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Factors Associated with Dental Pain in Toddlers – Using Dental Discomfort Questionnaire (DDQ)

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ABSTRACT

Dental pain is considered as one the most common symptoms associated with oral problems. It creates a great impact on the quality of life and if it gets worse, it may even affect the daily activities. In neonates and toddlers, behavioural and psychological variations are used to assess pain. The aims of this study are to evaluate the factors associated with dental pain in toddlers using DDQ. To compare dental pain and dental caries evaluated using ICDAS. To compare the frequency of dental pain and socio-economic status of parents. A cross sectional study was conducted in Saveetha Dental College Chennai, Tamilnadu. 93 children of the age group 1-4 years (toddlers) were submitted to an oral clinical examination for the evaluation of dental caries using International Caries Detection and Assessment System (ICDAS). The caregivers of the children were asked to fill a dental discomfort questionnaire along with a questionnaire addressing their socio-economic and educational status . The factors ``chewing on one side" and "reaching the cheek while chewing are the common associated factors of pain which were observed by the parents and caretakers of the children. Pain scores were higher in patients with caries involving dentin, with or without involving pulp (scores 4 and above). Families with low annual income had increased pain scores. Greater frequencies of pain were observed in families with low income and also in dental caries involving dentin with/without involving pulp.

KEY WORDS: DENTAL PAIN IN TODDLERS, TOOTH PAIN IN TODDLERS, CARIES IN TODDLERS, DENTAL DISCOMFORT QUESTIONNAIRE, PAIN ASSESSMENT IN TODDLERS..

INTRODUCTION

Dental pain is considered as one the most common symptoms associated with oral problems. It creates a great impact on the quality of life and if it gets worse, it may even affect the daily activities. (Ratnayake and Ekanayake, 2005; Moura-Leite et al., 2011; Marayza Alves Clementino et al., 2015) Pain is a subjective experience and hence self report pain measures are considered gold standard for assessment of pain. Objective assessment of pain in children is a great challenge for all healthcare workers including dentists. (Franck, Greenberg and Stevens, 2000) This is because children are unable to verbalise feelings of pain and moreover variations in children's cognitive abilities affect how they perceive, understand, remember, and report pain. (Versloot, Veerkamp and Hoogstraten, 2005; Daher, Abreu and Costa, 2015) Children gradually improve their understanding of pain (6–11 years), the cognitive sequence ends in the formal operational stage in which children (12 years and older) use sophisticated psychophysiological concepts to describe pain. These children generally understand why pain hurts and can explain its value. (Harbeck and Peterson, 1992)

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In neonates and toddlers, behavioural and psychological variations are used to assess pain. Hence parents play an important role in the assessment of pain in neonates and toddlers. (Reid et al., 1995; M. A. Clementino et al., 2015) The Dental Discomfort questionnaire (DDQ) is a tool devised to recognise pain and to assess the severity of pain in children 2-5 years of age through the reports of parents / caregivers regarding the changes in their child's behaviour. (Knowledge and Attitude of Parents Regarding Children's Primary Teeth & their Willingness for Treatment, no date; Versloot, Veerkamp and Hoogstraten, 2006; Daher et al., 2014) There are several factors associated with dental pain. In young children, the factors are less and one main factor among the several factors associated with pain is dental caries. (Slade, 2001; Ortiz et al., 2014; Ferreira-Júnior et al., 2015; Nivethithan and Raj, 2015; Schuch et al., 2015; Naziya et al., 2017) Pain caused by carious tooth can be manifested in different ways by the child – child may eat less, sleep less, sometimes may exhibit negative behaviour. In a study, post treatment of dental caries, there was a subsequent increase in the quality of life in children like eating and sleeping. (Naziya et al., 2017) A study on the effects of dental caries on the quality of life in children showed that only 48% of the children with carious lesions indicated that they had pain or discomfort, however they did manifest effects of pain by changing their eating and sleep habits. (Low, Tan and Schwartz, 1999)

