Prevalence of dental caries among learners with disabilities attending special education schools in the eThekwini District, KwaZulu-Natal

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ABSTRACT

Introduction

Individuals with special healthcare needs may have poor oral health as a result of systemic and structural issues that make it more difficult to maintain optimal oral health status. As such, these individuals may require specialised, multidisciplinary oral healthcare. Furthermore, determining the severity of oral conditions among these people is necessary to establish the number of people affected and the services required to improve oral healthcare for these affected populations.

Aims and objectives

To determine the prevalence of dental caries among learners with disabilities attending special schools education in the eThekwini district, using DMFT/dmft and PUFA/pufa indices.

Design

A cross-sectional descriptive study design.

Methods

A proportional stratified random sampling method was used to select learners from 22 special schools in the eThekwini district (n=435). The sample was divided into subgroups known as strata (schools) and a systematic sampling technique was used in each school. The learners were further categorised according to the classification of Special Health Care according to the Individuals with Disabilities Education Act (IDEA). Data collection comprised an intraoral examination to determine the prevalence of dental caries (using the DMFT/dmft index) and the extent of untreated dental caries using the PUFA/pufa index.

Results

Out of the 488 students in the special schools approached, 435 consented to participate in the study giving a response rate of 89.14%. The prevalence of dental caries in the permanent and primary dentition was 53.6% and 22.5% respectively. The overall D (decayed) component recorded in permanent teeth was 740 (88%), the F (filled) component was 30 (4%) and M (missing) component was 77 (9%). Females had higher mean DMFT and PUFA scores while males had higher dmft and pufa scores. The DMFT and dmft scores recorded were highest in the 18-20 years age group at 3.70 ± 3.83 and the 6-8 years age group at 4.31 ± 4.00 respectively. The relationship between the DMFT and dmft scores and participants' age was seen as statistically significant, as these increased with age (p <0.001). The highest caries prevalence was found in the intellectual disability group (46.4%; n=393). The "untreated caries to PUFA ratio" was 2.5 to 1, indicating that 26% of the D + d component (in DMFT/dmft) had progressed mainly to pulpal involvement. The PUFA/pufa scores were higher in the 12-14 years age group at 0.46 ± 1.33 and 6-8 years age group at 2.06 ± 3.45 respectively when compared to the other age groups in the study sample.

Conclusion

The high number of dental caries recorded in the permanent and primary dentition and the low number of restored teeth in the study sample highlight the need for promotive, preventive and restorative oral healthcare programmes within this population.

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Conflict of interest

The authors declare that there is no conflict of interest.

INTRODUCTION

Individuals with disabilities often face difficulties in oral hygiene maintenance which results in poor oral cleanliness when compared to the general population, who can usually manage their oral health[1]. Maintaining optimal oral health in disabled individuals is very challenging, as they also have compromised general health[2]. As a result, oral conditions exist among individuals with special needs and are influenced by factors such as the person's physical limitations, general illness, intellectual capacity, living situation, age and degree of impairment[3]. It is reported that these individuals have poorer overall oral health status, periodontal status, fewer remaining teeth and more untreated dental caries which are the most dominant unmet oral health problem in such

individuals[3]. Ordinarily, individuals with special needs are primarily dependent on parents, siblings and caregivers – especially the young, severely impaired and institutionalised – for general care as well as oral hygiene[4].

There is also limited published evidence in South Africa (SA) on oral health in special schools education, particularly in KwaZulu-Natal (KZN). However, a few studies have been conducted – specifically, in Vhembe district, Limpopo province; in Johannesburg, Gauteng province; a study conducted in four provinces of SA ie Gauteng, Limpopo, KZN and Mpumalanga; and one study in KZN[5-8]. The current study set out to determine the prevalence of dental caries among learners in KZN special schools education (referred to as special schools) through use of the DMFT/dmft and PUFA/pufa indices. The DMFT/dmft index was used to measure the prevalence of dental caries and the PUFA index was used to assess the presence of oral conditions resulting from untreated caries and to record the clinical consequences of untreated dental caries[9-10].

