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Assessment of dietary habits and dental caries in 12-15 years old orphanage and parented school children in Odisha: A comparative study

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Abstract

Background: Having healthy teeth is not the only aspect of enjoying good oral health. Due to untreated and active caries, many children experience poor oral and overall health. Neglecting dental hygiene and dietary habits in orphans can negatively affect vital aspects of life, including function, appearance, relationships, and even career opportunities. Aim and Objectives: This study aims to assess the prevalence of dental caries and dietary habits among 12-15-year-old orphaned and parented school children in Odisha.
Materials and Methods: 218 children were included in the study, comprising children from a non-governmental orphanage and those attending a government parented high school. Face to face interview was conducted to collect socio-demographic data and assess dietary habits. Clinical examinations (ADA type-3) were conducted following the WHO-2013 proforma guidelines. Descriptive statistics and chi-square test were used for statistical analysis.
Results: Total 50.46% of children residing in orphanages (110 participants) and 49.54% of children attending parented schools (108 participants). The mean DMFT (Decayed, Missing, Filled Teeth) index was 3.06 ± 2.54 in orphans and 3.42 ± 2.36 in parented school children. The mean age of the orphans was 13.82 years, while the mean age of parented school children was 13.74 years. Dietary items such as lemonade/carbonated drinks, sugar-containing chewing gum, milk with sugar, and tea with sugar were significantly associated with higher DMFT, particularly among children residing in orphanages compared to those in parented schools.
Conclusion: Parented school children exhibited higher rates of dental caries compared to children in orphanages.

Keywords: Dental caries, Diet, Orphan, WHO

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1. Introduction

By 2023, approximately 3.5 billion people worldwide are expected to be affected by dental diseases. Among them, about 2 billion will have cavities in their permanent teeth, while 514 million children will experience cavities in their baby teeth. Various factors contribute to the risk of tooth decay, including genetics, socioeconomic background, and dietary habits.[1]

Oral health is crucial for overall health and well-being at every stage of life and serves as an important indicator of a person's general health status.[2]

Dental caries is a complex disease influenced by various interrelated risks and protective factors. According to WHO, the most common non-communicable disease in children affects 60% to 90% of school-aged kids and a large majority of adults globally. It remains a significant public health concern in most developed countries.[3,4]

Dental caries develops when the biofilm microbiota, which typically exists in a balanced state in the oral cavity, shifts to an acid-producing, acid-tolerant, and cariogenic population due to frequent sugar intake.[5] This transition can manifest as clinically undetectable changes or as visible cavities due to a net loss of minerals within the tooth's hard tissues, resulting in carious lesions. A deeper understanding of the caries process has shifted the focus of treatment from operative methods to preventive strategies, emphasizing fluoride use and the re-mineralization of damaged tissue.[6,7]

With changing dietary patterns over the past few decades, globalization has contributed to higher sugar consumption, rising obesity, and caries prevalence in low- and middle-income countries like India.[8,9] Tooth decay

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begins with yellowish or chalky white spots on the enamel due to calcium loss, but it can be reversed with appropriate treatment.[10]

Consuming carbohydrates as free sugars is the primary risk factor for developing dental caries. The interaction between food products, specific dietary practices, and the frequency of food consumption may also play a significant role in the onset of dental caries.[11]

A child's well-being and health, particularly dental and oral health, are influenced by family support and care. Children often mimic their parent's behaviour when it comes to basic oral hygiene, and their caries experience, which impacts by their caregivers' attitudes and cultural knowledge about oral health.[12]

According to UNICEF, an orphan is defined as a child who has lost one or both parents or has been abandoned before reaching the age of eighteen. Consequently, orphans are often considered socially and economically disadvantaged, facing a higher risk of illness.[13]

