents	185 (71.2)		
Separated parents	75 (28.8)	1.00 (0.68–1.48)	0.984
Household crowding			
No crowding	65 (25.2)		
1 inhabitant per room	78 (30.2)	1.36 (0.82–2.24)	
2 inhabitants per room	51 (19.8)	1.41 (0.83–2.42)	
3 inhabitants per room	64 (24.8)	1.55 (0.94–2.54)	0.380
House property			
No	80 (30.8)		
Yes	180 (69.2)	0.79 (0.55–1.13)	0.201

**Table 1** (continued)

Mother's age			
≤ 30 years	121 (46.7)		
> 30 years	138 (53.3)	0.74 (0.53–1.05)	0.093
Father's age			
≤ 30 years	156 (66.7)		
> 30 years	78 (33.3)	1.20 (0.79–1.84)	0.395
Number of siblings			
None	85 (32.9)		
1	87 (33.7)	1.32 (0.88–1.97)	
2 or more	86 (33.3)	0.78 (0.49–1.26)	0.051
Mother's education			
< 8 years	102 (39.7)		
≥ 8 years	155 (60.3)	0.81 (0.57–1.15)	0.242
Father's education			
< 8 years	123 (52.6)		
≥ 8 years	111 (47.4)	0.88 (0.61–1.28)	0.502
Mother works away from home			
No	120 (46.5)		
Yes	138 (53.5)	0.81 (0.58–1.15)	0.243
Father works away from home			
No	39 (16.7)		
Yes	194 (83.3)	1.25 (0.67–2.34)	0.487
Family Income	247 (95.0)	1.00 (1.00–1.00)	0.101

\* calculated by Wald test. Robust RR: Robust Rate Ratio.

parents felt guilty. Table 1 shows that, as the severity of caries increases in children, more parents feel guilty ( $p < 0.001$ ). On the other hand, no association was found with any of the socioeconomic factors or with TDI or AMT ( $p > 0.05$ ). The forward stepwise multivariate model showed that only ECC was significantly related to parental guilt; therefore, the table is not shown.

As the “multivariate” model for parental guilt only included ECC, Table 2 was constructed to show the distribution of guilt in relation to the children's age and caries severity.

To better understand the sample, a multivariate model was developed by considering the severity of caries as an outcome (Table 3).

In this sample, TDI was not associated with the socioeconomic conditions ( $p > 0.05$ ), but was associated with AMT ( $p < 0.001$ ). Similarly, no association was observed between AMT and any of the analysed socioeconomic factors ( $p > 0.05$ ).

## Discussion

The present study found that parents feel guilty when their children's caries severity increases. To the best of our knowledge, only one study, to date, has focused on the presence of parental guilt in relation to oral diseases.<sup>11</sup> In that study, the authors found

**Table 2** - Distribution of parental guilt according to the children's age and caries severity.

Age	Caries severity	Parental guilt		Total n (%)	p-value
		No n (%)	Yes n (%)		
2	Caries Free	21 (8.1)	5 (1.9)	26 (10.0)	
	Low	11 (4.2)	5 (1.9)	16 (6.1)	
	High	1 (0.4)	3 (1.2)	4 (1.6)	*
3	Caries Free	14 (5.4)	7 (2.7)	21 (8.1)	
	Low	15 (5.8)	6 (2.3)	21 (8.1)	
	High	9 (3.5)	9 (3.5)	18 (7.0)	0.355 <sup>(a)</sup>
4	Caries Free	11 (4.2)	5 (1.9)	16 (6.1)	
	Low	12 (4.7)	6 (2.3)	18 (7.0)	
	High	13 (5.0)	19 (7.3)	32 (12.3)	0.088 <sup>(b)</sup>
5	Caries free	29 (11.1)	2 (0.8)	31 (11.9)	
	Low	19 (7.3)	13 (5.0)	32 (12.3)	
	High	12 (4.6)	13 (5.0)	25 (9.6)	< 0.001 <sup>(c)</sup>
Total		167 (64.2)	93 (35.8)	260 (100.0)	

\* Unable to adopt the Chi-square test; <sup>(a)</sup>  $\chi^2 = 2.07$ ;  $df = 2$ ; <sup>(b)</sup>  $\chi^2 = 4.87$ ;  $df = 2$ ; <sup>(c)</sup>  $\chi^2 = 15.03$ ;  $df = 2$ .

