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ORIGINAL ARTICLE

Oral Health Status and Treatment Needs of Individuals Attending a Special Education Center in South South Nigeria

État de Santé Bucco-Dentaire et Besoins de Traitement des Personnes Fréquentant un Centre D'éducation Spéciale dans le Sud du Nigeria

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ABSTRACT

BACKGROUND: Dental care has been the most commonly-reported unmet service need among individuals with special health care needs.

OBJECTIVES: To assess the oral health status and treatment needs of individuals with special health care needs in a selected special education centre in South South Nigeria.

METHODS: A cross sectional, descriptive study conducted among students of Special Education Centre in Calabar. Sociodemographic data was collected while oral health conditions and treatment needs of the participants were assessed through oral examination. Data entry and analysis was by IBM SPSS version 21 and statistical significance was set at $p<0.05$.

RESULTS: Eighty-one participants were recruited for this study. More than half of the participants were males (56.8%) and had hearing impairments alone (56%). The most common oral condition was dental caries (40.7%) with a mean DMFT/dmft of 0.4 (±1.0). Majority of the participants had fair oral hygiene and the mean OHIS was 2.4(±1.3). Male participants and participants within the 21-30 years age group had poorer oral hygiene than their female counterparts and other age groups respectively. The preventive and restorative treatment needs were 56% and 18.5% respectively.

CONCLUSION: Dental caries was the most prevalent oral health condition among this population with high unmet preventive and restorative treatment needs. **WAJM 2022; 39(12): 1260–1265.**

Keywords: Oral health, Dental caries, Oral hygiene, Special education, Special care needs.

RÉSUMÉ

CONTEXTE: Les soins dentaires sont le besoin de service non satisfait le plus souvent signalé chez les personnes ayant des besoins spéciaux en matière de santé.

OBJECTIFS: Évaluer l'état de santé bucco-dentaire et les besoins de traitement des personnes ayant des besoins spéciaux en matière de soins de santé dans un centre d'éducation spéciale sélectionné dans le sud du Nigeria.

MÉTHODES: Étude descriptive transversale menée auprès des étudiants du centre d'éducation spéciale de Calabar. Des données sociodémographiques ont été recueillies tandis que les conditions de santé bucco-dentaire et les besoins de traitement des participants ont été évalués par un examen bucco-dentaire. La saisie et l'analyse des données ont été effectuées par IBM SPSS version 21 et la signification statistique a été fixée à $p<0,05$.

RÉSULTATS: Quatre-vingt-un participants ont été recrutés pour cette étude. Plus de la moitié des participants étaient des hommes (56,8%) et présentaient uniquement des déficiences auditives (56%). L'affection buccale la plus fréquente était la carie dentaire (40,7 %), avec un indice CAOD/CAOD moyen de 0,4 (+1,0). La majorité des participants avaient une hygiène bucco-dentaire correcte et l'OHIS moyen était de 2,4 (+1,3). Les hommes et les participants de la tranche d'âge 21–30 ans avaient une hygiène bucco-dentaire moins bonne que leurs homologues féminins et les autres tranches d'âge respectivement. Les besoins en traitements préventifs et restaurateurs étaient respectivement de 56% et 18,5%.

CONCLUSION: Les caries dentaires étaient le problème de santé bucco-dentaire le plus répandu dans cette population, avec des besoins élevés en traitements préventifs et restaurateurs non satisfaits. **WAJM 2022; 39(12): 1260–1265.**

Mots clés: Santé bucco-dentaire, caries dentaires, hygiène bucco-dentaire, éducation spéciale, besoins en soins spéciaux.

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Abbreviations: AAPD, American Academy of Paediatric Dentistry; **CSHCN,** Children with Special Health Care Needs; **DMFT,** Decayed Missing Filled Teeth; **HRSA,** Health Resources and Services Administration; **MCHB,** Maternal and Child Health Bureau; **OHI-S,** Simplified Oral Hygiene Index; **WHO,** World Health Organization.