Scientific research highlights the ongoing relationship between diet, nutrition, and oral health, influencing both well-being and disease. Maintaining good oral health is crucial for overall health, as poor dietary habits, smoking, alcohol use, and insufficient oral hygiene are key contributors to various dental issues. Regular plaque removal and proper oral care play a vital role in preventing tooth decay and gum disease.[1]

Orphaned children from socially and economically disadvantaged backgrounds often lack access to essential oral healthcare due to its high costs. This inaccessibility makes them more vulnerable to oral diseases.[14]

Twelve years of age is typically when children finish elementary school, making it an ideal age for reliable sampling through the education system. By this age, all permanent teeth, except the third molars, have erupted. As a result, twelve years is the global indicator age for cross-national comparisons and disease trend monitoring. By age fifteen, permanent teeth have had 3 to 9 years of oral exposure, making it relevant to study caries prevalence in teenagers.[15]

Karishma A et al.[16] conducted a cross-sectional study among 263 participants in Indore, Madhya Pradesh. She reported that dental caries was the most commonly observed hard tissue lesion in orphans (31.8%), compared to 20.6% in school children.

Developing good oral health habits early is crucial, as childhood routines often continue into adulthood. Brushing, flossing, and regular dental check-ups help prevent plaque build-up and protect enamel. However, adherence among adolescents varies due to socioeconomic, cultural, and healthcare access factors.[1,17]

The occurrence of cavities was often associated with a combination of poor eating habits, nutrient deficiencies in the diet, inadequate oral hygiene, and an accumulation of bacterial plaque.[18]

In contrast to this there was very little literature related to dietary habits and dental caries among 12-15-year-old a group of orphan and parented school children in India as well as in Odisha. So, this study was novel in this field.

2. Materials and Methods

2.1. Study design

A descriptive cross-sectional study was conducted from January to May 2024, with samples collected from two authorized institutions, a government higher secondary school, and a private orphanage in Bhubaneswar, Odisha.

2.2. Sampling technique

A list of 14 orphanages, including both government-run and aided institutions, registered with the Department of Disabilities and Social Empowerment, Government of Odisha, was obtained from the District Collector of Khurda, Odisha. Simple random sampling was done to get the desired sample size. Bhubaneswar City was divided into three zones, the North Zone, the South East Zone, and the South West Zone. In the lottery method, the North Zone was selected randomly. Out of 14 orphanages 1 orphanage was selected randomly by lottery method. Similarly, for parented schools by lottery method from north Zone one school was selected. The sample size calculation was done using OpenEpi, Version 3 Software with a two-sided 95% confidence interval and a statistical power of 80%. The sample size ratio between Group 2 and Group 1 was 1:1, with each group consisting of 109 participants, resulting in a total sample size of 218. The mean value for Group 1 was 1.69 with a standard deviation of 2.58 and a variance of 6.6564, whereas Group 2 had a mean of 0.85, a standard deviation of 1.79, and a variance of 3.2041. The observed difference between the group means was 0.84.

2.3. Approval of the authorities

Permission to visit the selected orphanages and government high schools was obtained. The study's purpose was explained to the orphanage administrators and the school headmaster, and their approval was granted. Informed consent was secured from parents or guardians.

2.4. Inclusion criteria

1. Participants were present at the time of the study.
2. Individual parents or guardians who gave informed consent.

2.5. Exclusion criteria

1. Subjects who were uncooperative for the clinical examination during the study.

2. Subjects suffering from chronic systemic diseases and medically compromised. (To ensure a more homogenous sample and avoid confounding variables)

2.6. Standardization and calibration

To ensure consistent interpretation and application of the codes and criteria, the examiner and recording assistant underwent training and calibration at the Department of Public Health Dentistry, under expert guidance. Repeated examinations were performed on 5% of the sample at the start and on successive days, using the same diagnostic criteria to confirm examiner reliability. The calibration exercise yielded a kappa value of 0.87, indicating strong intra-examiner reliability.