METHODS AND MATERIALS
Study design
A descriptive cross-sectional study design was used to conduct the study.

Setting
Participants were drawn from the population of learners with disabilities attending special schools in eThekwini district, KZN province, SA. Data was collected between June and September 2022 during school hours and in accordance with Covid-19 protocols. The study was approved by the Biomedical Research Ethics Committee of the University of KwaZulu-Natal (BREC00003814/2022) and ethical guidelines were followed to ensure confidentiality in the management of data. Gatekeeper permission was obtained from the KZN Department of Education.

Study participants
The study population were students with special needs attending special schools within the 22 special schools of eThekwini district who gave consent to participate in the study.

Study size
According to the 22 special schools in eThekwini district that were part of the study, there were 4,875 enrolled pupils in these schools. Proportional stratified random sampling method was used to calculate the sample size of learners with special needs (participants). This sampling method was chosen because the population that was sampled was divided into subgroups know as strata (schools). The sample size from each stratum was obtained using this formula: (sample size/population size) x stratum size, that is 4,875 x 10% = 488 learners. However, only 435 learners consented to participate in the study; therefore, n=435.

Since the identified special schools in eThekwini district cater for a wide variety of disability types, the study did not stratify according to the disability types but stratified per schools. Systematic sampling technique was used for select potential participants in each identified school[11]. Systematic sampling involved selecting at random the first person from a list and then taking every third number or element (person) until the desired total of individuals was selected[12]. This number of learners was further distributed according to the following ages: 6-8, 9-11, 12-14, 15-17

Table I: The Special Health Care classification

Disability type	Total participants (n)
Specific learning disabilities	9
Other health impairment	22
Autism spectrum disorder	54
Emotional disturbance	15
Speech or language impairment	2
Visual impairment including blindness	7
Deafness	47
Hearing impairment	11
Orthopaedic impairment	65
Intellectual disability	182
Traumatic brain injury	5
Multiple disabilities	16
Total	**435**

and 18-20 years. The learners in the study sample were then categorised according to the classification of Special Health Care according to the Individuals with Disabilities Education Act or IDEA[13] as expressed in Table I above. The inclusion criteria hence included learners aged between 6 and 20 years. The study excluded learners who did not receive parental or caregiver consent and learners who did not meet the age requirement; those who were uncooperative and unwilling were also excluded from the study.

For the recruitment process, a meeting was first held with the school principal and educators to inform them of the proposed study. A meeting was also held with class educators and care-givers and all queries related to the study were addressed. Letters of invitation and the informed parental consent (IPC) form and an individual assent form (IAF) were sent to the parents via the class. A meeting was also held with interested parents to highlight the purpose and goal of the study. Both parental consent and child assent (where possible) were obtained and a child's refusal to participate in the study was upheld. Thus, voluntariness in study participation was maintained.

Data sources/measurement
A pre-designed data capturing sheet was then used to collect data on the demographic characteristics and dental caries status of the students. Intra-oral examinations were carried out to determine caries and the extent of dental caries using the DMFT/dmft and PUFA/pufa indices respectively. A designated space was provided by the schools for the review of each learner's IPC and IAF and to conduct the oral examinations. The dental examinations were noninvasive. Dental caries was evaluated by visual inspection under natural sunlight, with additional tactile inspection using mostly the mouth mirror, probe, explorer tweezers and sometimes tongue depressor if required. Sterile disposable clinical examination instruments were used for inspection.

Radiographic examinations were not undertaken.
The general demographic information data and the clinical dental examinations were collected/conducted by the researcher (a qualified dental therapist). Two research assistants (oral hygienist and dental assistant) were trained

in data documentation. One recorded the sociodemographic details, while the other recorded the result of the oral examination as communicated by the researcher.

