

Dental Neglect in Pediatric Population—A Critical Issue Necessitating Revolutionary Solution Strategies: Assessment by Tools Like Dental Caries, Prostheses and Restorations in Primary Teeth

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ABSTRACT

Aim: Child dental neglect is a critical issue that often goes unreported. Compromised oral hygiene and recurrent oral diseases reduce quality of life and create a dread of the dentist in children. The aim of the study is to determine dental neglect in primary teeth of children, so as to increase awareness about the importance of oral health and primary dentition.

Materials and methods: This was a cross-sectional survey conducted on a study sample of 3,324 children from 8 to 12 years. Intraoral camera was used to carry out the clinical examination by trained dental professionals. Data were compiled and analyzed.

Results: Among 3,324 subjects, 945 (28.43%) children were found to have existing dental issues. Out of 1,622 male subjects, 479 (29.53%) were affected and among 1,702 female subjects, 466 (27.38%) were affected.

Conclusion: Dental neglect is an alarming issue that needs to be recognized by healthcare professionals as well as parents. Given its high prevalence and detrimental effects, the necessity of awareness measures regarding primary teeth can be ascertained. Therefore, dental neglect should be further researched in larger population groups.

Keywords: Awareness, Caries, Cross-sectional study, Dental neglect, Oral health, Oral neglect, Parents, Prevalence, Primary teeth.

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INTRODUCTION

Dental neglect goes “unnoticed” since it is uncommon to physically evaluate the oral cavity for any issues, and “unsaid” due to the lack of proper communication between the child, parents, and practitioners.¹ Dental neglect manifests itself in a variety of ways, including a lack of interest in acquiring knowledge about dental care by parents/caregivers, lack of preventive care to be performed by parents at home (e.g., oral hygiene), and no-shows to dental appointments, among others. Therefore, it is crucial to determine the relationship between neglect and oral health problems in children.²

Dental neglect has been defined as “behavior and attitudes which are likely to have detrimental consequences on the individual’s oral health, or more specifically as failure to take precautions to maintain oral health, failure to obtain needed dental care, and physical neglect of the oral cavity”.³ Conventionally, most dental neglect definitions emphasized on unmet treatment needs, with little importance on the role of oral health promotion and primary prevention of dental diseases. Based on the clinical signs, dental neglect is classified as dental prevention neglect (DPN) (measured by treated and untreated dental conditions) and dental treatment neglect (DTN) (measured by untreated dental conditions).⁴

Prevention is always superior to cure. To attain good oral health, oral disease prevention is a very effective, efficient, and acceptable global practice. However, relatively few people practice proper regular dental care at home and do not have periodic/yearly dental checkups by dentists to maintain the health of their oral cavity.⁵

The most frequent disease in both adults and children is dental caries, with high prevalence in young children.⁶ Primary

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teeth are smaller and less mineralized in the outer layers along with having more pulp tissue than permanent teeth. As a result, carious lesions spread quickly and reach the pulp of primary teeth faster than permanent teeth.⁷ If detected early, dental caries is a preventable and reversible disease in primary teeth; nevertheless, if neglected, it can cause pain and discomfort, premature tooth loss, speech disorder, bacteremia, and negatively affects the successor permanent teeth.⁸

Hence, treatment options with different restorative materials, such as amalgam, conventional glass-ionomer cements, resin-modified glass-ionomer cements (RMGIC), high-viscosity GICs (HVGICs), resin composites and compomers are indicated. But

in the case of primary molars with multisurface lesions, stainless steel crowns and zirconia crowns are indicated to preserve the anatomical structure and arch integrity.⁹

Despite its high prevalence, dental neglect is typically under-recognized¹⁰ in childhood with adverse repercussions that extend to adulthood.¹ The objective of the current study is to understand better the extent of dental neglect in primary teeth of children by taking into account the prevalence of dental problems such as dental caries, fillings and prostheses.

MATERIALS AND METHODS

OroGlee Solutions Private Limited conducted a cross-sectional survey among children enrolled in school aged 8–12 years. The study was carried out in a number of schools in Hyderabad between January and April of 2023. The study sample consisted of 3,324 students who were in attendance at the time of the study. Camps were conducted in schools where permission was obtained from the principal. All children of consenting parents were included in the data collection, which was not restricted to any particular geographic area. Parents/guardians gave their informed oral consent after being fully educated about the process and told that the information they submitted would be kept confidential and used only for research.

