

Prevalence and Impact of Dental Pain on Oral Health Related Quality Of Life among 8-12 Year Old School Children in Bangalore City

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Abstract

Objectives

To determine the prevalence, intensity, characteristics and impact of dental pain on oral health related quality of life (OHRQoL) among 8-12 year-old school children in Bangalore city.

Methods

A cross-sectional study using a multi-stage random sampling technique was carried out to determine the prevalence and impact of dental pain among 782, 8-12 year old schoolchildren in Bangalore city. An OHRQoL measure, Child-Oral Impacts on Daily Performances index (Child-OIDP) was used to assess oral impacts.

Results

The life-time prevalence of dental pain was 52.9% and the last three months prevalence was 31.8%. Three month prevalence of dental pain was significantly higher in 8-10 year age group ($p=0.002$) in comparison with 11-12 year age group and in public schools ($p<0.001$) in comparison with private schools. About 88.3% of children had one or more oral impacts. The severity of impacts was highest for

eating (74.4%) followed by speaking and low for smiling and social contact performances. Females had 3.01 times odds of having an impact when compared to males ($p=0.006$). Adjusted odds ratio for dmft(t) was 1.95 (95% CI 1.24;3.05) ($p=0.003$) and for DMF(T) Was 1.94 (95% CI 1.21;3.11) ($P=0.006$).

Conclusion

The study revealed that the prevalence of dental pain was high among 8-12 year old children and had considerable impacts on quality of life. The impacts mainly related to difficulty eating and cleaning oral cavity.

Key word: Dental pain; School children; Oral Impact on Daily Performance (OIDP)

Introduction

Health is pivotal for having a productive and sustainable life. Oral health is congruent with general health and an integral component (1). A normal physical, psychological and social functioning is essential for good oral health. Oral pain can cause considerable disruption in normal functioning and social wellbeing (2). Quality of life incorporates the equilibrium of the individual in terms of

self-esteem, pleasure, satisfaction and principally wellbeing. The contemporary concept of health promotion is oriented towards improving the quality of life. Oral pain is one of the frequent cause which hampers this equilibrium resulting in a negative impact on the quality of life (3). According to the International Association for the study of pain it is an “unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (4). Pain although a very common symptom includes emotional, psychological, physical and neurological components (5). There has been a very limited amount of research into the prevalence of dental pain in children.

Pain significantly has an impact on the psychological and social well-being of both children and adults. Dental caries and its sequel, trauma to teeth, eruption of permanent teeth and exfoliating primary teeth, can give rise to oral pain (6). Pain affects reasonably on the daily activities and quality of life in children hence making it a public health problem (7). Assessment of pain in children is difficult due to limited cognitive skills. Various pain assessment scales have been devised for younger children and older children can report their pain verbally.

Two instruments have been developed to measure OHRQOL in younger age groups: Child Perception Questionnaire and Child - Oral Impacts on Daily Performance (Child-OIDP). Both the questionnaires are used to assess the symptoms, functional limitations and well-being in 6 to 10 year olds and in 11 to 14 year olds. The Child-OIDP has been found to be a reliable and valid instrument when applied to children in Thailand, France and UK (8). The Child Oral Impacts on Daily Performances (Child- OIDP) is used to assess the prevalence and severity of impacts and factors related to the impacts. The Child-OIDP assesses oral impacts on eating, smiling, cleaning teeth, speaking, emotional

stability, relaxing, doing schoolwork, and social contact (9).

The aim of this study was to determine the prevalence, intensity and the impact of dental pain on quality of life and respective associations with clinical oral health conditions among 8-12 year-old school children in Bangalore city.

Material and Methods

The present study design was of cross-sectional nature. Initially, the percentage distribution of 8-12 year-old children pertaining to each region was calculated from the information provided by the authorities (Deputy Director of Public Instructions (DDPI) office). Twelve schools (six from north and six from south) were randomly selected. A proportionate sampling was done. In addition, a Child-OIDP questionnaire, which is subjective measure of oral health-related problems experienced in the past 3 months was used on a random selection of children. Data were collected over a period of 6 months from the month of November 2013 to April 2014.

Inclusion Criteria

Children of 8-12 years of age who were willing to participate with parents consent for the oral examination. Children who were present on the day of the examination.

Exclusion Criteria

Study participants with disability (physical or mentally challenged).

Study participants with systemic illness requiring medication (respiratory, cardiovascular or any known allergies etc)

According to this list obtained from (DDPI) office, there were a total of 2064 schools in north zone and 2983 schools in south zone. Out of which 2,677 were higher secondary schools and among which 980 were government and 1,697 were private schools. Based upon the previous literature findings, with the confidence interval of 95% and

design effect of 2.0 the estimated sample size was 710, but considering the non-response rate, another 10% was added to compensate for any refusals to participate in the study and the final sample size was estimated to be 782.