Variables

The independent variables were age and gender. The components of DMFT/dmft index formed part of the dependent variables to measure the prevalence of dental caries and the presence of restored and/or missing teeth among children with special needs education in this study. The DMFT/dmft index score was calculated as Decayed (D) + Missing (M) + Filling (F) = DMFT and the total DMFT scores divided by the total number of subjects examined was used to calculate the total population DMFT scores[14]. To quantify the various progressive stages of a carious lesion, a measuring system was developed – the PUFA (P-pulpal involvement, U-ulceration, F-fistula and A-abscess) index[15], which is mainly used as a complementary tool to caries indices like DMFT[16]. The PUFA index was used to assess the presence of oral conditions resulting from untreated caries and to record the clinical consequences of untreated dental caries and is c,,alculated in the same way as the DMFT[9].

Bias

To reduce inter-examiner variability and improve validity every fifth oral examination completed was re-examined as per World Health Organisation standards for oral health surveys[10]. Furthermore, the Cronbach's alpha coefficient was measured to ensure the internal consistency, or reliability, of a set of survey items. The Cronbach's alpha result for the current study was 0.730.

Data analysis

Data collected was transferred onto an Excel spreadsheet and analysed using the SPSS version 28.0 software. Descriptive statistics were utilised to investigate possible relationships between the variables such as age, gender, race and DMFT/PUFA scores obtained. For the calculation of inferential statistics, Pearson's chi-squared test was used to assess the possible relationship between the independent variables and the dependent variables and statistical significance was only reported when the p-value was <0.05.

RESULTS

Sociodemographic characteristics of participants and the overall DMFT and PUFA scores

Out of the 488 students in the special schools approached, 435 consented to participate in the study, giving a response rate of 89.14%. Of the 435 learners who participated in the study, 271 (62.3%) were male and 164 (37.7%) were female. Participants identified themselves as belonging to one of four major racial groups: African 367 (84.4%), Indian 46 (10.6%), Coloured 11 (2.5%) and White 11 (2.5%). The mean age of the study participants was 13 years (SD: 3.58). The majority were in the 15 to 17-year-old category, which made up almost one-third of the sample (29.2%; n=127) as shown in Table 2. The participants were from two educational subdistricts in the eThekwini district[17] – Umlazi at 283 (65.1%) and Pinetown at 152 (34.9%).

Overall, learners from the Umlazi district had a higher mean ± (SD) DMFT value of 2.25 ± 2.90 compared to participants from the Pinetown district who had a DMFT score of 1.38 ± 2.10. Females had a higher mean DMFT score of 2.09 ± 2.73 compared to males with 1.86 ± 2.75. The highest DMFT score was also noted on the 18-20-year age group at 3.70

± 3.83. The DMFT score increased with age as illustrated in the next section and it was found to be statistically significant (p=0.001). Learners in Pinetown district had a higher mean dmft value of 0.99 ± 2.260 compared to participants from Umlazi who had a mean score of 0.91 ± 2.23. The highest dmft was noted in the 6-9-year age group at 4.31 ± 4.00. The relationship between the dmft score and participants' age was significant (p=0.001). The dmft score also increased with age as illustrated later in this section.

Learners from Umlazi district had a higher value of PUFA index of 0.46 ± 1.33 compared to participants from Pinetown district who had a mean PUFA index of 0.22 ± 0.70. The "untreated caries (n=295) to PUFA (n=116) ratio" was 2.5 is to 1 (41%) indicating that 26% of the D + d component had progressed mainly to pulpal involvement. Learners from Pinetown district had a higher value of pufa index of 0.56 ± 2.24 compared to participants from Umlazi district who had a mean pufa index of 0.37 ± 1.28.

Dental caries status in the permanent dentition

In the permanent dentition, the mean DMFT score was 1.97 ± 2.36. The prevalence of dental caries in permanent dentition was 53.6% (see Table 2). The highest mean DMFT score was recorded among the 18-20-year age group at 3.70 ± 3.83 as shown in Table 2. The highest caries prevalence in the study sample was found in the intellectual disability group (46.4%) (p=0.628) and the lowest in the speech or language impairment disability group (0.3%). The overall D component was 740 (88%), F component was 30 (4%) and M component was 77 (9%). The D component was the highest in the 18-20-year group at 132 (76%), with the F component of n=10 (6%) and M component of n=32 (18%) which is indicative of high unmet treatment needs and showing extraction as the main treatment option.

