Awareness, Knowledge and Attitude of Undergraduates Towards Sickle Cell Disease in South Eastern Nigeria

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***Abstract*:**

***Background*: Sickle cell disease (SCD) is a hereditary red blood cell defect characterised by persistent hemolytic anaemia and a variety of clinical complications. The aim of this study is to determine the awareness, knowledge, and attitude of undergraduates towards sickle cell disease in southeastern Nigeria.**

***Methods*: A descriptive cross-sectional study was conducted, with individuals chosen using a multistage sample procedure. Data was obtained using a self-administered, pre-tested questionnaire and processed with SPSS software version 20.**

***Results*: There were a total of 402 participants in the study, with 192 (47.8%) males and 210 (52.2%) females. The participants' average age was 22.32.7 years. All of the participants (100%) were aware of the presence of SCD, with the most prevalent sources of knowledge being schools (38.1%) and health personnel (19.9%). Two hundred and seventy-seven participants (68.9%) had sufficient understanding of SCD, although many of them had misconceptions. The majority of the participants in this survey, 344 (85.6 percent), have a good attitude toward people with SCD.**

***Conclusion*: The majority of people with an appropriate understanding of SCD had a favourable attitude, but those with insufficient information had the opposite perspective. The participants in this study have information gaps concerning SCD. Health education should be enhanced to provide students with an adequate comprehensive understanding of SCD to enable them to make educated marriage decisions, thus preventing the reproduction of SCD-affected children.**

***Keywords*: Awareness, Knowledge, Attitude, Anaemia, Sickle Cell Disease**

I. INTRODUCTION

Sickle cell disease (SCD) is a genetic blood disorder marked by abnormal (sickle) red blood cells. The most common and severe form of SCD is sickle cell anemia, which is caused by inheriting sickle cells from both parents. When sickle cells lose oxygen, their form changes from biconcave to crescent, causing anemia, organ damage, and early death (1, 2). Offspring who inherit the sickle cell trait from only one parent do not show symptoms, but they can pass the gene on to their children. Thalassemia, haemoglobin C, and haemoglobin D are other hereditary haemoglobin subtypes (3). The clinical appearance of illness among people afflicted is determined by the mix of genes inherited (2). Millions of people worldwide are affected by Sickle Cell Disease (SCD) (2, 3, 4,). People with ancestors from Sub-Saharan Africa, South America, Cuba, Central America, Saudi Arabia, India, and Mediterranean nations such as Turkey, Greece, and Italy are the most likely to have it. More than 75% of SCD cases occur in Africa (3), with approximately 150,000 infants born with the condition in Nigeria each year (4).In 2016, 0.7 percent of children in Uganda had SCD, and 13.3% had the sickle cell trait (5).

SCD contributes to a high incidence of childhood mortality in children under the age of five in Africa, obstructing progress toward the UN Sustainable Development Goal 3: improving health and wellbeing, which includes lowering childhood mortality (6). SCD also has a social and economic impact on children and their families, as recurrent sickle cell crises disrupt the patient's and family's lives in terms of schooling, job, and psychological development (2). In 2006, WHO identified SCD as a disease of public health priority, and member countries were recommended to develop, implement, and expand comprehensive national integrated SCD prevention and management strategies (2). Objectives and targets for the African region were set for 2020, as well as guiding principles and priority activities that should have been adjusted to local realities. Increased knowledge, disease prevention, and early diagnosis were projected to improve the quality of life and life expectancy of people with SCD, allowing them to live more productive lives (seven). Over 5% of the world's population has genes that cause hemoglobinopathies, and around 300,000 babies are born with haemoglobin abnormalities each year, with more than 200 000 cases of sickle-cell anaemia in Africa (4). With a birth rate of nearly 1 in 50, sickle cell anaemia is a reasonably common condition in Nigeria, with approximately 150,000 newborns born with sickle cell anaemia each year (4, 7, 8). Although

there is a scarcity of reliable, up-to-date evidence, sickle cell disease (SCD) is thought to be linked to a very high percentage of juvenile mortality in Africa, ranging from 50% to 90% (8).

There is little question that the illness is becoming more common in Nigeria, particularly among the urban educated elite and other areas with good basic health care. However, there is a clear lack of knowledge and education regarding the issue in our communities, as well as an increase in misunderstanding, misinformation, incorrect treatment, frustration, and stigmatization, as well as the uncertainty and debate surrounding it (3, 7, 9, 10).

