" ASSESSMENT OF DENTAL CARIES & TRAUMATIC DENTAL INJURIES AMONG GOVERNMENT INSTITUTIONALISED ORPHAN CHILDREN IN LUCKNOW CITY"

BABU BANARASI DAS UNIVERSITY, LUCKNOW

Thesis submitted in partial fulfilment of the requirements for degree of

MASTER OF DENTAL SURGERY

In the subject of

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DEPARTMENT OF PEDIATRIC AND PREVENTIVE DENTISTRY

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DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled **" ASSESSMENT OF DENTAL CARIES & TRAUMATIC DENTAL INJURIES AMONG GOVERNMENT INSTITUTIONALISED ORPHAN CHILDREN IN LUCKNOW CITY"** is a bonafide and genuine research work carried out by me under the guidance of **DR. SUBASH SINGH, M.D.S, Reader,** Department of Paediatric and Preventive Dentistry, Babu Banarasi Das College of Dental Sciences, Babu Banarasi Das University, Lucknow, Uttar Pradesh.

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This is to certify that the dissertation entitled **"ASSESSMENT OF DENTAL CARIES & TRAUMATIC DENTAL INJURIES AMONG GOVERNMENT INSTITUTIONALISED ORPHAN CHILDREN IN LUCKNOW CITY"** is an original bonafide research work done by **DR. AAYUSHI BHARDWAJ,** in partial fulfilment of the requirement for the degree of **MASTER OF DENTAL SURGERY (M.D.S)** in the speciality of **PEDIATRIC AND PREVENTIVE DENTISTRY** under our supervision.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF GRAPHS

TABLE OF ANNEXURES

ABSTRACT

Background: The pattern of living in orphanage is different from that of family living, as the former provides physical security, food, and shelter but is devoid of psychological assurance. The children residing in orphanages differ from children living with parents as they are underprivileged and may not receive the similar care that other children receive from their parents. Due to inadequate access to healthcare, orphans experience a disproportionately high burden of oral diseases and disorders, leading to a cascade of physical, economic, social, and psychological problems that significantly impact their quality of life. This vulnerable population exhibits considerably higher rates of dental caries, traumatic dental injuries, and gingival and periodontal diseases compared to their non-orphaned counterparts. This group exhibits concerningly low levels of oral hygiene practices. Failure to address this issue could result in systemic health complications. Recognizing these challenges is crucial to ensuring optimal oral health outcomes for these disadvantaged children.

Aim: The aim of the study was to assess the prevalence and associated risk factors for Dental caries and Traumatic dental injuries in Government Institutionalized Orphan Children in Lucknow city.

Materials and Methods: The present in-vivo study was conducted in the Department of Pediatric and Preventive Dentistry, Babu Banarasi Das College of Dental Sciences, Lucknow in collaboration with the Government Institutionalized Orphanages of Lucknow City, Uttar Pradesh. After obtaining approval from the Institutional Ethical Committee, Informed consent was obtained from the orphanages and the children who participated in the study, following the ethical guidelines for research involving minors. Assent was also obtained from children deemed capable of understanding the study and its implications. The study population consisted of healthy orphan children residing in the orphanages. An oral examination was done where Dental caries and Traumatic Dental Injuries were assessed. DMFT & dmft indices were used to assess the caries status of primary and

permanent dentition. At the same time, the 2013 WHO Oral Health Assessment Form for Children served as the tool for evaluating dental trauma status in the sample.

Result: The final data analysis encompassed a cohort of 528 children, comprising 248 males (47.0%) and 280 females (53.0%). The results revealed a prevalence of 85.7% dental caries in females and 83.4% in males. Stratifying by age group, the prevalence of dental caries was 97.2% in the 4-6 age bracket, 77.6% in the 7-9 age range, and 78.9% in the 10-12 age category. Notably, toothbrush usage emerged as the predominant method for dental hygiene in both genders, with toothpaste being the most commonly employed material for tooth cleaning.

Males exhibited a significantly higher prevalence of traumatic dental injuries (TDIs) compared to females, with rates of 20.2% and 13.9%, respectively. TDI exhibited the highest incidence in the 10-12 age group (34%), followed by the 7-9 age group (10.2%), and the lowest occurrence was observed in the 4-6 age group (9.1%). Sports-related incidents were identified as the primary cause of traumatic dental injuries, closely followed by falls. Enamel fractures were the most prevalent form of TDI, specifically affecting maxillary central incisors more frequently than other teeth.

Conclusion Despite the positive attitudes exhibited by orphanage children towards oral health, their knowledge and practices in this regard remain below satisfactory levels. The children either needed to receive adequate information or, if informed, the reinforcement and re-evaluation of their practical application required to be improved by the relevant authorities. This study's findings highlight the critical need to raise awareness regarding the significance of oral health practices among Lucknow's orphanage population.

The results in the present study indicate that the oral health condition of orphaned children has been neglected, with those from disadvantaged backgrounds exhibiting a high prevalence of dental caries and traumatic dental injuries coupled with low utilization of dental care services. Although institutionalized children in the orphanage demonstrated fair hygiene practices, there is a pressing need for effective oral health promotion

strategies and developing plans to raise awareness and implement preventive measures for TDIs to elevate the oral health and practices of children residing in such facilities.

INTRODUCTION

Children require protection within the family structure to develop confidence and navigate the world's challenges, coupled with the essential care that fosters a nurturing childhood. The United Nations Children's Fund (UNICEF 2008) defines an orphan, within the age range of 0-18 years, as a child who has lost one or both parents. In India, approximately 5% of children under the age of 18 fall into the category of orphans. The relationship between a child and their parents is often viewed as conforming to social norms rather than being inherently linked to the child's rights. Consequently, when a child is separated from their parents, it becomes the government's responsibility to ensure the provision of a family-like environment. Currently, there are 14 million orphans worldwide, a consequence of factors such as poverty, war, human immunodeficiency virus/acquired immunodeficiency syndrome, and various other causes, collectively constituting 2% of the global population. India, home to 19% of the world's children and boasting an annual birth rate of around 26 million, faces the challenge of providing for a substantial young population. According to the ChildLine portal of the Government, UNICEF estimates that as of 2022, there are approximately 31 million orphaned children in India.[1]

Living in an orphanage differs significantly from the experience of growing up in a family. While orphanages offer physical security, food, and shelter, they lack the psychological assurance that familial bonds provide. Children in orphanages, being underprivileged, do not receive the same level of care as their counterparts living with their parents. This discrepancy places orphans at a heightened risk of developing oral diseases and disorders, constituting an unmet healthcare need. The consequences extend beyond physical health, encompassing economic, social, and psychological challenges that detrimentally affect their overall quality of life.

Studies reveal a high prevalence of dental problems like caries, trauma, gingivitis, and periodontal disease among orphans, potentially linked to limited access to preventive care

and awareness about oral health's impact on overall well-being. Furthermore, oral hygiene practices within this group are markedly inadequate. Untreated oral health problems not only pose risks to physical well-being but also contribute to broader health issues. Recognizing and addressing these oral health challenges is imperative to ensure optimal well-being for these deprived children.

Traumatic dental injury (TDI) stands out as a notable public health concern, particularly given its heightened prevalence among children. According to **Andersson L. (2013),** in Epidemiology of traumatic dental injuries, the highest incidence of dental injuries occurs up to the age of 12, with a subsequent decrease in older age groups.[2] The spectrum of TDIs encompasses minor cracks and partial chipping to extensive injuries affecting the tooth's supporting structures and tissues and potentially resulting in displacement or avulsion.

Common causes of TDI among children include falls, collisions, interpersonal violence, sports-related activities, traffic accidents, and other iatrogenic factors. While there is a lack of comprehensive data on the prevalence of TDIs in children, especially within the institutionalized orphan population, the issue bears epidemiological significance due to its elevated occurrence in these demographic conditions. The incidence of dental trauma ranges from 9.4 to 41.6% in primary dentition and 6.1 to 58.6% in permanent dentition.[3]

Orphaned children face a heightened vulnerability to potentially traumatic events, given factors such as interpersonal violence, child abuse, and displacement from their homes or care settings, particularly evident in developing countries. Given the specific living conditions in orphanages, including overcrowding, insufficient nutrition, and limited staff attention, children in these institutions are more susceptible to experiencing traumatic dental injuries. Acknowledging these unique challenges is crucial for designing targeted interventions aimed at improving the oral health of this vulnerable population.

The age bracket spanning from 1 to 3 years and 10 to 12 years emerges as particularly more susceptible to dental trauma. In the age group 1-3 years, there is increased vulnerability to falls and front-tooth injuries as children develop walking skills with

limited motor coordination.[4] For the 10-12 age group, factors such as proclined upper front teeth, characteristic of the "ugly duckling stage," render children more prone to traumatic dental injuries (TDIs). Notably, there's a gender predilection, with boys exhibiting a higher incidence of dental trauma, attributable to their increased engagement in contact sports and adventurous activities.

Crucial determinants for assessing the nature and severity of the injury, intervention and management strategies, potential consequences, and prognosis include the child's dental age, stage of tooth development, intensity of force and direction, as well as the shape and size of the impacting object. A lack of awareness among caretakers regarding the prevalence, prevention, treatment, and management of dental trauma, coupled with challenges in accessing healthcare services and timely intervention, raises the risk of untreated TDIs. Particularly concerning is the impact of untreated anterior tooth injuries on the oral health-related quality of life (OHRQoL), influencing psychosocial behaviour and causing functional loss. Such injuries, leading to unsightly fractures, can significantly affect a child's behaviour and self-esteem, exerting a lasting influence on their overall well-being. Timely intervention is crucial in mitigating these adverse effects.[5] Understanding the urgency of addressing oral health concerns in orphan children, the present study was designed to assess the prevalence of traumatic dental injuries (TDIs) within this population. This comprehensive understanding of their dental health needs will inform the development of targeted preventive measures and evidence-based guidance.

Acknowledging the integral role of oral and dental health in overall well-being, it becomes imperative to address these facets as critical public health concerns. Oral diseases, notably dental caries and periodontal diseases, significantly contribute to the overall disease burden, particularly affecting the socially marginalized populations. Unfortunately, children in such circumstances often encounter barriers hindering their access to oral health information, thereby limiting their ability to prevent and manage oral diseases.

In India, a developing nation facing numerous challenges, poor oral health is a significant concern. This emphasizes the critical need for community involvement in ensuring the

oral health needs of orphaned children. As the World Health Organization (WHO) highlights, planning effective dental services relies on comprehensive surveys that assess oral diseases, health status, and treatment needs within specific populations. While extensive research examines the oral health of diverse groups, such as individuals with mental challenges, disabilities, or institutionalization, and those from lower socioeconomic backgrounds, a noticeable gap exists in the literature regarding the oral health assessment of orphaned populations.

Recognizing the lack of data on oral health among orphaned children, this study meticulously assessed the prevalence and associated risk factors for both dental caries and traumatic dental injuries (TDIs) within government-run orphanages in Lucknow, Uttar Pradesh, India.

AIM

To assess the prevalence and associated risk factors of Dental caries and Traumatic dental injuries in Government Institutionalized Orphan Children in Lucknow city.

OBJECTIVES

1. To assess the Dental caries status and its associated risk factors among 4–12-year-old Institutionalized Orphan Children in Lucknow city
2. Assessment of Traumatic Dental Injuries and its related risk factors among 4–12-year-old Institutionalized Orphan Children

REVIEW OF LITERATURE

Hasan, A. A., Qudeimat, M. A., & Andersson, L. (2010) conducted a cross-sectional study to determine the prevalence, etiology, classification of trauma, teeth involved, place of injury and treatment received after dental trauma in preschool children. The study in Kuwait examined 500 preschool children for signs of dental trauma. Of the participants, 243 were boys and 257 were girls, aged 2-6 years. Out of them, 56 children (11.2%) had experienced trauma to their primary teeth. Most incidents happened at home (87.5%), followed by the street (7.1%) and school (5.4%). Falls were the main cause (94.6%). The most affected tooth was the upper right primary central incisor (42.6%). Types of trauma included enamel fractures (29.4%), enamel-dentin fractures (26.5%), and complicated crown fractures (14.7%). Luxation occurred in 25% of cases, and only 4.4% involved avulsion. The study found a significant relation between the type of trauma and the provided treatment.[6]

Gupta, S. et. al (2011) performed a cross-sectional survey to assess the prevalence of traumatic dental injuries (TDI) in school children in Baddi- Barotiwala, Himachal Pradesh, India. The study was carried out in Government schools among 1059 government school children aged 4- 15 years.. The demographic detail was carried out on a structured questionnaire. Results showed a 4.15% prevalence of traumatic dental injuries (TDI), with 95.45% occurring in the upper front teeth. Maxillary central incisors were most commonly affected (54.5%), often with enamel-dentin-pulp exposure (43.1%). The majority of TDIs went untreated (97.7%). Falls were the main cause (54.5%), and factors like a large overbite and insufficient lip coverage contributed. Though the overall prevalence is relatively low, it still indicates a significant number of affected children, emphasizing the need for community education on preventing and treating dental injuries.[7]

Muralidharan D, Fareed N, Shanthi M. (2012) conducted a longitudinal institution-based interventional study among primary-grade children (n=162). The study aimed to improve the oral health status of children at an institute in the Nellore district of Andhra Pradesh, India, through a prevention-based comprehensive dental health care program (CDHP). in which the baseline data collection included (i) basic demographic data (ii) body mass index (BMI) (iii) assessment of the dentition status and treatment needs according to WHO 1997 criteria. The CDHP included group-based dental health education, professional oral prophylaxis, weekly (0.2%) sodium fluoride mouth rinse program, biannual application of topical fluoride (1.23% APF), pit and fissure sealants for all first permanent molars and provision of all necessary curative services and concluded that comprehensive dental health care program (CDHP) is effective in overall improvement of general and oral health. In resource-limited countries like India, such programs organized by dental schools can improve oral health.[8]

Kovacs, M.et al. (2012) performed a retrospective study to assess the prevalence of dental trauma in deciduous and permanent teeth among children and teenagers. The study looked at patients aged 1-18 years attending two clinics in Targu Mures between January 2003 and August 2011. They analyzed records for factors related to dental trauma: gender, age, dentition type, injury causes, lesion type, affected teeth, occlusion, and X-rays. The overall dental trauma prevalence was 24.5%. Boys and girls had similar rates of injuries to baby teeth, peaking between 1-2 years. In permanent teeth, boys had more trauma, with the highest incidence between 11-12 years for both genders. Falls were common causes in baby teeth (learning to walk), and in permanent teeth (cycling or sports accidents). Lateral luxation was frequent in baby teeth, while permanent teeth often had fractures involving enamel and dentin but not the pulp. A connection was found between having prominent front teeth and more frequent dental trauma.[9]

Khare V, Koshy A, Rani PJ, Srilatha S, Kapse SC, Agrawal A.(2012) conducted a descriptive cross-sectional study to assess the oral health status and treatment needs of orphan children. The study aimed to examine the prevalence of dental caries and

treatment needs among the orphan children and adolescents of Udaipur district, Rajasthan, India. The lists obtained comprised of 13 orphanages consisting of 923 inmates including both genders. The survey proforma was prepared using a self-administered structured questionnaire written in English and validated through a pretested survey. The study concluded that the prevalence of dental caries in primary teeth was found to be 49.6% and in permanent teeth was 41%. The unmet needs for decayed teeth were also found to be high indicating a very poor accessibility and availability of any oral health care and also this community has experienced a low utilization of preventive or therapeutic oral health services.[10]

Ojahanon PI, Akionbare O, Umoh AO. (2013) conducted a comparative study to determine the oral hygiene status of institution-dwelling orphans. 38 orphans from four orphanages in Benin City, Edo State of Nigeria were clinically examined and their oral hygiene status was determined using the simplified oral hygiene index of Greene and Vermillion (OHI-S). The study concluded that 73 percent of the orphans were found to have fair oral hygiene comprising mostly of those aged 6-13 years. More females were in this category while more males presented with poor oral hygiene status. More orphans presented with fair oral hygiene which indicated inadequate oral care. There was poor oral health education and limited access to services and there is a need for these to be improved as a solution to the poor oral health status of these vulnerable children.[11]

