

Assessment of Students' Oral Health Diseases Among Secondary School Students in Enugu State

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Abstract

The research evaluated secondary school pupils in Enugu State's awareness of oral health. The study was led by two null hypotheses and two research questions. The study was conducted in Enugu State using a descriptive research approach. Using a multistage sampling technique, a sample of 182 secondary school students—80 male and 102 female—was selected from a total population of 112,481 students—74,988 female and 37,493 male. Data was gathered using a standardised questionnaire called the Oral Health Cognition Questionnaire (OHCQ). The tool was verified by three specialists. With an overall reliability value of 0.90, clusters A and B had reliability coefficients of 0.73 and 0.89, respectively. The surveys were distributed immediately. The study questions were answered using the mean (\bar{x}) and standard deviation (SD), and the hypotheses were checked using t-test statistics at the significance level of 0.05. The study's findings demonstrate that both male and female students in Enugu State have a high level of awareness on the causes of oral health disorders as well as the preventative strategies for these conditions. According to the hypotheses, there is no discernible difference between male and female students' knowledge of the causes of oral health disorders and their knowledge of the preventative strategies for these conditions among Enugu State secondary school students. The research finds that secondary school pupils in Enugu State have a good degree of awareness of the causes and preventative strategies of oral health disorders. Therefore, the research suggests that the causes of oral health diseases among Enugu State secondary school students be continuously emphasized.

Keywords: Oral health, Oral Health cognition and Gender

Introduction

Despite national and international efforts to raise awareness about oral hygiene and other oral diseases, it is concerning that a growing number of junior secondary school students in Enugu State, Nigeria, lack adequate knowledge about oral health. Many of these students still suffer from dental cavities, gum infections, and tooth loss. Students' lack of understanding, bad attitudes, and poor dental hygiene make this problem worse. Unhealthy eating patterns, inadequate oral health education, and restricted access to dental care services—particularly in rural areas—are all contributing causes. Therefore, focused oral health education and awareness programs are recommended in order to enhance students' oral health knowledge, practice, and attitude. An individual's whole functioning and well-being have been deemed to depend on their oral health. It highlights the degree of dental hygiene that a person practices. The

World Health Organisation (WHO, 2017) defines oral health as the absence of oral infections, sores, mouth and face discomfort, and other oral disorders that impair a person's ability to bite, eat, smile, talk, and maintain psychological stability. Oral health, as defined by the US Department of Health and Human Services (USDHHS, 2022), is the state of the mouth, including the teeth, gums, throat, and surrounding bones. The Centres for Disease Control and Prevention (CDC, 2020) state that maintaining good oral health involves caring for one's teeth, gums, and entire oral-facial system, which allows one to chew, speak, and smile. According to the World Health Organisation (WHO, 2022), dental health is a crucial sign of wellbeing and life quality. According to the WHO, maintaining good oral health involves a variety of preventative measures against illnesses and ailments, such as dental caries, periodontal (gum) disease, tooth loss, and oral cancer etc.

According to the criteria given above, maintaining the health of the mouth, teeth, throat, and face might be considered oral health. Therefore, it may be assumed that there is oral health when one is able to maintain the mouth free from issues like plaque and infections that can result in tooth loss, oral cancer, cavities, and periodontal disease, among other things. According to the Healthline Editorial Team (2019), dental health is a vital component of overall health. Therefore, poor oral hygiene brought on by poor oral health maintenance may result in tooth cavities, gum disease, diabetes, and other conditions. According to the Healthline Editorial Team, keeping teeth and gums healthy requires a lifetime of dedication. This calls for consistent behaviours like brushing, flossing, consuming less sugar, eating a diet rich in fruits and vegetables, and so on. According to the American Dental Association (ADA, 2022), maintaining oral health can also be achieved by eating a balanced diet, avoiding between-meal snacks, brushing at least twice a day with fluoride toothpaste, flossing or using interdental cleaner to clean in between teeth, and replacing your toothbrush every three to four months. The significance of oral health is shown above. Oral health results in healthy teeth, gums, lips, tongue, salivary glands, chewing muscles, mouth and throat linings, and upper and lower jaws, according to the World Dental Federation (2022). According to Legacy Community Health (LCH) (2022), a person's total health is influenced by their dental health. People who have excellent oral health are able to speak clearly and are free from many dental issues as well as other illnesses that may spread from the mouth to other areas of the body, according to Legacy Community Health LCH. This is comparable to Access Dental Care's (2022) research, which found that a person's total health is favourably impacted by their dental health since it may help avoid gum disease, tooth decay, and bad breath, all of which can lead to physical and mental well-being. These all emphasise how crucial dental health is. As a result, oral health must be taken extremely carefully. This is because poor dental hygiene habits may create emotional, physical, and psychological instability in a person, which can hinder their capacity to perform effectively. Given the aforementioned, it is anticipated that people, particularly secondary school kids, would maintain excellent dental health. Scholarly studies, however, indicate that kids' oral health is poor, particularly in junior secondary school. According to Jackson Vann, Kotch, and Lee (2011), kids who suffer from poor