Knowledge about SCD is a means of avoiding and managing the illness because people will be better able to make educated marriage decisions, and youngsters are a good entry point for disease-controlling therapies (11, 12, 13). Because the country's tertiary educational institutions have a good representation of Nigerian youths, there is a need to assess the level of knowledge, ignorance, and misconceptions about sickle cell disease. An understanding of these factors will help to design appropriate public health education programmes to increase awareness and knowledge of the condition. There is a scarcity of published data on students' knowledge of sickle cell disease in our area. As a result, the goal of this research is to determine undergraduates' awareness and knowledge of sickle cell disease at the Federal University of Technology in Owerri, South-eastern Nigeria, as well as their attitudes toward those who have the condition.

Study Design

A descriptive, cross-sectional study was carried out on randomly selected students studying on the campus. This study was designed to assess the awareness, knowledge, and attitudes of undergraduate students towards Sickle Cell Disease at the Federal University of Technology Owerri in Imo State, Nigeria. In this study, the dependent variables were awareness, knowledge, and attitude, while the independent variables were the social demographic characteristics of the students randomly selected in FUTO.

Study Population

The population of this study was comprised of all the undergraduate students from the different colleges of FUTO who responded to the research study.

Sample Size and Sampling Methods

Sample size

The sample size was determined using the Taro &Yamane formula

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

Where;

n = Sample size
N = 22,000 (Population Size)
e = 0.05^2 (level of precision)
I = 1 (Constant)

Therefore,

N =22,000 (Total population of students)

$$\mathbf{n} = \frac{22{,}000}{1+22{,}000(0.05)^2}$$

n = 393

Adjusting for non-response rate at 5% (i.e. 95% expected response is 0.95)

nrr = n/expected response = 393/0.95 = 413.68 approximately 414

Therefore, 414 questionnaires were distributed and 402 was retrieved which was correctly filled and completed making it valid for the research.

Sampling methods

The study employed a multistage stage sampling approach. Three of the 10 faculties at the school were chosen using a simple random sample by ballot procedure. A simple random selection methodology was also used to choose three departments, one department from each of the three faculties, as well as students from the chosen departments, using the ballot method.

Data collection Instrument

A structured questionnaire was used for the data collection of the study. The questionnaire collected information on socio-demographic factors, awareness, attitude, and knowledge regarding SCD, including misunderstandings, causes of SCD, and preventive techniques.

Validity and Reliability of Instrument

Face and content validity was used for the study instrument prepared carefully by the researcher and a reliability coefficient of 0.88 was obtained following the test-retest method for reliability of instrument.

II. METHOD OF DATA COLLECTION

The respondents were given the questionnaire after giving their informed consent. The respondents completed the surveys on their own while being closely observed. Each questionnaire took around 4-6 minutes to complete.

Method of Data Analysis

Statistical package for Social Sciences (SPSS) version 20 was used for the analysis of the study after the data was cleaned for discrepancies in the replies before being entered into the computer. Percentages and averages were calculated using descriptive statistics. To determine the association between variables, the Chi square test was utilized. The results were

given as percentages/proportions, means, and standard deviation in tables and figures.

Ethical Considerations/Informed Consent

The Federal University of Technology Owerri's School of Health Technology's Local Ethics Committee granted ethical approval for this project. Before participating in the study, the subjects signed a written Informed Consent form.

III. RESULTS

The demographic characteristics of the respondents

A total of 402 respondents took part in the research, with 192 (47.8%) males and 210 (52.2%) females, indicating that females outnumbered males. The participants' ages varied from 16 to 36 years old, with a mean age of 22.3 2.7 years. The majority of the participants, 385 (95.7%), were Christians, while 367 (91.3%) were single (Table 1).

