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Assessment of demographic variables of patients at sickle cell clinics of Delta state, Nigeria

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Abstract

Background: Sickle cell disease (SCD) is a genetic disorder that poses a significant public health challenge in Nigeria where it affects 2-3% of its population and this translates to about 2-3 million living with SCD. In Delta State, approximately 11,000 patients have been registered in its 24 Sickle cell clinics. It is estimated that many more remain unregistered. Demographic data helps estimate the incidence, prevalence, and geographical variations in SCD distribution, informing target interventions. The assessment of demographic characteristics would inform healthcare planning, health education, and promotion of health equity in healthcare services administration and hospital management.

Objective: To assess the demographic variables of patients in the SCD clinics of Delta State.

Methods: This study used a descriptive approach combining a structured questionnaire with quantitative data analysis to explore the population characteristics.

Results: The study's findings revealed that among 672 SCD patients the majority were adolescents (65.8% aged 13-18 years), and students (72.9%). There were males (49.95%) and females (51.04%) with secondary education (82.1%) and tertiary education (18%). On religion, majority (83%) were Christians while 17% practiced Islam and traditional worship. Ethnically the respondents were predominantly Urhobo/Isoko (38.1%), followed by Ibo (25%) and Itsekiri/Ijaw (30.1%). In terms of marital status, 93.5% were single with a few (6.5%) married. The occupational status indicated that most were students (72.9%), 27.10% were not students.

Conclusion: This report of SCD patients' demographic characteristics gives a valuable insight into the disease impact on different subpopulations. Health care providers and policy makers can better understand the disease, its prevalence pattern, identify high-risk groups, tailor health care services, inform research and policy to improve patient health outcomes.

Keywords: SCD, Demography, Diagnosis, Management Practices, Sickle cell Clinics

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1. Background

Sickle cell disease (SCD) is a hereditary hemoglobinopathy characterized by the presence of abnormal hemoglobin S (HbS), which causes sickling of red blood cells, hemolytic anemia, and recurrent episodes of pain as a result of vaso-oclusive crisis (Mangla, 2021). SCD is especially prevalent in regions with high malaria endemicity, including parts of Africa, India, the Middle East, and the Mediterranean. There is a paucity of knowledge on how hemoglobin variants, personal characteristics, and environment (socio-demographic triangle) interact to influence SCD propagation (Nwabuko et al., 2022). Nigeria has the highest burden of SCD globally (Inusa et al., 2023) and it affects individuals of various ages with studies showing that despite improvements in life expectancy with various interventions, affected individuals still face a shorter lifespan compared to the general population.

In Delta State where 11,000 SCD patients have been registered (Okwe et al., 2023), genetic testing and counseling are done to reduce incidence and prevalence after diagnosis. Despite these interventions, there is a limited understanding of the demographic characteristics of individuals affected by the disease (Nwabuko et al., 2022).. This knowledge gap hinders the development of targeted interventions, health care services and management introduced at the clinics to meet their specific needs. Most SCD data collected are hospital- based and reliance on their number can cause disparities in health outcomes and resource allocation (financial and human) (Nwabuko et al., 2022). Some studies of socio-demography of the SCD population have given an insight of age, sex, ethnicity, socioeconomic status, geographical distribution which have an impact in ensuring the prevalence pattern of SCD is known and ensure health care providers are aware of cultural idiosyncrasies', differences and values of their patients to enable a delivery of effective management after diagnosis (Nwabuko et al., 2022). It is pertinent to note also that modification of the socio-demographic dynamics of SCD is a tactical approach of reducing clinical complications of SCD (Adzika et al., 2017; Nwabuko et al., 2022).

Objectives: To assess the demographic variables of Sickle cell patients at the Sickle Cell clinics of Delta State, Nigeria.

3.0. Methods

3.1. Research Design

The study employed a descriptive and quantitative research design using a non-experimental approach. A random sample of 700 participants (Okwe et al., 2024) were drawn from a population of 11,000 selected from 18 randomly chosen clinics (6 clinics/district) out of 24 in the study area (see table 2). The random selections adopted the proportionate sampling research (Engidaw, 2021). A structured paper-based questionnaire was administered to gather quantitative data on demographic characteristics of randomly selected patients at clinics. Descriptive statistics including frequencies, simple percentages were used to represent demographic data. This enabled effective data management and provided clear insights in the demographic characteristics of the participants.