INTRODUCTION

In the first few months of life, children depend entirely on their parents/ caregivers for their basic needs. With growth and development, it is expected that they would achieve age specific developmental milestones which enable them mature into independent adults. However, as a result of a complex mix of factors such as genetics, parental health and behaviors during pregnancy, complications surrounding pregnancy and birth, infections of the mother during pregnancy, infections of the baby early in life and exposure of the mother or child to high levels of environmental toxins, some children may experience developmental disabilities due to impairment in physical ability, learning, language or behaviour.[1]

The American Academy of Paediatric Dentistry (AAPD) defines special health care needs as "any physical, developmental, mental, sensory, behavioural, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs.[2] Health Resources and Services Administration's (HRSA) Maternal and Child Health Bureau (MCHB) further defines children with special health care needs (CSHCN) as those who have or are at increased risk for chronic physical, developmental, behavioural, or emotional conditions and who also require health and related services of a type or amount beyond that required by children generally.[3]

As a result of their health conditions, barriers such as language / communication barrier, sensory impairment, psychosocial barrier, transportation and cultural barriers limit their access to oral health.[2,4,5] A National survey conducted in the United States of America (USA) on Children with Special Health Care Needs showed that dental care was the most commonly-reported unmet service need.[6] It is generally agreed and reported that this population has higher prevalence of dental caries, poor oral hygiene, and compromised gingival and periodontal health than the otherwise healthy population.[7–9] The higher prevalence of oral care needs has been attributed to a number of factors ranging from limitations in oral hygiene performance due to their motor, sensory or intellectual disabilities and dependence on a care giver for regular oral hygiene care,[7] increased frequency of use of sweetened medication, preference for carbohydrates-rich foods, a liquid or pureed diet[10] and reduced access to dental care. There may also be increased tendency of parents /caregiver of CSHCN to neglect the oral health of the child due to other overwhelming medical needs of their child.

Studies in Nigeria[11] and Saudi Arabia[12] have rated dental health professionals' knowledge of management of CSHCN as inadequate. Few dental health professionals in our country may have received adequate training to assess, study and treat individuals with special needs as these services may require modifications to the known traditional methods such as the use of behavioural guidance technique, sign language instructor, Braille, feel-touch-technique among others. A report[13] showed that oral health professionals were more likely to care for patients with special needs better if they receive training early in their academic career and/ or when they first begin practicing.

With these factors contributing significantly to increased level of unmet dental needs among this population when compared to the general population, the need to have the oral health of every CSHCN monitored cannot be over emphasized. Early diagnosis and establishment of regular paediatric oral health care allows the Paediatric Dentists to institute preventive oral care for CSHCN, even while their other health problems and concerns are managed by their Paediatricians and/or general health care providers.

Several studies[8,10,12] have addressed oral health status and treatment needs of individuals with special health care needs in other countries. However, only a few studies[7,9,14] have investigated them in Nigeria and there are currently no studies on the oral health status of CSHCN in Cross River State, Nigeria.

This study therefore aimed to assess the oral health status of individuals with special health care needs in a selected special education centre. It will help provide a baseline data of the different oral health challenges existing within this population as well as plan for both the preventive and therapeutic needs of this group of individuals, educate the dental team that would provide care for this population and determine the resources required for these purposes.

SUBJECTS, MATERIALS AND METHODS

Study Location

This was a cross sectional survey carried out in a Special Education Centre in Calabar, Nigeria. This is the only government owned school for individuals with special health care needs in Calabar. Calabar is a capital city in Cross River State; one of the states in the South-South geopolitical region in Nigeria.

Ethical considerations

Approval for the study was obtained from the Cross River State Health Research Ethics committee (CRS-HREC) with reference number CRSMOH/ RP/REC/2021/173. Written approval was also obtained from the Government of Cross River State Ministry of Education. Written informed consent was obtained from the parents/caregivers a week prior to data collection and assent was obtained from pupils who could understand. All the students who presented their parent-signed informed consent forms were eligible while students whose parents did not consent to participate in the study and those who were absent from school on the day of data collection were excluded from the study.