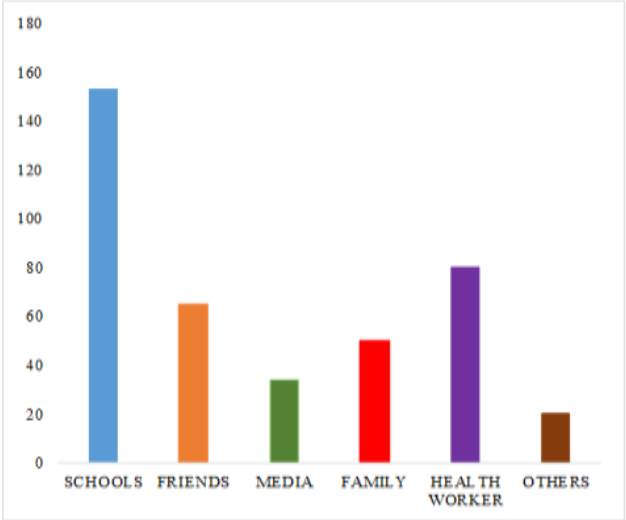
Table 1: Demographic Characteristics of Respondents

Characteristics	Frequency	Percentage
Sex		
Male	192	47.8
Female	210	52.2
Total	**402**	**100**
Age		
16 – 20	40	9.9
21 – 25	301	74.9
26 – 30	35	8.7
31 – 36	26	6.5
Total	**402**	**100**
Religion		
Christianity	385	95.8
Islam	5	1.2
Traditional	6	1.5
Others	6	1.5
Total	**402**	**100**
Marital Status		
Single	367	91.3
Married	30	7.5
Divorced	5	1.2
Widowed	0	0
Total	**402**	**100**
Ethnic Group		
Igbo	187	46.5
Yoruba	156	38.8
Hausa	32	8.0
Others	27	6.7
Total	**402**	**100**
Residence		
On Campus	195	48.5
Off Campus	207	51.5
Total	**402**	**100**
School		
SOHT	179	44.5
SAAT	131	32.6
SEET	92	22.9
Total	**402**	**100**

Sickle Cell Disease Awareness Level of the Respondents

Based on information from table 2 below, all the participants (100%) were aware of the existence of SCD. Schools were the most frequent source of information, 153 (38.1%). Other sources of information include health workers 80 (19.9%), friends 65 (16.2%), family members 50 (12.4%), the media 34 (8.5%), and others 20 (4.9%) (Figure 1)

Figure 1: Sources of Information about Sickle Cell Disease



The Sickle Cell Disease Knowledge Level of the Respondents

Two hundred and seventy-seven participants (68.9%) have sufficient knowledge about SCD (Figure 2). Table 3 shows the level of knowledge regarding SCD shown by the participants. The majority of the participants (38.5%) are aware that SCD is an inherited condition. SCD affects red blood cells and may be identified with a blood test, according to 372 (92.5%) of those polled. According to 44 percent of those polled (10.9%), SCD is contagious.Only 150 people (37.3%) are aware of the symptoms that are usually linked with SCD. 305 (75.9%) know that SCD can be identified by haemoglobin genotype; 369 (91.8%) know that SCD can be prevented; and 206 (51.2%) know how to prevent SCD. Table 2 shows the participants' additional information regarding sickle cell illness. Some of the participants also had misunderstandings regarding SCD, such as the belief that it is

caused by witchcraft, bad spirits, enemies' curses, and God's retribution.

Figure 2: Proportion of participants knowledge about SCD

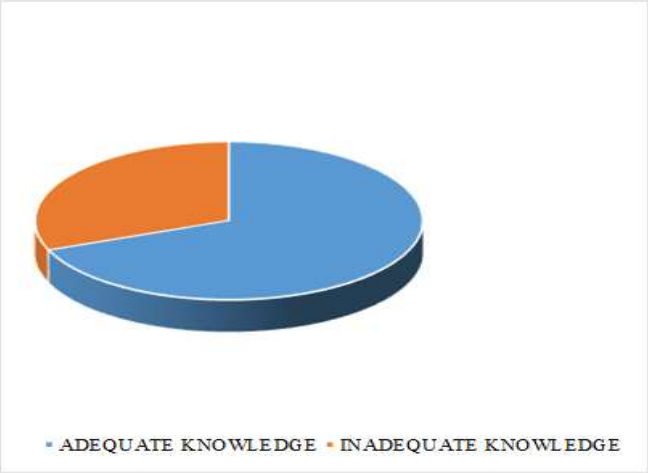


Table 2: Participants' Awareness about Sickle Cell Disease		
Variables	**Frequency**	**Percentage**
Aware of SCD		
Yes	402	100
No	0	0
Total	**402**	**100**
Source of Information		
Schools	153	38.1
Friends	65	16.2
Medias	34	8.5
Family	50	12.4
Health workers	80	19.9
Others	20	4.9
Total	**402**	**100**
Normal Hb is AA		
Yes	387	96.3
No	15	3.7
Total	**402**	**100**
SCD is heredity		
Yes	375	93.3
No	27	6.7
Total	**402**	**100**
SCD is a serious disease		
Yes	298	74.1
No	104	25.9
Total	**402**	**100**