Siqueira, M. B. et. al (2013) conducted a cross-sectional study to investigate predisposing factors for traumatic dental injury (TDI) in primary dentition and seeking dental care after the occurrence of TDI. study was carried out with 814 children aged 3 to 5 years enrolled at public and private preschools in the city of Campina Grande, PB, Brazil. Parents were asked to fill out a questionnaire on demographic data and the child's history of TDI. TDI was evaluated by clinical examinations performed by three previously calibrated dentists. The prevalence of TDI was 34.6% and 376 teeth were affected. The maxillary central incisors were the most affected (87.5%), followed by lateral central incisors (8.8%). Only 14 affected teeth (3.7%) were mandibular

incisors. Enamel fracture was the most common type of TDI (55.0%), followed by tooth discolouration (26.8%), more than one trauma to the same tooth (9.6%), tooth avulsion (1.3%), extrusive luxation (0.5%) and intrusive luxation (0.5%). Most children had only one tooth affected and the overjet >2 mm and absence of lip seal were associated with a greater occurrence of TDI. Home was the most frequent place of occurrence (77.5%) and falls constituted the most common cause (81.3%). [12]

Shanbhog R, Godhi BS, Nandlal B, Kumar SS, Raju V, Rashmi S. (2013) conducted a cross-sectional survey among 488 children of 12-14 years living in 5 different orphanages of Mysore district, India, to determine the prevalence and severity of oral condition related to untreated dental caries with PUFA index and to relate period of institutional stay, oral hygiene practice and diet of orphan children to caries experience ratio. Data regarding oral hygiene practices and oral health status (PUFA, DMFT, OH I-S and GI) were collected through structured questionnaires and by type III clinical oral examinations. The collected data were processed statistically. The study concluded that 21% of the decayed component had progressed to pulp involvement and abscess formation. The overall prevalence of PUFA was 37.7%. 31.1% of children showed one or more pulpally involved teeth in their oral cavity.. The result showed oral health conditions in orphan children were neglected. Children from this disadvantaged background have shown a high prevalence of dental caries with low dental care utilization.[13]

Bhayya, D. P., & Shyagali, T. R. (2013) conducted a cross-sectional study to assess the prevalence of traumatic injuries to the teeth of 4- to 6-year-old children living in Gulbarga City, India, to determine the prevalence of such dental traumatic injuries at the ages of 4, 5, and 6 years and to compare the prevalence of these injuries between male and female children. . Results showed that the prevalence of traumatic dental injuries was 76.13%, of which crown fracture with enamel involvement of teeth was the most prevalent, followed by crown fracture with both enamel and dentine involvement. Significant and highly significant differences were found between boys and girls for discolouration of teeth ($P<0.05$), crown fracture involving enamel

(P<0.001) and crown fracture involving both enamel and dentine (P<0.001). The prevalence of traumatic dental injuries in the 5-year-old children was higher than that in the 4- and 6-year-olds. The commonest cause of injury was due to a fall (60%) and in 40% of cases of traumatic injury, they occurred in a field/playground. The prevalence of traumatic injuries to the anterior teeth of the 4- to 6-year-olds who took part in this study was very high. There is a need to run educational programmes to increase parents' awareness of the risks of dental trauma.[14]

Mohan A, Misra N, Umapathy D, Kumar S, Srivastav D, Mohan U.(2014) conducted a cross-sectional study in Lucknow city among children of age group 5-14 years living in orphanages and school children living with their parents, to compare the oral and dental health status of children living in orphanages and children living with their families. A total of 80 orphan children and 80 school children of age group 5-14 years were taken for the study. The study concluded that about 21.8 percent of school children were without any clinical finding whereas only 2.5 percent of orphan children had no clinical finding. The hard tissue lesions were found in 83.7 percent while these were in 57.2 percent of school children. The soft tissue lesions were found in 70.0 percent of orphan children while these were in 31.2 percent of school children. The majority of orphan children were suffering from oral and dental problems. The most common hard tissue finding was dental caries and soft tissue finding were Aphthous and Coated tongue in orphanages. Overall oral and dental health of orphan children were poorer than school children.[15]

Sharma A. et al. (2014) conducted a 'Descriptive Cross-Sectional Survey' to assess the oral health status and treatment needs of 5, 12 and 15-year-old orphanage children in Jaipur city. Clinical data were collected using the WHO Oral Health Assessment Form (1997). The study concluded that the prevalence of caries was highest in 12-year-old females. Mean DMFT was 1.64±1.52 and 1.52 ±1.03 among 12-year-old males and females, while the mean DMFT of 15-year-old males and females was 0.94±0.89 and 2.07±2.14 respectively with statistically significant differences. The findings of the clinical examination highlighted untreated caries and no filled

component which may be attributed to poverty, illiteracy, poor awareness and lack of oral health services. And, to improve the oral health status a combined strategy that deals with the current disease load and helps to prevent the further occurrence of disease in the long run is needed.[16]

Shanbhog R, Raju V, Nandlal B (2014) conducted a cross-sectional survey among 488 children of 12-14 years of age living in five different orphanage houses, of Mysore district, Karnataka state, India, to assess the source of information, level of knowledge, attitude, and practice toward oral hygiene and oral health among socially handicapped children. Data regarding knowledge and practice were collected through a structured questionnaire and oral health status by type III clinical oral examinations by two trained examiners. A total of 88.5% of children showed one or more decayed teeth in their oral cavity, with an overall mean DMFT of 3.55. Among DMF, component D showed maximum value with a mean 3.42, followed by components F and M. Correlation between source of information, knowledge, and attitude for oral health to oral hygiene index (OHI-S; $P < 0.05$) and gingival index ($P < 0.001$) showed highly significant negative values. Correlation between oral hygiene practice to OHI-S, DMFT, and gingival index ($P < 0.001$) showed highly significant ($P < 0.001$) negative values. Although children in orphanages have positive attitudes toward oral health, knowledge and practice among children are still below the satisfactory level.[17]

Gaur A, Sujan SG, Katna V. (2014) conducted a cross-sectional study of 166 children residing in juvenile and orphanage homes with 384 school children. The study aimed to evaluate the oral health status (caries prevalence, dmft, DMF, OHI index) of the institutionalized children that is, juvenile homes, and orphanage homes run by the Gujarat Government in Vadodara city with that of normal school-going children. The study concluded that the prevalence of dental caries was higher among the school-going children (62.12%) with the juvenile group having (52.4%) but oral hygiene was poor among the juvenile group children concerning those of the school-going group. The juvenile group children had lower caries prevalence but poor oral hygiene status in contrast to school-going children.[18]

Al-Maweri SA, Al-Soneidar WA, Halboub ES.(2014) conducted a matched case-control study to assess the prevalence of oral mucosal lesions (OMLs) and dental caries and to evaluate oral health practices among institutionalized orphan-children in Sana'a city, Yemen. A sample of 202 institutionalized male orphan children in the main orphanage in Sana'a city, were matched to 202 non-orphan schoolchildren. Clinical examination included assessment of OMLs based on standard international diagnostic criteria and evaluation of dental status using the Decayed/decayed, Missed/missed and Filled/filled (DMFT/dmft) index according to World Health Organization recommendations. Demographic data and oral hygiene practices were obtained by interviewing each subject using a special questionnaire form. The study concluded that the majority of children were in the 12–15-year age group. Nine types of lesions were reported among orphans; the most common lesions were fissured tongue (24.3%), herpes labialis (7.9%) and traumatic ulcers (2.5%). The institutionalized children in this orphanage had a high prevalence of OMLs but a low prevalence of dental caries, though they revealed poor oral hygiene practices. Effective oral health promotion strategies need to be implemented to improve the oral health and oral health practices of children living in orphanages.[19]

Hans R, Thomas S, Dagli R, Bhateja GA, Sharma A, Singh A.(2014) conducted a cross-sectional study to assess the oral health knowledge, attitude and practices and to assess the dental caries status and treatment needs among the orphan children of orphanages. The study was carried out on 100 children to assess the oral health knowledge, attitudes and practices of children and adolescents of orphanages in Jodhpur city, Rajasthan, India. The study concluded that almost 93% of the children felt the necessity of maintaining oral hygiene. There were 69% of the children believed that it was necessary to brush their teeth after every meal, 51% of children believed that regular tooth brushing prevents all tooth problems and 93% of children knew that tobacco is carcinogenic in nature. Also, it was found that 77% of the children believed that regular dental visits help in maintaining oral hygiene. Many of them had acquired knowledge of oral health. More than half of the study subjects were aware of the

importance of maintaining good oral hygiene, regular dental visits and the harmful effects of tobacco.[20]

Chikkala J, Chandrabhatla SK, Vanga NR.(2015) conducted a pilot study to assess the impact of parental loss on dental anxiety among 6-13-year-old children. A total of 444 children within the age group 6-13 years were selected. Group 1 consisted of orphan children living in government-run orphanages, Group 2 consisted of orphan children taken care of by a person with a motherly relationship, Group 3 consisted of abandoned children living in private organizations and Group 4 consisted of children living with their parents. Dental anxiety was measured using the children's fear survey schedule-dental subscale and the modified faces version of the modified child dental anxiety scale. The study concluded that the highest number of anxious children were observed in Group 4 and the difference in the anxiety levels among the four groups was found to be highly statistically significant. Children living in government-run orphanages had the least dental anxiety. All the orphans may not have the same anxiety levels and the environment of upbringing of the orphans plays a significant role in the development of the anxiety.[21]

Khedekar M et al. (2015) conducted an Interventional study to determine the knowledge and oral hygiene status of orphanage children in Pune and changes in them after health education. A specially designed questionnaire was used to assess the dental problems and existing oral hygiene maintenance practices among children between 5 - 12 years of age (n=100) in an orphanage centre. The intervention was in the form of oral health education, demonstration of correct brushing technique, diet counselling and maintenance of overall oral hygiene. The study concluded that the orphans had multiple dental problems along with improper oral hygiene practices and careless attitudes towards oral health. There was considerable improvement in the oral hygiene status of orphans due to educational intervention and Oral health education at the right age can help to cultivate healthy oral hygiene practices in orphans which will benefit them for lifelong. Caretakers should be educated and trained about oral hygiene practices so that they can implement them and supervise orphan children.[22]

Markeviciute G, Narbutaite J. (2015) conducted an Interventional study to evaluate the effect of motivation and practical skills development methods on the oral hygiene of orphans. 68 orphans aged between 7 and 17 years from two orphanages in Kaunas were divided into two groups: the practical application group and the motivation group. Children were clinically examined by determining their oral hygiene status using the Silness-Löe plaque index. The study concluded that all children had a plaque on at least one tooth in both groups: motivation 1.14 (SD 0.51), practical application 1.08 (SD 0.4) (P = 0.58). Girls in both groups showed significantly better oral hygiene than boys (P < 0.001). After 3 months educational program oral hygiene status improved in both groups significantly 0.4 (SD 0.35) (P < 0.001). Significantly better oral hygiene was determined in the practical application group 0.19 (SD 0.27) in comparison with the motivation group 0.55 (SD 0.32) (P < 0.001). By comparing the results of the first and second questionnaire surveys on the use of soft drinks, the statistically significant decline in their use was in both groups (P = 0.004), therefore educational programs are effective in improving oral hygiene, especially when they're based on practical skills training.[23]

Rubin PF, Winocur E, Erez A, Birenboim-Wilensky R, Peretz B. (2016) conducted a cross-sectional study to assess the overall dental treatment needs of children living in an orphanage in Uganda. A total of 155 residents were living in the orphanage during the study period, and all but 2 consented to participate in the study. The age range of the participants was 5-17 years (mean age 12.17±2.64). Teeth were diagnosed as needing treatment by obvious frank carious lesions (WHO criteria), temporary fillings, staining, or very deep pit and/or fissures possibly requiring sealants. Calculus or crowding in the mandibular anterior region and evidence of tooth fractures were recorded, as were signs of wear on the mandibular molars and canines and the maxillary incisors. The study concluded that most of the primary teeth (64%) required no dental treatment, but almost all (98%) of the permanent teeth did. A mean (standard deviation) of 4.81±1.92 permanent teeth required treatment. The mean number of missing teeth was 0.47. Thirty-one children (20.2%) had crowding, 52

(34%) had calculus, and 49 (32%) had signs of attrition on primary and permanent molar teeth (45 enamel only and 4 enamel and dentin). [24]

Thetakala RK, Sunitha S, Chandrashekar BR, Sharma P, Krupa NC, Srilatha Y. et. al (2017) conducted a cross-sectional study among 6 to 15-year-old children residing in eight orphanages with an aim to explore periodontal and dentition status among orphans and children with parents in Mysore city, India. An equal number of age and gender-matched children living with parents were selected from government schools (non-orphans) located in the same geographical areas for comparison. Clinical examination was conducted by a single trained, calibrated examiner and oral findings were recorded according to World Health Organization (WHO) diagnostic criteria 2013. The mean defs and DMFS were significantly higher among government school children (non-orphans) (defs: 3.20±4.0; DMFS: 2.43±2.8) compared to children from orphanages (defs: 2.72±4.4; DMFS: 1.72±2.3). The prevalence of gingival bleeding among orphans (79.49%) was higher compared to non-orphans (71.4%). The study concluded that the prevalence of caries was lower among orphans but periodontal status was poor among them as compared to non-orphans. [25]

Ain, T. S. et. al (2016) conducted a cross-sectional study to assess the prevalence of traumatic dental injuries to anterior teeth among 12-year-old school children in Kashmir, India. The study was conducted in private and government schools in India among 1600 schoolchildren aged 12 years. In addition to the recording of the type of trauma (using Ellis and Davey's classification of fractures, 1970), overjet, Angle's molar relation and lip competence were also recorded. The socioeconomic status and academic performance of the study subjects were registered. The data obtained were compiled systematically and then statistically analyzed. The study concluded that the overall prevalence of TDI to anterior teeth was found to be 9.3%. The TDI to anterior teeth in males was more than females, but the difference was statistically nonsignificant ($P < 0.01$). Falls and sports were the most common causes of trauma in the present study. The highest potential risk factor for the occurrence of trauma was

over jet. Therefore, prevention should consider several characteristics such as oral predisposing factors, environmental determinants and human behaviour.[26]

Shah AF, Tangade P, Ravishankar TL, Tirth A, Pal S, Batra M.(2017) conducted a cross-sectional study to assess the dental caries status of institutionalized orphan children from Jammu and Kashmir. A total of 1,664 children including 1,201 boys and 463 girls from registered orphanages in the state of Jammu and Kashmir were included in the study. Written informed consent was obtained prior to the start of the study; decayed, extracted, filled teeth (deft)/ decayed, extracted, filled surface (defs) and decayed, missing, and filled teeth (DMFT)/decayed, missing, and filled surface (DMFS) indices were used to assess the caries status of primary and permanent dentition. Multiple choice, close-ended questionnaires were administered to assess the oral hygiene habits, knowledge, and dietary behaviour of orphan children prior to examination. The study subjects were divided into three groups according to the age of ≤ 6, 7 to 11, and ≥12 years. Results showed that caries prevalence in primary dentition was higher in subjects ≤6 years of age where the prevalence was 50.9%; in subjects 7 to 11 years of age, the prevalence was 25.2%. Caries prevalence in permanent dentition within the age group 7 to 11 was 69.1%, while in subjects≥12 years, the prevalence was 66.2%. The use of toothbrushes was the most prevalent method of cleaning the teeth in both genders, while toothpaste was reported to be the most prevalent material to be used for tooth cleaning followed by tooth powder.[27]

Kamran R, Farooq W, Faisal MR, Jahangir F(2017) conducted a cross-sectional survey to determine the prevalence and clinical effects of untreated dental caries in Pakistani children residing in orphanages using the DMFT and PUFA index. A total of 753 orphan children belonging to 4-17 years of age group residing in the twin cities of Rawalpindi and Islamabad, Pakistan. Clinical examination of children was performed using the DMFT and PUFA index for the assessment of dental caries and untreated decay, followed by a questionnaire enquiring about eating and oral hygiene habits, dental visiting patterns and dental pain and swelling experience.. The study concluded that the overall caries prevalence was 34.8% and overall prevalence of