Data Collection and Data Collection Tool

Data collection was done using a proforma made up of two sections. Section A consists of questions on the socio-demographic characteristics of the respondents while section B was a dental examination record form, based on World Health Organization oral health survey guidelines[15] that recorded observations from the clinical examination. Information on demographics (age as at last birthday and gender) and the medical conditions of the participants were elicited from their teachers and support staff using their class register.

Oral examination was carried out on all students using standard World Health Organization oral health indices to assess dental caries, oral hygiene status, dental trauma, dental anomalies, other oral health parameters and treatment needs of the participants. This examination was conducted using survey materials/ supplies such as disposable sterile tongue depressors, facemasks, gauze, disinfectant, and examination hand gloves. All intra oral examinations were carried out in an upright chair under natural light.

The decayed, missing and filled teeth were scored using DMFT/dmft index, in permanent/primary teeth respectively. The oral hygiene status was assessed using the Simplified Oral Hygiene Index of Greene and Vermillion (OHI-S).[16] This was computed from the debris and calculus scores. The oral hygiene status was graded as follows: a score of 0–1.2 was considered good, 1.21–3.0 fair, and 3.1– 6.0 poor. Traumatic dental injuries were assessed visually using the World Health Organization's Application of International Classification of Diseases to Dentistry and Stomatology[17] as modified according to Andreasen's recommendation. Dental anomaly was assessed based on the type of abnormality seen. Hypoplasia was assessed when there was a defect affecting the surface of enamel and associated with a localized reduction in the thickness of enamel in the form of pits, grooves and bands.[15]

A tooth was classified as missing if it had not erupted after six months of its expected eruption date[15] while a tooth was also classified as retained if it was still in the arch after six months of its expected date of exfoliation.[15] Malocclusion was categorized using Angle's classification of malocclusion[18] into Angle's class 1, 2, and 3 including other forms of malocclusion such as presence of crowding, spacing, anterior cross bite and anterior open bite.

Oral Health Education was taught to all the pupils after data collection by the investigator. This was delivered with the aid of pictorials, demonstration and sign language by one of their teachers.

Data Analysis

Data was analysed using the IBM SPSS Statistics version 21. Categorical variables were reported as frequencies and percentages and presented as tables and figures. Continuous variables such as age were reported as Mean ± Standard deviation (SD). Chi-square test of association was used to determine significant statistical associations for categorical variables such as the association between socio-demographic variables and oral health conditions. The level of statistical significance was set at $p < 0.05$.

RESULTS

A total of 81 study participants were recruited for this study. More than half 46(56.8%) were males and majority (69.1%) of the participants were in the 11–20 years age group. The mean age of the participants was 14.9(±5.0) years. There were significantly more males across the age groups (p=0.006) (Table 1).

Over half 45(56%) of the participants had hearing impairments alone while about a quarter, 21(26%), had both hearing and speech impairments. Other medical conditions were Intellectual disability 4(4.9%), Down syndrome 5(6.2%), Cerebral Palsy 1(1.2) and speech impairment alone 5(6.2%) (Figure 1).

Majority of the participants had fair oral hygiene and the mean OHIS was 2.4 ± 1.3 (Figure 2). There were statistically significant differences between gender, age and oral hygiene status of the participants. Males(37%) and older participants in the 21–30 years age group (45.4%) had poorer oral hygiene than their female counterparts (28.6%) and younger age groups <10;(14.3%), 11–20; (35.7%) respectively (Table 2).

The most common oral condition was dental caries with a prevalence of 40.7% (Figure 3). The mean decayed, missing, filled teeth index (DMFT/dmft) of the participants in this study was 0.4 (±1.0).

With regards to age, majority of the participants in the 11–20 years age group, 9(64.3%), had more carious lesions than the other age groups. Males also had more carious lesions compared to the females but these were not statistically significant (Table 3).