Knowledge towards Sickle Cell

The table 3 below illustrates the participants knowledge level towards sickle cell disease

Table 3: Participants' knowledge about Sickle Cell Disease		
Variables	**Response N (%)**	
	Correct	**Incorrect**
Cause of SCD	380 (94.5)	22 (5.5)
Body fluid with which to diagnose SCD	372 (92.5)	30 (7.5)
SCD is contagious	358 (89.1)	44 (10.9)
SCD is curable	308 (76.6)	94 (23.4)
Ways of curing SCD	362 (90.0)	40 (10.0)
Component of blood affected by SCD	382 (95.0)	20 (5.0)
SCD can be detected with hemoglobin genotype	305 (75.9)	97 (24.1)
Features commonly associated with SCD	150 (37.3)	252 (62.7)
SCD can be prevented	369 (91.8)	33 (8.2)
Ways of preventing SCD	206 (51.2)	196 (48.8)
How is SCD inherited	294 (73.1)	108 (26.9)
What makes SCD a serious disease	318 (79.1)	84 (20.9)

Attitudes of Respondents towards Sickle Cell Disease

The majority of participants in this survey have a favourable attitude toward people with SCD, with 348 (86.6%) agreeing that people with SCD should not be secluded from others. 367 individuals (91.3%) agreed that people with SCD should attend school alongside their peers; 295 (73.4%) consented to having someone with SCD as a roommate; and 385 (95.8%) agreed to having someone with SCD as a study partner. 391 people (97.3%) accepted to be friends with someone who has SCD. 370 (92.0%) said they would eat with someone who has SCD; 365 (90.8%) said they would care more about people who have SCD; and 304 (75.6%) said they would sympathise with those who have SCD (Table 4).

Table 4: Attitude towards People living with SCD			
Attitudinal Statements	**N (%)**		
	Attitude	**Response**	
	Positive	**Negative**	**Indifferent**
People with SCD should be Isolated for others	348 (86.6)	36 (8.9)	18 (4.5)
People with SCD should not be enrolled in schools	367 (91.3)	27 (6.7)	8 (2.0)
I will accept person living with SCD as a roommate	295 (73.4)	74 (18.4)	33 (8.2)
I will study with person living with SCD	385 (95.8)	10 (2.5)	7 (1.7)
I will accept person living with SCD as a friend	391 (97.3)	6 (1.5)	5 (1.2)
I will invite person living with SCD to my birthday party	383 (95.3)	12 (3.0)	7 (1.7)
I will eat with person living with SCD	370 (92.0)	10 (2.5)	22 (5.5)
We should worry less towards people with SCD since they would soon die	365 (90.8)	20 (4.2)	17 (5.0)
I feel sympathy towards people with SCD	304 (75.6)	71 (17.7)	27 (6.7)

Relationship between Level of knowledge and attitude toward SCD

Though not statistically significant, the relationship between knowledge of SCD and attitude toward people living with SCD revealed that the majority of those with adequate knowledge had a positive attitude toward people living with SCD, while the majority of those with inadequate knowledge had a negative attitude (Table 5).

Table 5: Relationship between knowledge and Attitude towards people living with SCD

Attitude towards people living with SCD	**Knowledge about SCD**			
	Adequate (%)	**Inadequate (%)**	**Total**	**X^2 (p-value)**
Negative	27 (46.6)	31 (53.4)	58	23.4 (0.6312)
Positive	198 (57.6)	146 (42.4)	344	