PUFA/pufa was 15.9%. The mean score of DMFT and dmft was 1.18 (SD 0.39) and 1.04 (SD 0.23), and mean PUFA was 1.18 (SD 0.57) and mean pufa score 1.14 (SD 0.35). Untreated caries ratio 49.1%. No significant association of gender was found with DMFT, dmft, PUFA and pufa ($p > 0.05$), however, when analysed individually, the 'D' component of DMFT was significantly associated with male gender ($p = 0.05$). Furthermore, no significant association of DMFT/dmft or PUFA/pufa in either dentition was found with behavioural characteristics such as dietary and oral hygiene habits. Also, 66.2% of children who experienced pain had not been to the dentist in the past year ($p = 0.013$) and 52.6% of children who mentioned experiencing pain at night had not been to the dentist in the past year ($p = 0.009$). Children with decay were more likely to have visited the dentist (OR 3.3, 95% CI 1.42-7.6, $p = 0.006$). However, children who reported to have experienced pain were less likely to have visited the dentist in the past year (OR 0.53, 95% CI 0.32-0.88, $p = 0.014$Initiation of preventive services for children residing in orphanages in Pakistan would help greatly towards reducing the burden of untreated decay.[28]

Bennadi D, Shabanam S, Abdul NN, Jacob A, Malini K, Bharateesh JV. (2018) conducted a cross-sectional survey was conducted among 2- to 15-year-old children residing in five orphanages of Tumkur, Karnataka, to assess the baseline data regarding oral health problems among orphan children. A total of 110 children aged between 2 and 15 years were included in the study. A specially designed questionnaire was answered by the orphans and their caretakers to assess their problems, duration of stay, existing oral hygiene practice, and attitude toward oral health. An intraoral examination was performed. Baseline data were collected on oral hygiene, fractured teeth, and presence or absence of gingivitis, status of decayed, missing and filled teeth among permanent (DMFT) and deciduous dentition (dmft). The collected data were subjected for analysis. The findings of the examination highlighted untreated caries and no filled component which may be attributed to poverty, illiteracy, poor awareness, and lack of oral health services. The survey showed the need for oral health care services at orphanages of Tumkur.[29]

Ali Z, Abu N, Ankamah IA, Gyinde EA, Seidu AS, Abizari AR (2018) conducted an analytical cross–sectional study to compare the nutritional status and dietary diversity of orphan and non-orphan children. 246 (123 non-orphans and 123 orphans) were sampled from households (non-orphans) and four orphanages (orphans). Maternal / caregiver and child socio-demographic characteristics and dietary diversity of children were assessed with a semi–structure questionnaire. We measured the anthropometric characteristics of children. Stunting, wasting and underweight in children were classified using Height- – for–age Z – scores (HAZ), Weight–for–height Z – scores (WHZ) and Weight – for – age Z – scores (WAZ) respectively. Bivariate and multivariate analyses were used to compare the nutritional status and dietary diversity of orphan and non-orphan children. The study concluded that the majority of the children were male (52.4%). The prevalence of stunting, wasting and being underweight was 17.9, 5.3 and 7.7% respectively for all children. However, orphans had higher mean dietary diversity scores ($p < 0.001$) and minimum dietary diversity ($p < 0.001$) than non–orphans. The study data show no significant difference in the anthropometric status of orphan and non-orphan children. Orphans were more likely to receive a diversified diet than non-orphans.[30]

Kavayashree G, Girish Babu KL.(2019) conducted a descriptive cross-sectional study to assess the oral health status of children residing in orphanages of Hassan city, India. children without parents, aged 6–14 years were selected from government-run orphanages. Oral hygiene status was assessed using the oral hygiene index (OHI) given by Greene and Vermillion. Gingival status was assessed using the gingival index by Loe and Silness. The status of oral mucosa, dental carries, and dental trauma was assessed according to the WHO criteria (2013). The study shows that the mean oral hygiene score among males was 1.32 ± 0.69 and among females was 0.89 ± 0.80 ($P = 0.006$). On comparison of the mean gingival index score between males and females, it was not statistically significant ($P = 0.160$). The prevalence of dental caries in primary and permanent dentition was 26.21% and 23.07%, respectively. The prevalence of fractured teeth was found to be 8.57%. The oral hygiene status and

gingival health status of the orphan children were good. The prevalence of dental caries and dental trauma was low among them.[31]

Abedassar S, Malek-Mohammadi T, Tania Dehesh T, Dahesh S. (2019) conducted a cross-sectional study to evaluate the oral health status and oral hygiene behaviour of orphans who are living in care homes in Kerman City, Iran". All children aged between 6-18 years who were living in 20 orphan care homes participated in the study after acquiring legal permission and signing the consent form.. A descriptive analysis was performed to reach the study's aim and objectives. In total, 356 children participated, with 50.6% of the male group. The study subjects were classified into two age groups 6-12 and 13-18 years old. Mean decayed, missing, and filled teeth (DMFT)/dmft was 1.73 ‡ 1.84 and 4.13 ÷ 3.80 in 6-12-year-old group, respectively. Only 39.5% of 13-18-year-old group had healthy gingiva. The mean of plaque index (PLI) was 0.98 ÷ 0.86 for the whole study population. There was a significant relationship between gender and PLI and also tooth brushing behaviour. The study concluded that the oral health of orphan children is not adequate. Therefore, a regular dental check-up and oral health program is necessary. [32]

Christian B et al(2019) conducted a cross-sectional study to determine caries status and associated risk factors among children in orphanages in Kerala, India. Caries was assessed using World Health Organization (WHO) criteria, and caries experience was reported as decayed, missing and filled primary or secondary teeth (dmft or DMFT, respectively). Overall, 1,137 children residing in 31 orphanages across the State of Kerala were recruited for the study. Female children made up 82% of the sample. In 6-year-old children, the prevalence of caries was 77% and the mean dmft score was 3.60 (SD= 3.50); in 12-year-old children, the prevalence of caries was 44% and the mean DMFT score was 1.35 (SD = 1.96). Among 12-year-old children, those who reported being shown how to clean their teeth were less likely to have caries (odds ratio = 0.62; 95% confidence interval: 0.38–0.95). They concluded that Caries rates among children in orphanages were much higher than among children in the general population in Kerala. There is an urgent need for evidence-based and sustainable

primary prevention strategies to reduce the burden of caries in this highly vulnerable population.[33]

DeLacey E et al (2020) conducted a systematic review aimed at evaluating currently available data on the nutrition status of children living within institutionalized care. They looked at data from 25 papers out of 3,602 titles, covering children from over 2.7 million in institutions. Most studies were cross-sectional, and the majority focused on children above 5 years. The prevalence of low birth weight ranged from 25-39%, and undernutrition varied, with stunting from 9-72%, wasting from 0-27%, and underweight from 7-79%. Overweight/obesity ranged from 10-32%. Malnutrition was more common in younger children. The review highlighted limited evidence on institutionalized children's nutrition, indicating they are often malnourished, with micronutrient deficiencies and obesity prevalent. Data quality was a concern, with poor reporting on disabilities despite their common occurrence. The findings emphasized the need to improve nutrition, especially for younger children, and gather more information to better address the rights and healthy development of children in institutional care.[34]

Sewnet SS, Derseh HA, Desyibelew HD, Fentahun N. (2020) conducted an institution-based cross-sectional study to assess undernutrition and associated factors among under-five orphan children in orphanages in Addis Ababa, Ethiopia. A simple random sampling technique was employed to recruit a total of 275 orphan children. An interviewer-administered questionnaire and anthropometric measurements were used to collect data.. The study showed that the prevalence of undernutrition was very high compared to national data. Health status, meal frequency, and vaccination status were associated factors of stunting. Vaccination status and dietary diversity score were associated factors with wasting and underweight, respectively. Therefore, improving meal frequency, dietary diversity, and early treatment during childhood illness are important to reduce orphan undernutrition.[35]

Tewari, N. et. al (2020) conducted a systematic review and meta-analysis to estimate the prevalence of traumatic dental injuries (TDI) in India. The secondary objective was to evaluate the prevalence rate according to the differences in gender, age, regions, type of TDI and risk factors associated with TDI. The PubMed, LILACS, Web of Science, Cochrane, CINHAL, and Scopus databases, along with the Public Health Electronic Library, TRoPHI and DoPHER were searched from 1st March to 15thApril 2019 without any restriction of language and year of publication. The study concluded that the pooled prevalence of TDI in the Indian population was 13 cases in 100 individuals. The prevalence of TDI for age groups of ≤6 was 15% (males, 15%; females, 16%) and for >6 years was 12% (males, 13%; females, 8%). The most common cause of TDI was falls, and the most frequent location was at home. The odds ratio for occurrence of TDI and inadequate lip-coverage was 3.35 and overjet greater than 3 mm was 3.53. prevalence of TDI was 13% and slightly higher in children less than 6 years of age. Inadequate lip coverage and increased overjet are the risk factors associated with TDI. [36]

Goswami M, Aggarwal T. (2021) conducted a retrospective to evaluate the prevalence of dental trauma in children in the age group of 1 to 14 years in New Delhi. The total study sample comprised of 6,765 children between 1 year and 14 years of age, who reported to the department between March 2017 and December 2017. Out of these, there were 85 children in whom trauma to teeth and surrounding structures was recorded. Data including age, gender, type of trauma, and involvement of soft tissue were extracted from departmental records maintained for every outpatient irrespective of the presence or absence of trauma. Injuries to dentition were classified based on Ellis and Davey's classification (1960). Results showed that the mean age of participating children was 9.98 ± 1.704 and trauma was present in 1.25% of children. Ellis class IV type of trauma was seen in maximum (36.5%) cases with maxillary central incisors being most frequently injured during dental trauma.[37]

Kumari A et al (2021) conducted a cross-sectional study to assess oral hygiene status and practices among 12- to 15-year-old orphanage children in Delhi State, IndiaHealthy orphanage children in the age group of 12 to 15 years who were willing to be examined and also gave verbal consent were include. The clinical oral examination for the oral hygiene status of orphans was assessed using OHI-S given by Greene and Vermillion, and PI given by Silness and Loe. The gingival status was assessed using the GI given by Loe and Silness. The majority of the orphanage children had good oral hygiene status (53.8%) followed by fair (32.3%) and poor (13.9%) oral hygiene status. A large proportion (48.3%) of the orphanage children had mild gingival status followed by moderate (34.9%) and severe (16.8%) gingival status. No statistical difference was reported for the distribution of oral hygiene status and gingival score across all the age groups. Most (53%) of the orphanage children among all age groups had good plaque status. The correlation of gingival index (GI) scores with plaque index (PI) scores and oral hygiene index-simplified (OHI-S) scores showed a significant correlation of GI scores with PI scores (r = 0.815) and OHI-S scores (r = 0.799). The study concluded that the oral hygiene practices and oral hygiene status along with gingival status were found to be satisfactory among orphanage children.[38]

Girish Babu KL, Kavyashree GH. (2021) conducted a cross-sectional study to assess the oral health-related quality of life and dental caries status among institutionalized orphan children. A total of 64 males and 39 females participated in this study. Children aged 6–14 years, were selected from government-run orphanages. Following, an intraoral examination of each child was carried out in an adequate natural light using a sterilized mouth mirror and probe. Dental caries was assessed according to the World Health Organization criteria. The data obtained were subjected to statistical analysis. The study concluded that the Decayed, Missed and Filled teeth (DMFT) score of males was 0.41 ± 0.86 and females was 0.97 ± 1.44, and the difference was statistically significant. The mean of oral symptoms, functional limitation, emotional well-being, and social well-being was 26.49 ± 4.48, 37.75 ± 3.63, 33.31 ± 4.18, and 47.92 ± 3.37, respectively. The prevalence of dental caries was low

among these orphan children. The quality of life of these children was not affected by their dental caries status.[39]

Agarwalla S, Chandra B, Santra A, Kundu GK. (2022) conducted a cross-sectional study to evaluate the IQ and dental caries status of socially deprived orphan children and compare them with children living with their parents. For comparison, 100 children in the age-group 7-11 years, were divided into two groups: 50 orphanage children (orphanage-group) and 50 school-going children living with their families were included (home group). The study concluded that there was a statistically significant difference between children with different levels of IQ for both groups. However, the majority of children who belong to below-average IQ scores had higher dental caries**.** Children with better IQ had less dental caries. There was no difference in IQ and DMFT/dmft scores between both genders. The overall DMFT/dmft was high in children living with their parents when compared to orphanage children.[40]

Goswami M, Bhardwaj S. (2022) conducted a cross-sectional study to determine the prevalence of Traumatic dental injuries (TDIs) in institutionalized orphan children. The study was conducted in six institutions for orphan children in New Delhi, India. A total of 500 institutionalized orphan children in the age group of 5–14 years were included in the study. Results showed that the prevalence of TDI was found to be 5.8% among the institutionalized orphan children with a higher prevalence among boys when compared with girls. The most common tooth involved was maxillary central incisors. Enamel and dentin fractures were the most prevalent TDIs. The prevalence was higher among 10–12-year-old children in the present study and can be attributed to the ugly duckling stage of mixed dentition. There is reduced access to dental care services, and minor injuries remain unnoticed among institutionalized orphan children. Therefore, the implementation of educational programs for caretakers of orphanages should also be done to enhance their knowledge and provide adequate and timely dental trauma intervention to orphan children.[41]

Elizabeth, S.et al (2022) conducted a cross-sectional study to assess the impact of upper incisor trauma on the quality of life (QoL) in young children studying between the age group 8 and 13 years in Faridabad, Haryana. The prospective study was conducted to assess the visible permanent maxillary incisor traumas according to the classification of traumatic dental injuries (TDI) and to determine the predisposing risk factors that affect TDI and their impact on QoL in children aged 8-13 years. Questionnaires were made to gather information on demographic and socioeconomic characteristics like age, gender, and the father's and mother's education. Data on dental caries in anterior teeth were also collected using current World Health Organization criteria. The study concluded that there were a total of 66 males and 24 females. The total decayed, missing, and filled permanent teeth (DMFT) prevalence observed was 8.9%. The main reason for trauma was found to be an accident or accidental fall (36.7%). The most common place for trauma followed by road (21.1%).). Several risk factors need to be considered when assessing TDIs, as TDIs can have a negative impact on the functional, social, and psychological well-being of young children. As they are frequent in children, affecting teeth, their supporting structures, and adjacent soft tissues, they may cause both functional and esthetic problems.[42]

Unnikrishnan Vet al (2022) conducted a cross-sectional study to assess the perception of oral health and practices among children residing in orphanages in Bengaluru city. Data were collected from chosen inmates in Bengaluru City orphanages between the ages of 12 and 17. A questionnaire was obtained from the World Health Organization's Oral Health Basic Survey Methods. There were 14 items about the perception of oral health and habits in the questionnaire. The pilot study was carried out to determine the feasibility of the investigation, as well as to train and calibrate the investigator and assess the questionnaire's test-retest reliability. Results showed that the self-assessments and practices of the study participants varied significantly. The proportion of substance abuse was very low, and the oral hygiene practices of the majority of participants were good. Interventions need to be undertaken to improve and reinforce oral health awareness among the study participants.[43]

Singh RK, Gourav R, Kaur S, Naidu D. (2022) conducted a cross-sectional study to assess the dental caries experience, oral hygiene status and periodontal status among the orphanage children in Prakasam District, Andhra Pradesh, India. The study was conducted among 485 orphan children of various institutes ranging from 12 to 16 years where Oral Hygiene Status was recorded using Simplified Oral Hygiene Index, periodontal status using CPI index using WHO Proforma 2013 chi-square test and descriptive statistics test was used for statistical analysis by using SPSS 22.0 software. The results showed that 73.4% were having dental caries and the mean DI-S scores, CI-S scores and OHI-S scores were 1.41 ±0.47, 1.07 ±0.47 and 2.48 ±0.92 respectively. The prevalence and severity of gingival bleeding were found to be more i.e.64.7% among them. The majority of orphan children were suffering from oral problems; hence the Oral health fraternity should actively involve other parts of the community to maintain oral care of this group.[44]