3.2. Research setting

Delta State, Nigeria, is a diverse region in the South-South geopolitical zone known for its cultural heritage and hospitality. It is located within the Niger Delta area, and characterized by its low-lying terrain, extensive river systems, and coastline. It has 24 sickle cell clinics located in 24 out of 25 Local Government Areas of the 3 senatorial districts. Each clinic has registered SCD patients monitored by the Genetic counselors and supervised by the Medical Directors. The Genetic counselors are mainly Nurses and Doctors who have been trained and charged with the sole responsibility of health care delivery, management and counseling of sickle cell patients and their parents. Monthly data of the newly diagnosed SCD patient and the already diagnosed are recorded (Hospital SCD registry records & DHPRS (SMOH) records.

3.4. Data collection and sample size distribution

As illustrated in table 1 the research methodology is guided by an outline and overview of the research framework objectives and study design. Table 2 summarizes the number of participants distribution of 700 questionnaires(39/clinic) across 18 sickle cell clinics, their locations, and the sample size distribution across the

three senatorial districts each served by 6 clinics.

3.5. Sampling Technique:

700 SCD patients were randomly selected among 11,000 SCD patients who are registered in the 24 SCD clinics in the 3 senatorial districts (Okwe et al., 2023). Demographic measures of age, sex, marital status, ethnicity, religion, educational qualification, occupation were requested in a paper-based questionnaire. Figure 1 shows the senatorial districts questionnaires were distributed.

3.3. Research Participants and Selection criteria

Table 1: shows the inclusion and exclusion criteria of selecting SCD participants

S/No	Inclusion	Exclusion
1	All sickle cell patients at the clinics	Parents not allowed to participate in this study
2	Those that voluntarily choose to participate	Those not willing to participate
3	Those that are well during data collection	SCD patients that are ill during data collection
4	Sickle cell clinics randomly selected are to participate	Health care workers in the sickle cell clinics are not allowed to fill questionnaires
5	Research assistants to explain questions when there is a need to do so	
6	Interpreters to explain questions to patients when language is a barrier	

Table 2. SCD participants, clinics & questionnaires distributed

SN	Senatorial districts	SCD patients	Number of clinics	Questionnaires
1	Delta Central	233	6	39/clinic
2	Delta North	234	6	39/clinic
3	Delta South	233	6	39/clinic
	TOTAL	**700**	**18**	

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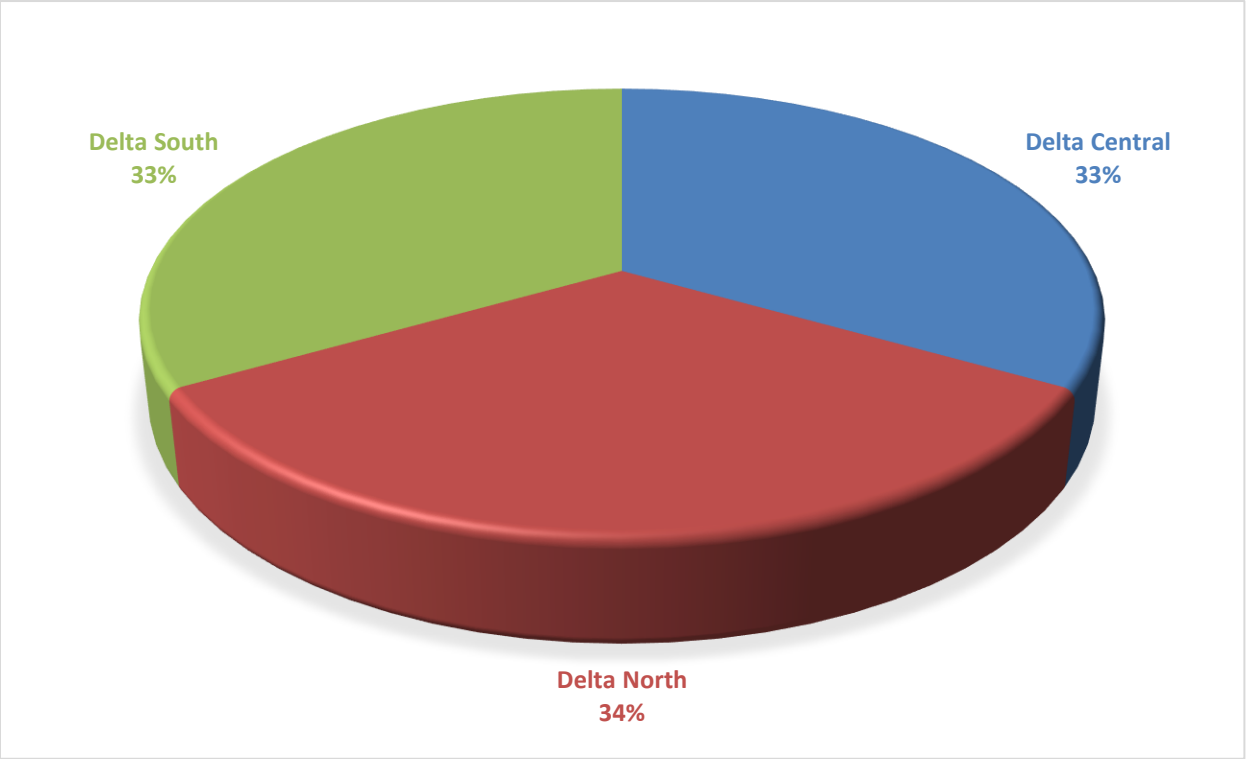