dental health are more likely to skip school due to the discomfort they endure. According to a 2012 World Health Organisation research, 60% to 90% of children and around 100% of adults suffer from oral health issues, which is a concerning degree of poor oral health among individuals. Similarly, 64.2% of pupils had poor dental health, according to Burman Dorgupta, Banarjee, Sembia, and Paul (2019). Similarly, 60 to 90 percent of children who are clearly students have at least one tooth cavity, according to the Healthline Editorial Team (2019). This suggests that poor dental health is an issue for secondary school pupils. More than 45 billion dollars and more than 34 million school hours are missed each year as a result of dental emergency, according to the Centres for Disease Control and Prevention (2022). This indicates that among schoolchildren, oral health is a significant issue. In an effort to address the issue of schoolchildren's poor oral health, researchers have pinpointed potential contributing variables. Among them include excessive sugar intake, alcohol and tobacco use, and inadequate personal cleanliness (WHO, 2022). According to Shaghaghian and Zeraatkar (2017), one of the main indicators of students' poor oral health is their inability to wash their teeth. According to Dalesandro, Derickson, and Weege (2020), smoking, tobacco usage, poor food, and poor oral hygiene are all contributing causes to students' poor oral health. This indicates that the aforementioned causes are to responsible for the high frequency of poor oral health among students. Researchers have worked to address the issue of students' poor oral health by using the above mentioned elements.

These researchers' efforts are evident in the writers' papers. The WHO (2022) suggested promoting a low-sugar, balanced diet and reducing alcohol and tobacco use, among other things. Among other things, the Centres for Disease Control and Prevention (CDC) (2021) recommended drinking fluoridated water, brushing your teeth often, using toothpaste, and seeing a dentist on a regular basis. In an effort to address the problem of oral health among pupils, Haque (2016) recalls implementing oral health education. Surprisingly, despite all of the efforts made by researchers and stakeholders, oral health issues seem to be becoming more prevalent, particularly among secondary school kids. According to Omale (2014), there is a concerning prevalence of poor oral health among kids, particularly among junior secondary school students in Enugu state. This might indicate that kids lack the fundamental information needed to

maintain excellent oral health. Therefore, research on secondary school pupils' oral health knowledge is required.

Scholars have offered a variety of explanations for oral health cognition, often known as oral health knowledge. Oral health cognition, according to Carneiro, Kabulwa, Makyao, Mrosso, and Choum (2011), is the degree of oral health knowledge or perception that a person has developed. According to Al-Darwish, Abuhassana, and Thomairy (2015), oral health cognition is the knowledge about oral illness, its causes, and preventative methods. According to these criteria, awareness of oral health is the main emphasis of oral health cognition. Accordingly, the operational definition of oral health cognition would be a person's degree of knowledge and comprehension of oral health and associated behaviours. Therefore, it may be said that knowledge of oral health behaviours, such as maintaining excellent dental hygiene and the repercussions of not doing so, is present when there is oral health cognition. Students will essentially comprehend that maintaining good oral hygiene requires a variety of behaviours, including cleaning their teeth on a regular basis and abstaining from alcohol and tobacco. According to Haque et al. (2016), oral health education may improve students' oral health cognition.