The overall mean PUFA score for the permanent dentition was 0.34 ± 1.01, and females had a slightly higher PUFA index score of 0.35 ± 0.94 compared to males with 0.34 ± 1.05. The mean PUFA score was highest in the 12-14-year age group at 0.46 ± 1.33 as shown in Table 2. Learners with traumatic brain injuries had the highest mean PUFA score of 1 ± 1.26, followed by participants with intellectual disability and multiple disabilities at 0.44 ± 1.25 as well as 0.44 ± 1.06; however, this data was not seen as significant.

Dental caries status in primary dentition

The prevalence of dental caries in primary teeth was 22.5%. The lowest caries prevalence was found in the speech or language impairment disability group (0%) and the highest was found in the intellectual disability group (38.8%) (p=0.537) predominantly in the 6-9-year group. The mean dmft score was 0.95 ± 2.36. The overall "decayed" component of 408 (99.52%) was the most prominent factor in dmft scores. The d component was the highest in the 6-9-year-olds at 288 (70%). The f component was only noted in the 10-11-year-olds at n=1 (1%) which is indicative of high unmet treatment needs.

The average mean dmft score within primary dentition was 0.95 ± 2.36. The mean dmft score was highest in the 6-8-year age group at 4.31 ± 4.00 as shown in Table 2. Learners with visual impairment, including blindness, had the highest dmft score 2.43 ± 2.06, followed by the participants with autism spectrum disorder 1.44 ± 2.69.

The overall mean pufa score for the primary dentition was 0.44 ± 1.68, and males had a significantly higher pufa index score of 0.47 ± 1.88 compared to females with 0.37 ± 1.26. The mean pufa score was highest in the 6-8-year age group at 2.06 ± 1.26 with the p component at 134 (96%), f component at 3 (2%) and a component at 3 (2%). Learners with autism spectrum disorder and other health impairments such as dyslexia and ADHD had the highest mean pufa score 0.77 ± 2.05 as well as 0.77 ± 3.85 respectively; however, the low sample size in these categories is noted.

DISCUSSION
The study sample comprised more males (62.3%) and this finding is consistent with other studies carried out in SA and in other parts of the world[4,6-8,18-20]. According to Haddad (2020), males are one-third more likely than females to have a special need[21]. However, the gender distribution reported in this study is contrary to that reported by the Statistics South Africa Census 2011 which reported that the prevalence of disability was higher among females[22].

Additionally, dental caries in the permanent dentition was more prevalent in females (18-20-year age group), but caries in the primary dentition was more prevalent in males (6-8-year age group). Only a few observations were recorded for the F (filling) component. This finding suggests high unmet treatment needs in the study sample. Gender variations in dental caries prevalence have been consistently reported, with females often experiencing a greater prevalence and severity of disease at all ages. The reason for this gender imbalance is currently not understood; however, it could be partially explained by the different influences of genetic factors on the sexes[23,24]. Other authors postulated that it could be because females experience early eruption times, therefore had longer exposure time to cariogenic foods[25]. Additionally, it has been noted that the varying oestrogen levels in females between adolescence and menstruation slow down the salivary flow, alter its composition and ultimately make them more susceptible to developing cavities[24]. These findings are in line with other studies that indicated an association between the age of children with impairments and dental caries[3,26]. One possible explanation is the fact that children in the 6 to 8-year age group may have lower oral hygiene skills than children in other age groups[27]. This could have an impact on the rise in caries prevalence as compared to other age groups. Another reason could be the high percentage of deciduous teeth found in this group of learners and, because they have thinner enamel, they have a faster spread of caries from the enamel to the dentine than newly erupted permanent teeth[26,28]. On the other hand, exposure time also gives insight into why the prevalence of caries is higher in the 18-20-year-old group than in other groups[26,29].