Fig 1: Senatorial districts and percentage of questionnaires distributed

3.6. Scope of the Research

The scope of this research encompasses an investigation into the demographic variables of age, sex, location, ethnicity, religion, occupation, and socio-economic status of the sickle cell population in Delta State. This is relevant as it will provide information on its incidence, locations of prevalence, targeted interventions, institution of health policy and resource allocation.

3.7. Statistical analysis

This will be mainly descriptive. Daily checking of filled questionnaires will be carried out by the researcher at the end of each field day, to avoid incomplete data collection and to also ensure accuracy of data.

3.8. Operational process

The research assistants from the Department of Planning, Research and Statistics (DPRS) of the Ministry of Health (MOH) trained on program Monitoring and Evaluation (M&E) were educated on SCD and recruited. They administered and collected the questionnaires

from various clinics after some explanations on the intention and confirmation of consent. This was done on SCD clinic days. Questionnaires were checked for proper completion on collection from participants. Daily checking of filled questionnaires was done at the end of each field day, to ensure data collection completion and accuracy of data. Data was coded and kept confidential. Collation and analysis of data was done by the researcher.

3.9. Statistics rationale/justification:

1. Sampling: Stratified random sampling (Cochran, 1977) of clinics from each senatorial district was used to reduce sampling bias
2. Patient selection: Random sampling of 700 sickle cell participants from randomly chosen clinics to represent the population registered (11,000) at the SCD clinics. This was to enable participants have an equal chance of being chosen.
3. Data collection: A structured questionnaire was administered through paper -based questionnaire to gather quantitative data on their demographic factors.
4. Data analysis methods using tables, pie & bar charts and quantitative measures were done. Statistics was represented in frequencies and simple percentages to enable data management and clarity of the results
5. Statistical analysis is descriptive and inference at 95% confidence level using the statistical package for social sciences (SPSS Inc. Chicago 11.) computer software version 22.0 to manage data efficiently
6. Research is significant as it will highlight the demography of patients at the Delta State sickle cell clinics, establish the prevalence pattern and confirm utilization of the health services at these clinics.

3.10. SWOT analysis

To contextualize the research findings a SWOT analysis was conducted to identify the strengths, weaknesses, opportunities, and threats related to sickle cell disease diagnosis and management in the state districts.

3.11. Research bias

Table 4. Indicates bias encountered and ways they were mitigated

Table 3: Indicates SWOT analysis

Strengths	Weakness	Opportunities	Threats
Established SCD clinics	Limited accessibility to far- to -reach areas of Delta State (rural and riverine	Increasing focus on interventions	Limited funding due to competing health programs
Growing interest in research of SCD	Stigma and misconceptions on SCD diagnosis, and management	Collaborations with NGOs	High fuel costs associated with trips to SCD clinics for questionnaire administration and collection
Support by Delta State Ministry of Health and NGOs	Maintaining participant engagement throughout the study	Increased funding for training of genetic counselors	Getting SCD patients to read, understand, respond, and fill out their questionnaire
Research on SCD	Cost of travelling to various SCD clinics in all the LGAs is high	SCD genotype testing and neonatal screening	Ethical concerns and legal considerations on statewide neonatal screening

3.12 Ethical Approval:

Ethical clearance was obtained from the Novena University, Ogume and Delta State Ministry of Health, Ethical Committee (MOHREC) Asaba.

3.13. Consent to participate

Consent from the respondents was obtained before the actual study and their confidentiality assured using a typed consent form. The content and scope of this study was explained to them to elicit their co-operation in each of the clinics and there were requests to respond to the questions after the purpose of the research and the questionnaire introduction section was explained.

3.14. Confidentiality of data:

Respondents were also informed that any information discussed and collected during the course of study will be kept confidential; the researcher ensured the research instruments was kept anonymous and results made accessible to them.