According to the aforementioned, pupils who get enough instruction on oral health have higher levels of oral awareness and practice. Therefore, it can be said that oral health cognition brings many benefits to people, especially students. This is very achievable because when students understand the importance of oral health, they may teach them fundamental oral hygiene behaviours that can lead to a healthy oral state and prevent oral illnesses like cavities, plaque, tooth loss, oral cancer, periodontal disease, and so forth. According to the research by Gao, Ruan, Zhou, Huan, and Tian (2014), students who have a sufficient understanding of oral health are more likely to exhibit acceptable oral health behaviours. According to the aforementioned, pupils' oral health cognition should be promoted. According to the research by Haque et al. (2016), pupils have a high degree of oral health knowledge. A high degree of oral health consciousness among students was also documented by Carneiro, Kabulua, Makvao, Mrosso, and Choun (2011). In contrast to the results above, Burman et al. (2022) and Farsi, Merdad, Mridad, Batweel, and Alefai (2020) revealed that students' oral cognition is poor. These studies reveal discrepancies in the researchers'

conclusions on pupils' knowledge of oral health. Therefore, it is necessary to investigate the oral health of secondary school pupils in Enugu State in order to remedy these discrepancies. An individual's overall well-being is greatly influenced by their oral health. Lack of any one of these three factors may lead to poor oral health. Students' understanding and practice of effective oral hygiene are crucial for maintaining good oral health. The latter may put pupils at risk for oral illnesses that, if left untreated, result in tooth loss. The quality of life is negatively impacted by tooth loss on a physical, social, and psychological level. Students often deal with health issues that might either make them more susceptible to oral illnesses or more complicated dental issues. Diabetes and nutritional disorders, such as vitamin C insufficiency, have also been linked to periodontal disease.

Due to their daily high intake of sugary foods and beverages, certain secondary school students in Nigeria struggle with their oral health, making them more susceptible to periodontal and dental caries. It is also regrettable to note that secondary school students' oral health habits receive little to no attention, which has led to a high prevalence of oral health conditions among them, especially in Enugu State. These conditions include cavities, dental cancer, tooth decay, plaque, and periodontal disease.

In a given culture, gender is a social construct that delineates the distinct duties and obligations assigned to men and women. Gender disparities in health status knowledge have a tendency to draw attention to power imbalances in many areas of life, including households, workplaces, educational institutions, and religious communities, to name a few. The under-representation of women in the dentistry field has garnered a lot of attention lately. According to Casad et al. (2020), the dentistry field is making sluggish progress towards gender equality.

The researcher has seen firsthand how dental caries, gingivitis, and tooth discolouration affect secondary school students in Enugu State. The researcher is concerned that when students suffer from oral health issues, they may miss school and miss out on lessons because of the pain and discomfort they endure. However, pupils' overall wellness would improve and the country's educational standards would rise if they were aware of the importance of dental health and had a good attitude and practice towards it. Therefore, "what are the oral health cognition, attitude, and practices among secondary school students in Enugu state?" is

the study's stated issue. The study's main goal is to evaluate oral health conditions among Enugu State secondary school pupils. In particular, the research found that

1. The degree to which secondary school pupils in Enugu State, both male and female, are aware of the causes of oral health disorders
2. the degree to which Enugu State secondary school pupils, both male and female, are aware of the preventative measures for oral health diseases?

The following research questions served as the study's compass:

1. How much do male and female pupils in Enugu State's secondary schools know about the causes of oral health diseases?
2. How much do male and female students in Enugu State's secondary schools know about the ways to avoid oral health diseases?

The study's hypotheses, which were assessed at the 0.05 level of significance, were as follows:

1. The degree to which male and female students in Enugu State's secondary schools are aware of the causes of oral health disorders does not differ significantly.
2. There is no discernible difference between male and female students' awareness of oral health disease prevention strategies among Enugu State secondary school pupils.

