DO SPECIAL NEEDS STUDENTS KNOW ABOUT ORAL HEALTH CARE AND ITS EFFECT ON ORAL DISEASES? EXPERIENCE FROM SOKOTO, NIGERIA.

MIKE EGHOSA OGBEIDE[1,2], GABRIEL OSEREMEN OGBEBOR[2]

[1]DEPARTMENT OF DENTAL AND MAXILLOFACIAL SURGERY, USMANU DANFODIYO UNIVERSITY TEACHING HOSPITAL, SOKOTO, SOKOTO STATE, NIGERIA.

[2]Department of Oral Diagnosis & Radiology, University of Benin, Edo State, Nigeria.

CORRESPONDING AUTHOR

MIKE EGHOSA OGBEIDE: DEPARTMENT OF DENTAL AND MAXILLOFACIAL SURGERY, USMANU DANFODIYO University Teaching Hospital, Sokoto, Sokoto State, Nigeria. E-mail. miketop247@gmail.com

ABSTRACT

Objective: To explore the knowledge level of special needs students on oral health care and its effect on oral diseases.

Methods: A questionnaire-based cross-sectional survey was carried out amongst the special needs students of Abdulrasheed Adisa Raji Special School Sokoto. A sample size of 236 was obtained from a total population of 448 students. The stratified random sampling technique proportional-to-size and a systematic random sampling method were used for group and subject selection respectively. Version 23 of IBM SPSS was used for Data analysis. A P-value of ≤ 0.05 was considered significant.

Results: Subjects consisted of 167 (70.8%) males and 69 (29.2%) females, aged between 6 to 28years (mean age 14.55 ± 3.657). The knowledge of oral health care and its effect on dental caries, periodontal disease, tooth loss, and dental problems, was generally adequate (The exception was the knowledge of the significance of using fluoride-containing toothpaste in preventing tooth decay)

When analysed by the type of disability, the physically impaired group had the best knowledge level (94%). The overall oral health care knowledge grade was fair (4.03 ± 1.55). The result was statistically significant (p=0.004).

Conclusion: Oral health care knowledge Level was generally fair among the study population. However, knowledge of the importance of brushing with fluoride toothpaste was deficient.

Keywords: Oral health care, Special needs, students, Sokoto, Nigeria.

INTRODUCTION

Oral health contributes significantly to an individual's daily routine namely, chewing, speaking, grinning, and positive societal contributions which represent an individual's well-being [1]. Thus, oral diseases come with a great burden [2,3]. Many of these diseases particularly periodontal disease and dental caries are preventable [4,5,6,7] with appropriate oral health care measures [6], nonetheless, they remain a global public health issue [4]. Most developed countries rate oral disease treatment among their top four most expensive disease treatments [8,9]. In developing countries, poor awareness and limited access to oral health care facilities may negatively affect oral health [4]. Furthermore, the prevailing myths and cultural beliefs in these countries (including Nigeria) may have a negative public health impact on health [10], oral health inclusive [11].

The aforementioned challenges to oral health also affect the special needs population and may in addition to other difficulties associated with special needs ("such as physical, emotional, behavioral, or learning disabilities/impairments that cause them to require additional or specialized services or accommodations") [12] increase their risk of developing oral diseases [13,14]. Another reason for the increased risk of oral diseases among special needs individuals is that many of them particularly children, take sugary medications for health conditions, and are also more likely to be frequently pacified by refined carbohydrates given by parents and caregivers [15], thus making them more susceptible to dental caries. Moreover, their health problems could directly impact their oral health negatively, for instance, people with down syndrome are more susceptible to acute necrotizing ulcerative gingivitis as a result of defective body immunity [16]. Those with intellectual disabilities and those with hearing disabilities have been reported to be prone to oral diseases due

to their inherent challenges (i.e., reduced ability to understand health information for those with intellectual disabilities or communication barriers for those with hearing disabilities) [17,18].