Mahanta Pet al (2022) conducted a cross-sectional study to evaluate the physical and psychosocial status of orphan children living in orphanages in the Sonitpur district, Assam. A pretested, predesigned questionnaire has been used for the data collection on the physical health of orphan children. A total of 83 orphan children aged 5 to 19 living in three different orphanages, meeting the inclusion criteria were randomly selected for the study. The study concluded that the majority (38.6%) of the orphans were malnourished, reflected by severe thinness of < -3SD, Dental caries in 5% of children in the present study were observed. The results in the present study also revealed malocclusion in 32.5%, calculus in 37.3%, and gingival recession in 13.2%, besides decay in 19.3% of orphans, which were the signs of bad oral hygiene.. In the present study, 18.5% of the 10–19-year-old orphan children were contained with behavioural or mental distress, as these children are more exposed to abuse and mistreatment, often neglected in mainstream society and lack love and care, they are more prone to psychosocial distress. Malnutrition is predominantly found in orphans living in orphanages, and this aspect of malnourishment needs to be analysed systematically and addressed scientifically. [45]

Meshki R, Basir L, Motaghi S, Kazempour M.(2022) conducted a case-control study to assess dental caries among two groups of institutionalized orphan children and compare their results with a group of parented school children in Giza, Egypt. A total of 156 children were included in this study, residing in a non-governmental orphanage, a governmental orphanage, and parented children attending private primary school. The dental examination was carried out as recommended by the WHO. DMF and def indices were used to assess dental caries for primary and permanent teeth. Also, the unmet treatment needs index, care index, and significant caries index were calculated. The results revealed that mean values for DMF total score were 1.86 ± 2.96, 1.80 ± 2.54, and $0.7\ 5 \pm 1.29$ for, non-governmental, governmental orphanages, and school children respectively. While the mean def total scores were 1.69 ± 2.58, 0.41 ± 0.89, and 0.85 ± 1.79 for non-governmental, governmental orphanages, and school children, respectively. There was a high level of unmet treatment needs, especially among orphans. The study concluded that the institutionalized orphanage children had a high prevalence of dental caries and worse caries experience compared to parented school children. Effective oral health preventive strategies are required to improve the oral health status and oral health practices of those children.[46]

Alhallak E, Kouchaje C, Hasan A, Makieh R. (2022) conducted a randomized clinical trial to compare the effectiveness of nonchemical mouthwashes (probiotics) with chemical mouthwashes (fluoride) on plaque accumulation in orphan children after 7, 14, and 30 days of use. study was a triple-blind randomized controlled trial with two parallel groups (A and B), which included 30 healthy children. Each group included 15 children aged between 8 and 10 years. Group A used 10 ml of probiotic mouthwash (ProbioClean) and group B used 10 ml of fluoride mouthwash (Colgate) for 60 seconds for 30 days. Turesky Modified Quigley-Hein (TMQH) plaque index was used in this study to record the values of plaque accumulation on days 7, 14, and 30. Results showed statistical significance between probiotics and fluoride mouthwashes on days 14 ($p < 0.001$) and 30 ($p = 0.001$), and there was no statistical

significance on day seven (p = 0.934). According to the results of this study, probiotic mouthwashes are considered an effective solution for maintaining oral health. However, probiotics are more effective in reducing plaque accumulation after a month of use.[47]

Kaul, R. et. al (2023) conducted a cross-sectional study to investigate the prevalence and associated risk factors of traumatic dental injuries to permanent anterior teeth in school-going children of Kolkata aged 7-14 years. The study was conducted among 3762 school-going children attending various private and public schools of Kolkata aged 7-14 years. A multistage random clustering sampling technique was adopted to select the children. Type of trauma using Ellis and Davey's classification of fractures along with Andresen's Epidemiological Classification of Traumatic Injuries to Anterior Teeth, including WHO codes, was used. All values were considered statistically significant at $P < 0.05$. the study concluded that the prevalence of TDI to anterior teeth was found to be 9.89%. The mean age of children who presented with TDI was 11.06 ± 1.99.years. The most common place of occurrence of TDI was home. Falls were the most common cause of trauma. Children belonging to higher socioeconomic status were observed to have an increased prevalence of TDIs. The highest potential risk factor for the occurrence of trauma was a past history of trauma.[48]

MATERIALS & METHODS

A descriptive cross-sectional study was conducted in the Department of Pediatric and Preventive Dentistry, BBDCODS, BBDU, Lucknow in collaboration with the Government Institutionalized orphanages, in Lucknow City, Uttar Pradesh, India, after taking the approvals/permissions (Institutional Ethical Committee) from the concerned authorities.

Study population

The present study was designed and conducted after obtaining the list of the Government Institutionalised Orphanages in the Lucknow District, was obtained from the District Probation Officer. The list comprised of 9 Orphanages consisting of 528 inmates including both sexes.

Sampling Design

All the available children residing in the orphanages of Lucknow district formed the study population.

Official permission and ethical clearance were taken and a written permission was obtained from the District Probation Officer, Lucknow.

Eligibility Criteria:

Children of 4-12 years of age meeting the inclusion/ exclusion criteria were included in the study after their consent and assent.

Inclusion criteria:

1. Children aged between 4-12 years.
2. Gender inclusive.
3. Children residing in Government Institutionalized Orphanages in Lucknow city.

Exclusion criteria:

1. Children with special health care needs.
2. Patient not willing to submit their consent/assent.

Study Sample size calculation

Sample size estimation was done using the following Formula:

Formula

$$n = \frac{Z^2_{1-\alpha/2}\, p(1-p)}{d^2}$$

Where, p: Expected prevalence of dental caries = 0.69.1%

d: Absolute precision required on either side of the prevalence = 0.05 or 5%

Z: 1.96

The sample size adjusted for a finite population is given by,

Where,

p : Expected proportion

d : Absolute precision

1- α/2 : Desired Confidence level

The minimum sample size required for the study was 328 in order to obtain a confidence interval level of 95% and at least 80% power for analysis and minimal error. Thus, further the minimum sample size was rounded off to 350.

Sampling Method- Cluster Sampling

A cluster sampling approach was employed, encompassing all Institutionalized Government orphanages in Lucknow, to establish the sample frame.

MATERIALS

- Mouth mirror (GDC Germany)
- Dental Explorer (GDC Germany)
- Tweezer (GDC Germany)
- William's Probe (GDC Germany)
- Kidney trays
- Cotton rolls
- Gloves and moth masks
- Savlon solution (chlorhexidine solution i.p. 1.5% v/v and strong cetrimide solution b.p. equivalent to i.p. 3.0% v/w, colours: Tetrazine and Sunset Yellow FCF)
- WHO Oral Health Assessment Form for Adults (2013)
- WHO Oral Health Assessment Form for children (2013)

METHODOLOGY

The study was aimed to assess the prevalence and associated risk factors of Dental caries and Traumatic dental injuries in Government Institutionalized Orphan Children in Lucknow City. The study population consisted of 528 healthy orphan children between the age group of 4-12 years of both genders. To ensure participant privacy and ethical research practices, all respondents and their caretakers were explicitly informed about the confidentiality of their data. Only the primary investigator had access to the collected information. Informed consent and assent were obtained through written documentation from all participating children and their legal guardians/caretakers prior to initiating the study, ensuring ethical research practices.

Children were clinically examined for detection of Dental caries and Traumatic dental injuries by visual and tactile methods, in adequate natural light using a sterilized mouth mirror and probe. The clinical examination to check Dental caries and TDIs in the oral cavity was done by a single calibrated examiner in the study sample of 528 institutionalized orphan children. Dental caries was assessed using DMFT/dmft indices in permanent and primary dentition, and the Traumatic Dental Injuries were evaluated using the WHO Oral Health Assessment Form for Children 2013.

Prior to introducing the diagnostic instrument into the oral cavity, the children underwent a familiarization process with the diagnostic kit. In the case of the 4-6 age group, caregivers provided assistance to ensure better cooperation. The examination took place with the children seated either on laps or chairs, maintaining an upright position and benefiting from direct natural light.

For the older age groups, specifically 7-9 and 10-12, chairs equipped with back support were provided. Children were instructed to sit in an upright position during the examination, and data were systematically recorded. This approach aimed to facilitate a comprehensive and comfortable clinical assessment while ensuring the cooperation of children in different age brackets.

The "Dental Trauma Status" was evaluated using the WHO Oral Health Assessment Form for Children 2013, according to which the teeth affected by dental trauma were coded as follows:

0 = No sign of injury

1 = Treated injury

2 = Enamel fracture only

3 = Enamel and dentine fracture

4 = Pulp involvement

5 = Missing tooth due to trauma

6 = Other damage

9 = Excluded tooth

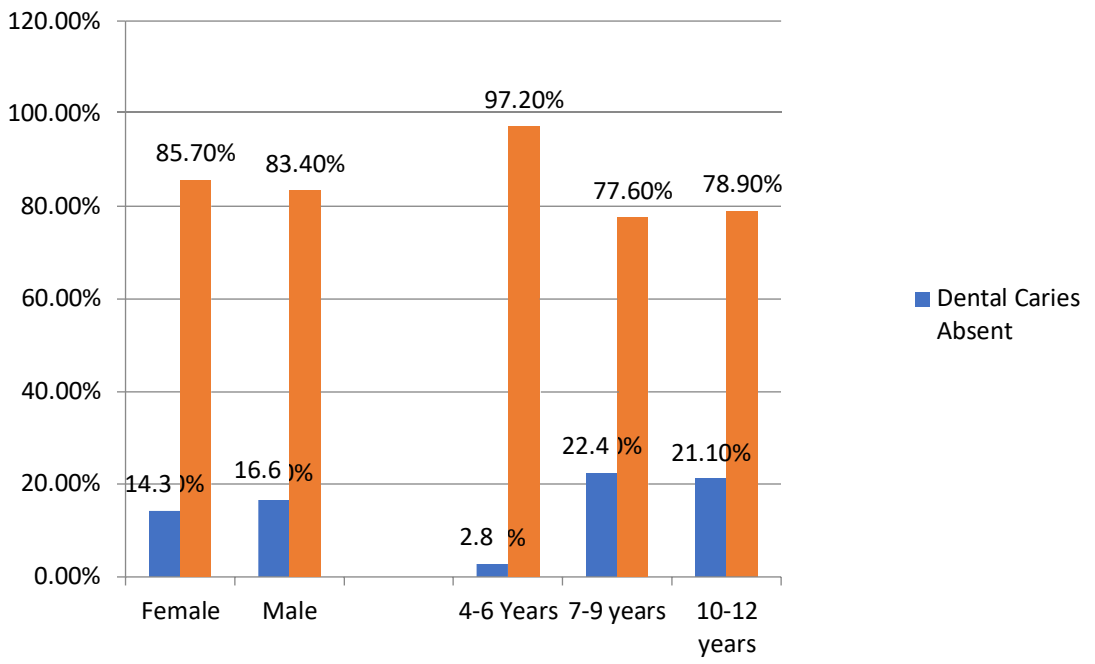
Statistical Analysis

The statistical software namely SPSS 15.0 was used for the analysis of the data. Data comparison was done by applying specific statistical tests (t-test, ANOVA and regression analysis) to find out the statistical significance of the comparisons. Significance level was fixed at $p \leq 0.05$.

PREVALENCE OF DENTAL CARIES –BASED ON AGE AND GENDER

	Total Study Sample (n= 528)	Dental Caries Present	Dental Caries Absent	Chi Square value	P value
Gender Wise Prevalence	Female (n=280)	240	40	0.567	0.987
		85.7%	14.3%		
	Male (n=248)	206	40		
		83.4%	16.6%		
		Dental Caries Present	Dental Caries Absent		
Age Group Wise Prevalence	4-6 Years (n=176)	171	5	33.732	0.001
		97.2%	2.8%		
	7-9 years (n=196)	152	44		
		77.6%	22.4%		
	10-12 years (n=156)	124	32		
		78.9%	21.1%		

Table no: 1 Prevalence of dental caries – based on age and gender



Graph no 1: <u>Prevalence of dental caries – based on age and gender</u>

<u>Table no: 1 & Graph no: 1</u> represents the prevalence of dental caries based on age and gender.

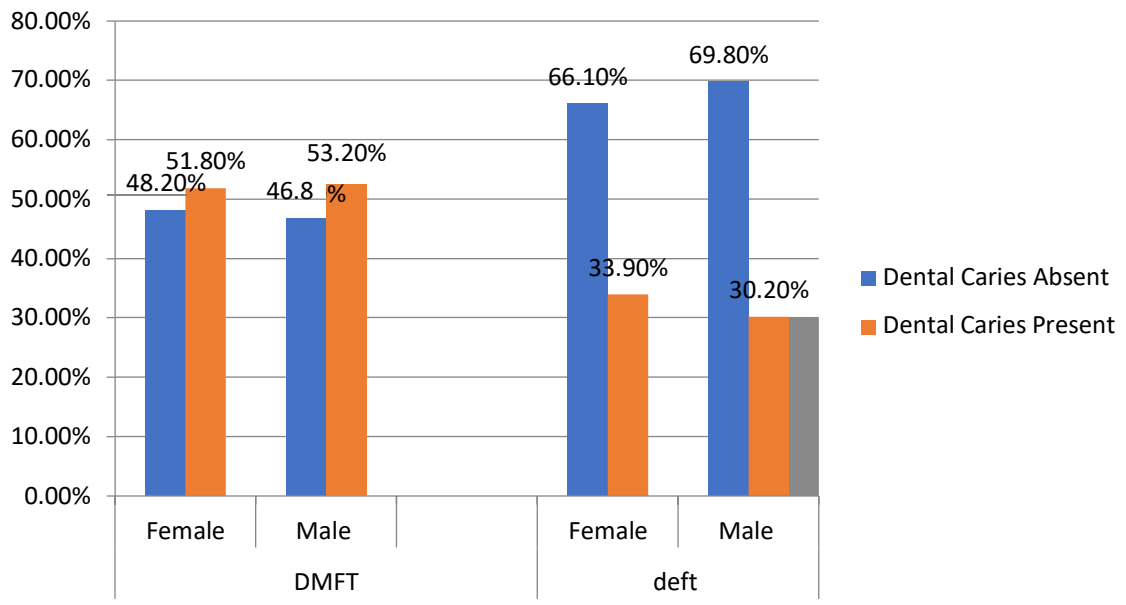
The prevalence of dental caries in **females** was 85.7%, while in **males** was 83.4%. A high prevalence of dental caries was noted in both genders; however, intergroup difference between genders was statistically not significant (p-value 0.987).

Based on the **age group**, the prevalence of dental caries in 4-6 years was 97.2% and 77.6% in 7-9 years while the age group 10-12 years showed a prevalence of 78.9% of dental caries. The intergroup prevalence of dental caries was significantly higher in the 4-6 years age group compared to the other age groups, this difference was highly significant (p-value 0.001).