Techniques

The research design used in this study was descriptive. The study was conducted in Nigeria's Enugu State. All 112,481 secondary school pupils enrolled in Enugu State's public secondary schools that are governed by PPSMB made up the study's population. There are 37,493 male pupils and 74,988 female students. Using a straightforward multi-stage sampling approach, the study's sample consisted of 182 secondary school students from public secondary schools in Enugu State (80 male and 102 female). To guarantee manageability and representativeness, a multistage sampling approach was used. In order to do this, Enugu State was divided into senatorial zones. To guarantee geographic representation across the state, one zone was chosen using a simple random selection process. To remove bias, four schools were chosen at random from the chosen senatorial district using the straightforward random sampling method of

fortunate dip with replacement. Students were chosen proportionally by gender distribution among the chosen schools (80 men and 102 girls), mirroring the overall population makeup of 37,493 males and 74,988 females. Data was gathered using a standardised questionnaire called the Oral Health Cognition Questionnaire (OHCQ), which the researcher had created. A and B are the two portions of the instrument. While section B consists of two clusters, each with ten item statements, section A contains the demographic information of the respondents. Very High Extent (VHE), High Extent (HE), Low Extent (LE), and Very Low Extent (VLE) were the four possible answers for the items. Each choice was worth 4, 3, 2, and 1 points. Three experts were provided draft copies of the instrument together with the research topic, study goal, research questions, hypotheses, study scope, and the produced instrument in order to verify the validity of the instrument. Three specialists from the Faculty of Education at Enugu State University of Science and Technology, Enugu, were selected: two from the Department of Human Kinetics and Health Education, and one from the Department of Measurement and Evaluation, Department of Mathematics, and Computer Education. The experts were asked to evaluate the items' comprehensiveness, appropriateness, applicability, and relevance in answering the study questions. They were also asked to evaluate how clear the instructions were for the respondents. Twenty copies of the questionnaire were given to a sample of eight male and twelve female students from public secondary schools in Ebonyi State as part of a trial testing process to verify the instrument's internal consistency and reliability. The Cronbach Alpha Reliability Coefficient was used to assess the instrument's internal consistency based on data gathered from the respondents' answers. With an overall reliability value of 0.90, the instrument produced the following reliability coefficients: cluster A had 0.73 and cluster B had 0.89. This suggests that the instrument is dependable and appropriate for the research. An introduction letter from the head of the Department of Health and Physical Education, ESUT, was acquired and given to the principals of the sampled schools in order to get access to the students at the secondary schools that were chosen in Enugu State. A brief introduction note outlining the goal of the research is sent with every questionnaire. Three

researcher assistants who are aspiring health educators assisted in distributing the surveys. Since this is an awareness research, the instrument was immediately taken from the respondents in order to reduce sampling error and interference. Descriptive statistics were used to analyse the information gathered from the questionnaire. The study questions were answered using the mean (\bar{x}) and standard deviation (SD), and the hypotheses were

checked using t-test statistics at the significance level of .05. As a result, when responding to the research question, any item with a weighted mean greater than ($>$) 2.50 was deemed to have a high extent, and any item with a weighted mean less than ($<$) 2.50 was deemed to have a low extent. As for the hypotheses, the hypothesis was rejected for $p \leq 0.05$ and not rejected for $p \geq 0.05$.

Results

Table 1: Mean and Standard Deviation of the Extent to which Male and Female Students are aware of the Causes of Oral Health Diseases among secondary school students in Enugu State