Ethical Clearance

Prior to the start of the study, a protocol of the intended study was submitted to the Ethical Committee, The Oxford Dental College, Hospital and Research Center, Bangalore and ethical clearance for the present study was obtained.

Sampling Method

Participants were selected based on multi-stage random sampling method. Schools in urban area of Bangalore are divided into North and South Zones. The first stage comprised of all the zones in Bangalore city (i.e. north and south zone). In the second stage all the private and public schools in both the zones of Bangalore city were taken. The third stage comprised of all the children within the selected schools. Schools were selected at random. Because the number of children differed in each school, an equal probability method was adopted by sampling with a probability proportional to school size. Permission was obtained from the Block Education Officers followed by Head masters of all the government and private high schools selected for the study in Bangalore city. Parents of students who agreed to participate in the study provided written informed consent and assent was obtained from students for conducting interview and oral examination.

A pilot study was conducted in the month of November 2013 on 10% of the sample (n=80). It facilitated to identify any organizational problems, to check the feasibility and relevance of the questionnaire.

The clinical examination of every child was comprehensively carried out by investigator himself. The Kappa co-efficient for intra-examiner reliability was 0.8. Kappa coefficients and intraclass coefficients were used to

assess the variability of DMFT/dmft, CPI and Child-OIDP scores between 2 weeks.

The data were collected by means of a pretested proforma. The linguistic validity was checked by a back-translation method, involving blind retranslation into English. The proforma was pilot-tested for validity and reliability. Reliability was tested by test-retest method. Validity was assessed by Cronbach's alpha. Cronbach's alpha of 0.81 was obtained reflecting a good reliability and excellent validity.

A combination of face-to-face interview with proforma and clinical oral examination was conducted. Principal investigator himself conducted the oral examination in the field with a trained intern as a recorder. The participant was seated on a chair either outside the school building or in a separate room. Natural light was used as the source of illumination. Each tooth was dried with cotton prior to examination. Dental instruments and necessary materials were packed and sterilized in sufficient quantities for each work day. For each child it took 15 - 25 minutes to carry out the interview along with clinical examination. An average of 20 to 25 students was examined each day.

Statistical Analysis

Results were entered, organized and analyzed using Statistical Package for Social Sciences (SPSS version 20.0) software. Cross tabulations with chi-square test were used to describe the association between explanatory (age, gender, school) and outcome variables (frequency, characteristics, intensity of pain). Mann-Whitney U test was used to compare the dmft and DMFT with respect to age, gender and school. Bivariate and multivariate regression analyses were performed with OIDP as an outcome variable (dichotomized) and other explanatory variables.

Results

Table 1: Distribution of study participants based on caries experience

Age (years)	Caries experience - dmft (t)		Caries experience - DMF(T)	
	dmft (t) > 0 n (%)	Mean±SD	DMF(T) > 0 n (%)	Mean±SD
8-10	167 (35.8)	1.57±1.70	102 (21.8)	0.66±1.00
11-12	17 (5.3)	0.44±0.72	47 (14.8)	1.54±1.35
p-value	<0.001*		<0.001*	
Gender				
Male	42 (10.3)	1.24±1.64	47 (11.6)	1.05±1.24
Female	142 (37.6)	0.98±1.31	102 (27.1)	0.97±1.22
p-value	0.08		0.22	
School				
Public	102 (26.1)	1.58±1.71	95 (24.2)	1.19±1.27
Private	82 (20.9)	0.64±1.03	54 (13.8)	0.84±1.16
p-value	<0.001*		<0.001*	
Total	552 (70.5)	1.11±1.49	447 (57.2)	1.01±1.23

*p < 0.05 (Significant) **p < 0.001 (Highly significant) (Mann-Whitney U test)

The life time prevalence of dental pain was 52.9%. The prevalence of dental pain in past three months was 31.8%. Characteristics of dental pain were assessed for a sample of 249 children who had experienced pain in past three months. About 67.1% reported pain once in last three months whereas 32.9% reported two or more times but this was statistically not significant. Only 22.9% of study participants cried due to pain in past three months. Majority of participants reported the pain as severe in nature (47.8%) whereas 39.3% reported it as moderate and 12.9% as very severe. Biting (74.7%) followed by consumption of sweets (21.7%), cold (2.0%) and hot (1.6%) food substances were considered as the cause of pain. About 56.2% had pain all day whereas 38.6% had pain for few minutes and 5.2% of the study participants didn't know how long the pain lasted. Dental caries (76.7%) was reported to be the major cause of pain whereas 17.3% of participants didn't know the cause of pain and 6.0% reported it due to reasons such as trauma, ulcer etc. Mothers (85.9%) took care of them during the episode of pain followed by grandparents (28.0%) and

11.1% reported that both mother and father together took care of them.