2.7. Data collection

A single examiner conducted the clinical examinations and an assistant recorded the data using the WHO Oral Health Assessment Form for Children, 2013.[15] This form was designed to evaluate oral disease prevalence across all age groups. The investigator interviewed the study participants in their local vernacular language using the WHO's Oral health questionnaire for children. From the standardized questionnaire, the dietary habits, demographics, and oral hygiene practices were recorded. [15] After that ADA-type 3 clinical examination was conducted using mouth mirror and probe under adequate illumination (natural or artificial), and caries experience was recorded using the WHO-2013 proforma. The oral examination adhered to the WHO guidelines.[15]

2.8. Ethical consideration

The research protocol received ethical approval from the Institutional Review Board KIIT/ KIMS/ IEC/ 1781 /2024. The reporting of this study complies with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) Statement.[19]

2.9. Statistical analysis

Data entry and analysis were conducted using SPSS version 27 and Microsoft Excel 2019. Mean and standard deviation were used for continuous variables, while frequency and percentage were used for categorical data. The t-test and chi-square test were applied, with a significance level of $p < 0.05$.

3. Result

Table 1 presents the gender distribution of students in two types of schools: an orphanage and a parented school. In the orphanage, there were 110 students, of which 41 were male (37.27%) and 69 were female (62.73%). In contrast, the parented school had 108 students, comprising 56 boys (51.85%) and 52 girls (48.15%). Overall, across both institutions, there were 121 female students (55.50%) and 97 male students (44.50%), leading to a total of 218 pupils. A statistically significant difference in gender distribution between the two school types was indicated by a p-value of 0.030, highlighting a notable disparity in the percentages of boys and girls.

Figure 1 shows the mean age of both study groups. The mean age of parented school children was 13.74 ± 1.47 years, while orphans had a mean age of 13.82 ± 1.21 years, with ages ranging from 12 to 15 years.

Table 2 compares oral hygiene practices between orphanage and parented school students, revealing notable differences. While both groups predominantly use toothbrushes (Orphanage: 50.46%, Parented School: 49.54%), this practice shows no significant difference ($p = 0.990$). However, the frequency of cleaning differs significantly ($p = 0.014$), with more orphanage students cleaning twice daily (64.38%) compared to parented school students (35.62%). Cleaning techniques also vary ($p = 0.002$), with orphanage students favoring horizontal cleaning (64.71%) and parented school students preferring vertical cleaning (70%). Although orphanage students show a slight preference for fluoridated toothpaste (56.44% vs. 43.56%), the difference is not statistically significant ($p = 0.095$). Overall, these findings indicate distinct dental hygiene practices between the two groups.

Table 3 compares the dietary habits of the orphanage and parented school students, highlighting significant differences across several categories. Fresh fruit consumption is higher in parented school students (75%) than in orphans (25%) ($p = 0.042$). Biscuit and cake consumption show no significant difference ($p = 0.195$), though parented students consume them more daily (53.91%). Lemonade and carbonated drink intake are significantly higher in parented students (80%) ($p = 0.001$). Jam and honey are consumed more weekly by orphans (71.43%) ($p = 0.007$). Orphanage students are less likely to consume chewing gum with sugar (65.06%) ($p = 0.000$). Sweets and candy consumption, though not significant ($p = 0.122$), is higher in orphans (59.74%). Orphans also consume less milk with sugar ($p = 0.000$) and tea with sugar ($p = 0.000$), while coffee with sugar is consumed only by parented students ($p = 0.033$). These findings suggest distinct dietary patterns between the two groups, indicating areas for targeted nutritional interventions.

Figure 2 summarizes the mean, minimum, and maximum values for the DMFT index components (decayed, missing, and filled teeth), reflecting dental health. The mean number of decayed teeth is 2.31, ranging from 0 to 8. Missing teeth have a mean of 0.37, with values from 0 to 4, while filled teeth average 0.57, ranging from 0 to 5. The total DMFT score has a mean of 3.24, with a range of 0 to 10. These values highlight the prevalence and extent of dental caries in the studied population.