S/ N	ITEM STATEMENT	Gender	N	Mean	Std. D.	Decision
1	Poor oral hygiene is a major cause of oral health diseases	Male	80	3.46	.53	High Extent
		Female	102	3.47	.52	High Extent
2	Bacteria in the mouth can cause tooth decay and gum diseases	Male	80	3.51	.53	High Extent
		Female	102	3.43	.50	High Extent
3	Not brushing and flossing regularly can lead to plaque buildup	Male	80	3.54	.53	High Extent
		Female	102	3.58	.52	High Extent
4	Tooth decay is caused by the interaction of food, bacteria, and acids in the mouth	Male	80	3.53	.55	High Extent
		Female	102	3.53	.52	High Extent
5	Regular dental check-ups help prevent oral health diseases	Male	80	3.45	.53	High Extent
		Female	102	3.35	.56	High Extent
6	Eating too many sugary foods and drinks increases the risk of cavities	Male	80	3.33	.59	High Extent
		Female	102	3.24	.57	High Extent
7	Acidic foods and drinks can erode tooth enamel over time	Male	80	3.60	.49	High Extent
		Female	102	3.64	.48	High Extent
8	Drinking plenty of water helps to prevent oral health problems	Male	80	3.51	.57	High Extent
		Female	102	3.38	.55	High Extent
9	Dairy products (e.g., milk and cheese) can help protect teeth from decay	Male	80	3.44	.61	High Extent
		Female	102	3.29	.73	High Extent
10	Frequent snacking between meals can contribute to oral health diseases	Male	80	3.54	.53	High Extent
		Female	102	3.55	.57	High Extent
Total		Male	80	3.49	.28	High Extent
		Female	102	3.45	.31	High Extent

According to the results in Table 1, male students gave mean answers of $\bar{X}=3.49$, $SD=.28$, while female students gave mean answers of $\bar{X}=3.45$, $SD=.31$, regarding the degree to which male and female students in Enugu State secondary schools are aware of the

causes of oral health disorders. This suggests that both male and female students in the state of Enugu are well knowledgeable about the causes of oral health problems.

Table 2: t-test analysis on the Difference on the Extent to which Male and Female Students are aware of the Causes of Oral Health Diseases among secondary school students in Enugu State

Gender	N	Mean	Std. Deviation	df	T	Sig. (2-tailed)
Male	80	3.49	.28	180	.992	.322
Female	102	3.45	.31			

Table 2's findings indicates that $t = (180, .992)$, $p < .322$. This suggests that the null hypothesis, according to which there is no discernible difference between male

and female students' knowledge of the causes of oral health problems among Enugu State secondary school students, was not disproved.

Table 3: Mean and Standard Deviation on the extent to which Male and Female Students are aware of the Preventive Measures of Oral Health Diseases among secondary school students in Enugu State

S/N	ITEM STATEMENT	Gender	N	Mean	Std. D	Decision
1	Brushing my teeth at least twice daily helps to prevent tooth decay	Male	80	3.45	.57	High Extent
		Female	102	3.40	.63	High Extent
2	Changing my toothbrush every three months improves oral hygiene	Male	80	3.53	.57	High Extent
		Female	102	3.47	.58	High Extent
3	Rinsing my mouth with clean water after every meal helps prevent oral diseases	Male	80	3.54	.55	High Extent
		Female	102	3.57	.55	High Extent
4	Avoiding sugary foods and drinks can help prevent cavities	Male	80	3.56	.59	High Extent
		Female	102	3.49	.59	High Extent
5	Drinking plenty of water helps to keep my mouth clean and healthy	Male	80	3.49	.55	High Extent
		Female	102	3.51	.59	High Extent
6	Eating fruits and vegetables promotes strong and healthy teeth	Male	80	3.35	.70	High Extent
		Female	102	3.25	.64	High Extent
7	Consuming dairy products like milk and cheese can help prevent tooth decay	Male	80	3.55	.55	High Extent
		Female	102	3.59	.62	High Extent
8	Visiting the dentist at least twice a year helps prevent oral health diseases	Male	80	3.40	.63	High Extent
		Female	102	3.40	.62	High Extent
9	Regular dental check-ups help detect oral health problems early	Male	80	3.43	.59	High Extent
		Female	102	3.37	.67	High Extent

10	Professional dental cleaning removes plaque and prevents gum disease	Male	80	3.44	.59	High Extent
		Female	102	3.46	.68	High Extent
		Male	80	3.47	.32	High Extent
	Total B	Female	102	3.45	.35	High Extent

According to the results in Table 3, male students gave mean answers of $\bar{X}=3.47$, $SD=.32$, while female students gave mean answers of $\bar{X}=3.46$, $SD=.68$, regarding the degree to which male and female students in Enugu State secondary schools are aware of the preventive measures of oral health diseases. This suggests that a high degree of awareness of oral health illness prevention is present among both male and female students in Enugu state.