The corresponding class teacher completed a basic pre-designed questionnaire prepared by a public health dentist regarding the child’s health and dental problems as well as information about the school, class, and section. Ethical clearance was not taken as it is an observational study and no interventions were done.

An intraoral camera, with its ability to record information of diseases in their early stages and its magnification aiding in the diagnosis of oral diseases was utilized to record the clinical findings. The principal investigator trained three licensed dentists in the use of intraoral camera for oral examinations. The teeth were categorized as decayed, filled, and prostheses based on visual representation.

Inclusion Criteria

- Children aged 8–12 years were included in the study.
- Children with only mixed dentition were included in the study.

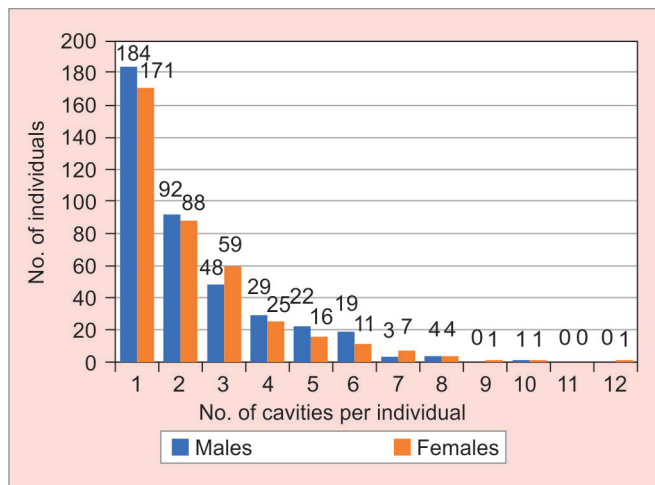


Fig. 1: Graphical representation of number of individuals with dental caries

Exclusion Criteria

- Participants below the age of 8 years and above the age of 12 years were excluded from the study.
- Participants with all permanent teeth were excluded from the study.

RESULTS

A total of 3,324 subjects were screened at camps conducted by OroGlee Solutions Private Ltd. at various schools. Among 3,324 subjects, 1,622 were males and 1,702 were females.

Out of 1,622 male subjects, 479 (29.53%) and among 1,702 female subjects, 466 (27.38%) were found to have either cavity or restoration or prostheses. Among all the dental problems, dental caries was the most predominant condition.

Dental Caries

The data were segregated depending on the number of caries-affected teeth in a single individual. Among 3,324 subjects, 786 (23.65%) children suffered from dental caries. Among 786 affected children, 402 (51%) were males and 384 (49%) were females. Many of the subjects (184 boys, 171 girls) had a single cavity, while a few (1 boy, 3 girls) had more than nine cavitated teeth. Data based on the number of teeth affected is given in Figure 1.

Restorations (Table 1)

The data were segregated depending on the number of filled teeth in a single individual. A total of 125 subjects were found with one or multiple restored teeth.

Prostheses (Table 2)

The data were segregated depending on the number of teeth with prostheses in a single individual. A total of 34 subjects were found with one or multiple prostheses.

Table 1: Numerical representation of restorations according to the number of affected teeth and gender

No. of teeth with restorations	No. of children with restorations		Total no. of restorations	
	Males	Females	Males	Females
1	31	37	31	37
2	16	15	32	30
3	6	8	18	24
4	3	1	12	4
5	3	5	15	25
Total	59	66	108	120
	125		228	

Table 2: Numerical representation of prostheses according to the number of affected teeth and gender

No. of teeth with prostheses	No. of children with prostheses		Total no. of prostheses	
	Males	Females	Males	Females
1	12	11	12	11
2	3	3	6	6
3	1	1	3	3
4	2	1	8	4
Total	18	16	29	24
	34		53	

Table 3: Numerical representation of dental conditions according to age-group

Age of the child (in years)	No. of children with decayed teeth	No. of children with restorations	No. of children with prostheses	Total no. of children with dental conditions
8	25	8	5	38
9	179	41	9	229
10	299	45	14	358
11	165	22	5	192
12	118	9	1	128
Total	786	125	34	945

Age-group (Table 3)

The data were segregated depending on the number of subjects with either of the dental conditions, such as cavity, restorations, and prostheses in a specific age-group.