Majority (57.0%) of them was taken to dentist for treatment, around 39.0% were given medication and for 4.0% nothing was being done and it was father (71.1%) who took them to dentist. At the dentist majority of them (66.1%) received restoration followed by extraction (18.3%) whereas 15.4% were given medication. Pain subsided in all the study participants who visited dentist.

Table 2: Distribution of study participants based on overall prevalence and impact intensity on daily performances

	Overall	Eating	Speaking	Cleaning	Sleeping	Emotion	Smiling	Studies	Social contact
OIDP Prevalence n (%)	220 (88.3)	186 (74.4)	29 (11.6)	94 (37.8)	66 (26.5)	75 (30.1)	41 (16.4)	82 (32.9)	46 (18.5)
OIDP Score									
Range	0-44	0-9	0-9	0-4	0-9	0-6	0-4	0-4	0-4
Mean (SD)	9.7(12.0)	3.2(2.7)	1.3(2.7)	0.22(0.7)	2.1(3.5)	0.4(1.1)	0.2(0.5)	1.0(1.4)	0.3(1.00)
Impact intensity									
Very little	-	16 (8.6)	5(17.2)	28(29.2)	10(15.1)	14(18.7)	20 (48.8)	15 (18.2)	23 (50.0)
Little	-	44 (23.7)	7(24.1)	35(37.2)	18(27.2)	31(41.3)	12 (29.3)	27 (32.9)	6(13.0)
Moderate	-	74 (39.7)	11(37.9)	28(29.8)	32(48.5)	25(33.3)	7(17.0)	30 (36.6)	17 (36.9)
Severe	-	31 (16.7)	4(13.7)	2(2.1)	4(6.1)	3(4.0)	2(4.8)	6(7.3)	0
Very severe	-	21 (11.3)	2(6.8)	1(1.1)	2(3.0)	2(2.7)	0	4(4.9)	0

The prevalence of dental caries in primary dentition was 70.5%. The total mean dmft(t) of the study population was 1.11±1.49. The dmft(t) of participants in public schools (1.58±1.71) were significantly higher (p=<0.001) when compared to private schools (0.64±1.03). The prevalence of dental caries in permanent dentition was 57.2%. Mean DMF(T) of the study population was 1.01±1.23. The DMF(T) of participants in public schools (1.19±1.27) were significantly higher (p=<0.001) when compared to private schools (0.84±1.16).

Around 64.1% of study participants had a CPI score of 0 (healthy), 9.4% had a score of 1 (bleeding), 26.5% had a score of 2 (calculus). The overall OIDP prevalence was found to be 88.3%. Overall prevalence for eating was found to be highest (74.4%) followed by cleaning (37.8%),

studies (32.9%), emotion (30.1%), sleeping (26.5%), smiling (16.4%) whereas the least was for speaking (11.6%). The range for overall impact intensity score ranged from 0-44. Overall mean impact score was 9.7±12.0. Impact intensity for majority of daily activities were moderate in intensity.

Table 3: Association between various explanatory variables and their impact on daily activities (bivariate and multivariate logistic regression analysis)

Age	Impact absent n (%)	Impact present n (%)	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
8-10	22 (11.2)	175 (88.8)	1.23(0.49;3.07)	0.64	-	
11-12	7 (13.5)	45 (86.5)	1		-	
Gender						
Male	14 (21.2)	52 (78.8)	1	0.006*	1	0.01*
Female	15 (8.2)	168 (91.8)	3.01(1.36;6.65)		2.97(1.28;7.33)	
School						
Public	15 (11.1)	120 (88.9)	1.12(0.51;2.43)	0.77	-	
Private	14 (12.3)	100 (87.7)	1		-	
dmf(t)						
0	15 (23.1)	50 (76.9)	1	0.001**	1	0.003*
> 0	14 (7.6)	170 (92.4)	3.64(1.64;8.05)		1.95(1.24;3.05)	
DMF(T)						
0	17 (17.0)	83 (83.0)	1	0.03*	1	0.006*
> 0	12(8.1)	137 (91.9)	2.33(1.06;5.14)		1.94(1.21;3.11)	
CPI						
0	14(17.9)	64 (82.1)	1	0.04*	1	0.17
> 0	15 (8.8)	156 (91.2)	2.27(1.03;4.98)		1.39(0.86;2.24)	

*p < 0.05 (Significant) **p < 0.001 (Highly significant)