Due to a higher risk, of developing oral diseases, the special needs individuals would require oral health care similar to or more than that required by their non-special needs peers. However, in other to effectively plan oral health education and intervention programs for these individuals with special needs, there is the need to first explore their current oral health care knowledge level and its effect on oral diseases. Various authors have reported a relationship between improved knowledge and better oral health [19,20,21]. Therefore, ample knowledge of oral health is necessary for imbuing appropriate oral health conduct and thus forestall oral diseases [22,23,24,25].

An ideal target group for implementing an educational approach to tackling oral health problems would be the student population including those with special needs. This is because a healthy lifestyle and habits acquired early in life are more sustainable [5,7].

Rarely a handful of studies are available in Nigeria and none in northern Nigeria (including Sokoto state) that explored the knowledge level of special needs students on oral health care and its effect on oral diseases. As a result, this study aims to explore the knowledge level of special needs students on oral health care and its effect on oral diseases.

MATERIALS AND METHOD

A questionnaire-based cross-sectional survey was carried out amongst the students of Abdulrasheed Adisa Raji Special School Sokoto, (the only special needs school in the state) Sokoto State, Nigeria. All special needs students of the school with parental/guardian informed consent forms who were inclined to take part in the study were recruited for the study. Special needs students of the school who met the above criteria but were very uncooperative or too ill to participate in the study and those absent during the study period were not included in the study.

Sampling procedure: From a total population of 448, the sample size was calculated using Yamane's (1967) formula [26]

$$n = \frac{N}{1 + N(e)^2}$$

The final sample size after adjusting for 10% non-respondent (NR) was 236.

The study participants were grouped into 4 groups according to their disabilities in conformity with the school's established disability groupings, namely, intellectual**,** visual, hearing, and physical impairment groups.

Each participant recruited for the study was selected through a systematic random sampling method using the formulae K = $\frac{N}{n}$

Where N = Population size (448)

n = Sample size (236)

k = Sampling interval.

Inputting the values, $\frac{448}{236} = 1.9$ Which is approximately= 2

Thus, using the list of the students for each disability group obtained from the school authority, a random pick of a number from each class list was used as the starting point number adopted for that class and every 2nd participant from the frame was selected until the required sample size for each class was obtained for each disability group. To determine the required sample size for each class, a stratified random sampling formula was used as shown below

$$\frac{class\ population}{448\ (total\ population)} \times 236\ (sample\ size) = class\ sample\ size$$

Thus, the total number of participants for each disability group was gotten by the addition of each class sample size for that particular disability group.

Ethical consideration: Usmanu Danfodiyo University Teaching Hospital Ethics Board gave ethical clearance (UDUTH/HREC/2019/No. 790) for this study. Permission to use the school was obtained from the Sokoto State Ministry of Basic and Secondary Education. A structured questionnaire which was a modification of the WHO 2013 Oral Health Assessment Form [27] to suit the peculiarity of our study population and the study objectives was used. To ensure clarity, comprehensiveness, and acceptability of the final output, the questionnaire was pre-texted on twenty (20) special needs students (5 per group). Trained teachers/instructors (for each disability group) of the school assisted in the administration of the questionnaire. It was then designed as a close-ended questionnaire and consisted of sections arranged into a sociodemographic section and an oral health knowledge section.

Data collection procedure: Each participant completed an interviewer-administered structured closed-ended questionnaire.

Data analysis: IBM SPSS Statistics for Windows, Version 23.0 was used for data analyses. Descriptive statistics were used to determine the socio-demographic characteristics of the

participants. Frequency analysis of oral health care knowledge and its effect on oral diseases was done for the participants and for each disability group using descriptive statistics. The oral health knowledge level of each participant was also scored and graded, the correct option was assigned 1 point while the incorrect option/unknown option, was assigned 0 points. Each participant was assigned a grade from three possible grades (i.e., poor, fair, and good). The breakdown is presented thus: - Oral Health Knowledge (range= 0-6): 0-2 = poor, 3-4 = fair, and 5-6 = good. The relationship between grade for oral health knowledge level and types of disability was assessed and presented with a contingency table. A P-value of ≤ 0.05 was regarded as significant.

RESULTS.

Sociodemographic.