Our department is passionate about child care, we have published numerous high quality articles in this domain over the past 3 years. (Govindaraju, Jeevanandan and Subramanian, 2017a, 2017b; Panchal, Gurunathan and Shanmugaavel, 2017; Ravikumar, Jeevanandan and Subramanian, 2017; Jeevanandan and Govindaraju, 2018; Nair et al., 2018; Ravikumar et al., 2018, 2019; Ravindra et al., 2018, 2019; Subramanyam et al., 2018; Vishnu Prasad et al., 2018; Jeevanandan, Ganesh and Arthilakshmi, 2019; Ramadurai et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Veerale Panchal, Jeevanandan and Subramanian, 2019; Vignesh et al., 2019; V. Panchal, Jeevanandan and Subramanian, 2019; Samuel, Acharya and Rao, 2020). With this inspiration we planned to pursue research on the factors associated with dental pain in toddlers - using dental discomfort questionnaire (DDQ). The usage of Dental Discomfort Questionnaire aids in the assessment of dental pain in children less than 5 years and helps in understanding dental pain experience in them. The aims of this study are to evaluate the factors associated with dental pain in toddlers using DDQ. To compare dental pain and dental caries evaluated using ICDAS. To compare the frequency of dental pain and socio-economic status of parents.

MATERIAL AND METHODS

A cross sectional study was conducted in Saveetha Dental College Chennai, Tamilnadu. 93 children of the age group 1-4 years (toddlers) were submitted to an oral clinical examination for the evaluation of dental caries using International Caries Detection and Assessment System (ICDAS). The caregivers of the children were asked to fill a dental discomfort questionnaire along with a questionnaire which includes their demographic details, socio economic status and educational status of the family. Only the mother's educational status was included in the study as it has a great significance in the oral health of the child. Children with systemic health problems that required medical assistance and greater care on the part of the parents/caregivers were excluded from the study.

The questionnaire consisted of 3 parts. First part included demographic details. The second portion included the Dental Discomfort Questionnaire (DDQ) and the final portion of the questionnaire included questions assessing their socioeconomic status and educational status of the parent. The DDQ included the following questions (Figure 1)

Figure 1: Dental Discomfort Questionnaire (DDQ)

Dental Discomfort Questionnaire

How often did the child have a toothache?

a. Never
b. Sometimes
c. Often
d. I do not know

If sometimes or often , when does it occur?

a. During meals
b. During the day
c. During the night

Do you notice the toothache yourself? Yes/No

Does your child indicate the toothache to you? Yes/No

Behavioural and lifestyle changes observed : Each question is given a score based on the option selected. Final score is calculated.

0: Never 1: Sometimes 2. Often

1. Bites with molars instead of front teeth
2. Puts away something nice to eat
3. Cries during meals
4. Has problems with brushing lower teeth
5. Has problems with brushing upper teeth
6. Has earache during the day
7. Has earache at night
8. Has earache while eating
9. Has problems chewing
10. Chews on one side
11. Reaches for the cheek while eating
12. Suddenly cries at night

Final score:

RESULTS AND DISCUSSION

This study investigated factors associated with dental pain detected using DDQ. A total of 93 children (71% females and 29% males) aged 1-4 were included in the study [figure 2 and 3] . Only 6.5% of the respondents experienced tooth ache often; 54.8% of the respondents had toothache sometimes and 25.8% of the respondents never had toothache [figure 4]. 50% of the children experienced toothache during the day, 22.7% at night and 27.2% during meals [figure 5]. 35.7% parents admit that

they can't notice the toothache by themselves [figure 6]. 57.1% of the respondents say that their child indicates toothache to them [figure 7].

Figure 2: Bar graph depicting toddlers belonging to different age groups. X-axis shows the different age groups - 1 year (lavender colour), 2 years (blue colour), 3 years (green colour) and 4 years (beige colour) respectively. Y-axis shows the number of participants. Participants aged 4 years were more.