Table 4: t-test Analysis of the Difference on the extent to which Male and Female Students are aware of the Preventive Measures of Oral Health Diseases among secondary school students in Enugu State

Gender	N	Mean	Std. D	df	t	Sig. (2- tailed)
Male	80	3.47	.32	180	.425	.671
Female	102	3.45	.35			

Table 4's findings indicates that $t = (180, .425)$, $p < .671$. This suggests that the null hypothesis, according to which there is no discernible difference between male and female students' awareness of oral health disease prevention strategies among Enugu State secondary school students, was not disproved.

Discussion of Findings

According to the study's findings, both male and female students in Enugu State have a high level of awareness on the causes of oral health conditions. The results also indicate that among secondary school students in Enugu State, there is no discernible difference between male and female students' levels of awareness of the causes of oral health disorders. This suggests that there is no significant difference in the replies of male and female secondary school students in Enugu State regarding their knowledge of the causes of oral health problems. The pupils' understanding may have been greatly enhanced by public health campaigns and awareness initiatives run by governmental bodies, non-governmental organisations, and community health professionals. These programs often teach young people how to practise good oral hygiene and avoid common dental issues via school visits, posters, and the media. This result is consistent with the findings of Haque et al. (2016), who found that students had a high degree of oral health cognition. A high degree of oral health consciousness among students was also documented by Carneiro, Kabulua, Makvao, Mrosso,

and Choun (2011). However, the findings contrast those of Burman et al. (2022) and Farsi, Merdad, Mridad, Batweel, and Alefai (2020), who proposed that students had a poor degree of knowledge about the causes of oral health. It is intriguing to see, then, that the development and progress of secondary school pupils in Enugu State depend on their degree of understanding about the causes of oral health disorders. The study's findings also demonstrate that a high degree of awareness of oral health illness prevention is shared by male and female students in Enugu State. The results also indicate that among secondary school students in Enugu State, there is no discernible difference between male and female students' awareness of the preventative measures for oral health problems. One explanation for this might be because successful school-based health education initiatives stress both the prevention and the causes of oral health issues. All students, regardless of gender, may benefit from the thorough discussions of personal and dental hygiene that are often included in subjects like basic science and physical and health education. This result is consistent with the findings of Haque et al. (2016), who found that students had a high degree of oral health cognition. A high degree of oral health consciousness among students was also documented by Carneiro, Kabulua, Makvao, Mrosso, and Choun (2011). However, the findings contrast those of Burman et al. (2022) and Farsi, Merdad, Mridad, Batweel, and Alefai (2020), who proposed that students had a poor degree of knowledge about the causes of oral health. It

is intriguing to see, then, that the development and progress of secondary school pupils in Enugu State depend on their degree of understanding about the causes of oral health disorders.

In conclusion based on the study's conclusions. We may infer that secondary school students in Enugu State, both male and female, are well aware of the causes of oral health issues and how to avoid them. The degree of this awareness does not significantly vary by gender. Public health campaigns, successful health education initiatives, and easier access to health information via the media and curriculum might all be responsible for this consistency in student understanding.

Suggestion

1. To strengthen students' comprehension of the causes and preventative strategies of oral health concerns, curriculum designers and educational

institutions should keep including oral health themes into the curriculum of disciplines like physical education, health education, and basic science.

2. To ensure that all kids benefit equally from these initiatives, government and non-governmental organisations should extend their oral health awareness efforts to additional schools, particularly in rural regions.
3. To distribute oral health information in student-friendly forms, stakeholders in the education and health sectors should make use of digital campaigns, mobile apps, and social media.
4. Since parents and guardians have a big impact on kids' understanding and habits, they should be made aware of the need of setting an example of proper dental hygiene at home.
5. To guarantee that oral health education is inclusive and available to all kids, the government should work tirelessly.