**Table 3** - Multivariate model of the association between the severity of caries and socioeconomic conditions.

Socioeconomic conditions	n (%)	Robust RR (95% CI)	p-value
Child's age			
2 years old	46 (17.7)		
3 years old	60 (23.1)	2.05 (1.17–3.61)	<b>0.012</b>
4 years old	66 (25.4)	2.85 (1.67–4.85)	<b>&lt; 0.001</b>
5 years old	88 (33.8)	2.16 (1.23–3.72)	<b>0.006</b>
Child's sex			
Male	137 (52.7)		
Female	123 (47.3)	0.74 (0.56–0.98)	<b>0.035</b>
Family income	247 (95.0)	0.88 (0.81–0.96)	<b>0.003</b>
Mother's age			
≤ 30 years	121 (46.7)		
> 30 years	138 (53.3)	0.71 (0.54–0.94)	<b>0.018</b>
Mother works away from home			
No	120 (46.5)		
Yes	138 (53.5)	0.75 (0.57–0.99)	<b>0.046</b>

\* Wald test Chi-square:  $p \leq 0.001$ . Robust RR: Robust Rate Ratio.

that parents feared being blamed for their children's oral problems. Another study, which focused mainly on the quality of life of children with heart disease, observed that parents of special care children felt more guilty than parents of healthy children.<sup>20</sup> This relationship between parental guilt and oral problems could be due to the impact that ECC has on the child, the family and the community.<sup>21</sup>

"Guilt" is a feeling that occurs when one assesses one's specific action as a failure or, especially, when the particular action has led to failure.<sup>22</sup> The feeling of guilt is related to shame, which is felt when one considers oneself to be a "bad thing" because of what has happened.<sup>23</sup> The present study considered all answers to be guilt, but did not investigate why parents felt guilty. However, the feeling of guilt arises when parents fear being blamed for their children's oral problems.<sup>11</sup> This phenomenon can be speculated because the main causes of dental caries are widely broadcast by many oral health professionals.<sup>24</sup> Therefore, if parents know how to prevent oral problems, it is reasonable to believe that their lack of preventive measures has led to their feelings of guilt.

Parental guilt could be further explained from another perspective. Parents commonly accept the lack of pain in their children to be a sign of good health. In addition, some parents believe that dental caries is a common/normal occurrence in children and that it is somehow inevitable.<sup>24</sup> This misconception could explain the large number of parents who answered "never feeling guilty".

In the present study, parental guilt was assessed using one question from the ECOHIS questionnaire, but during its validation,<sup>25</sup> a significant correlation was found between the section containing the question on guilt and the children's dental health ( $r = 0.30$ ). In our study, parental guilt and ECC showed a similar  $r$ -value, suggesting that this question could be used to measure parental guilt.

Although parental guilt was associated with dental caries, no association was found between parental guilt and socioeconomic factors, TDI or AMT. In relation to TDI, a condition which does not cause long periods of pain for the child, 84.6% of all TDI was categorised as "not severe". Similarly, AMT also causes no pain for the child. Therefore, parents might have judged their children as having no oral problems and not feel guilty for their children's TDI or AMT. Additionally, the factors associated with TDI and AMT are not clearly explained to parents. This can lead parents to believe that TDI is caused by accident or that AMT is hereditary. However, these oral problems can be prevented,<sup>9</sup> and greater efforts should be made to educate parents and caretakers about the prevention of these problems. Therefore, one of the reasons for the significant increase in TDI during the last few years, from 9.4% to 13.9% in children, could be that parents and caretakers do not believe that TDI is preventable.<sup>3</sup>

As this study was performed during the Screening Programme, it is possible that parents would try to provide an answer simply to get their child into the dental treatment programme. However, as soon as the parents arrived, they were informed that the children would be placed on waiting lists and that treatment was guaranteed. As it was clear to the parents that all children would be admitted, there was little risk that the parents would provide answers that they perceived would enable their child to be

admitted into treatment. Furthermore, parents usually seek dental care for their children when an oral problem arises.<sup>26</sup> This phenomenon may explain the possible overestimation of the prevalence of ECC, TDI and AMT in our study, but there is also a possibility that these parents already felt guilty about their children's oral problems. This possibility could additionally indicate an overestimation in the presence of parental guilt. However, the present results show that parents are considerably more concerned about their children's oral health.<sup>27</sup>

Parental knowledge, attitudes and the family's socioeconomic condition have a direct influence on children's oral health;<sup>24,28</sup> thus, it would be interesting to perform studies to discover the reasons for why parents feel guilty. Moreover, future studies should consider whether parents who feel guilty about their children's carious lesions could be motivated to change their behaviour towards better and

healthier habits.<sup>11,29</sup> If such changes are possible, dentists can work with this issue to change oral habits in the family and improve oral health in preschool children.

## Conclusion

In conclusion, it can be stated that the chances of parents feeling guilty for their children's oral problems increases with the increase of their children's dental caries severity; parental guilt is not associated with TDI or AMT.

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