GENDER-WISE PREVALENCE OF DENTAL CARIES IN PERMANENT DENTITION (DMFT) & PRIMARY DENTITION (deft)

	Total Study Sample (n= 528)	Dental Caries Present	Dental Caries Absent	Chi Square value	P value
Permanent Dentition (DMFT)	Female **(n=280)**	145	135	0.109	0.793
		51.8%	48.2%		
	Male **(n=248)**	132	116		
		53.2%	46.8%		
		Dental Caries Present	Dental Caries Absent	Chi Square value	P value
Primary Dentition (deft)	Female **(n=280)**	95	185	0.810	0.401
		33.9%	66.1%		
	Male **(n=248)**	75	173		
		30.2%	69.8%		

Table no:2 Gender-wise prevalence of dental caries in permanent dentition (DMFT) & primary dentition (deft)



Graph no:2 Gender-wise prevalence of dental caries in permanent dentition (DMFT) & primary dentition (deft)

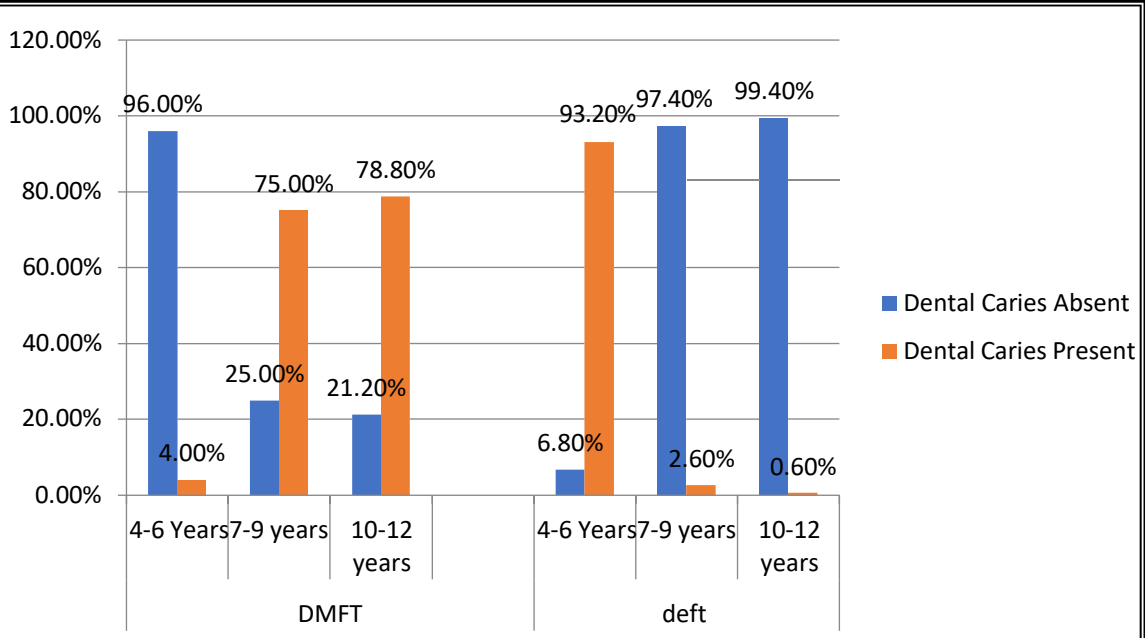
Table no: 2 & Graph no 2: shows the gender-wise prevalence of dental caries in permanent dentition (DMFT) & primary dentition (deft). In **permanent dentition**, the prevalence of Dental Caries (DMFT) was 51.8% in females and 53.2% among males. In the intergroup comparison, the prevalence of dental caries in permanent dentition (DMFT) between both the genders was statistically insignificant, as evidenced by a p-value of 0.793.

In **primary dentition**, the prevalence of Dental Caries (deft) was 33.9% in females and 30.2% among males. Hence, intergroup comparison showed insignificant differences statistically between both the groups with a p-value of 0.401. Therefore, gender-based analysis of dental caries prevalence in both permanent and primary dentitions indicated statistically insignificant differences showing a lack of gender-related disparities in the occurrence of dental caries in both primary and permanent dentitions.

AGE - WISE PREVALENCE OF DENTAL CARIES IN PERMANENT DENTITION (DMFT) & PRIMARY DENTITION (deft)

		Dental Caries Present	Dental Caries Absent	Chi Square value	P value
Permanent Dentition (DMFT)	4-6 Years	7	169	248.31	0.001
		4.0%	96.0%		
	7-9 years	147	49		
		75.0%	25.0%		
	10-12 years	123	33		
		78.8%	21.2%		
		Dental Caries Present	Dental Caries Absent	Chi Square value	P value
Primary Dentition (deft)	4-6 Years	164	12	449.12	0.001
		93.2%	6.8%		
	7-9 years	5	191		
		2.6%	97.4%		
	10-12 years	1	155		
		.6%	99.4%		

Table no: 3 Age-wise prevalence of dental caries in permanent dentition (DMFT) & primary dentition (deft)



Graph no: 3 <u>Age-wise prevalence of dental caries in permanent dentition (DMFT) & primary dentition (deft)</u>

<u>Table no: 3 and graph no: 3</u> demonstrates the age-wise prevalence of dental caries in permanent dentition (DMFT) & primary dentition(deft).

The prevalence of dental caries in the **permanent dentition** in the age group of 4-6 years was 4%, in 7-9 years was 75% and in 10-12 years, it was 78.8%. The intergroup comparison showed that the 10-12-year-old children exhibited the highest prevalence while the other two groups displayed almost the same prevalence rate, emphasizing a shared susceptibility to dental caries. Statistical analysis in the different age groups indicated significant difference with a p-value of 0.001.

In the **primary dentition** (deft) the prevalence was 93.2% in 4-6 years age, 2.6% in 7-9 years and 0.6% in 10-12 years age group. In the intergroup comparison within the primary dentition, the age group of 4-6 years exhibited the highest prevalence as compared to the other age groups (7-9 years & 10-12 years), this difference was statistically highly significant with p-value of 0.001, emphasizing a decrease in the prevalence of dental caries in primary dentition with increase of age.

PREVALENCE OF DENTAL CARIES BASED ON DENTAL CARE PRACTICES IN RELATION TO GENDER

Total Study Sample n=528	Overall		Males(n=248)		Females (n=280)	
Mode of cleaning	**Total**	**With Caries**	**Total**	**With Caries (206)**	**Total**	**With Caries (240)**
Tooth paste and Tooth Brush	515	433 (84.07%)	238	196 (82.35%)	277	237 (85.55%)
Finger	11	11 (100.00%)	8	8 (100.00%)	3	3 (100.00%)
None	2	2 (100.00%)	2	2 (100.00%)	0	0
Frequency of cleaning						
Once	428	375 (87.61%)	213	184 (86.38%)	215	191 (88.83%)
Twice	98	69 (70.40%)	33	20 (60.60%)	65	49 (75.38%)
Never	2	2 (100.00%)	2	2 (100.00%)		
Visit to dental hospital						

Only When in Pain	**193**	**167 (86.52%)**	92	78 (84.78%)	101	89 (88.11%)
Once	**100**	76(76%)	46	35 (76.08%)	54	41 (75.92%)
Twice	**53**	38 (71.69%)	24	18 (75.00%)	29	20 (68.96%)
Never	**182**	165 (90.65%)	86	75 (87.20%)	96	90 (89.58%)

Table no: 4 Prevalence of Dental caries based on dental care practices in relation to gender

Table no: 4 shows the prevalence of Dental caries based on dental care practices in relation to gender.

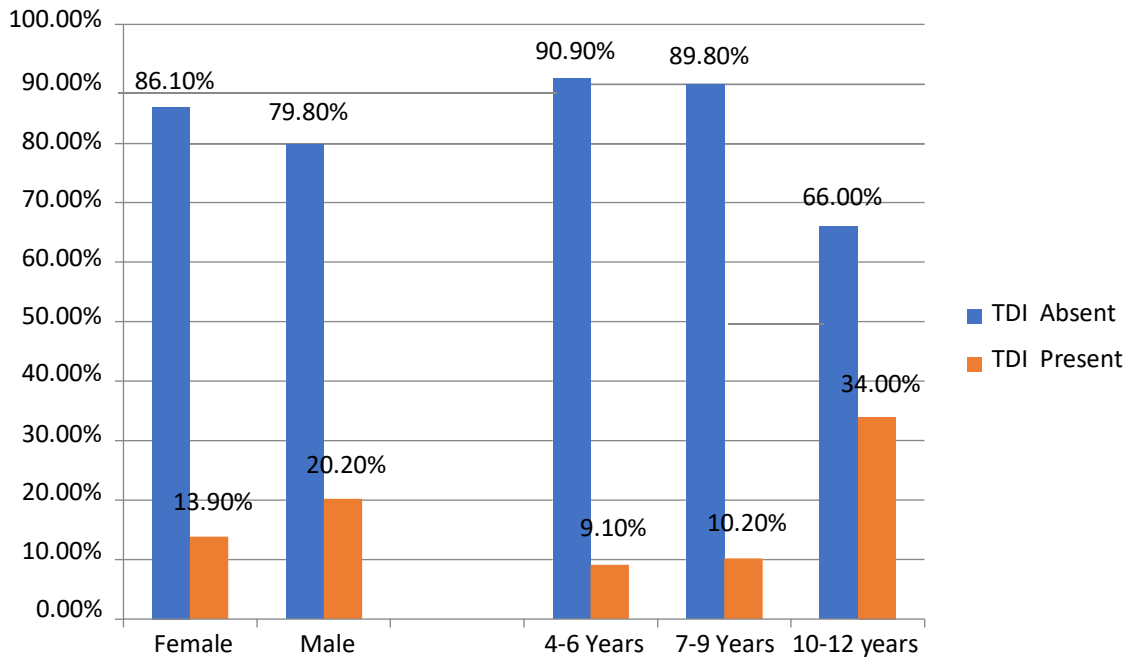
The prevalence of dental caries in **males**, stratified by **dental care practice**s, reveals distinct patterns. Among males employing toothpaste and toothbrushes, the prevalence of dental caries is 82.35%, while those utilizing their fingers and those refraining from using any cleaning tool manifest 100% prevalence. **Based on cleaning frequency**, males who clean their teeth once daily showed the prevalence of 86.38%, while a lower prevalence of dental caries i.e. 60.60% for those who clean twice daily. A notable 100.00% prevalence was observed among males who do not engage in any teeth-cleaning practices. **Considering dental hospital visits**, dental caries prevalence in males attending only when experiencing pain was 84.78%. In contrast, those visiting once or twice exhibit lower dental caries prevalence rates of 76.08% and 75.00%, respectively, while males who never visit a dental hospital present a prevalence rate of 87.20%. These findings underscore the impact of dental care practices and frequency on the prevalence of dental caries among males.

Among females **employing toothpaste and toothbrushes**, the prevalence of dental caries was 85.55%, while those utilizing their fingers for cleaning exhibit a 100%. Based on **cleaning frequency,** females who clean their teeth once daily show a prevalence of 88.83%, while those cleaning twice daily exhibit a lower prevalence of 75.38%. Considering **dental hospital visits**, dental caries prevalence I females attending only when experiencing pain was 88.11%. while those visiting once or twice exhibit lower dental caries prevalence rate of 75.92% and 68.96%, respectively, while females who never visit a dental hospital present a prevalence of 89.58%. These findings underscore the substantial impact of dental care practices, frequency, and hospital visits on the prevalence of dental caries among females.

PREVALENCE OF TRAUMATIC DENTAL INJURIES BASED ON AGE AND GENDER

Total Study Sample (n= 528)		TDI Present (n= 89)	TDI Absent (n= 439)	Chi Square value	P value
Gender Wise Prevalence	Female	39	241	3.645	0.037
		13.9%	86.1%		
	Male	50	198		
		20.2%	79.8%		
		TDI Present	**TDI Absent**		
Age Group Wise Prevalence	4-6 Years	16	160	46.731	0.001
		9.1%	90.9%		
	7-9 years	20	176		
		10.2%	89.8%		
	10-12 years	53	103		
		34.0%	66.0%		
	Overall	89 (16.85%)	439 (83.15%)		

Table no: 5 Prevalence of Traumatic Dental Injuries based on Age and gender



Graph no: 4 Prevalence of traumatic dental injury based on gender and age.

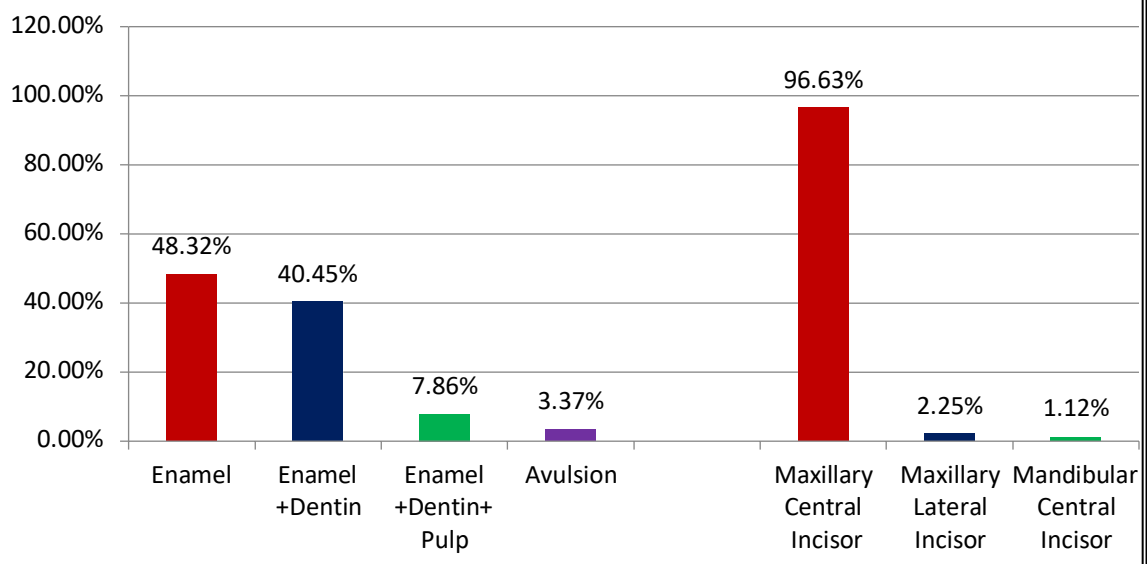
Table no 5 and graph no: 4 demonstrates the age and gender-wise prevalence of Traumatic Dental Injuries. Traumatic Dental Injuries (TDI) in males showed a higher prevalence rate of 20.2% as compared to females ie 13.9%. The intergroup comparison substantiated a statistically significant difference indicated by a p-value of 0.037.

Among different age groups, 10-12 years showed the highest prevalence rate of 34% followed by the 7-9 years age with 10.2%, and 4-6-years age group accounting for 9.1%. The intergroup comparison showed a significance of these age-based differences, denoted by a p-value of 0.001.

TYPES OF TRAUMATIC DENTAL INJURIES & THE TOOTH INVOLVED AMONG STUDY SUBJECTS

Total Study Sample (n= 528)		Frequency (n=89)	Percent
Type of Traumatic Dental Injury	Enamel	43	48.32%
	Enamel +Dentin	36	40.45%
	Enamel +Dentin+ Pulp	7	7.86%
	Avulsion	3	3.37%
		Frequency	Percent
Tooth Affected by Traumatic Dental Injury	Maxillary Central Incisor	86	96.63%
	Maxillary Lateral Incisor	02	02.25%
	Mandibular Central Incisor	01	1.12%

Table no: 6 Types of Traumatic Dental Injuries & the Tooth involved among study subjects



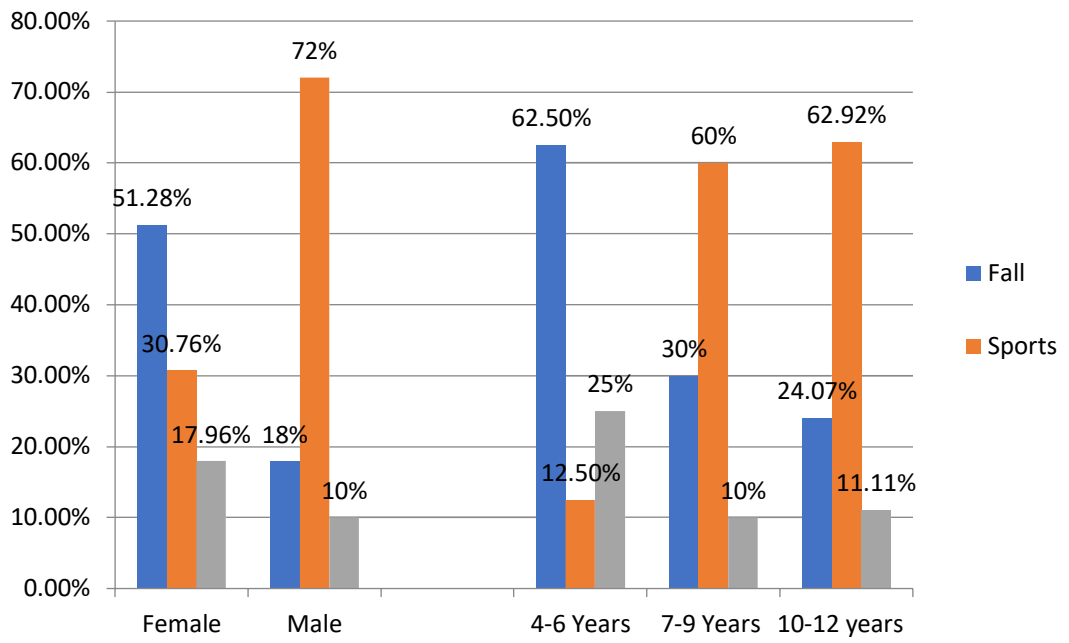
Graph No. 5 <u>Types of Traumatic Dental Injuries & the Tooth Involved among Study Subjects</u>

<u>Table no: 6 and graph no: 5</u> represents the **types of Traumatic Dental Injuries** & the **Teeth involved** in the study subjects. In the categorization of Traumatic Dental Injuries (TDI), **enamel fractures** are the most prevalent type accounting for 48.32% followed by **enamel and dentin fractures** with 40.45%, **Enamel-dentin-pulp fractures** for 7.86, and loss of **teeth due to trauma** with 3.37%. The tooth that was most frequently affected by dental trauma were the **Maxillary Central Incisors**, accounting for 96.63% followed by the **Maxillary Lateral Incisors** with 2.25% and the **Mandibular Central Incisor** exhibiting the lowest prevalence of 1.12%. This distribution highlights the distinct susceptibility of the Maxillary Central Incisors to dental trauma in comparison to other teeth

RISK FACTORS FOR TRAUMATIC DENTAL INJURIES AMONG DIFFERENT AGE GROUPS AND GENDER

Total Study Sample (n= 528)		**Fall (n=29)**	**Sports (n=48)**	**Other Causes (n=12)**	**P value**
Gender Wise Distribution	Female (n=280)	20 51.28%	12 30.76%	7 17.96%	0.001
	Male (n=248)	09 18%	36 72%	05 10%	
		Fall	Sports	Other Causes	P value
Age Group Wise Distribution	4-6 Years (n=176)	10 62.5%	02 12.5%	04 25%	0.001
	7-9 Years (n=196)	06 30%	12 60%	02 10%	
	10-12 Years (n=156)	13 24.07%	34 62.92%	06 11.11%	

Table no: 7 Risk factors for Traumatic Dental Injuries among different Age groups and Gender



Graph no :6 Risk factors for Traumatic Dental Injuries among different age groups and gender

Table no:7 and graph no: 6 demonstrates the **risk factors** of Traumatic Dental Injuries among the different **Age groups and Gender**.