Data were analyzed from 236 appropriately filled questionnaires of which 167 (70.8%) were males, while 69 (29.2%) were females. They were aged between 6 and 28years (mean age was 14.55 ± 3.657). The hearing-impaired group had the highest number of subjects (n=124; 52.5%), while the physically impaired group had the lowest number of subjects (n=17; 7.2%). Most subjects (n=213; 90.3%) were from the Hausa-Fulani ethnic group, other ethnic groups made up the balance of 9.7% (n=23). The primary school section had a slight majority of subjects (n=122; 51.7%) than the secondary school section. (Table 1)

Table 1: Socio-Demographics of Study Subjects

NUMBER (n)	VARIABLE	PERCENTAGE (%)
	GENDER	
167	Male	70.8
69	Female	29.2
	TYPE OF DISABILITY	
54	Intellectually Impaired	22.9

41	Visually Impaired	17.4
124	Hearing Impaired	52.5
17	Physically Impaired	7.2
	CLASS (GRADE)	
122	Primary	51.7
114	Secondary	48.3
	ETHNIC GROUP	
213	Hausa-Fulani	90.3
4	Ibo	1.7
14	Yoruba	5.9
5	Others	2.1

Knowledge of the importance and care of the teeth and gum:

Assessment of the knowledge of the importance of the teeth and gum shows that 93.6% (n=221) knew that teeth are an important part of the human body, while 79.7% (n=188) agreed that the care of the teeth and gum is as important as other parts of the body. (Table 2)

Table 2: Knowledge of the importance and care of the teeth and gum

Variable	Responses		
	I agree	**I disagree**	**I don't know**
	n (%)	**n (%)**	**n (%)**
Teeth are an important part of your body	221 (93.6)	10 (4.3)	5 (2.1)
The care of the teeth and gum is as important as other parts of the body	188 (79.7)	35 (14.8)	13 (5.5)

Knowledge of Oral health care effect on dental caries

The majority (75.0%; n=177) knew that cleaning the teeth can prevent tooth decay. On the importance of using fluoride-containing toothpaste, more than half of the subjects (56.8%; n=134) either didn't know or disagreed that using fluoride-containing toothpaste helps to prevent tooth decay. It was agreed by 63.1% (n=149) that the habit of taking too many sweets, sugary foods, and drinks can cause tooth decay. (Table 3)

Table 3: Knowledge of the effect of oral health care on dental care

Variable	Responses		
	I agree	**I disagree**	**I don't know**

	n (%)	**n (%)**	**n (%)**
Cleaning teeth can prevent tooth decay	177 (75.0)	42 (17.8)	17 (7.2)
Using fluoride-containing toothpaste helps to prevent tooth decay	102 (43.2)	16 (6.8)	118 (50.0)
Too much of sweets, sugary foods & drinks can cause tooth decay	149 (63.1)	64 (27.2)	23 (9.7)

Knowledge of Oral health care effect on periodontal disease and tooth loss.

Poor oral health care over an extended period of time without intervention can lead to periodontal diseases, and eventually tooth loss. When this knowledge was assessed, 56.8% (n=134) of the subjects knew that cleaning the teeth can prevent gum bleeding and tooth loss. (Fig 1)