Table 4 presents the comparison of the mean and standard deviation of the DMFT components between the two groups. The Decayed (D) component was 2.09±1.86 for

orphans and 2.53±1.97 for parented school children, with no significant difference (p=0.09). The Missing (M) component was 0.34±0.67 for orphans and 0.39±0.76 for parented children (p=0.65). The Filled (F) component was 0.63±1.08 in orphans and 0.51±0.94 in parented children, also showing no significant difference (p=0.39). The total DMFT scores were 3.06±2.54 for orphans and 3.42±2.36 for parented children, with no significant difference (p=0.28).

Table 5 represents the distribution of DMFT Experience groups by School Type which shows the distribution of students across three DMFT (Decayed, Missing, Filled Teeth) Experience categories—low (≤2.6), medium (2.7–4.4) and high (≥4.5)—differentiated by school type. In orphanage schools, 54.74% are classified as a low-experience group, 48.08% as a medium-experience group, and 46.48% as a high-experience group. Comparatively in parented schools, 45.26% fall into the low-experience group, 51.92% into the medium-experience group, and 53.52% into the high-experience group. The calculated DMFT community index was 3.45.

Table 6 represents the correlation between dmft experience, oral hygiene practice, and dietary habits. The correlations indicate that certain dietary habits such as consumption of fresh fruit, chewing gum containing sugar, sweets/candy, milk with sugar, and certain beverages like lemonade/carbonated drinks and coffee with sugar are significantly associated with higher DMFT experience Categories.

Table 1: Distribution of gender by school type

	Gender			
School	**Male n (%)**	**Female n (%)**	**Total n (%)**	**p-value**
Orphanage	41 (37.27)	69 (62.73)	110 (100)	0.030*
Parented School	56 (51.85)	52 (48.15)	108 (100)	
Total	97 (44.50)	121 (55.50)	218 (100)	

Table 2: Distribution of oral hygiene practice by school type

Oral Hygiene Practices	**Orphanage n (%)**	**Parented School n (%)**	**Total n (%)**	**p-value**
Type of Cleaning				0.990
Toothbrush	109 (50.46)	107 (49.54)	216 (100)	
Finger	1 (50)	1 (50)	2 (100)	
Frequency of Cleaning				
Once	62 (43.36)	81 (56.64)	143 (100)	0.014*
Twice	47 (64.38)	26 (35.62)	73 (100)	
Thrice	1 (50)	1 (50)	2 (100)	
Method of cleaning				
Vertical	12 (30)	28 (70)	40 (100)	0.002*
Horizontal	44 (64.71)	24 (35.29)	68 (100)	
Circular	54 (49.09)	56 (50.91)	110 (100)	
Material Used				
Fluoridated Toothpaste	57 (56.44)	44 (43.56)	101 (100)	0.095
Non-fluoridated Toothpaste	50 (43.86)	64 (56.14)	114 (100)	
Tooth Powder	1 (100)	0 (0)	1 (100)	
Others	2 (100)	0 (0)	2 (100)	

Table 3: Distribution of dietary practice of the study participants

Dietary Habits	**Orphanage n (%)**	**Parented School n (%)**	**Total n (%)**	**p-value**
Fresh Fruit				0.042*
Never	5 (25)	15 (75)	20 (100)	
Several Times in Months	6 (66.67)	3 (33.33)	9 (100)	
Once a Week	23 (65.71)	12 (34.29)	35 (100)	
Several Times a Week	45 (50)	45 (50)	90 (100)	
Everyday	29 (51.79)	27 (48.21)	56 (100)	
Several Times a Day	2 (25)	6 (75)	8 (100)	
Biscuit/Cakes				
Never	4 (66.67)	2 (33.33)	6 (100)	