Within the age group of **4-6 years**, the primary risk factor for Traumatic Dental Injuries (TDI) was attributed to falls, constituting the majority at 62.5%, followed by other reasons at 25%, and sports at 12.5%. In the age group of **7-9 years**, sports was the most common cause for TDI, accounting for 60%, followed by falls at 30%, and other reasons at 10%. In the age group of **10-12 years**, sports was the most common cause for TDI, accounting for 62.92%, followed by falls at 24.07%, and other reasons at 11.11%. A meticulous intergroup comparison confirmed the statistical significance of these distinctions in risk factors among different age groups for Traumatic Dental Injuries, with a p-value of 0.001. These findings underscore the need for age-specific preventive measures, recognizing the varying risk factors that contribute to TDI in distinct developmental stages.

In the context of gender predilection, males exhibited a higher susceptibility to Traumatic Dental Injuries (TDI), with sports identified as the most predominant cause, accounting for 72%, followed by falls at 18%, and other reasons at 10%. In contrast, females demonstrated a lower predilection for TDI, with falls as the most prevalent reason at

51.28%, followed by sports at 30.76%, and other causes at 17.96%. An intergroup comparison confirmed the statistical significance of these differences in risk factors based on gender, as indicated by a p-value of 0.001. These findings emphasize the gender-specific nature of TDI risk factors, underscoring the need for targeted preventive strategies tailored to the distinct patterns observed in males and females

DISCUSSION

Children who reside with their families typically benefit from the assurance of physical security, access to nourishment, shelter, and psychological support. Unfortunately, orphaned children, who have lost one or both parents, often face social and economic disadvantages. While there is sympathy for orphaned children, they tend to be somewhat hidden within communities. The realization of their full potential is impeded by various factors in their social environment, including parental inadequacy, environmental deprivation, and emotional disturbances.

Orphans, particularly those in orphanages, frequently encounter challenges in receiving adequate preventive health care. As a result, numerous significant issues may go undetected, or even if diagnosed, they may not be thoroughly evaluated and treated. This neglect often results in chronic health problems, developmental issues, and psychiatric disorders among orphaned children.

Given that oral health is a fundamental aspect of overall health and quality of life, its neglect can lead to adverse health consequences and negatively impact the social lives of individuals. Research indicates a compromised oral health status in children and adolescents experiencing social hardships. This compromised oral health of children living in orphanages is often attributed to factors such as overcrowding, insufficient staff, poor oral hygiene practices, improper dietary habits, deficiencies in the orphanage system, and inadequacies in the healthcare system.

However, there is a notable scarcity of studies reporting on the oral health status of orphaned children, particularly in northern India. Therefore, the present study was initiated to assess the prevalence and associated risk factors for Dental caries and Traumatic dental injuries in Government Institutionalized Orphan Children in Lucknow city.

The present study aimed to include a minimum of 350 participants, meeting the eligibility criteria. However, more participants than the calculated sample size were enrolled, resulting in a total experimental sample size of 528 study participants (n=528). The age of institutionalised orphan children in the present study ranged from 4 to 12 years with a mean age of 8.06 ± 2.06 years. This was according to Piaget, who also took the same age group of children aged 6–12 years as they have reached the third major stage of cognitive development, the concrete operational phase, and acquire the ability to understand. It is of utmost importance to establish an adequate oral hygiene routine and knowledge early in life to have a long-lasting impact on oral healthcare.

The overall prevalence rate of dental caries in the present study, based on age and gender was found to be high i.e. 46.5%. **(Table no: 1 & Graph no:1).** A higher prevalence rate of dental caries was seen in females (85.7%) than in males (83.4%); however, intergroup differences between genders were statistically insignificant. The slightly higher prevalence of dental caries in females can be due to Earlier tooth eruption: Girls tend to develop teeth earlier than boys, exposing them to the cariogenic environment for a longer period, Hormonal fluctuations: Puberty in females brings hormonal changes that can affect saliva composition and flow, potentially reducing its protective capacity against caries, Enamel characteristics: Some studies suggest differences in enamel composition between sexes, with females possibly having slightly less mineralized enamel and Dietary habits: Studies have shown girls might consume more sugary snacks and drinks compared to boys during childhood. The findings of our study are in accordance to previously reported studies done in orphanages by Al Maweri SA et al[19], Seow et al.[49] and Morosini IA et al[50] who concluded that there are insignificant differences in the prevalence of dental caries within the two genders.In the present study, the prevalence of dental caries based on the age group was significantly highest in the 4-6 years age group(97.2%), mediocre in the age group 10-12 years(78.9%) and lowest in the age group of 7-9 years(77.6%) suggesting a notable decrease in the occurrence of dental caries with increase in age. Early Childhood (2-6 years)period often sees high caries prevalence, primarily due to developing teeth, dietary habits, and evolving hygiene practices.

The present study revealed that the gender-wise prevalence rate of dental caries in permanent dentition (DMFT) was higher in males (53.2%) than in females (51.8%) and in the primary dentition (deft), the prevalence rate of Dental Caries (deft) was higher in females (33.9%) than the males (30.2%), the statistical differences were insignificant showing a lack of gender-related disparities in the occurrence of dental caries in both primary and permanent dentitions**.(Table no: 2 and graph no: 2).** The contributing factors can be i) Homogenized Diet: In orphanages, children likely consume a similar diet provided by the institution, reducing individual dietary choices that contribute to caries risk. This could eliminate gender-based dietary differences often seen in families. ii) Standardized Oral Hygiene Practices: Orphanages often enforce uniform brushing routines, minimizing personalized habits that might lead to varying caries susceptibility between genders. iii) Limited Access to Sugary Treats: Orphans have restricted access to sugary snacks and drinks compared to children in households with diverse access and purchasing power. This could negate potential gender differences in snacking habits. iv) Equal Access to Dental Care: Orphanages provide standardized dental care programs, ensuring similar oral hygiene education, preventive treatments, and access to dental professionals, regardless of gender. In the present study, the prevalence of dental caries among males and females was found to be statistically non-significant. The findings are in line with the findings of Saravanan et al [51] and Lopez IY et al [52] who concluded that there was no significant difference in the prevalence of dental caries among males and females in the orphanages. However, in a study conducted by UR Rehmani et al[53] higher prevalence of dental caries was reported in females(60.1%) as compared to males(57.2%) due to more frequent consumption of snacks.

In the present study, it was observed that the age-wise prevalence of dental caries in permanent dentition showed a higher prevalence rate in the age group 10-12 years (78.8%) followed by the age group 7-9 years(75%) and lowest in the age group 4-6 years (4%). (**Table no: 3 and graph no: 3)** The intergroup comparison showed that children in the age group 10-12 years exhibited the highest prevalence rate which was statistically

significant, and the other two groups displayed almost the same prevalence rate, emphasizing a shared susceptibility to dental caries. The increase in the occurrence rate of dental caries in the age group 10-12 years can be attributed to many factors like i) Developing Permanent Teeth: During this age range, most children transition from primary teeth to permanent teeth. Permanent teeth have deeper grooves and fissures, making them more prone to harbouring plaque and bacteria that cause decay. ii)Dietary Habits: This age group often experiences increased independence and may make more food choices on their own. Sugary drinks, snacks, and processed foods become increasingly appealing, leading to higher sugar intake and increased caries risk. iii)Developing Oral Hygiene Habits: Brushing and flossing techniques may not be fully developed during this age, resulting in missed areas and inadequate plaque removal. Additionally, the transition from primary teeth to permanent teeth can make brushing less comfortable, leading to decreased effort and iv)Hormonal Changes: Puberty brings hormonal fluctuations that can affect saliva production and composition, reducing its natural protective capacity against caries. These results are similar to the study conducted by Aasim F Shah et al[54] and Chen JW et al[55] where the children in the age group more than 10 years of age showed a slightly higher prevalence of dental caries(80.1%), while in a study conducted by Dixit S et al a lower caries prevalence rate(47.5%) has been reported for 10-12-year-old children in Jammu and Kashmir state. In the primary dentition (deft) the age group of 4-6 years exhibited the highest prevalence rate of dental caries (93.2%), while 7-9 years showed a notably lower prevalence rate (2.6%) and the age group of 10-12 years showed the lowest prevalence rate of (0.6%), this can be attributed to the fact that Sugar-sweetened beverages, processed snacks, and other cariogenic foods are often readily available or used as rewards, leading to increased sugar intake and caries risk and also the orphanages may struggle to provide individualized supervision and ensure proper brushing and flossing techniques for each child. A similar caries prevalence rate has been reported in primary dentition by Bali et al and Aasim F Shah et al[54] who reported similar dental caries prevalence rate in children living in orphanages in India on the other hand Mazhari F et al.[56] in his study found a low dental caries prevalence rate (45.4%) in the age group of 6 years and below, in orphans in Mashad, Iran. Al-Malik el al[57] in his study showed that in orphanages majority of the children are malnourished. Early

childhood malnutrition has shown to be associated with caries in primary dentition, though its association with permanent dentition has not been substantiated. Malnutrition has been associated with delayed exfoliation of the primary teeth, which could be the reason for the presence of higher prevalence of caries in the primary teeth. Malnutrition along with poor oral health awareness and practices could be the reason for high dental caries in primary class children.

Regarding the oral health behaviour concerning gender **(table no: 4),** we observed that among both genders, the children who used toothpaste and toothbrushes showed a slightly low prevalence rate of dental caries (82.35% and 85.55%) and those utilizing their fingers or refraining from using any cleaning tool manifested the highest prevalence of caries. Further analysis based on cleaning frequency highlights significant differences, males and females who clean their teeth once daily showed a higher prevalence (86.38% & 88.83%), while a lower prevalence of dental caries (60.60% and 75.38%)was observed in those who clean their teeth twice daily. Considering dental hospital visits, males attending only when experiencing pain demonstrated a prevalence rate of 84.78% and females demonstrated a prevalence rate of 88.11%. In contrast, those visiting once or twice exhibit a lower prevalence rate, majority of children either never visted the dentist or had visited the dentist only when in pain The findings have been similarly echoed by the other study of Aasim et al where 31.57% of the children had never visited the dentist and a high prevalence rate of dental caries(88.2%). The reason for this finding can be attributed to the fact that the majority of the children and caretakers in the orphanages lack the proper knowledge regarding the importance of regular visits to dental health professionals. In our study, 84.07% of the children were using toothpaste and toothbrushes and very few children were using Finger or other methods. The higher percentage of the subjects using toothbrushes and toothpaste as oral hygiene aids are similar to the findings of previous studies done by Kahabuka FK et al[54], Srinivas et al[58] and Santosh K et al[59] in institutionalized orphan children which reported regular use of toothbrushes and toothpaste contributed to low prevalence rate of dental caries. The higher percentage of children using toothbrushes and toothpaste is due to the widespread and adequate

availability of these products in the orphanages as provided by charitable organizations, government agencies and individual donations. Even with the use of toothpaste and toothbrushes, the high prevalence of dental caries has been seen in the children in the current study, the finding supports the fact that there are many other additional factors such as social and emotional well-being which may impact the oral health status of these children (Bradley C et al).[60]

Traumatic dental injury (TDI) is considered a public health problem due to its higher prevalence among children (Peterson PE et al) Andersson concluded that high incidence of Traumatic Dental Injuries is till 12years of age, and in higher ages, the incidence is less (Andresson L et al)[61] The TDI may range from a minor crack in the tooth, chipping off a part, extensive dentoalveolar injuries, involving supporting structures of teeth like bone tissues or it may lead to tooth displacement or avulsion. The common etiology of TDI among children includes falls, collisions, interpersonal violence, sports-related activities, traffic accidents, and other iatrogenic causes. Orphan children are specifically more vulnerable to potentially traumatic events due to interpersonal violence, child abuse, and being forced from their home or care setting, especially in developing countries.

The special living conditions in orphanages with overcrowding of children, improper nutrition, and inadequate staff attention make them more prone to traumatic injuries. (Whetten K et al)[37]. The children residing in the orphanages often do not have regular access to professional dental care which may lead to a higher prevalence of untreated dental injury among these children (Solis-Riggioni A et al).[62] The problem is further exaggerated by the lack of awareness regarding Traumatic Dental injury among the caretakers and children in the orphanages. (Shanbhog R et al)[17] Henceforth there is an utmost need to access the prevalence of Traumatic Dental Injury among the institutionalized orphanage children which can provide a database to formulate plans to prevent dental trauma in this marginalized population.