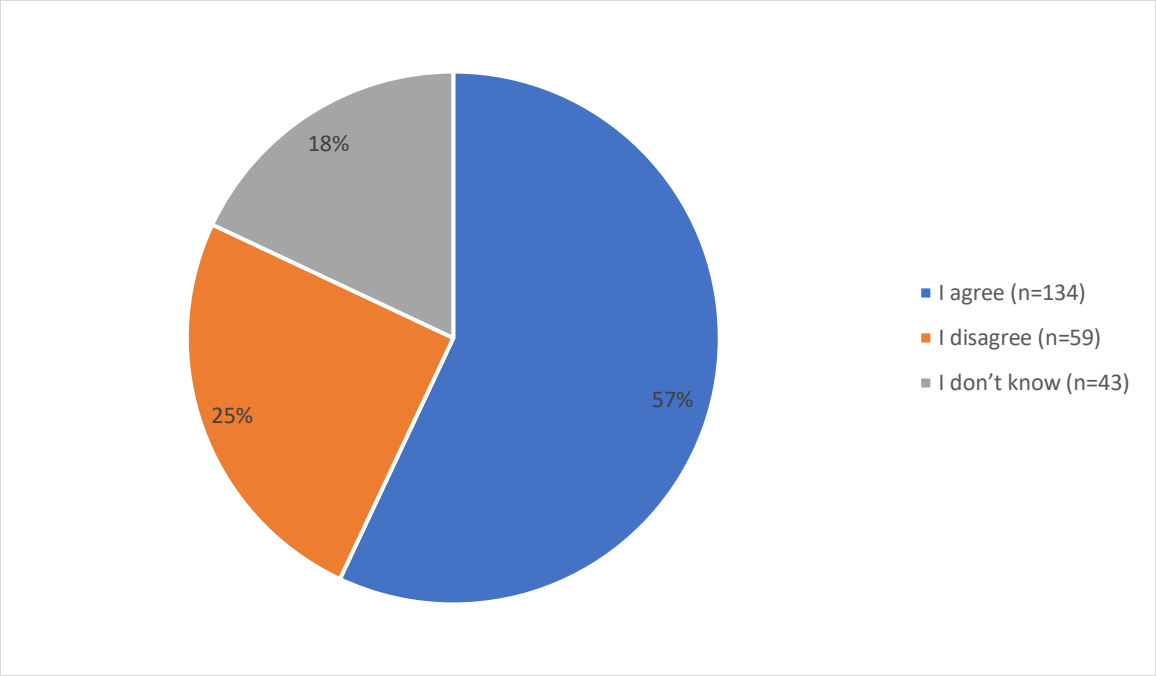
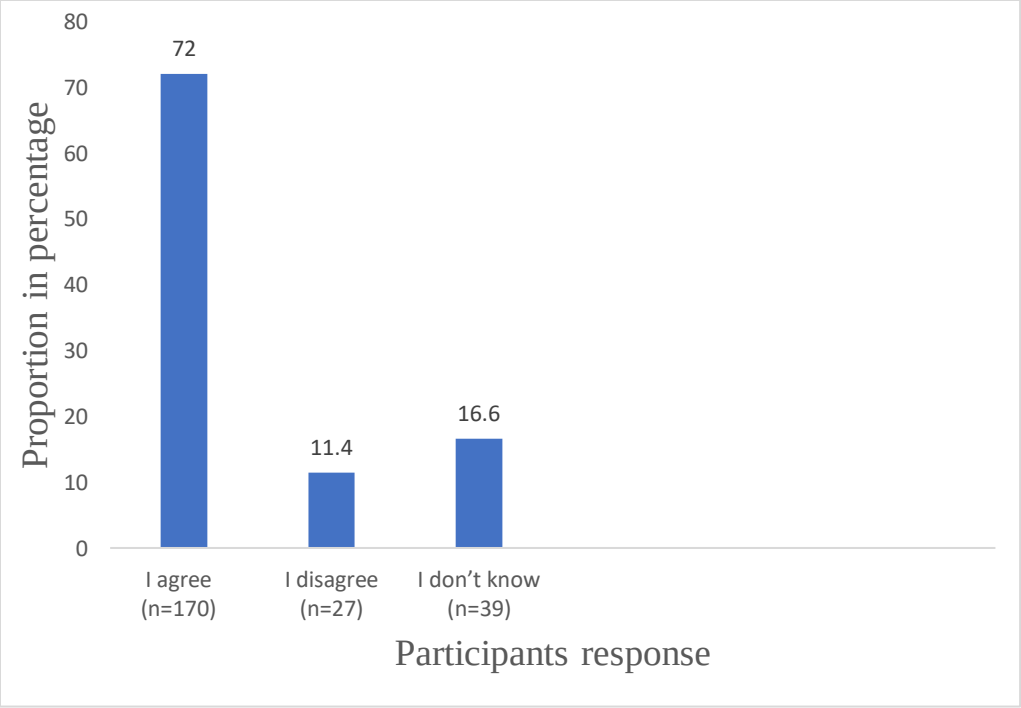