The prevalence of dental caries reported in this study for primary dentition (22.5%) and permanent dentition (53.6%) is consistent with the findings of other studies conducted in South African special needs schools. In Gauteng province, a study reported the caries prevalence at 27.55% and 33.56% in primary and permanent dentition, respectively[6] while in KZN, Naidoo and Singh reported caries prevalence among school-going children with autism spectrum disorders at 51.7% and 40.8%, respectively[8]. In contrast to the current study's findings, a study conducted in Ile-Ife, Nigeria indicated dental caries rates of 22.8% in children with special needs[30]. In Port Harcourt, authors indicated that only 28.1% of their study participants had caries[31].

On the other hand, some studies conducted in mainstream schools in Africa revealed a lower prevalence of dental caries than the current study. In Tshwane, South Africa a study reported a dental caries prevalence of 25.9% in permanent dentition and 30.2% in primary dentition[25]. In a systematic review and meta-analysis conducted in Africa, the overall caries prevalence was 36%[32]. It is interesting to note that a systematic review (1995 to 2019) reported a global prevalence of 46.2% dental caries in primary teeth and 53.8% in permanent teeth, which is consistent with the current study[33]. At the same time, studies conducted elsewhere in mainstream schools revealed overall caries prevalence that was higher than the current study. A study conducted in KZN revealed the caries rate of the study sample was 73%, while 27% was caries free[34]. These inconsistencies in the reported dental caries rates highlight the need for locally developed oral health promotion programmes that can address the specific unmet needs of the affected population.

This study reported that the highest caries prevalence was found in the intellectual disability group, and this may be due to the fact that the majority of the study participants come from this group. However, learners with traumatic brain injuries had the highest mean DMFT and PUFA score, followed by participants with intellectual disability and multiple disabilities respectively. Although, this data was not seen as significant, given the low sample size in these categories.

LIMITATIONS
The current study focused on learners with different types of disabilities attending special schools in KZN, thus providing a better picture of the prevalence of dental caries across the different disability types, despite several limitations. The study focused only on children who were enrolled in the identified schools and there could have been missed opportunities to identify such children who are not enrolled in schools. More research is required to compare those who attend special schools to those who do not so as to improve the sample's representativeness. The study also focused on the number of teeth affected by dental caries as opposed to the number of surfaces that were affected by caries. This information could have provided a clearer picture of the unmet treatment needs. It is recommended that dental caries diagnosis is conducted through clinical examination with the use of instrumentation and radiographic examinations as this provides a more accurate diagnosis. However, this study used only clinical examination and instruments, and that could have resulted in a possible underdiagnosis of caries, especially in interproximal areas, as well as dental abscesses that are not clinically visible. Future studies could include the Kappa score in data analysis to determine further statistical significance of the data.

RECOMMENDATIONS
Overall, the study findings have important practical and policy implications and could be of value to the KZN Department of Health, oral health professionals and the Department of Education for developing effective oral health and oral care programmes. The study findings further draw attention to the need for dental treatment, oral health education and oral health promotion in the identified population. Future research should focus on improving access to oral health education for children with disabilities, educating parents of disabled children about oral healthcare, improving access to topical fluoride applications, and implementing other