Table 1: Age and Gender of the Participants

Age Groups (Years)	Gender			P value
	Male n (%)	Female n(%)	Total n(%)	
<10	10(71.4)	4(28.6)	14(100)	0.006*
11 – 20	30(53.6)	26(46.4)	56(100)	
21 – 30	6(54.5)	5(45.5)	11(100)	

**P<0.05*

†Mean age 14.9 (± 5.0) years

Table 2: Association between Age, Gender and Oral Hygiene Status of the Participants

Variable	Oral Hygiene Status (OHI)			P value
	Good n(%)	Fair n(%)	Poor n(%)	
Gender				
Male	9 (19.6)	20(43.5)	17(37.0)	0.001*
Female	7(20)	18(51.4)	10(28.6)	
Age-Group				
<10	1(7.1)	11(78.6)	2(14.3)	0.001**
11 – 20	12(21.4)	24(42.9)	20(35.7)	
21 – 30	3(27.3)	3(27.3)	5(45.4)	

**P<0.05*

† Mean OHI = 2.4 (±1.3)

Table 3: Association between Age, Gender and Decayed, Missing, Filled Teeth (DMFT) Scores of the Participants

Variable	Decayed, Missing, Filled, Teeth Index (DMFT/dmft)				Total Number of Carious Lesion n(%)	*P* value
Age-Group	**DMFT/dmft=1**	**DMFT/dmft=2**	**DMFT/dmft=3**	**DMFT/dmft=6**		
≤10	0	2	1	1	4(28.6)	0.48
11–20	2	4	3	0	9(64.3)	
21–30	1	0	0	0	1(7.1)	
Gender						
Female	2	2	1	0	5(35.7)	0.82
Male	1	4	3	1	9(64.3)	

**Mean DMFT/dmft =0.4 (±1.0)*
†Fischer's exact test was used to determine if there was a significant association between age, gender and DMFT scores.

The treatment need was assessed based on World Health Organization guideline. Twelve (14.8 %) needed no treatment, 45(56%) needed preventive treatment, 9(12.3%) one surface filling, 2(2.5%) two surface fillings, 3(3.7%) pulp care and restorations, 2(2.5%) needed prosthetic care, while 6(7.4%) needed extractions.