Table 4: Identified biases and mitigations

Bias	Bias content	Ways bias was mitigated
Information and recall bias	Inaccurate information on recall of past age of being diagnosed	Using hospital documents to verify
	Participants providing information that are socially acceptable rather than their true perspectives	Research assistants trained to administer questionnaire to patients and communicate explanations with building trust and rapport.
	Language bias	An interpreter from the local environment was used for those that had language barrier to enable a clear understanding of the questions.
Bias in confounding variables	Demographic variables (sex, age, education) can influence can influence the outcome of answers	Analyzed data in sub-groups.
	Patients from different socio-economic backgrounds may have varying levels of health care access and response to survey questions	Training of research assistants to administer questionnaire to SCD patients and communicating explanations of questionnaire easily.
Measurement bias	Researchers' biases may influence how data is collected	Used validated measuring tools to minimize instrument bias
Analytical bias	Using statistical methods that are not suitable for data or research question	Specified the data analysis plan (see table 2, sampling technique, sample analysis and data presentation)
Selection bias	Patients from specific age groups may not represent the larger population	Selected clinics and SCD patients with a simple random sampling and stratified sampling of age to enable representation of subgroups within the population. The inclusion and exclusion criteria were applied.
	Non-response bias	Multiple attempts were made to contact them
Sampling bias	Selection bias	The multistage sampling of randomly selecting 18 clinics out of 24 and then randomly selecting participants. This ensured representation of the sample.

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4.0. Results

4.1 Out of 700 questionnaires distributed, a total of 672 patients responded to the questions. 28 participants did not submit. The data collected are represented in tables and analyzed using simple percentages and quantitative measures.

4.2. Pie chart distribution percentage of participants and non –participants

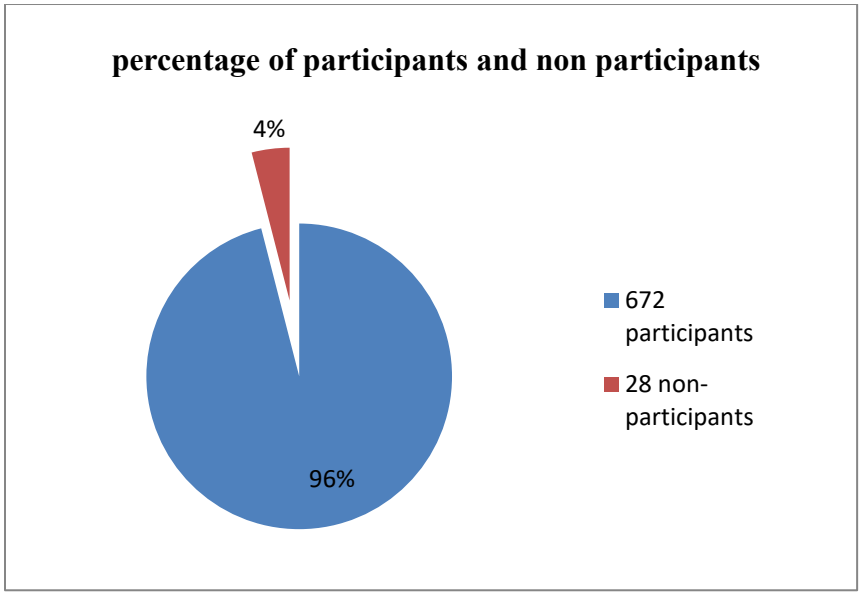

Fig 2. Pie chart showing number & % of participants and non-participants

4.3. Demographic Information such as age, sex, educational qualification, religion, ethnicity, occupation, marital status, age was documented. They are represented below in tables, bar and pie charts. The total number of participants is N=672. Mean of age of the participants is 15.71years, with a range being 60 (Table 5).

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Table 5. Distribution of respondents by stratified age group

Ages	Mid-point	Frequencies	Percentage %	Valid %	Cumulative %
7-12	9.5	0	0	0	0
13-18	15.5	460	68.5	68.5	68.5
19-24	21.5	123	18.3	18.3	86.8
25-30	27.5	29	4.3	4.3	91.1
31-36	33.5	18	2.7	2.7	93.8
37-42	39.5	12	1.8	1.8	95.6
43-48	45.5	15	2.2	2.2	97.8
49-54	51.5	8	1.2	1.2	99
55-60	57.5	4	0.6	0.6	99.6
61-66	63.5	3	0.4	0.4	100
67-72	69.5	0	0	0	100
	0	0	0	0	
	total	**672**	**100**	**100**	