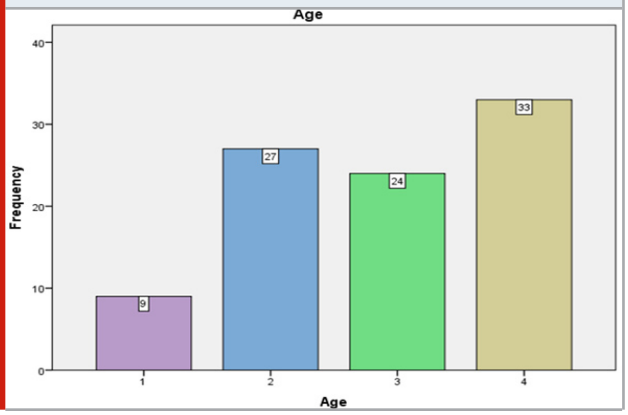


Figure 3: Bar graph depicting the gender of participants. X-axis shows gender - males (green colour) and females (blue colour). Y axis shows the number of participants. Females (71%) were more compared to males (29%).

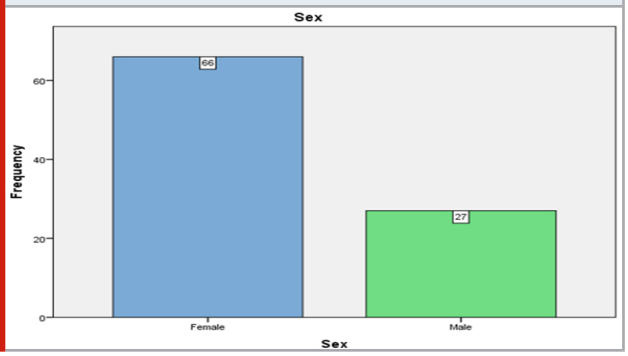


Figure 4: Pie chart depicting the frequency of toothache among the participants. 54.84% of the participants responded that their child experienced toothache "sometimes" (magenta colour), 25.81% said "never" (green colour), 6.45% said "often" (beige colour) and 12.9% said "they don't know" (blue colour).

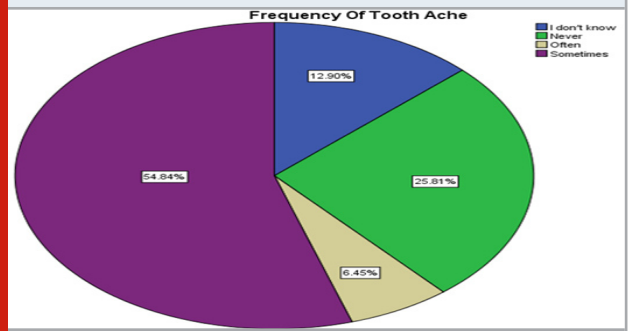


Figure 5: Pie chart depicting the onset of pain among the participants. 35.48% of the participants responded that their child experienced toothache "during the day" (green colour), 29.03% said "during meals" (blue colour), 16.13% said "during the night" (beige colour). Majority of the participants reported toothache during the day.

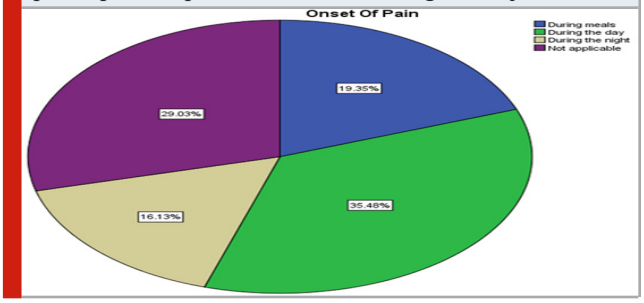


Figure 6: Pie chart depicting the signs of pain identified by the parents. 58.06% of the participants responded that they did not find any sign indicating toothache (blue colour), 32.26% said they were able to identify signs indicating toothache (beige colour).