DISCUSSION

According to the WHO Global Oral Health Status Report (2022), oral diseases affect close to 3.5 billion people worldwide, with 3 out of 4 people affected living in middle-income countries. Globally, an estimated 2 billion people suffer from caries of permanent teeth and 514 million children suffer from caries of primary teeth.¹¹ According to a recent study in Kollam, Kerala, the prevalence of untreated dental caries in deciduous dentition was 38.3% as compared with permanent dentition which was 4.1%.¹²

Dental caries is caused by the interaction between sugary substances on the surface of enamel and bacteria (*Streptococcus mutans*). This causes the breakdown of carbohydrates, which lowers the pH of the oral cavity, leading to enamel demineralization and the formation of a cavity.¹³ Caries, if left untreated, can have a negative impact on children's quality of life due to pain and discomfort, which can lead to a lack of nutrition, sleep deprivation, acute and chronic infections,¹⁴ emergency visits and possible hospitalizations.¹³ Furthermore, the likelihood of acquiring cavities or developmental defects in the underlying successor tooth is raised.¹⁴

Dental products manufacturers have developed a wide range of materials, including amalgam, glass ionomer cement, composite cement, and full coverage restorations like stainless steel crowns, which somewhat mimic the characteristics of natural teeth. The attributes of natural teeth themselves, however, have proven to be superior to any restorative material to date.¹⁵

Aside from post-endodontic restoration, stainless steel crowns are also used as a treatment option for a number of conditions, such as fractured teeth, systemic disorders like hypophosphatemia, genetically acquired dental anomalies like amelogenesis imperfecta and dentinogenesis imperfecta, and environmentally induced defects like enamel hypoplasia that require restoration.^{16,17}

Dental neglect is more prevalent among children of any age-group and is influenced by variables such as socioeconomic status and demographics. Dental neglect can be categorized into:

- Based on its etiology:
 - Active dental neglect—The deliberate neglect of parents to complete their obligation of providing their children with dental care.
 - Passive dental neglect—Lack of knowledge regarding oral hygiene routines or treatment alternatives, as well as any financial concerns resulting in reduced care in children.
 - Self-neglect—May develop due to mental, physical, or developmental constraints.¹⁸

- Based on clinical signs:

- Dental prevention neglect—defined as the neglect of the prevention of oral diseases which results in the experience of dental conditions (measured by treated and untreated dental caries and/or traumatic dental injuries and/or dental pain)
- Dental treatment neglect—defined as the neglect of necessary dental treatment that results in the experience of untreated dental caries and/or traumatic dental injuries and/or dental pain.³

There has been research that shows how various variables affect dental neglect. Low socioeconomic level has been linked to an increase in carious lesions in children due to lack of resources for maintaining oral hygiene. In the event of a single-parent family, the child may be ignored due to lack of time and money. The degree of parental education is thought to be a predictor in dental neglect and can influence how feasible it is to spread oral health knowledge.¹⁹ Freeman et al. previously discovered a link between children's dental neglect and parents who had a history of unpleasant dental experiences or others who did not appropriately care for their teeth or had a phobia of dentists.¹⁸

Dental neglect can have a long-term impact on both general health and social-emotional development. Acute/continuous pain, infections, and swelling cause a reduction in playtime and socialization as well as a loss of school hours. It eventually leads to low self-esteem and a diminished quality of life. Few case reports revealed an increased risk of psychiatric difficulties, as well as a disorganized attachment style linked to a variety of developmental issues, such as dissociative symptoms, anxiety, depression, and acting out symptoms. As a result of oral diseases, more than 50 million school hours are wasted each year which can influence children's academics and future achievements.²⁰

According to our study, out of 3,324 children, 28.43% children were found to be having either cavity or restoration or prostheses. Among 1,622 males, 479 (29.53%) were affected—402 had dental caries, 59 had restorations and 18 had prostheses. Among 1,702 females, 466 (27.38%) were affected—384 had dental caries, 66 had restorations and 16 had prostheses.