Table 2: All categories of DMFT/dmft and PUFA/pufa scores

DMFT/dmft and PUFA/pufa							
	participants	DMFT/dmft					
Category	No:	DMFT			dmft		
	N(100%)	N(%)	Mean(SD)	p-values	N(%)	Mean(SD)	p-values
Overall DMFT/dmft							
Overall	435(100%)	847(100%)	1.95(2.74)		410(100%)	0.95(2.36)	
Gender							
Female	164(38%)	343(40.5%)	2.09 (2,73)	0.590	125 (30.5%)	0.76(2.04)	0.379
Male	271(62%)	504(59.5%)	1.86 (2.75)		285 (69.5%)	1.05(2.53)	
Age category							
06-08	67(15.4%)	23(2.7%)	0.36 (0.95)	0.001	289 (70.5%)	4.31 (4.00)	0.001
09-11	88(20.2%)	79(9.3%)	0.89 (1.27)		106(25.9%)	1.20 (2.00)	
12-14	106(24.4%)	257(30.3%)	2.42 (2.99)		13 (3.2%)	0.12 (0.54)	
15-17	127(29.2%)	314(37.1%)	2.46 (2.78)		2 (0.5%)	0.12 (0.54)	
18-20	47(10.8%)	174(20.5%)	3.70 (3.83)		0 (0%)	0(0.00)	
Subdistrict							
Umlazi	283(65%)	637(75.2%)	2,25 (2,99)	0.140	260(63.4%)	0,91(2,23)	0.064
Pinetown	152(35%)	210(24.8%)	1,38(2,10)		150(36.6%)	0,99(2,60)	
Race							
African	367(84.4%)	794(93.7%)	2.17(2.82)	0.713	353(86.1%)	0.96(2.42)	0.890
Indian	46(10.6%)	32(3.8%)	0.70(2.08)		38(9.3%)	0.83(2.24)	
Coloured	11(2.5%)	13(1.5%)	1.18(1.54)		3(0.7%)	0.27(0.62)	
White	11(2.5%)	8(0.9%)	0.73(1.56)		16(3.9%)	1.45(1.72)	
Level of study							
Junior phase	144(33.1%)	101(11.9%)	0.71(1.44)	0.001	384(93.7%)	2.66(3.47)	0.001
Intermediate phase	141(32.4%)	299(35.3%)	2.13(2.78)		25(6.1%)	0.177(0.63)	
Senior phase	150(34.5%)	447(52.8)	2.97(3.17)		1(0.2)	0.01(0.08)	
Location							
Rural	56(12.9%)	115(13.6%)	2.13(2.67)	0.288	35(8.5%)	0.63(1.96)	0.965
Peri-urban	261(60%)	567(66.9)	2.16(2.87)		263(64.1%)	1.01(2.49)	
Urban	118(27.1%)	165(19.5)	1.39(2.40)		112(27.3%)	0.95(2.24)	
Disability type							
Specific learning disabilities	9(2.1%)	3(0.3%)	0.33(0.70)	0.628	8(2%)	0.88(0.99)	0.537
Other health impairment	22(5.1%)	49(5.8%)	2.32(3.12)		27(6.6%)	1.23(2.19)	
Autism spectrum disorder	54(12.4%)	92(10.9%)	1.70(2.72)		78(19%)	1.44(2.69)	
Emotional disturbance	15(3.4%)	32(3.8%)	2.13(2.70)		1(0.2%)	0.06(0.24)	
Speech or language impairment	2(0.5%)	3(0.3%)	1.50(0.71)		0(0%)	0.00(0.00)	
Visual impairment including blindness	7(1.6%)	0(0%)	0.00(0.00)		17(4.1%)	2.43(2.06)	
Deafness	47(10.8%)	86(10.2%)	1.83(2.09)		17(4.1%)	0.36(2.06)	
Hearing impairment	11(2.5%)	21(2.5%)	1.91(3.96)		2(0.5%)	0.18(0.39)	
Deaf-blindness	0(0%)	0(0%)	0.00(0.00)		0(0%)	0.00(0.00)	
Orthopaedic impairment	67(15.4%)	122(14.4%)	1.82(2.42)		94(22.9%)	1.40(2.96)	
Intellectual disability	180(41.4%)	393(46.4)	2.18(2.95)		159(38.8%)	0.88(2.49)	
Traumatic brain injury	5(1.1%)	23(2.7)	4.60(3.85)		2(0.5%)	0.40(0.80)	
Multiple disabilities	16(3.7%)	23(2.7)	1.44(2.22)		5(1.2%)	0.31(0.85)	