4.4. Age distribution of participants

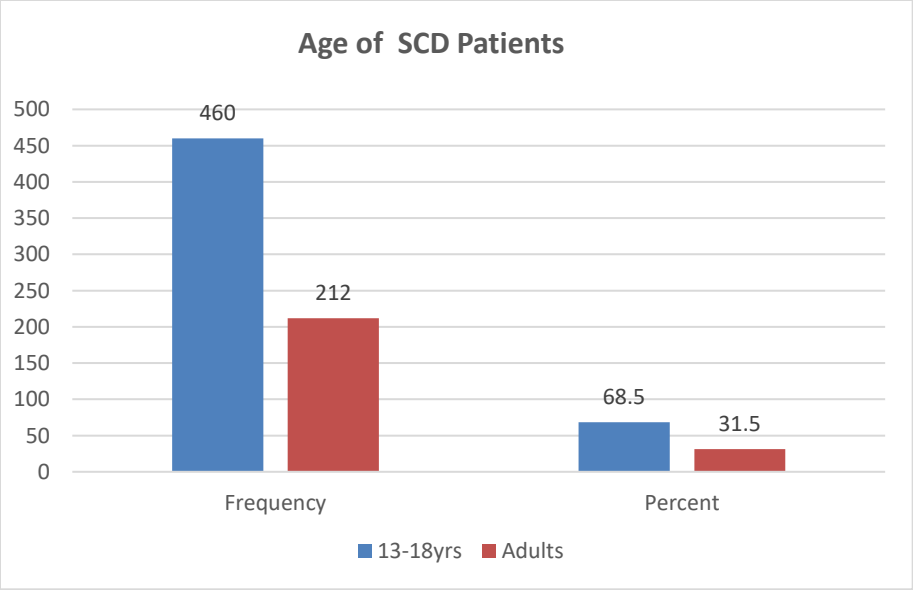

Fig 3. % Bar chart Age of participants

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4.5. Sex of participants

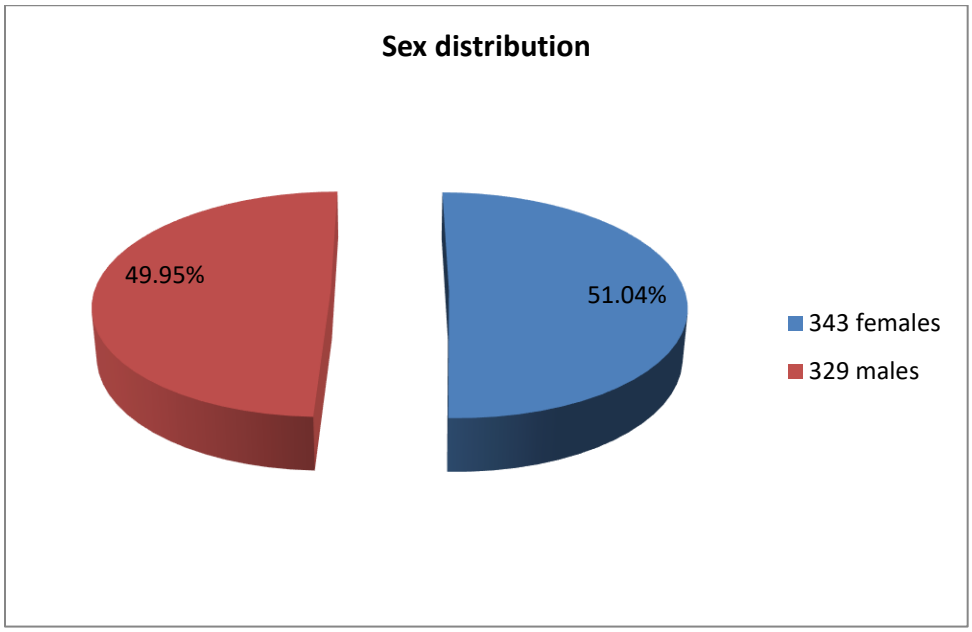

Fig.4. Pie chart of % Sex distribution

4.6 Religion

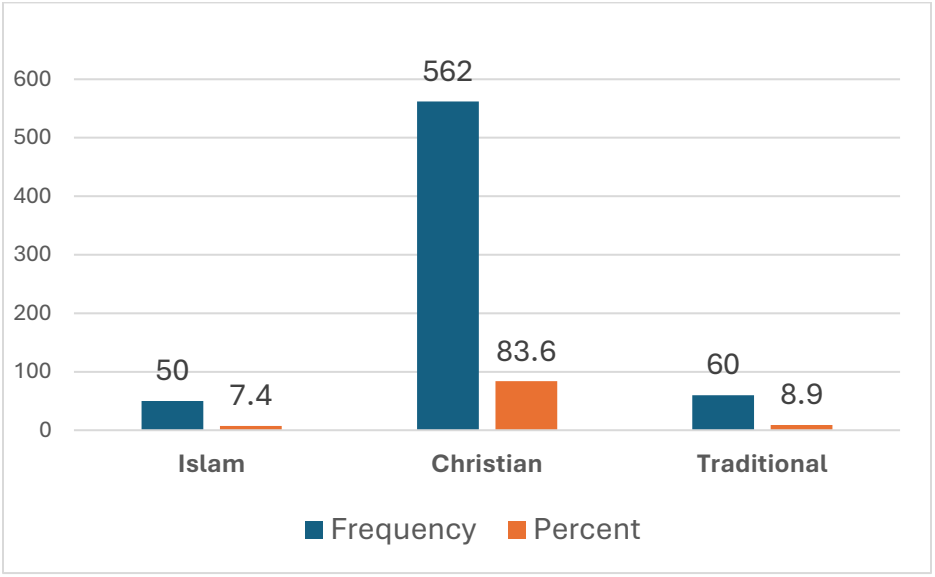

Fig 5. Bar chart of % Religion

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4.7: Educational Qualification

Table 6. Shows educational qualification of SCD patients

Qualification level	Frequency	Percent	Valid Percent	Cumulative Percent
Primary	85	12.6	12.6	12.6
Secondary	467	69.5	69.5	69.5
Tertiary	120	17.9	17.9	17.9
Total	672	100	100	100