Several Times in Months	1 (50)	1 (50)	2 (100)	
Once a Week	9 (52.94)	8 (47.06)	17 (100)	
Several Times a Week	43 (58.11)	31 (41.89)	74 (100)	0.195
Everyday	53 (46.09)	62 (53.91)	115 (100)	
Several Times a Day	0 (0)	4 (100)	4 (100)	
Lemonade/Carbonated Drink				
Never	26 (74.29)	9 (25.71)	35 (100)	
Several Times in Months	23 (51.11)	22 (48.89)	45 (100)	
Once a Week	25 (62.50)	15 (37.50)	40 (100)	
Several Times a Week	30 (42.25)	41 (57.75)	71 (100)	0.001*
Everyday	5 (20)	20 (80)	25 (100)	
Several Times a Day	1 (50)	1 (50)	2 (100)	
Jam/Honey				
Never	42 (44.21)	53 (55.79)	95 (100)	
Several Times in Months	11 (42.31)	15 (57.69)	26 (100)	
Once a Week	35 (71.43)	14 (28.57)	49 (100)	0.007*
Several Times a Week	15 (50)	15 (50)	30 (100)	
Everyday	7 (53.85)	6 (46.15)	13 (100)	
Several Times a Day	0 (0)	5 (100)	5 (100)	
Chewing Containing Sugar				
Never	54 (65.06)	29 (34.94)	83 (100)	
Several Times in Months	8 (38.10)	13 (61.90)	21 (100)	
Once a Week	16 (76.19)	5 (23.81)	21 (100)	
Several Times a Week	21 (50)	21 (50)	42 (100)	0.000*
Everyday	9 (21.95)	32 (78.05)	41 (100)	
Several Times a Day	2 (20)	8 (80)	10 (100)	
Sweets/Candy				
Never	19 (51.35)	18 (48.65)	37 (100)	
Several Times in Months	5 (26.32)	14 (73.68)	19 (100)	
Once a Week	10 (55.56)	8 (44.44)	18 (100)	0.122
Several Times a Week	46 (59.74)	31 (40.26)	77 (100)	
Everyday	27 (46.55)	31 (53.45)	58 (100)	
Several Times a Day	3 (33.33)	6 (66.67)	9 (100)	
Milk with Sugar				
Never	60 (68.18)	28 (31.82)	88 (100)	
Several Times in Months	0 (0)	10 (100)	10 (100)	
Once a Week	2 (40)	3 (60)	5 (100)	0.000*
Several Times a Week	7 (23.33)	23 (76.67)	30 (100)	
Everyday	37 (48.05)	40 (51.95)	77 (100)	
Several Times a Day	4 (50)	4 (50)	8 (100)	
Tea with Sugar				
Never	104 (61.18)	66 (38.82)	170 (100)	
Several Times in Months	2 (33.33)	4 (66.67)	6 (100)	
Once a Week	3 (23.08)	10 (76.92)	13 (100)	0.000*
Several Times a Week	1 (10)	9 (90)	10 (100)	
Everyday	0 (0)	19 (100)	19 (100)	
Coffee with Sugar				
Never	106 (53.27)	93 (46.73)	199 (100)	
Several Times in Months	2 (66.67)	1 (33.33)	3 (100)	
Once a Week	1 (16.67)	5 (83.33)	6 (100)	
Several Times a Week	1 (16.67)	5 (83.33)	6 (100)	0.033*
Everyday	0 (0)	4 (100)	4 (100)	

Table 4: Comparison of Mean and standard deviation of DMF component among different school type.