PUFA/pufa					
PUFA			pufa		
N(%)	Mean(SD)	P-value	N(%)	mean(SD)	p-value
148(100%)	0.34(1.01)		191(100%)	0.44(1.68)	
57(39%)	0.35(0.94)	0.873	61(32%)	0.37(1.26)	0.909
91(61%)	0.34(1.05)		130(68%)	0.47(1.88)	
6(4%)	0.06(0.29)	0.145	140(73%)	2.06(3.45)	0.001
19(13%)	0.22(0.80)		47(25%)	0.53(1.45)	
48(32%)	0.46(1.33)		3(2%)	0.03(0.17)	
54(37%)	0.43(1.03)		1(1%)	0.01(0.09)	
21(14%)	0.45(0.99)		0(0%)	0(0.00)	
110(74%)	0.39(1.14)	0.880	106(55%)	0.37 (1.28)	0.334
38(26%)	0.25(0.70)		85(45%)	0.56 (2.24)	
144(97%)	0.39(1.08)	0.984	168(88%)	0.46 (1.77)	0.541
3(2%)	0.07(0.32)		10(5%)	0.22 (0.88)	
1(1%)	0.09(0.29)		2(1%)	0.18(0.57)	
0(0%)	0.00(0.00)		11(6%)	1(1.60)	
24(16%)	0.17(0.87)	0.048	178(93%)	0.12(2.71)	0.001
58(39)	0.41(1.13)		13(7%)	0.09(0.44)	
66(45)	0.44(0.98)		0(0%)	0.00(0.00)	
19(13%)	0.34(0.76)	0.578	2(1%)	0.04(0.19)	0.721
106(72%)	0.41(1.16)		142(74%)	0.54(1.99)	
23(16%)	0.19(0.67)		47(25%)	0.40(1.21)	
0(0%)	0.00(0.00)	1.000	5(3%)	0.55(1.07)	0.974
7(5%)	0.32(0.63)		17(9%)	0.77(1.93)	
20(14%)	0.37(1.06)		42(22%)	0.77(2.05)	
1(1%)	0.07(0.25)		0(0%)	0.00(0.00)	
0(0%)	0.00(0.00)		0(0%)	0.00(0.00)	
0(0%)	0.00(0.00)		2(1%)	0.29(0.45)	
12(8%)	0.26(0.70)		5(3%)	0.11(0.42)	
1(1%)	0.09(0.29)		0(0%)	0.00(0.00)	
0(0%)	0.00(0.00)		0(0%)	0.00(0.00)	
16(11%)	0.24(0.67)		26(14%)	0.39(1.13)	
79(53%)	0.44(1.25)		94(49%)	0.52(2.09)	
5(3%)	1(1.26)		0(0%)	0.00(0.00)	
7(5%)	0.44(1.06)		0(0%)	0.00(0.00)	

Table 3: Overall DMFT/dmft and PUFA/pufa scores according to age distribution

Age	06-09 years		10-11 years		12-14 years	
No:	67		88		106	
	n (%)	Mean(SD)	n (%)	Mean(SD)	n (%)	Mean(SD)
DMFT	23 (100%)	0.36(0.95)	79(100%)	0.89(1.27)	257(100%)	2.42(2.99)
D	22 (96%)	0.33(0.88)	74(94%)	0.84(1.28)	239(92%)	2.25(2.93)
M	1 (4%)	0.01(0.12)	4(5%)	0.05(0.26)	9 (4%)	0.08(0,31)
F	0 (0%)	0(0)	1(1%)	0,01(0,.11)	9(4%)	0,09(0,55)
dmft	289(100%)	4.31(4.00)	106(100%)	1.20(2.00)	13 (100%)	0,12(0,54)
d	288(66.7%)	4.29(3.98)	105(99%)	1.19(1.98)	13(100%)	0,12(0,54)
m	1(0.3%)	0.01(0,12)	0(0%)	0(0.00)	0(0%)	0(0,00)
F	0 (0%)	0(0.00)	1(1%)	0.01(0.10)	0(0%)	0(0.00)
Age	06-09 years		10-11 years		12-14 years	
No:	67		88		106	
	n (%)	Mean (SD)	n (%)	Mean (SD)	n (%)	Mean (SD)
PUFA	6(100%)	0.06(0.29)	19(100%)	0.22(0.80)	48(100%)	0.46(1.33)
P	6(100%)	0.06(0.29)	19 (100%)	0.23(0.80)	47(98%)	0.45(1.33)
U	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0(0%)	0 (0.00)
F	0 (0%)	0 (%)	0 (0%)	0 (0%)	0(0%)	0 (0.00)
A	0 (%)	0 (%)	0 (0%)	0 (0%)	1(2%)	0.009(0.10)
pufa	140(100%)	2.06(3.45)	47(100%)	0.53(1.45)	3100%)	0.03(0.17)
p	134(96%)	1.97(3.42)	46(98%)	0.25(1.43)	3(100%)	0.03(0.17)
u	0 (%)	0(0.00)	0 (0%)	0(0.00)	0(0%)	0(0.00)
f	3(2%)	0.04(0.36)	0(0%)	0(0.00)	0(0%)	0(0.00)
a	3(2%)	0.04(0.36)	1(2%)	0.001(0.11)	0(0%)	0(0.00)