4.8. Ethnicity

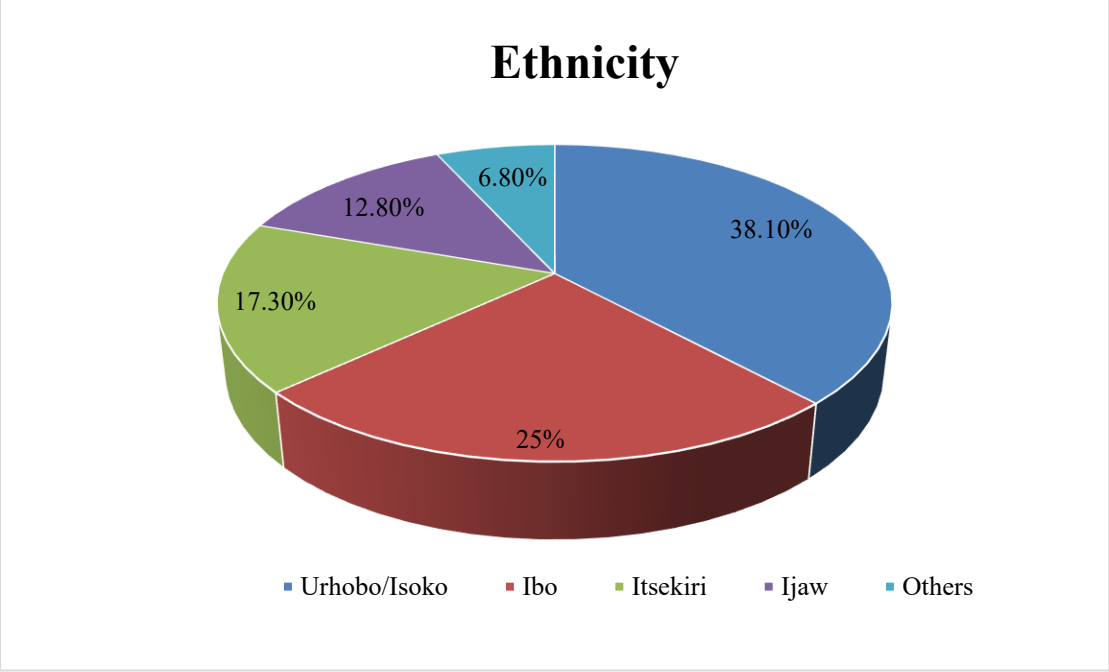

Fig 6. Pie chart of % ethnicity of participants

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4.9. Marital status

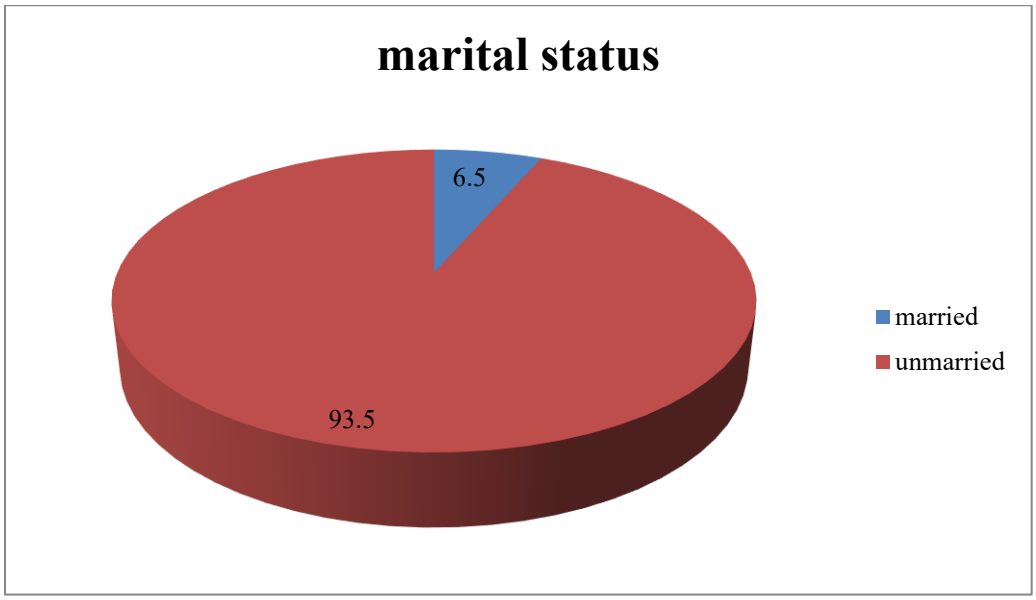

Fig 7. Pie chart of % ethnic distribution of SCD participants

4.10. Occupation

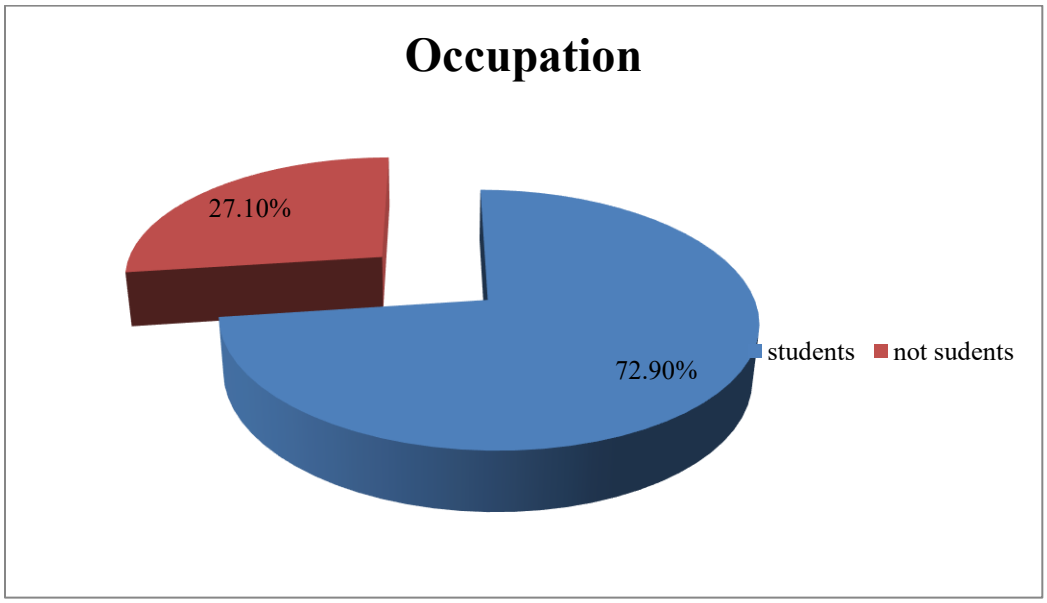

Fig 8. Show % distribution of occupational status of participants

5. 0 Discussions

5.1. Overview

672 (96%) SCD participants out of 700 fully participated in this study. Among the population, 28 participants (4%) did not participate. Eight (8) were hesitant to share their personal information, 5 were afraid to participate in the research for fear of stigma, 10 explained they had no time to fill the questionnaire and 5 were unavailable at the time for submission.

Figure 1 shows the percentage of participants (96%) and non- participants (4%). Sickle cell patients may hesitate to participate in research due to historical mistrust of medical professionals and research institutions, fears about the risks and unknown nature of clinical trials, and a lack of understanding about the potential benefits and the critical role research plays in developing new treatments (Lee et al., 2021; Phillips et al., 2022). Some may not wish to interact with unknown medical personnel, especially when dealing with the unpredictable nature of the questions asked. Patients may prioritize their immediate needs and concerns over participating in research, which may seem like a long-term investment (Baumann et al., 2023).

Demographic studies however plays an important role if applied to Delta State Sickle cell clinics as records (Okwe et al., 2024) indicate that there has been a progressive increase in the number of children living with the Sickle Cell Disease since 2015. With the commissioning of a Sickle cell Referral centre and development of sickle cell clinics in 23 Local Government Areas (Asaba Metro news, 2022), there has been improvement of quality of life among sickle cell sufferers in various clinics. However, mortality and morbidity amongst these children from crises every year still remain significant and desires increased attention by Government.