Fig 1: Participants' response to the variable- Cleaning the teeth can prevent gum bleeding and tooth loss. (Note: percentage has been approximated to the nearest whole number)

Knowledge of Oral health care effect on dental problems

The prevention of dental problems by regular professional dental care was assessed. More than two third (n=170; 72%) agreed that regular visits to the dentist may prevent dental problems. (Fig 2)

Fig 2: Participants' response to the variable- Regular visits to the dentist prevent dental problems



The Knowledge of Oral health care and its effects on oral disease assessed by disability type

The knowledge of oral health care and its effect on oral diseases was further explored by the type of disability group. The physically impaired reported the best knowledge of the teeth being an important part of the body (100%), and the teeth and gum being as important as other parts of the body (94.1%). They also reported the best knowledge about the effect of oral health care on periodontal disease and tooth loss with 94.1% agreeing that cleaning teeth prevent gum bleeding and tooth loss. On the effect of oral health care on dental caries, different disability groups reported the best knowledge of the different variables. The physically impaired reported the best knowledge on the variable that cleaning the teeth can prevent tooth decay (100%), the hearing impaired reported the best knowledge on prevention of tooth decay by the use of fluoride toothpaste (54.0%), while the visually impaired reported the best knowledge of the caries-causing effect of too many sweets, sugary foods, and drinks intake (73.2%). On the prevention of dental problems by a regular visit to the dentist, the hearing impaired reported the best (84.4%) knowledge. (Table 4)

Table 4: Oral health care knowledge of participants by disability type

Variable	Intellectually Impaired n (%)	Visually Impaired n (%)	Hearing Impaired n (%)	Physically Impaired n (%)
Teeth are an important part of your body				
I agree	47 (87.0)	38 (92.7)	119 (96.0)	17 (100.0)
I disagree	7 (13.0)	1 (2.4)	2 (1.6)	0 (0.0)
I don’t know	0 (0.0)	2 (4.9)	3 (2.4)	0 (0.0)

The care of the teeth and gum is as important as other parts of the body				
I agree	36 (66.7)	34 (82.9)	102 (82.3)	16 (94.1)
I disagree	11 (20.4)	5 (12.2)	19 (15.3)	0 (0.0)
I don’t know	7 (13.0)	2 (4.9)	3 (2.4)	1 (5.9)
Cleaning teeth can prevent tooth decay				
I agree	40 (74.1)	38 (92.7)	82 (66.1)	17 (100.0)
I disagree	14 (25.9)	2 (4.9)	26 (21.0)	0 (0.0)
I don’t know	0 (0.0)	1 (2.4)	16 (12.9)	0 (0.0)
Using fluoride-containing toothpaste helps to prevent tooth decay				
I agree	18 (33.3)	10 (24.4)	67 (54.0)	7 (41.2)
I disagree	6 (11.1)	2 (4.9)	8 (6.5)	0 (0.0)
I don’t know	30 (55.6)	29 (70.7)	49 (39.5)	10 (58.8)
Too much of sweets, sugary foods, and drinks can cause tooth decay				
I agree	30 (55.6)	30 (73.2)	80 (64.5)	9 (52.9)
I disagree	20 (37.0)	5 (12.2)	36 (29.0)	3 (17.6)
I don’t know	4 (7.4)	6 (14.6)	8 (6.5)	5 (29.4)
Cleaning teeth prevent gum bleeding and tooth loss				

I agree	36 (66.7)	32 (78.0)	50 (40.3)	16 (94.1)
I disagree	13 (24.1)	3 (7.3)	43 (34.7)	0 (0.0)
I don't know	5 (9.3)	6 (14.6)	31 (25.0)	1 (5.9)
Regular visits to the dentist prevent dental problems				
I agree	29 (53.7)	26 (63.4)	105 (84.7)	10 (58.8)
I disagree	17 (31.5)	4 (9.8)	6 (4.8)	0 (0.0)
I don't know	8 (14.8)	11 (26.8)	13 (10.5)	7 (41.2)