Variables	Orphanage	Parented School	p-value
Decayed (mean/SD)	2.09±1.86	2.53±1.97	0.0940
Missing (mean/SD)	0.34±0.67	0.39± 0.76	0.6545

Filled (mean/SD)	0.63± 1.08	0.51±0.94	0.3919
Total DMFT (mean/SD)	3.06±2.54	3.42±2.36	0.2774

Table 5: Distribution of DMFT Experience groups by school type

School	DMFT Experience groups			
	Low (≤2.6) n (%)	Medium (2.7–4.4) n (%)	High (≥4.5) n (%)	Total
Orphanage	52 (54.74)	25 (48.08)	33 (46.48)	110 (50.46)
Parented School	43 (45.26)	27 (51.92)	38 (53.52)	108 (49.54)
Total	95 (100)	52 (100)	71 (100)	218 (100)
DMFT Community Index				3.45

Table 6: Correlation between DMFT experience, Oral hygiene and dietary habits

Variables	DMFT Experience		
	Spearman's Rho Correlation Coefficient	p-value	N
Type of Cleaning	0.0701	0.3027	218
Frequency of Cleaning	-0.0309	0.6504	218
Method of Cleaning	0.0591	0.3856	218
Material Used	0.1043	0.1247	218
Fresh Fruit	0.1590	0.0188	218
Biscuit/Cakes	0.1039	0.1261	218
Lemonade/Carbonated Drink	0.1333	0.0494	218
Jam/Honey	0.1173	0.0839	218
Chewing Gum Containing Sugar	0.2322	0.0005	218
Sweets/Candy	0.1717	0.0111	218
Milk with Sugar	0.2721	0.0000	218
Tea with Sugar	0.0446	0.5127	218
Coffee with Sugar	0.1575	0.0200	218

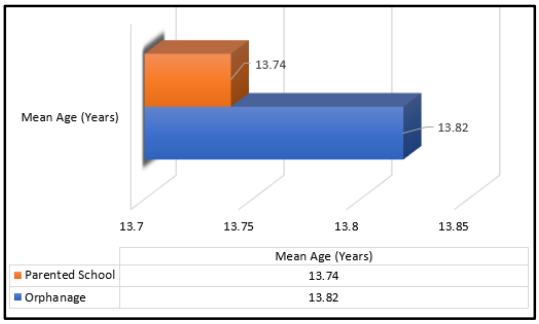

Figure 1: Mean age of orphanage and parented school children

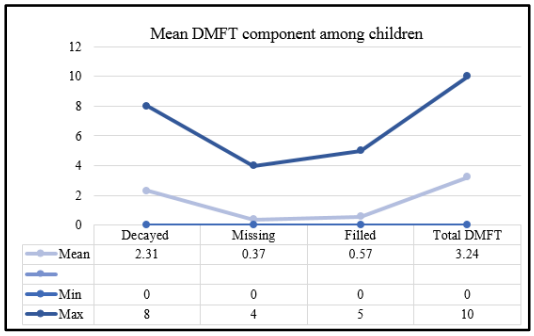

Figure 2: Descriptive statistics of DMFT components (Decayed, Missing, Filled Teeth) among school children

4. Discussion

Dental caries is the most common dental condition among school-aged children, often considered a childhood disease.[3] As it worsens with age and is irreversible, early onset can lead to lifelong consequences, impacting quality of life and increasing societal costs. Reducing caries risk in children's permanent teeth is crucial, with high sugar intake being a key factor.[11] Parental education and cultural influences significantly shape children's oral health habits and dietary practices. Prevention relies on a balanced diet and good oral hygiene, monitored by a responsible guardian.[12]

An estimated 153 million children worldwide, from infancy to adolescence, have lost one or both parents. As a vulnerable and marginalized group, orphaned children need special care to develop into healthy, mentally sharp, and morally grounded individuals, equipped with the skills and motivation to contribute to society.[20]

In this current study children with systemic disease were excluded because it was well-documented that systemic disease may create discrepancies in study results. A study reported by Ferizi L et al.[21] shows that Children with type 1 diabetes mellitus showed a significantly higher prevalence of dental caries, reduced salivary flow rate and buffering

capacity, and an increased Lactobacillus count compared to healthy children.