The prevalence rate of Traumatic Dental Injuries (TDIs) in government-institutionalised orphan children in the present study of the total sample of n=528 was 16.85% **(Table no**

5 and graph no: 4). Traumatic Dental Injuries (TDI) in males showed a higher prevalence rate (20.2%) than females (13.9%) sustaining a statistically significant difference. This can be attributed to the fact that Males often engage in more risk-taking activities and rough play, increasing the chances of falls, collisions, and other accidents that can cause dental injuries. Sports participation: Males are more likely to participate in contact sports, where facial injuries and TDIs are more common. Boys may be more involved in physical altercations and fighting, leading to a higher risk of dental trauma. Head size and jaw structure: Males typically have larger heads and more prominent jaws, potentially making their teeth more vulnerable to impacts.Tooth prominence: Some studies suggest male teeth might be slightly more protrusive, increasing their exposure to injury. Similar findings were reported among institutionalized orphans in India by Khare et al[10] and Salwa Alsadan[63] who concluded that there is a higher prevalence rate of TDIs in orphanages with significant differences in the occurrence rate of TDIs in both genders. This is perhaps due to overcrowding in the orphanage and the psychological stress to which the orphans are subjected. The orphans spend more time (the whole day) in physical contact with each other in an overcrowded environment compared with the controls. In addition, the psychological stress may increase the violence between children. In contrast, a study conducted by Goswami et al[37] and Al-Maweri et al[15]. showed a lower prevalence rate of traumatic dental injury (5.8%, 6.5%) among institutionalized orphan children

In present study among different age groups observed that, 10-12 years showed the highest prevalence rate (34%) followed by the 7-9 years age(10.2%,)and 4-6-years(9.1%) showing a statistically significant difference in all age groups. These findings are in agreement with the study conducted by Norton E et al.[64] and Juneja et al.[65] who reported the incidence of dental trauma to be in the range of 6.1 to 58.6% in permanent dentition. In a study of Goswami et al the prevalence of dental trauma was more common among the age group of 10–12 years, the prevalence was highest in the age group of 10 years and lowest in the age group of 5–8 years. In a study by Soriano et al. in Brazil among 12-year-old school children, a higher incidence of TDI was observed, these findings can be attributed to the ugly duckling stage of mixed dentition. The age group of 10–12 years is more prone to trauma due to more proclined upper anterior teeth, especially maxillary incisors. Children in this age group are more physically active participating in sports,

playing outdoors, and engaging in activities with higher risk of falls and collisions. Social pressures to participate in certain activities or impress peers can contribute to risk-taking behaviors that increase the chance of injuries. The permanent teeth in this age group are still developing, making them more susceptible to damage due to their weaker enamel and incomplete root formation. With increased independence, children may spend more time unsupervised, increasing the chances of accidents and injuries. Children in orphanages may have limited access to safety equipment or organized sports programs with proper supervision, leading to higher vulnerability.

we also observed in our study that the most affected tooth was the maxillary central incisor 96.63%, followed by maxillary lateral incisors 2.25% and mandibular central incisors 1.12% **(Table no: 6 and graph no: 5).** This can be related to the fact that maxillary teeth are in the most prominent position being located at the front of the upper jaw, making them the most exposed and vulnerable to direct impacts during falls, accidents, or contact sports. Central incisors are among the first permanent teeth to erupt, often between 6-8 years old, coinciding with a period of increased physical activity and risk-taking in children. Their roots are relatively smaller and shorter compared to other teeth, offering less stability and anchorage within the jawbone, making them more prone to being avulsed (knocked out) upon impact. Compared to posterior teeth, the enamel covering the crown of central incisors is thinner, offering less protection against fractures and chips and Children often use their front teeth for activities like biting objects, which can lead to accidental fractures or chipping. This result was in conjunction with a study by Juneja et al[65], Stockwell AJ.et al[66] and Skaare AB[67] et al among school-going children in the same age group. In our study, it was observed that the most common type of traumatic dental injury was enamel fractures with a prevalence rate of 48.32% followed by enamel and dentin fractures with a prevalence rate of 40.45%, Enamel-dentin-pulp fractures at 7.86% and a prevalence of tooth loss due to trauma with 3.37%. In contrast, studies conducted by Avsar et al.[68], Murthy et al.[69], AlSarheed et al[70] and Franca et al.[71] showed a higher prevalence of uncomplicated crown fractures.

In the present study for risk factors for Traumatic Dental Injuries among different age groups and Gender **(Table no:7 and graph no: 6),** it was observed that within the age

group of 4-6 years, the primary risk factor for Traumatic Dental Injuries (TDI) was attributed to falls, constituting the majority at 62.5%, followed by other reasons at 25%, and sports at 12.5%. In the age group of 7-9 years, sports was the most common cause for TDI, accounting for 60%, followed by falls at 30%, and other reasons at 10%. In the age group of 10-12 years, sports was the most common cause for TDI, accounting for 62.92%, followed by falls at 24.07%, and other reasons at 11.11%. A statistical significance of these distinctions in risk factors among different age groups for Traumatic Dental Injuries was observed(p-value 0.001) These findings underscore the need for age-specific preventive measures, recognizing the varying risk factors that contribute to TDI in distinct developmental stages.

In the context of gender predilection, males exhibited a higher susceptibility to Traumatic Dental Injuries (TDI)(79.80%), with sports identified as the most predominant cause, accounting for 72%, followed by falls at 18%, and other reasons at 10%. In contrast, females demonstrated a lower predilection for TDI(86.10%), with falls as the most prevalent reason at 51.28%, followed by sports at 30.76%, and other causes at 17.96%. An intergroup comparison confirmed the statistical significance of these differences in risk factors based on gender, as indicated by a p-value of 0.001. These findings emphasize the gender-specific nature of TDI risk factors, underscoring the need for targeted preventive strategies tailored to the distinct patterns observed in males and females. The gender predilection for trauma can be attributed to increased indulgence in contact sports and adventure activities. (Andersson et al)[12]. Based on reasons for traumatic dental injuries in females fall was the most prevalent reason followed by sports, similar results were found in the studies conducted by Kumar and Dixit et al[41]., Nayak et al[58]., Bagattoni S et al.[72], and Ferreira et al. where the traumatic episodes that commonly occurred were entitled to the activities of the children when they were left unsupervised.

The current study observed that young orphaned children (4–12 years) living in orphanage institutions were prone to trauma and had untreated dental injuries. Traumatic dental injury can hamper physiology and may result in loss of function like mastication and phonetics. Moreover, this age group of children is undergoing personality and psychological development, and any form of trauma leading to an unaesthetic appearance may lead to lower self-esteem. These injuries however can be prevented with strategies that include intraoral and extraoral appliances. The use of mouthguards can eliminate the risk of trauma associated with falls and sports-related injuries. The helmets can be recommended for children involved in contact sports (Goswami et al)[37] For these preventive strategies to be implemented at earlier ages there is an utmost need to collect more data regarding traumatic dental injuries and associated factors among the institutionalized orphan children The educational programmes taking into consideration the prevention strategies of dental trauma should be held for children, caretakers, and teachers. The programs should also focus on the importance of the proper management of traumatized teeth with complete dental care. Addressing the evident oral health disparity among institutionalized orphans and school children, targeted dental health programs are crucial to elevate their oral health status and prevent prevalent oral diseases.

CONCLUSIONS

The present study was carried out in the Department of Pediatric and Preventive Dentistry, BBDCODS, Lucknow, in collaboration with the Government Institutionalized Orphanages of Lucknow City, Uttar Pradesh, after obtaining clearance from the Institutional Ethical Committee.

Through the course of the study, based on the observations we have derived the following conclusions:

- The prevalence rate of dental caries in institutionalised orphan children in the age group 4- 12 years was 46.5% with no significant difference in both the genders.

- The associated risk factors for dental caries included the type of dental care practices, in which the children who brushed twice daily with toothpaste had a lower dental caries prevalence rate compared to those using fingers or other methods. Moreover, children with one or two dental visits per year had a lower caries rate than those with none.

- The prevalence rate of Traumatic Dental injuries among the institutionalised orphan children aged 4- 12 years was 16.85%. Notably, the male population displayed a significantly higher prevalence than the female and the age group of children most affected by TDIs was 10-12 years.

- Sports emerged as the primary cause of traumatic dental injuries in this study, followed by falls and other factors. Among all affected teeth, maxillary central incisors followed by maxillary lateral incisors, had the highest incidence of TDIs, manifesting predominantly as enamel fractures, with enamel-dentin fractures being less common.

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ANNEXURE I

BABU BANARASI DAS UNIVERSITY

BBD COLLEGE OF DENTAL SCIENCES, LUCKNOW

INSTITUTIONAL RESEARCH COMMITTEE APPROVAL

The project titled **"Assessment Of Dental Caries & Traumatic Dental Injuries Among Government Institutionalised Orphan Children In Lucknow City"** submitted by **Dr Aayushi Bhardwaj** Postgraduate student in the **Department of Pediatric & Preventive Dentistry** for the Thesis Dissertation as part of MDS Curriculum for the academic year 2021-2024 with the accompanying proforma was reviewed by the Institutional Research Committee in its meeting held on **14th September, 2022** at BBDCODS.

The Committee has granted approval on the scientific content of the project. The proposal may now be reviewed by the Institutional Ethics Committee for granting ethical approval.

Prof. Dr. Puneet Ahuja
Chairperson

Dr. Mona Sharma
Co-Chairperson

ANNEXURE II

BABU BANARASI DAS UNIVERSITY
BBD COLLEGE OF DENTAL SCIENCES, LUCKNOW

BBDCODS/IEC/09/2022 **Dated: 16th September, 2022**

Communication of the Decision of the Xth Institutional Ethics Sub-Committee Meeting

IEC Code: 26

Title of the Project: Assessment Of Dental Caries & Traumatic Dental Injuries Among Government Institutionalised Orphan Children In Lucknow City.

Principal Investigator: Dr Aayushi Bhardwaj **Department:** Pediatric & Preventive Dentistry

Name and Address of the Institution: BBD College of Dental Sciences Lucknow.

Type of Submission: New, MDS Project Protocol

Dear Dr Aayushi Bhardwaj,

The Institutional Ethics Sub-Committee meeting comprising following members was held on 15th September, 2022.

1.	Dr. Lakshmi Bala Member Secretary	Prof. and Head, Department of Biochemistry
2.	Dr. Praveen Singh Samant Member	Prof. & Head, Department of Conservative Dentistry & Endodontics
3.	Dr. Jiji George Member	Prof. & Head, Department of Oral Pathology & Microbilogy
4.	Dr. Amrit Tandan Member	Professor, Department of Prosthodontics and Crown & Bridge
5.	Dr. Rana Pratap Maurya Member	Reader, Department of Orthodontics & Dentofacial Orthopaedics

The committee reviewed and discussed your submitted documents of the current MDS Project Protocol in the meeting.
The comments were communicated to PI, thereafter it was revised.

Decisions: The committee approved the above protocol from ethics point of view.

Forwarded by:

Lakshmi Bala 16/09/22

Prof. Dr. Puneet Ahuja
Principal
BBD College of Dental Sciences
BBD University, Lucknow

PRINCIPAL
Babu Banarasi Das College of Dental Sciences
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Dr. Lakshmi Bala
Member-Secretary
Institutional Ethics Sub-Committee (IEC)
BBD College of Dental Sciences
BBD University, Lucknow

Member-Secretary
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BBD College of Dental Sciences
BBD University
Faizabad Road, Lucknow-226028

ANNEXURE III

Babu Banarasi Das College of Dental Sciences

(Babu Banarasi Das University)

BBD City, Faizabad Road, Lucknow – 227105

(INDIA)

Consent Form (English)

Title of the Study: **ASSESSMENT OF DENTAL CARIES & TRAUMATIC DENTAL INJURIES AMONG GOVERMENT INSTITUTIONALISED ORPHAN CHILDREN IN LUCKNOW CITY**

Study Number……..

Subject's Full Name…….

Date of Birth/Age ……

Address of the Subject…….

Phone no. and e-mail address……

Qualification ……

Occupation: Student / Self Employed / Service /

Housewife/Other (Please tick as appropriate)

Annual income of the Subject……

Name and of the nominees(s) and his relation to the subject..... (For the purpose of

Compensation in case of trial related death).

1. I confirm that I have read and understood the Participant Information Document dated

……..for the above study and have had the opportunity to ask questions. **OR** I have beenexplained the nature of the study by the Investigator and had the opportunity to ask questions.

2. I understand that my participation in the study is voluntary and given with free will without any duress and that I am free to withdraw at any time, without giving any reason and without my medical care or legal rights being affected.
3. I understand that the sponsor of the project, others working on the Sponsor‘s behalf, the Ethics Committee and the regulatory authorities will not need my permission to look at my health records both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the trial. However, I understand that my Identity will not be revealed in any information released to third parties or published.
4. I agree not to restrict the use of any data or results that arise from this study provided sucha use is only for scientific purpose(s).
5. I permit the use of stored sample (tooth/tissue/blood) for future research. **Yes [ ] No [ ]**

Not Applicable [ ]

6. I agree to participate in the above study. I have been explained about the complications andside effects, if any, and have fully understood them. I have also read and understood the participant/volunteer’s Information document given to me.

Signature (or Thumb impression) of the Subject/Legally AcceptableRepresentative:……..

Signatory‘s Name……. Date …….

Signature of the Investigator…… Date……..

Study Investigator‘s Name..... Date……..

Signature of the witness…… Date……..

Name of the witness……

Received a signed copy of the PID and duly filled consent form Signature/thumb impression of the subject or legally

Date……

Acceptable representative

ANNEXURE IV

बाबू बनारसी दास कॉलेज ऑफ ड1टल साइंसेज

(बाबू बनारसी दास

ि व7ि व8ालय) बीबीडी ि सटी, फै जाबाद रोड,

लखनऊ - 227105 (भारत)

@ितभागी सूचना दCावेज

1.अEयन शीषक

लखनऊ शहर मा सरकारी सं Kाि पत अनाथ बNों के बीच दं त Oय और ददनाक दं त चोटों का आकलन।

2. आमंSण पैराUाफ

आपको एक शोध अEयन मा भाग लेने के िलए आमं ि Sत ि कया जा रहा है। ि नणय लेने से पहले आपके िलए यह समझना महYपूण है ि क अEयन Z ों ि कया जा रहा है और इसम1 Z ा शाि मल होगा। कृपया ि न\ि ल]खत

जानकारी को Eान से पढ़ने के िलए समय ि नकाल1 और यिद आप चाह1 तो ि मSो, _र ेदारों और अपने इलाज

करने वाले ि चिकaक/पा_रवा_रक ि चिकaक के साथ इस पर चचा कर1 । ि कसी भी bकरण या अिधक जानकारी के िलए हमसे पूछ1 । आप भाग लेना चाहते ह या नही,ं यह आपका ि नणय है।

3. अEयन का उgे h Z ा है?

अEयन का उgे h लखनऊ शहर मा सं Kागत अनाथ बNों मा दं त Oय और ददनाक दं त चोटों के @सार और संबंिधत जो]खम कारकों का आकलन करना है।

4. मुझे Z ों चुना गया है?

आपको इस अEयन के िलए चुना गया है Z ोि क आप इस अEयन के िलए आवhक मानदं डों को पूरा कर रहे ह।

5. Z ा मुझे भाग लेना है?

शोध म1 आपकी भागीदारी पूरी तरह से ्j ै]kक है। यदि आप ऐसा करते हे, तो आपको यह सूचना पSक रखने के िलए िदया जाएगा और सहमित @पS पर हC।Or करने के िलए कहा जाएगा। अEयन के दौरानआप िकसी भी समय और िबना कोई कारण बताए वापस लेने के िलए jतंS हe।

6. यदि मe भाग लेता oँ तो मेरा Z। होगा?

@ितभागी को लाभ होगा Z्ोंिक यह अEयन दंत मुgो, मौ]खक ्j kता, उपचार आदि पर िशOा @दान करेगा और दंत जागqकता वाता पैदा करेगा, छाSों को सामाr दंत रोगों के बारे म1 िशिOत करेगा, िवशेष qप से दांतों की सड़न और मसूड़ों की बीमा_रयों और उt1 रोकने के उपायों पर जोर देगा।

7. मुझे Z। करना होगा?

अEयन आबादी म1 अनाथालयों म1 रहने वाले jK अनाथ े। मौ]खक जांच की जाएगी जहां बNे शािमल होग दंत Oय और ददनाक दंत चोटों का मूuांकन िकया जाएगा। डीएमएफटी और डीएमएफएस सूचकांकों का उपयोग @ाथिमक और Kायी दांतों के Oरण की]Kित का आकलन करने के िलए िकया जाएगा। बNों के िलए डvूएचओ मौ]खक j ्Tx मूuांकन फॉम 2013 का उपयोग करके दंत आघात की]Kित का मूuांकन करने के िलए नमूने म1 नैदािनक परीOा की जाएगी।

8. िकस @िzया का परीOण िकया जा रहा है?

लखनऊ शहर म1 संKागत अनाथ बNों म1 दंत Oय और ददनाक दंत चोटों के @सार और संबंिधत जो]खम कारकों की {ापकता का अEयन करने के िलए अEयन िकया जाएगा।

9. अEयन के िलए Z। हCOेप हe?

@ितभािगयों पर कोई @िzया नहीं की जाएगी।

10. भाग लेने के दु।भाव Z। हे?

इस अEयन म1 भाग ल◌ेन◌े के क◌ोई स◌ंभा◌ि वत द◌ु ▌भाव नही◌ं ह◌ेI

11. भाग लेने के संभा◌ि वत नुकसान और जो]खम Z◌I हe?