Oral health care knowledge level (grade) by disability group

Analysis of the oral health care knowledge grade/level by type of disability shows that the physically impaired group had the best knowledge level with 94% having a grade of either fair or good. (Table 5). The overall oral health care knowledge grade of the study population was fair with a mean knowledge score and standard deviation of 4.03 ± 1.55. The result was statistically significant (p=0.004)

Table 5: Oral Health Care Knowledge Level (Grade) by disability group

Type of Disability	**Oral Health Knowledge grade**				**X^2**	**p-value**
	Poor	**Fair**	**Good**	**Total**		
	n (%)	**n (%)**	**n (%)**	**n (%)**		
Intellectually Impaired	8 (14.8)	29 (53.7)	17 (31.5)	54 (100.0)		
Visually Impaired	4 (9.7)	17 (41.5)	20 (48.8)	41 (100.0)		
Hearing Impaired	31 (25.0)	31 (25.0)	62 (50.0)	124 (100.0)		
Physically Impaired	1 (6.0)	7 (41.1)	9 (52.9)	17 (100.0)		
					19.12	0.004
Total	44 (18.7)	85 (36.0)	107 (45.3)	236 (100.0)		

DISCUSSION

The knowledge of oral health care and its effect on oral diseases was generally fair. A good number of the respondent agreed that the teeth were an important part of the body and that its care along with that of the gum was as relevant as required for other parts of the body. This is quite encouraging given that a high level of awareness could positively impact their oral health care and by extension, their oral health status. This has been supported by several authorities [19,20,21]. They also had a good knowledge of the effects of oral health care on the development or prevention of dental caries (tooth decay), periodontal disease (bleeding gum), tooth loss, and the need for regular dental visits. The exception was the knowledge of the significance of using fluoride-containing toothpaste in preventing tooth decay where the knowledge of the participants was below average. This was contrary to the result of a study on the oral health care knowledge and practices of a group of deaf adolescents in Lagos, Nigeria, in which only a few of the total subjects had ample knowledge of the cause of tooth decay [28], however, on the knowledge of the causes of bleeding gum, the findings of adequate knowledge by a majority of subjects in that study were similar to the findings of this present study.

Exploring further this knowledge by the type of disability, this study showed that different disability groups reported varying degrees of oral health care knowledge and its effect on oral disease across the different variables assessed. Nevertheless, the physically impaired group showed the best knowledge across more of the variables assessed than the other disability groups. Further analysis by scoring and grading the responses also revealed the best grade (i.e., fair to good) was found among the physically impaired group compared to others. A possible

reason for this finding may be because most physically impaired individuals may have very little or no deficit in cognitive or intellectual function (particularly as seen in this study where the majority of the physical impairments observed were mainly deformities of the extremities and trunk with only a few having neurologic involvement). As such, they may have had a better understanding of oral health information compared to their other special needs counterparts. The grade level was found to be worse among the intellectually and hearing-impaired groups. This may have a lot to do with the learning and communication difficulties usually experienced by the intellectually and hearing-impaired groups. This is in agreement with several studies that reported learning difficulties among intellectually impaired [17,29,30,31], and hearing-impaired [18,32] special needs groups.

It is interesting to note however that in general, the oral health care knowledge level and its effect on oral diseases was fair in this study. This may be related to the urban location of the study population and the school being a stone's throw from both the secondary and tertiary health centers in the state. As such, they may have been exposed to general and oral health education.

CONCLUSION

This study observed that the oral health care knowledge level and its effect on oral diseases were generally fair among special needs students in Sokoto, Nigeria. However, knowledge of the importance of brushing with fluoride toothpaste was deficient.

RECOMMENDATION: Oral healthcare-related educational courses should be included in the school curriculum of special needs students in Sokoto, Nigeria with emphasis on the importance of brushing with fluoride toothpaste and a greater focus given to the intellectually impaired and hearing-impaired groups.

CONFLICT OF INTEREST

The authors have no conflict of interest

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