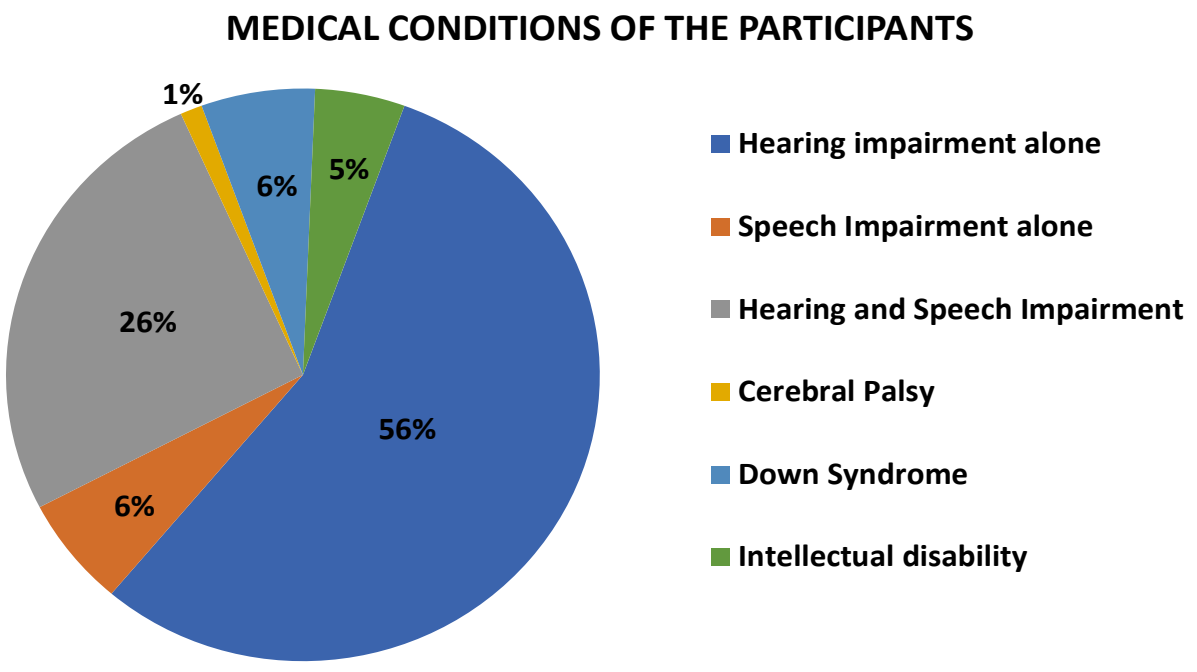


Fig. 1: Medical Conditions of the Participants

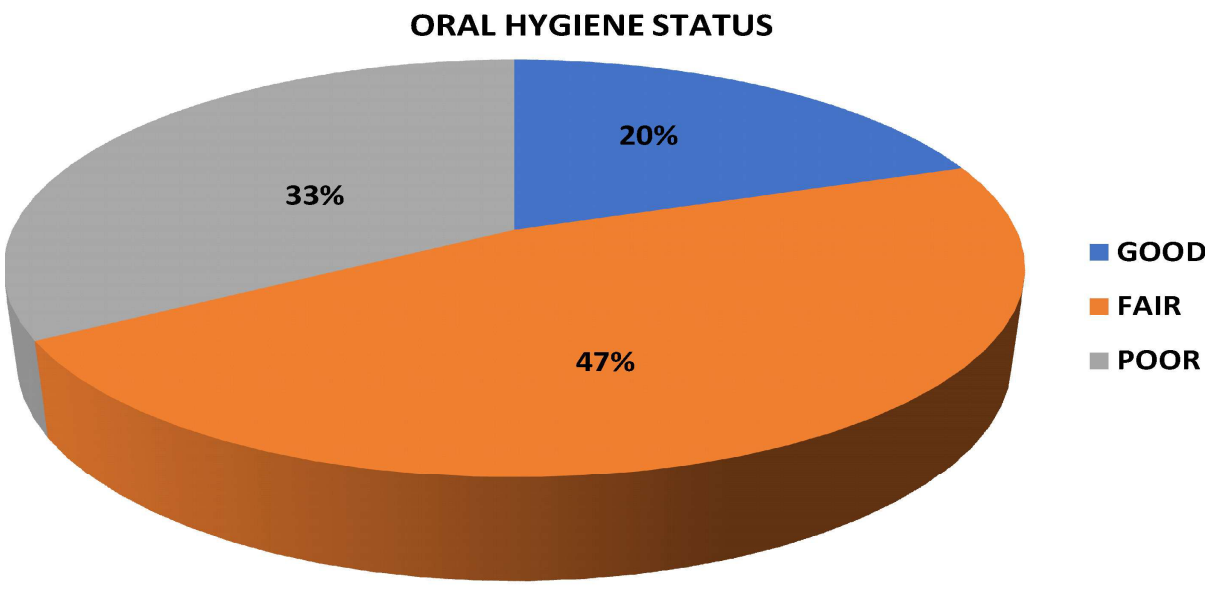


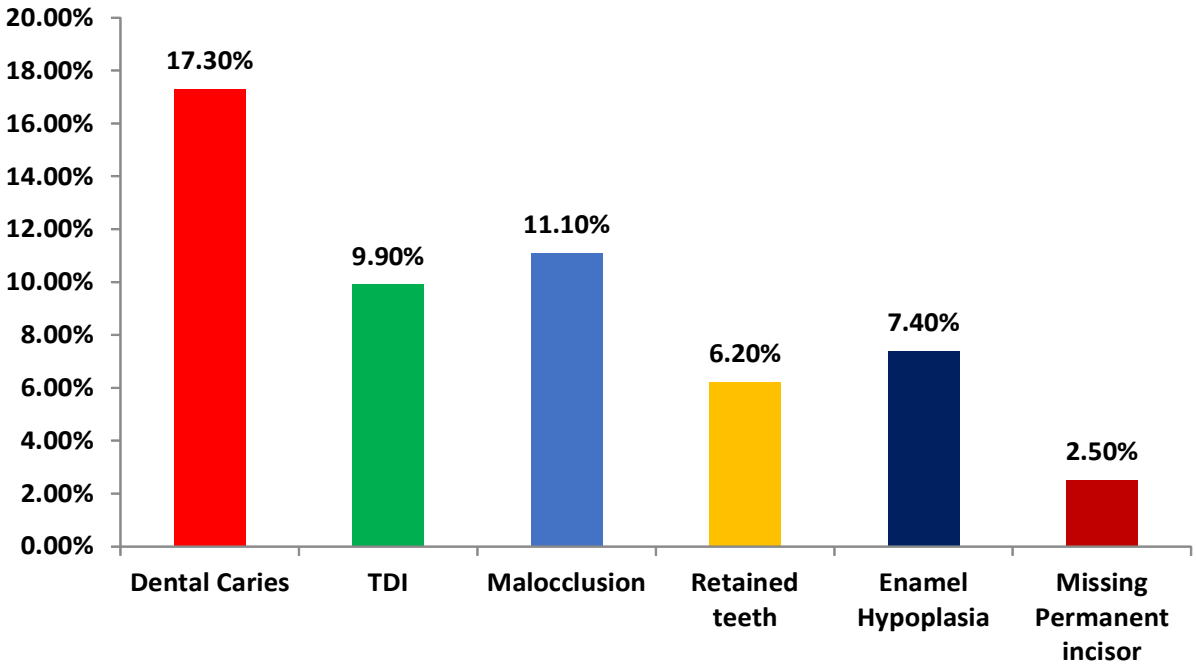
Fig. 2: Oral Hygiene Status of the Participants

DISCUSSION

This study assessed the oral health status and the treatment needs of CSHCN in the study location. The mean age was 14.9 (±5.0) years with majority of the study participants (69.1%) in the 11–20 years age group. This agrees with previous studies[9,19,20,21] where majority of the study population were within that age group. Most of these studies were conducted in institutions where most of the participants were school aged children. The authors believed that most parents of individuals with special health care needs do not enroll their children early in school as they spend the early years of the child optimistically battling with their children's health conditions, living in denial and scared of stigmatization. Newacheck et al[20] in their study reported that school-age children are twice as likely as toddlers to require special needs care, and this prevalence continues to increase as children grow older.

There were more males than females across all the age groups in this study. According to the report of national Survey of children with special health care needs[6], gender has been found to be the strongest predictor of special health care needs with about 60% of children with special health care needs being males and 30% being females. Reports from other studies[7,14,21] also showed higher number of male participants when compared with female participants.