इस अEयन म1 भाग लेने के कोई नुकसान नहीं ह{, दवा के rञ्नतम दु|भाव हो सकते ह{।

12. भाग लेने के संभावित लाभ Zा हe?

@तिभागी को लाभ होगा Zोंकि यह अEयन दंत मुgो, मौ]खक jkता, उपचार आदि पर शिOा @दान करेगा और दंत जागqकता वाता पैदा करेगा, छाSों को सामाr दंत रोगों के बारे म1 शिOत करेगा, विशेष qप से दांतों की सड़न और मसूड़ों की बीमा_रयों और उt1 रोकने के उपायों पर जोर देगा।

13. Zा होगा यदि नई जानकारी उपल} हो जाती है?

यदि शोध के दौरान अति_र~ जानकारी उपल} हो जाती है तो आपको इनके बारे म1 बताया जाएगा और आप अपने शोधकता के साथ इस पर चचा करने के लिए jतंS ह{, आपका शोधकता आपको बताएगा कि Zा आप अEयन जारी रखना चाहते ह{। यदि आप वापस लेने का निणय लेते ह{, तो आपका शोधकताआपकी वापसी की {वKा करेगा। यदि आप अEयन जारी रखने का निणय लेते ह{, तो आपसे एक अ8तन सहमित फॉम पर हCाOर करने के लिए कहा जा सकता है।

14. जब शोध अEयन बंद हो जाता है तो Zा होता है?

@तिभागियों को कुछ नहीं होगा।

15. अगर कुछ गलत हो जाए तो Zा होगा?

सम4ाओं/ शिकायतों को एचओडी या आईआरसी Äारा नियंिSत किया जाएगा। अगर कुछ गंभीर होता है तोसंKान सम4ाओं का Eान रखेगा।

16. Zा इस अEयन म1 मेरे भाग लेने को गोपनीय रखा जाएगा?

हां इसे गोपनीय रखा जाएगा।

17. शोध अEयन के प_रणामों का Zा होगा?

अEयन के प_रणामों का उपयोग लखनऊ शहर म1 संKागत अनाथ बNों म1 दंत Oय और ददनाक दंत चोटों के @सार और संबंधित जो]खम कारकों का अEयन करने के लिए किया जाएगा। किसी भी _रपोट/@काशन केमामले म1 आपकी पहचान गोपनीय रखी जाएगी

18. शोध का आयोजन कौन कर रहा है?

यह शोध बाल चिकि3ा और निवारक दंत चिकि3ा विभाग, बीबीडीसीओडीएस म1 किया गया है। शोध j-वÅ पोषित है। @तिभागियों को संKा Äारा दिए गए @zयाÇक शुÉ का भुगतान करना

होगा।

19. Z◌T अEयन समाÑ होने के बाद अEयन के प_रणाम उपल} कराए
जाएं गे? हां
20. अEयन की समीO◌ा िकसने की है?
संK◌ान के एचओडी और आईआरसी/आईईसी के सद4ोें ने अEयन की समीO◌ा की और उसे मंजूरी दी।
21. अिधक जानकारी के िलए संपक
करा डॉ.आयुषी भारÄ◌ाज

बाल िचिकa◌ा और िनवारक दंत िचिकa◌ा
िवभागबाबू बनारसी कॉलेज ऑफ ड1टल
साइंसेज। लखनऊ-227105
मोब- 9621402256
डॉ. लÖ◌ीबाला
संK◌ा की आचार सिमित के सद4 सिचव,
बाबू बनारसी कॉलेज ऑफ ड1टल साइंसेज।

ANNEXURE V

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ANNEXURE VI

Babu Banarasi Das College of Dental Sciences

(Babu Banarasi Das University)

BBD City, Faizabad Road, Lucknow – 227105 (INDIA) Child

Information Document

Study title: — ASSESSMENT OF DENTAL CARIES & TRAUMATIC DENTAL INJURIES AMONG GOVERNMENT INSTITUTIONALISED ORPHAN CHILDREN IN LUCKNOW CITY.

Introduction

To study the prevalence and associated risk factors of Dental caries and Traumatic dental injuries in Institutionalized Orphan Children in Lucknow city.

What will you have to do?

To participate in this research study, you will be interviewed/ examined by Dr Aayushi Bhardwaj. If found to fulfil pre-specified criteria, you will be eligible to be enrolled in this research study.

Since you are in the age group of 4-12 years, we ask your accompanying parent/guardian to sign a similar form called the Parent Informed Consent Form.

Risks and discomforts

There is no foreseen significant risk/hazard to your health if you wish to participate in the study. If you follow the directions of the dentist in charge of this study and you are injured due to any procedure given under the study plan, the institute will take care.

Benefits

The participant will benefit as this study will impart education on dental issues, oral hygiene, treatments etc. and create dental awareness talk, educating students about common dental ailments, especially stressing tooth decay and gum diseases and measures to prevent them.

Your parent/guardian will have the right to access personal information about you at any time with the study doctor and the right to correct this personal information. Your parent/guardian can take away your authorization to collect, process, and disclose data about you at any time.

Right to refuse or withdraw

You do not have to take part in this research if you do not wish to do so. You may stop participating in the research at any time you wish. The study investigator may decide to withdraw you from the study if they consider it is in your best interest. You will be informed of important new findings developed during the study, so you will be able to consider your participation in the study in light of further information.

Parents' responsibilities.

It is the responsibility of your parent/guardian to come along with you to the centre during the study period for all the visits unless you withdraw or are prematurely discontinued from the study. It is also your responsibility and your parent/guardian to report any expected or unexpected reactions (side effects) that you notice during the study period.

We expect your co-operation throughout the study.

ANNEXURE VII

BABU BANARASI DAS UNIVERSITY
[Approved by UGC Under Section 2(f) of UGC Act. 1956]
Website : www.bbdu.ac.in / Email ID : info@bbdu.org
Phone Number: +91 – (522) - 6196222 / 6196223

To,

The District Probation Officer

Lucknow

Date: - 23rd May, 2022

Subject- Request for permission to conduct Oral Health Check-up and Awareness Camp.

Respected Sir,

I am writing this to request you to permit Dr. Aayushi Bhardwaj, currently enrolled as first year postgraduate student (Department of Pediatric&Preventive Dentistry, BabuBanarasi Das College of Dental Sciences, BBDU) to conduct Oral Health check-up and Awareness Camp at the Orphanages in Lucknow. I wish to mention that she is working on her dissertation, for which she needs to do oral examination of children.

Therefore, I request you to kindly allow her to proceed. We will be highly obliged. Anticipating an affirmative reply from you.

Thanking you,

Yours sincerely

Dr. Puneet Ahuja
Professor and Principal
BBDCODS 23/5/2022
BBDU

PRINCIPAL
Babu Banarasi Das College of Dental Sciences
(Babu Banarasi Das University)
BBD City, Faizabad Road, Lucknow

23/05/22

Dr. Monika Rathore
Professor and Head
Department of
Pediatric and Preventive Dentistry
BBDCODS

Head of Department
Pediatric & Preventive Dentistry
BBDCODS, BBD University, Lucknow

Address: BBD City, Faizabad Road, Lucknow (U.P.)-226028, India

ANNEXURE VIII

World Health Organization
Oral Health Assessment Form for Adults, 2013

Loss of attachment

Severity
0 = 0–3 mm
1 = 4–5 mm Cemento-enamel junction (CEJ) within black band
2 = 6–8 mm CEJ between upper limit of black band and 8.5 mm ring
3 = 9–11 mm CEJ between 8.5 mm and 11.5 mm ring
4 = 12 mm or more CEJ beyond 11.5 mm ring
X = Excluded sextant
9 = Not recorded

* Not recorded under 15 years of age

Index teeth

	17/16	11	26/27	
(173)	☐	☐	☐	(175)
(176)	☐	☐	☐	(178)
	47/46	31	36/37	

Enamel fluorosis ☐ (179)

Severity
0 = Normal
1 = Questionable
2 = Very mild
3 = Mild
4 = Moderate
5 = Severe
8 = Excluded (crown, restoration, "bracket")
9 = Not recorded (unerupted tooth)

Dental erosion

Severity ☐ (180)

0 = No sign of erosion
1 = Enamel lesion
2 = Dentinal lesion
3 = Pulp involvement

Number of teeth affected

(181) ☐☐ (182)

Dental trauma

Status ☐ (183)

0 = No sign of injury
1 = Treated injury
2 = Enamel fracture only
3 = Enamel and dentine fracture
4 = Pulp involvement
5 = Missing tooth due to trauma
6 = Other damage
9 = Excluded tooth

Number of teeth affected

(184) ☐☐ (185)

Oral mucosal lesions

☐ (186)
☐ (187)
☐ (188)

☐ (189)
☐ (190)
☐ (191)

Condition

0 = No abnormal condition
1 = Malignant tumour (oral cancer)
2 = Leukoplakia
3 = Lichen planus
4 = Ulceration (aphthous, herpetic, traumatic)
5 = Acute necrotizing ulcerative gingivitis (ANUG)
6 = Candidiasis
7 = Abscess
8 = Other condition (specify if possible)
9 = Not recorded

Location

0 = Vermillion border
1 = Commissures
2 = Lips
3 = Sulci
4 = Buccal mucosa
5 = Floor of the mouth
6 = Tongue
7 = Hard and/or soft palate
8 = Alveolar ridges/gingiva
9 = Not recorded

Denture(s)

Upper ☐ (192) **Lower** ☐ (193)

Status

0 = No denture
1 = Partial denture
2 = Complete denture
9 = Not recorded

Intervention urgency ☐ (194)

0 = No treatment needed
1 = Preventive or routine treatment needed
2 = Prompt treatment (including scaling) needed
3 = Immediate (urgent) treatment needed due to pain or infection of dental and/or oral origin
4 = Referred for comprehensive evaluation or medical/dental treatment (systemic condition)

ANNEXURE IX

World Health Organization

Oral Health Assessment Form for Children, 2013

Leave blank (1) (4) | Year Month Day (5) (10) | Identification No. (11) (14) | Orig/Dupl (15) | Examiner (16) (17)

General information: Sex 1=M, 2=F (18) | Date of birth (19) (24) | Age in years (25) (26)

(Name)

Ethnic group (27) (28) **Other group** (29) (30) **Years in school** (31) (32) **Occupation** (33)

Community (geographical location) (34) (35) **Location** Urban (1) Periurban (2) Rural (3) (36)

Other data (37) (38) **Other data** (39) (40)

Other data (41) (42) **Extra-oral examination** (43) (44)

Dentition status

	17	16	55 15	54 14	53 13	52 12	51 11	61 21	62 22	63 23	64 24	65 25	26	27	
Crown	(45)														(58)
Crown	(59)														(72)
	47	46	85 45	84 44	83 43	82 42	81 41	71 31	72 32	73 33	74 34	75 35	36	37	

Periodontal status

	17	16	55 15	54 14	53 13	52 12	51 11	61 21	62 22	63 23	64 24	65 25	26	27	
(73)															(86)
(87)															(100)
	47	46	85 45	84 44	83 43	82 42	81 41	71 31	72 32	73 33	74 34	75 35	36	37	

Gingival bleeding

Scores
0 = Absence of condition
1 = Presence of condition
9 = Tooth excluded
X = Tooth not present

Primary teeth	Permanent teeth
	Status
A	0 = Sound
B	1 = Caries
C	2 = Filled w/caries
D	3 = Filled, no caries
E	4 = Missing due to caries
—	5 = Missing for any another reason
F	6 = Fissure sealant
G	7 = Fixed dental prosthesis/crown, abutment, veneer
—	8 = Unerupted
—	9 = Not recorded

Enamel fluorosis (101)

Status

0 = Normal
1 = Questionable
2 = Very mild
3 = Mild
4 = Moderate
5 = Severe
8 = Excluded (crown, restoration, "bracket")
9 = Not recorded (unerupted tooth)

Dental erosion

Severity (102)

0 = No sign of erosion
1= Enamel lesion
2 = Dentinal lesion
3 = Pulp involvement

No. of teeth (103) (104)

Dental trauma

Status (105)

0 = No sign of injury
1 = Treated injury
2 = Enamel fracture only
3 = Enamel and dentine fracture
4 = Pulp involvement
5 = Missing tooth due to trauma
6 = Other damage
9 = Excluded tooth

No. of teeth (106) (107)

Oral mucosal lesions

Condition		Location	
(108)		(111)	
(109)		(112)	
(110)		(113)	

Condition:
0 = No abnormal condition
1 = Ulceration (aphthous, herpetic, traumatic)
2 = Acute necrotizing ulcerative gingivitis (ANUG)
3 = Candidiasis
4 = Abscess
8 = Other condition
9 = Not recorded

Location:
0 = Vermillion border
1 = Commissures
2 = Lips
3 = Sulci
4 = Buccal mucosa
5 = Floor of mouth
6 = Tongue
7 = Hard and/or soft palate
8 = Alveolar ridges/gingiva
9 = Not recorded

Intervention urgency (114)

0 = No treatment needed
1 = Preventive or routine treatment needed
2 = Prompt treatment (including scaling) needed
3 = Immediate (urgent) treatment needed due to pain or infection of dental and/or oral origin
4 = Referred for comprehensive evaluation or medical/dental treatment (systemic condition)

ANNEXURE IX

DrillBit

The Report is Generated by DrillBit Plagiarism Detection Software

Submission Information

Author Name	AAYUSHI BHARDWAJ
Title	ASSESSMENT OF DENTAL CARIES & TRAUMATIC DENTAL INJURIES AMONG GOVERNMENT INSTITUTIONALISED ORPHAN CHILDREN IN LUCKNOW CITY"
Paper/Submission ID	1423840
Submitted by	amarpal.singh056@bbdu.ac.in
Submission Date	2024-02-12 13:01:51
Total Pages	13
Document type	Dissertation

Result Information

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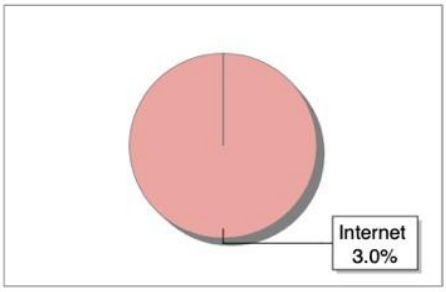

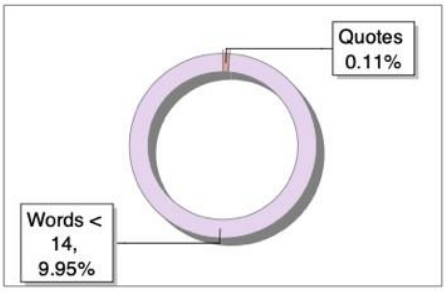

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Quotes	Excluded
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Database Selection

Language	English
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Journals & publishers	Yes
Internet or Web	Yes
Institution Repository	Yes

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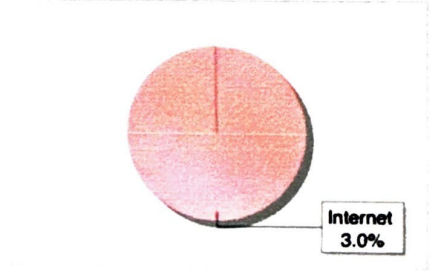
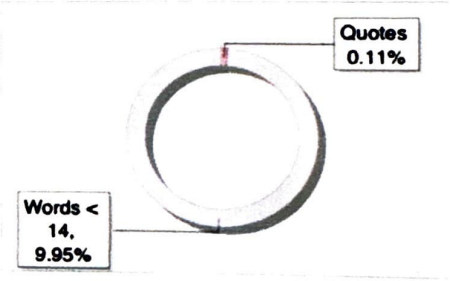
Paper/Submission ID	1423840
Submitted by	amarpal.singh056@bbdu.ac.in
Submission Date	2024-02-12 13:01:51
Total Pages	13
Document type	Dissertation

Result Information

Similarity **3 %**





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Quotes	Excluded
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Sources: Less than 14 Words %	Excluded
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Excluded Phrases	Not Excluded

Database Selection

Language	English
Student Papers	Yes
Journals & publishers	Yes
Internet or Web	Yes
Institution Repository	Yes