appropriate interventions to better support children with disabilities.

CONCLUSION

The results of the current study illustrate that dental caries was most frequently recorded in the study population while very few restorations (fillings) were observed. This suggests that dental caries is common among children with disabilities in the identified schools in eThekwini district but that there are also unmet oral health needs, given the low number of restored teeth observed. The high number of dental caries recorded in the permanent and primary dentition and the low number of restored teeth in the study sample highlight the need for promotive, preventive and restorative oral healthcare programmes within this population.

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15-17 years		18-20 years		p-value	Total-overall DMFT/dmft		p-value
127		47			435		
n (%)	mean (SD)	n (%)	mean(SD)		n (%)	mean(SD)	
314(100%)	2.46(2.78)	174(100%)	3.70(3.83)		847(100)	1.95(2.74)	
273(87%)	2.15(2.43)	132(76%)	2.81(2.94)	0.001	740(88)	1.71(2.43)	0.590
31(10%)	0.24(0.76)	32(18%)	0.68(1.15)		77(9)	0.17(0.05)	
10(3%)	0.08(0.64)	10(6%)	0.21(1.03)		30(4)	0.07(0.56)	
2(100%)	0.12(0.54)	0(0%)	0(0.00)		410(100)	0.95(2.36)	
2(100%)	0.015(0.12)	0(0%)	0(0.00)	0.001	408(99.52)	0.95(2.36)	0.379
0(0%)	0(0.00)	0(0%)	0(0.00)		1(0.2)	0.002(0.04)	
0(0%)	0(0.00)	0(0%)	0(0.00)		1(0.2)	0.002(0.04)	
15-17 years		**18-20 years**		**p-value**	**Total-overall PUFA/pufa**		p-value
127		47			435		
n (%)	mean (SD)	n (%)	mean(SD)		n (%)	mean(SD)	
54(100%)	0.43(1.03)	21(100%)	0.45(0.99)		148(100%)	0.34(1.01)	
54(100%)	0.43(1.03)	21(100%)	0.45(0.99)	0.145	147(99%)	0.33(1.00)	0.873
0 (0%)	0 (0.00)	0 (0%)	0(0.00)		0(0%)	0.00(0.00)	
0 (0%)	0 (0.00)	0 (0%)	0(0.00)		0(0%)	0.00(0.00)	
0 (0%)	0 (0.00)	0 (0%)	0(0.00)		1(1%)	0.002(0.05)	
1(100%)	0.007(0.09)	0(0%)	0(0.00)		191(100%)	0.44(1.68)	0.909
1(100%)	0.007(0.09)	0(0%)	0(0.00)		184(96%)	0.42(1.65)	
0(0%)	0(0.00)	0(0%)	0(0.00)	0.001	0	0.00(0.00)	
0(0%)	0(0.00)	0(0%)	0(0.00)		3	0.006(0.14)	
0(0%)	0(0.00)	0(0%)	0(0.00)		4	0.009(0.15)	

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