More than half (55.5%) of this study population had hearing impairment (HI), followed by those with both hearing and speech impairments (25.9%). Hearing



**Some participants presented with more than one oral condition*
†TDI: Traumatic Dental Injury

Fig. 3: Oral Health Conditions diagnosed among the Participants.

impairment is the most frequent sensory deficit in human populations and individuals with HI constitute one of the major population groups of CSHCN.[22]

Though majority of the participants had fair oral hygiene, less than a quarter of them had good oral hygiene. Male participants and the older age groups had poorer oral hygiene. The overall fair oral hygiene index score in this study is in agreement with an earlier study in Southwest Nigeria[9] but in contrast to the other studies[7,14] where a higher percentage of 53.1% and 46.3% of the CSHCN had good oral hygiene. Other studies showed differing results within the subgroups of the study population. For example, Goud *et al.,*[23] reported that visually impaired subjects had more calculus when compared with the hearing impaired children, citing overwhelming challenge in maintaining good oral hygiene and the influence of hormones on the periodontium as possible reasons. Nonetheless, it is important to note that majority of them had never visited the dentist and therefore had never had a professional cleaning. This poor oral health behaviour could cause constant accumulation of plaque and calculus on their teeth. In addition, Denloye[24] in her study stated that oral hygiene status of children with special care needs is also determined by the institutionalized status, age and gender; thus non institutionalized, males and older children had poorer oral health.