In this study, 110 orphanage students included 41 males (37.27%) and 69 females (62.73%), while the parented school had 56 males (51.85%) and 52 females (48.15%), totaling 108 students. Overall, there were 97 males (44.50%) and 121 females (55.50%) across both groups, with a combined total of 218 students. The average age was 13.74 years for parented school children and 13.82 years for orphans, ranging from 12 to 15 years.

A similar study by Khattab NMA et al.[13] reported a total of 156 children, with 52 children in each group of a case-control study.

Karishma A. et al.[16] documented that a total of 263 study subjects aged 6-12 years, 132 (50.2%) were orphans are more than 131 (49.8%) were school children. However, the dissimilarities found that the majority of the orphans were males (62.9%) than school children (59.5%). Sinha A et al.[20] also conducted a study among 62 orphans and 60 schoolchildren, with the participants ranging in age from birth to 20 years.

In contrast, Gupta R et al.[4] conducted a study in 2024 among orphan dwellers in Raichur city, which included 101 participants. The data shows the majority of the dwellers are male 57 (54.9%).

Soni A. et al.[14] included 1005 children, comprising 658 (65.37%) males and 347 (34.53%) females in the 3–18 years age group. Goel R et al.[22] conducted a study in Ambala among 12-15-year-old school children including 992 participants, with 236 (23.7%) aged 12 and 756 (76.3%) aged 15. Of the total, 57% (564) were male and 43.1% (428) were female.

The study found significant differences in oral hygiene practices between orphanage and parented school students. Both groups primarily used toothbrushes 99.02% (Orphanage: 50.46%, Parented School: 49.54%) with no significant difference ($p = 0.990$). Orphanage students had higher rates of twice-daily cleaning (64.38%) compared to parented students (35.62%) ($p = 0.014$). Orphanage students favored horizontal brushing (64.71%), while parented students preferred vertical brushing (70%) ($p = 0.002$). Although more orphanage students used fluoridated toothpaste (56.44% vs. 43.56%), the difference was not significant ($p = 0.095$).

Almost similar data reported by Gupta R et al.,[4] about 95% of the study participants use toothbrush and toothpaste for cleaning. Karishma A. et al.[16] reported similarity in the use of toothbrushes with toothpaste among 92 (69.7%) orphans and 128(97.7%) school children.

Additionally, 68.6% (162) of 12-year-olds and 77.4% (585) of 15-year-olds brushed their teeth at least once daily, as reported by Goel R et al.[22]

The study found notable differences in dietary habits between orphanage and parented school students. Parented school students consumed fresh fruit more frequently (75% vs. 25%, $p = 0.042$). Biscuit and cake consumption showed no significant difference ($p = 0.195$), though parented students had higher daily intake (53.91% vs. 46.09%).

The intake of carbonated drinks and lemonade was significantly higher in parented school students (80%) compared to orphanage students (20%) ($p = 0.001$). Weekly consumption of jam and honey was greater in orphanage students (71.43%) than in parented school students (28.57%) ($p = 0.007$).

Punitha V et al.[23] reported that the consumption of carbonated drinks and confectionery, including sweets and chocolates, was significantly linked to both the occurrence and severity of dental caries. Children who consumed confectionery more than four times a day had nearly 20 times the risk of developing caries. Additionally, those who frequently drank carbonated beverages (more than four times a week) had a sevenfold higher likelihood (OR = 7.00) of developing caries compared to those who did not consume these drinks.

There were also notable variations in the amount of sweet chewing gum used ($p = 0.000$), with 65.06% of pupils in orphanages never having used it compared to 34.94% of students in parent-sponsored schools.

A noteworthy difference was noted in sugar-containing milk consumption, with 68.18% of orphanage students never drinking it compared to 31.82% of parented school students ($p = 0.000$). Additionally, 61.18% of orphanage pupils never consumed tea with sugar, while 38.82% of parented school students did ($p = 0.000$). Notably, all daily coffee with sugar consumption came from parented school students, with none reported in the orphanage group ($p = 0.033$). A study documented by Min EJ et al.[24] found a correlation was there between milk consumption and the risk of dental caries in Korean adults. Those who consumed higher amounts of milk showed an increased prevalence of dental caries, with this association being especially prominent among females.