Dental prevention neglect accounts for 28.43% whereas DTN accounts for 23.65% of the total study population. Gender-wise, 29.53% of the males and 27.38% of the females had DPN whereas 24.78% of the males and 22.56% of the females had DTN.

However, the tooth-wise data imply a greater magnitude of dental neglect. Among 786 caries-afflicted children, 355 (45.16%) had a single cavity followed by 180 (22.90%) and 107 (13.61%) children with two and three cavities, respectively. Similarly, among 125 children with restorations, 68 (54.4%) and 31 (24.8%) children had one and two restorations, respectively. Among 34 children

with prostheses, 23 (67.64%) had single prostheses and 6 (17.64%) had two prostheses.

In the group of 8-year-olds, 25 had cavities, 8 had restorations, and 5 had prostheses. For 9-year-olds, the numbers were 179 cavities, 41 restorations, and 9 prostheses. Among 10-year-olds, there were 299 cavities, 45 restorations, and 14 prostheses. In the 11-year-old category, 165 had cavities, 22 had restorations, and 5 had prostheses. Lastly, among 12-year-olds, 118 had cavities, 9 had restorations, and 1 had a prosthesis.

According to a study done by Skaret et al. in UK among 11–16-year-old children, the prevalence of DPN and DTN was 41.0% and 45.1%, respectively.³

In a study done by Coolidge et al. among adolescents with mean age of 14.3 years, out of 97 subjects, 30 adolescents had visible caries with 24 being moderate and 6 being severe. The overall mean dental neglect scale (DNS) score was 13.2%. The mean scores in males and females were 13.6% and 12.8%, respectively.²¹

In a study done by Bhattarai et al. in a hospital in Kathmandu, the mean DNS score was found to be 18.40%, while 60.3% of the total subjects had ≤ 3 DMFT index value, 39.7% had > 3 DMFT index value.²²

Because caries-inducing dietary habits are established by 12 months of age, early preventive measures are crucial. Children ought to visit a dentist within 6 months after the appearance of their first tooth, but no later than 1 year of age. Using a bottle as a pacifier, allowing their toddler to fall asleep with bottle of fluid containing sweeteners, and eating a sugary diet on a regular basis should all be avoided by new parents. Teeth should be cleaned on a regular basis as soon as they emerge, which is normally about 6 months of age, by wiping a child's teeth and gums with damp cloth and then using a soft toothbrush when he or she is 12 months old. Brushing twice a day with fluoridated toothpaste lowers the risk of caries formation and progression. Up to the age of seven, children require adult supervision since they lack the manual capacity to adequately brush their teeth on their own. Children under the age of three should use "rice-size" amounts of fluoridated toothpaste, while children between the ages of 3 and 6 should use "pea-size" amounts of fluoridated toothpaste. Rinsing the mouth soon after brushing is not recommended in order to fully reap the therapeutic effects of fluoride.¹⁰

Early dental intervention minimizes a child's chances of developing larger carious lesions. It also familiarizes the child with the dentist and the dental clinic atmosphere, allowing them to develop a strong oral hygiene regimen, and as a result, a decent quality of life. Asymptomatic tooth does not imply the lack of tooth decay. When there is pain/abscess, the treatment is often more drastic, and tooth extraction is occasionally required.²

The findings of this study demonstrated dental neglect in primary teeth by taking into account a number of variables. Furthermore, it uses a novel conceptual framework to better comprehend the widespread problem of dental neglect and establish the groundwork for further investigation. There is a greater need for research as there have not been many studies that specifically address this issue.

However, the study has limitations. Demographic information like socioeconomic status and parental education factors were not taken into consideration. Questionnaires with previous dental experiences would also provide valuable information.

CONCLUSION

In today's world, dental health is frequently disregarded. The impact of oral diseases in child's social life is huge. Hence, since

early childhood, children and adolescents should be taught about oral health and the repercussions of untreated dental issues. At the same time, awareness programs for parents should be made available. As dentists, we should be more responsible for identifying dental neglect and ensuring that necessary actions are reinforced because primary dentition is important for healthy permanent teeth.

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