The crudes odds ratio of having an oral impact in 8-10 year age group was 1.23 (0.49;3.07) and was statistically not significant . Females had 2.97(1.28;7.33) times odds of having an impact when compared to males and this was statistically significant (p=0.006). Those participants having caries in primary dentition [dmf(t) score of more than 0] had 3.64 times odds of having an impact when compared to those without caries in primary dentition [dmf(t)=0] which was statistically significant (p=0.001). Adjusted odds ratio for dmf(t) was 1.95(1.24;3.05) and was statistically significant (p=0.003). Those participants having caries in permanent dentition [DMF (T) score of

more than 0] had 2.33 times odds of having an impact when compared to those without caries in permanent dentition [DMF(T) =0] which was statistically significant (p=0.03). Adjusted odds ratio for DMF(T) was 1.94(1.21;3.11) and was statistically significant (p=0.006). Those participants having gingivitis [CPI score of more than 0] had 2.27 times odds of having an impact when compared to those without gingivitis [CPI=0] which was statistically significant (p=0.04). Adjusted odds ratio for CPI was 1.39 (0.86; 2.24) which was statistically not significant (p=0.17).

Discussion

Recent years have seen a keen interest in studying the prevalence and impact of dental pain in children in various age groups (3),(5),(6),(10),(11),(12). Many literature describes oral pain as pain which originates within the oral cavity and dental pain as pain originating from the innervated tissue. The term ‘toothache’ for dental pain is been synonymously used (6). In our study the **lifetime prevalence of pain** was 52.9%, this was similar to the study conducted by, Mudit Mittal et al (57%), Eliane Paula Reis Barrêto et al (45.9%), Maro D et al (59.1%) (2),(3),(14). Study across various countries conducted by Slade et al have reported the prevalence of toothache to range from 5% to 33% (17).

Further, in the present study, nearly 31.8% of children stated that they had experienced dental pain in past 3 months. This was similar when compared with the reported prevalence of Greek (21), Chinese (20) and Brazilian (7) children where it was found to be about 35%. A study conducted by Eliane Paula Reis Barrêto et al to assess the prevalence of dental pain in past one month showed the prevalence as low as 15.6% (3). The variation in prevalence rates seen in different countries could be because of the changing disease trends and also accountable to the time frame in which pain was measured.

Three month prevalence of dental pain was high among children studying in public schools (43%) when compared to those in private schools (20.7%). The type of school (public and private schools) was used as an indicator of socio-economic status. Majority of the children in public schools are from the lower socioeconomic group and their accessibility and affordability to dental services were limited. This result corroborates with the findings in other studies that demonstrate the negative effects of a low socioeconomic level on the clinical oral condition of the population (Ratnayake et al, Barretto et al, Honkala et al, Slade et al) (6),(15),(16),(17). Majority of participants reported the pain as severe in nature (47.8%) whereas 39.3% reported it as moderate and 12.9% as very severe. This is in agreement with the findings from other studies (6),(14),(23). Majority of the study participants had pain while biting (74.7%) followed by sweets (21.7%), cold (2.0%) and hot (1.6%) respectively, this was similar in study conducted by M. A. Shepherd et al (10). Cavity/decayed tooth was perceived as the cause of pain by majority of children (76.7%). Majority of study participants reported that their mothers took care of them during the episode of pain. Similar findings were observed in studies conducted by, Fabíola Rocha et al, Kawabata et al, who reported that mothers took care of them during the episode of pain (5),(19). This could be attributed to the fact that as in Indian scenario majority of women are homemakers and they stay back at home and hence get more time to spend with their child and care for them. Furthermore, slightly more of the children in private schools (66.7%) than those in public schools (52.4%) reported visits to a dentist. The plausible explanation can be because the private school children are able to express themselves to their parents and their parents can afford the dental treatment. Contrary to this, children from public schools belong to less affluent families where there exists a

perpetual lack of awareness among both parents and children, or lack of affordability to pay for the required services. According to the study participants, it was the father (71.1%) who took them to dentist when compared to mother (28.9%). The overall prevalence of the participants experiencing an **impact in the past three** month due to dental pain was 88.3%, in accordance to Sudaduang et al who reported a 89.8% among Thai children of the same age and lower to the one reported by Pau et al among the Pakistani children (21). The most commonly reported **impact** was 'difficulty in eating', and this is in agreement with the findings of Fabíola Rocha et al, Ratnayake et al Shepherd et al, S. Naidoo et al (5),(6),(10),(13). It is evident from the present study and other studies that dental pain predominantly causes one or other impacts in the daily life of children, thus making the purpose of conducting this study relevant and meaningful.

The prevalence of dental pain was significantly higher in this population, this could be accounted to the unattended dental diseases and lack of education from parents part. Oral impacts on daily performances in this child population were very high. Oral impacts affected children's quality of life mainly through difficulty in eating and cleaning. Knowledge about the extent and significance of reported dental pain clearly indicates a need to strengthening preventive and therapeutic dental services among school children. Oral healthcare policymakers could plan oral healthcare programs to promote health resources and address oral health needs and demands.

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