These findings indicated distinct dietary patterns between the two groups, highlighting potential areas for targeted nutritional interventions.

In contrast, Tenelanda-López D et al.[18] reported weekly food consumption, 28.2% of participants ate fruits two to four times a week, while 20.33% had sweets during the same period. Sugary drinks were consumed by 24.5%, Daily consumption included milk or dairy products (28.2%). A significant association ($p = 0.049$) was observed between

fruit consumption and DMFT levels, showing a slight positive correlation. This suggests that increased fruit consumption is linked to a higher risk of developing cavities.

This study reported the means and standard deviations of the DMF components and overall DMFT scores. For orphans, the Decayed (D) component was 2.09±1.86, and for parented school children, it was 2.53±1.97, showing no significant difference (p=0.09). The Missing (M) component was 0.34±0.67 for orphans and 0.39±0.76 for parented school students, also not significant (p=0.65). The Filled (F) component was 0.63±1.08 for orphans and 0.51±0.94 for parented school children, with no significant difference (p=0.39). Overall, DMF scores were 3.06±2.54 for orphans and 3.42±2.36 for parented students, which, while higher, was not statistically significant (p=0.28).

Soni A. et al.[14] conducted a study in Rajasthan and found that the prevalence of dental caries among orphans was 13.83% for primary teeth and 20.70% for permanent teeth. Furthermore, only 1.19% of participants had dental fillings in their permanent teeth.

Whereas a descriptive cross-sectional study was conducted by Sinha A et al.[20] in north India he found that dental caries prevalence was higher among school children, with a mean DMFT score of 1.85±2.177, compared to orphans, who had a mean DMFT score of 1.61±1.978.

Goel R et al.[21] reported dental caries prevalence was 46.5% in the 15-year-old age group and 34.3% among the 12-year-olds. The mean DMFT score was 1.26 for the 15-year-olds and 0.82 for the 12-year-olds.

In a contrary Study conducted in Egypt by Khattab NMA et al.[13] the mean DMF total scores were 1.86 ± 2.96 for non-governmental orphanages, 1.80 ± 2.54 for governmental orphanages, and 0.75 ± 1.29 for school children. Also, in a study reported by Bhat PK,[25] the mean number of decayed surfaces was higher in orphanage children (4.57±3.9) compared to school children. Similarly, the mean number of missing surfaces was greater in orphanage children (0.17±0.91) than in school children (0.16±0.37).

The DMFT community index score was found 3.45 in our study. Which was moderate according to the WHO. A study done by Mittal M et al.[26] reported a low community caries index that was 1 and a higher DMFT community index of 6.47 by Tenelanda-López D.[18]

5. Limitation

Considering smaller sample size of this study, we suggests doing the research in a larger sample. Matching on the basis of variable such as socio-economic status or baseline oral health was not done in our study which could potentially interfere with the outcomes.

6. Recommendations

1. Preventive programs for children in orphanages as well as Govt. School and private schools should be developed and implemented on a routine basis, focusing on oral health education, proper oral hygiene practices, monitoring toothbrushing techniques, ensuring the use of fluoride toothpaste regularly, and their consumption of sugars.
2. Health services should prioritize screening for common medical and oral health issues, highlighting the need for an active and effective program to address both general and oral health.

7. Conclusion

In comparison to children in orphanages, parented schoolchildren had higher rates of dental caries and more severe cases within the confines of this comparative research. The cross-sectional design of the study doesn't lead to an inference that only diet and oral hygiene practices are the primary reasons for dental caries. Dental caries is a serious public health issue, especially for school-age children, and diet is a crucial factor in preventing it.

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9. Conflict of Interest

None.

10. References

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