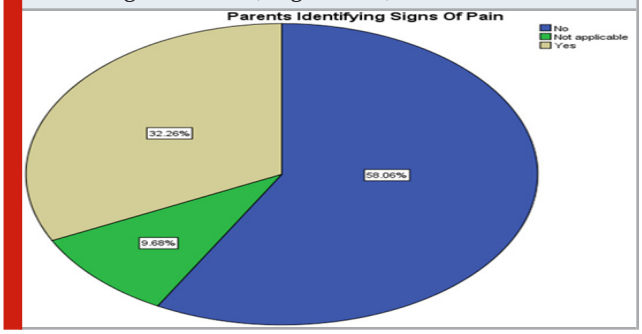
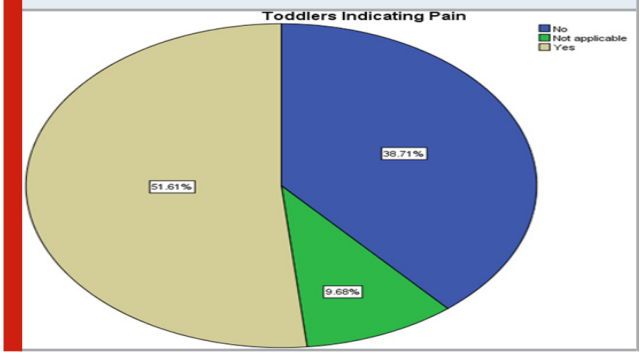


Figure 7: Pie chart depicting the frequency of toddlers indicating toothache. 51.61% of the toddlers were able to indicate pain (beige colour), 38.71% of toddlers were not able to indicate tooth pain (blue colour).



The percentage of different factors associated with pain and is expressed by the respondents is tabulated in Table 1.

From Table 1 it is evident that the factors ``chewing on one side" and "reaching the cheek while chewing are the common associated factors of pain which were observed by the parents and caretakers of the children. These

results were in contrast with the results obtained in a study done by Isabella Barbican Fernandes et.al., where the most frequent factors were "suddenly cries at night", "puts away something nice to eat" and bites with molars instead of front teeth". (Fernandes et al., 2018)

Table 1. DDQ index

Factor	Never (n%)	Sometimes (n%)	Often (n%)
Bites with molars instead of front teeth.	48.4%	45.2%	6.5%
Puts away something nice to eat	54.8%	41.9%	3.2%
Cries during meals	54.8%	45.2%	0
Has problems with brushing lower teeth	54.8%	45.2%	0
Has problems with brushing upper teeth	71%	19.4%	9.7%
Has earache during the day	74.2%	22.6%	3.2%
Has earache at night	80.6%	16.1%	3.2%
Has earache while eating	80.6%	90.4%	0
Has problems chewing	61.3%	38.7%	0
Chews on one side	35.5%	61.3%	3.2%
Reaches for cheek while eating	41.9%	58.1%	0
Suddenly cries at night	64.5%	29%	6.5%

Pain scores were higher in patients with caries involving dentin, with or without involving pulp (scores 4 and above). This is due to the exposed dentinal tubules. This is in accordance with several studies done to find the association with dental caries and dental pain. (Low, Tan and Schwartz, 1999; Thomas and Primosch, 2002) More advanced stages of dental caries have proven to restrict the daily activities of affected children [6].

Mother's age and schooling did not have any correlation with increased pain score as observed by Isabella Barbican Fernandes et.al., But socioeconomic status had an effect on the pain score. Families with low annual income had increased pain scores. This is in accordance with the study done by Isabella Barbican Fernandes et.al., (Fernandes et al., 2018) Several other studies have also proved the association between dental pain and socioeconomic factors. (Slade, 2001; Ratnayake and Ekanayake, 2005; Ferreira-Júnior et al., 2015; Schuch et al., 2015; Narayanan, 2017; Siddiqui et al., 2019)

CONCLUSION

This study investigated various factors associated with dental pain in toddlers using DDQ. These findings are of great importance to understand the determinants of pain and also to educate parents to under and identify these behavioural changes associated with pain. Many children with rampant caries remain untreated as they fail to verbally express pain. In this study, greater frequencies of dental pain was observed in children with caries involving dentin, with or without involving pulp. Also there were increased scores in children with low annual income. This study was done to educate parents to identify these factors and to seek dental help at the earliest and prevent further damage to teeth.

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