IV. DISCUSSION

The participants in this study varied in age from 16 to 36 years old, with an even gender distribution. The participants were all young individuals, most of whom were single, which made them appropriate for the study on SCD knowledge, as shown by prior studies both in and outside Nigeria (8, 10, 11, 12, 13). Knowledge about SCD will aid individuals in making an informed marriage decision, avoiding the conception of SCD-affected children. This research also discovered that all of the pupils had heard about SCD and were aware of it. This is comparable to the findings of Gbeneol *et al*. (16), who found that all of the participants in their study were aware of SCD, although Durotoye *et al*. (15) found that 79.5 percent of their participants had heard of SCD. This might be because their populations were largely made up of teenagers in secondary school, who may not have been exposed to additional information about SCD, as opposed to Gbeneol *et al.* (16), whose study population was mostly made up of young adults with secondary and higher education. Many of them were married or in the process of getting married, and they were taught about SCD and genotyping as part of the process. Lectures, health workers, acquaintances, and coworkers are all good sources of knowledge regarding SCD. This is in line with the findings of a study conducted in Jos, Nigeria (11) that found health workers, family members, and friends to be the most valuable sources of information. Despite the fact that all of the participants were aware of the presence of SCD, many of them lacked a full understanding of the disease and held certain misconceptions about it. SCD has been blamed on witchcraft, infections, demonic spirits, and enemies' curses, according to some. Other myths about SCD include the fact that it is communicable, that it cannot be diagnosed with a blood test, and that it cannot be prevented. Other research (9, 10, and 12) revealed a similar misunderstanding. These knowledge gaps are the result of a lack of sufficient SCD education and awareness. In comparison to students from other schools, students from the school of health had much higher levels of sufficient knowledge. This is unsurprising given that health students are more likely than students from other faculties to be informed about SCD and other health conditions. This supports the notion that good SCD education will aid in closing knowledge gaps and provide individuals with the tools they need to make educated decisions and conduct effective SCD management measures. A study of health-care workers and medical students found that they have a better understanding of SCD because they come into contact with patients who have the condition more frequently (13). The majority of the participants had a good attitude toward those who had SCD. Furthermore, the majority of individuals with a good attitude toward people with SCD were found to have enough awareness about the disease. A larger percentage of people with a negative attitude had insufficient information regarding SCD. Other research have shown similar results (5, 8, 9,12). Negative attitudes will lead to denial and concealment of the disease by both affected people and carriers, which will have negative repercussions. The level of societal understanding regarding SCD concerns determines how easily negative attitudes, prejudice, and stigmatisation may be eliminated.

V. CONCLUSION

Sickle cell disease is a severe public health problem that affects people all over the world. Nigeria still has a high prevalence of the illness. According to current research, existing care is poor. In general, SCD prevention, control, and treatment in Nigeria are still in their infancy. In the light of the massive illness load, previous efforts, despite current interventions, look modest. The government at all levels, as well as other concerned parties, must make a more concerted effort to regulate SCD. Appropriate interventional programmes backed by an effective national policy should be instituted. In addition, physicians involved in the care of SCD patients should be conversant with current knowledge and standard practises in the treatment of sickle cell disease in order to improve treatment outcomes. Although all of the students were aware of SCD, many of them lacked thorough information about it and had some misconceptions about it. A greater number of respondents had a favourable attitude toward people with SCD, and the majority of those who had a positive attitude were found to have appropriate knowledge about SCD, whereas those who had a negative attitude were found to have inadequate knowledge about SCD. Health education should be enhanced to influence a comprehensive understanding of SCD. This will assist individuals in making educated decisions and actions, as well as instilling in society a positive attitude toward people with SCD, resulting in SCD prevention and control.

VI. RECOMMENDATIONS

Recommendations and policies to help prevent sickle cell disease (SCD) include the following:

1. Incorporate SCD into the Nation's Primary Health Care Program, involving government participation at all levels; federal, state, and local council.
2. Capacity building and development of health professionals through training and re-training on genetic counselling and testing, diagnostics, and clinical management and support of people living with SCD.
3. Establishing newborn screening programmes and centres for mandatory screening of all newborns.
4. They collaborate with religious institutions and faith-based organisations to sustain and improve the quality of their various premarital screening programs.
5. Establishing a genetic counselling and testing programme for the general population at the primary care level (community and local councils).
6. Massive health education programmes to increase awareness of SCD and the need for voluntary counselling and testing
7. Nationwide provision of adequate infrastructure and personnel for testing services.

Limitations

This includes

1. The study's sample size However, due to the broad geographic areas to be covered, a multistage random sampling procedure for participant selection was judged suitable.
2. The cost of reaching the intended audience due to financial restrictions

Ethics Approval and consent to Participate

Not Applicable

Consent to Publish

Not applicable

Availability of Data and Materials

The Data set from the study are available to the corresponding author upon request.

Competing Interests

Authors have declared that they have no competing interests

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Not Applicable

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