Just like in the general population, one of the most common oral health problems in the CSHCN is dental caries. This study found dental caries to be the most prevalent oral condition among the study population (17.3%). The prevalence of dental caries in this population is lower than that of previous studies in Nigeria[7,9,14,] which recorded a prevalence of 33.3%, 29.0% and 22.8%, while that of Ethiopia was 38.9%[19] and India, 49%.[23] This is probably related to the type of health conditions that make up the study populations; for example, in this study, majority of them had hearing impairment which is a sensory defect while in the other studies mentioned above, majority of the population had cerebral palsy which is a condition that affects muscular movement and coordination, making it difficult for them to practice oral hygiene by themselves or practice oral cleansing after eating.

This study recorded a very low mean DMFT/dmft of 0.40 with no filled or missing component. This highlights the burden of untreated dental caries and poor dental visits. It is also an indicator of poor dental care utilization as well as poor knowledge of parents/caregivers on the consequences of late presentation for dental care. The mean DMFT/dmft for CSHCN individuals in most Nigerian studies[7,9,14] were less than 1.0 and this is similar to the findings of this study. However, other studies from Ethiopia,[19] India[25] and Iran[26] recorded higher DMFT scores of greater than 1.0. This could be a reflection of the global trend of DMFT score among children as a whole which is generally higher in those countries when compared to that seen in the Nigerian society. Nzomiwu *et al*[27] attributed this variation to the differences in sample composition such as age groups, methods, population, diet and oral hygiene practice. Similarly, Okoye *et al*[28] ascribed it to cultural and social conditions such as dietary, tooth cleaning habits, dental experience existing within each geographical area as well as variation in the methods and sampling procedures. Traumatic dental injuries (9.9%), retained primary teeth (6.2%), enamel hypoplasia (7.4%), malocclusion traits (11.1%) and missing permanent teeth (2.5%) were the other oral health conditions found in this study population. Injury to both the primary and permanent teeth and the supporting structure is probably one of the commonest health problems seen in children and adolescents across the world next to caries.[29] A hospital based study in Nigeria reported a higher prevalence of traumatic dental injury (12.1%) and enamel hypoplasia (25%) while a prevalence of 28.6% for traumatic dental injuries was found amongst the population of children with special health care needs in India.[30] As stated previously, the category of special needs that participated in this study may have contributed to the reduced number of traumatic dental injuries in this study in contrast to that found among the visually impaired who may topple over structures or objects because of their poor vision.

The normative need identified in this study include preventive treatment needs, restorative needs, prosthetic needs and the need for extraction. Prevention therapy such as oral prophylaxis, sealing of deep pits and fissures and topical fluoride therapy are needed to arrest new and incipient carious lesion as well as protect their teeth against future oral diseases.

This study was able to assess the oral health status of CSHCN who were in attendance at the Special Education Centre. The authors are aware that many parents/caregivers do not get their children enrolled in school due to

financial reasons or fear of stigma thus this report would not be very representative of this population in this region. Other limitations include inability to assess the oral health conditions with radiographs and to offer treatment at the school. However, those that needed treatment were referred to a dental clinic for their dental care.

CONCLUSION

This study revealed that dental caries was the most prevalent oral health condition among this population with high unmet preventive and restorative treatment needs.

There is need for improved oral health education among this group of individuals and their parents/caregivers. In addition, through Government policies, dental care should be made affordable, accessible and available at all times.

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