5.2 Age.

The ages of the patients were presented in various strata but for assessment and analysis it was classified in two categories; 13-18yrs and adults (≥19). The statistical analysis of the participants can be seen in the distribution of the stratified age groups at table 5. The mode was 13-18 years indicating the SCD population in these strata were more in number and their mean age is 15 years. There

is also a large age-range of 60years (the oldest). The large range and high deviation shows some patients are significantly older than the majority.

Sickle cell anemia does not target a certain age group. Each age group is affected equally because the disease is hereditary. Both parents must have the sickle cell trait (SCT) for the offspring to inherit the disease. In Nigerian sickle cell clinics, the age distribution of patients ranges from infancy to adulthood, with a significant burden of the disease in children and a high proportion of patients requiring blood transfusions, particularly as they age (Adewoyin, 2015). Table 5 shows that a larger proportion of the sampled population children) fall within the ages of 13-18yrs with 68.5%. The overall mean age of 15-16 years clearly shows that SCD is still predominated by pediatric age status as can be seen in another study in Ghana and Nigeria where the mean age was 14 years (Nwabuko et al., 2022).

This study also showed that the proportion of SCD patients being treated at the Delta SCD clinics was mostly children. Another study (Isa et al., 2020) acknowledged that in Nigerian SCD clinics, data suggests that more pediatric SCD cases (including adolescents) are recorded compared to adult SCD cases. This may be an indication of reduction in mortality rate of SCD as the disease progresses from childhood to adulthood (Mulumba & Wilson, 2015).

This could be explained by the gradual improvement in the care of people living with SCD in the region. This contrasts to previous studies that showed that 50%-80% of children born with SCD in low-middle-income countries of sub-Saharan Africa die before their 5th birthday (Uyoga et al., 2019). Although about 95% of children with SCD reach adulthood in developed counties with well -equipped clinics, adolescents and young adults face difficulties in establishing adult care and experience progression of disease severity as they get older due to several clinical crisis and life events especially in under- developed counties. These may affect their psychosocial perception and attitude (Egesa et al., 2022) towards the disease and consequently cause poor health outcomes. Increasing the adult-pediatric ratio of SCD is a strategic approach of breaking the chain of its transmission and this can be applied to Delta State sickle cell

health plan so that more individuals with SCD can reach reproductive age and potentially pass on the sickle cell gene, thus potentially reducing the overall number of affected individuals in the long run.

Already with a bill passed into law by Delta State house of Assembly in May 2022, on Sickle cell control (Ochei, 2023). It enabled the establishment of 24 sickle cell clinics focusing on collecting, coordinating, and distributing data on sickle cell, making newborn hemoglobinopathy screening mandatory, and using hydroxyurea to reduce crisis. The law also aims to improve healthcare for sickle cell patients through Universal Health coverage. This is a strategy to improve the adult- paedaetric ratio thus improving survival of SCD patients in Delta State.

5.3. Sex distribution

The gender distribution showed 343 females (51%) and 329 (49%) males. This is clearly seen in the pie chart in fig 4**.** There is a relatively equal gender (4.1%). Along with the ages, both genders are both equally affected by sickle cell anemia. Males and females are affected equally because the disease is autosomal and hereditary (Mangla, 2021). The relatively equal gender ratio from the study is similar to that found in previous similar studies (Alzahrani etal., 2024; Nwabuko et al., 2022). But on the contrary there are some gender related differences (Ceglie et al., 2019) where pain crisis frequency per year was significantly increased in the male population with a mean number of crises per year of 1.6 vs. 0.6 in the female population.

Also, severe complications (both infectious and cardiovascular) were mostly found in the male population. The data hypothesis in Ceglie study suggested that gender plays a critical role in determining the clinical course of SCD, even though more studies are needed to assess the weight of its influence over the course of the disease. The higher morbidity in males is a feature of SCD in adults and these findings have been only partially studied in the pediatric population (Ugwu, 2022). These differences have, in adults, been attributed to hormonal variations found in the two sexes after puberty (Barden et al., 2002). Gender could be an important factor in the risk assessment of SCD patients at diagnosis, and can guide therapeutic decision. Genetic counseling is of utmost importance especially

when considering risk assessment as each gender reacts differently to crises and depression in SCD (Garvin, 2010).

In Delta State, Nigeria, the strategy of recruiting health workers as genetic counselors and providing them with annual training to care for SCD patients significantly improves patient-centered care. This proactive approach ensures that both male and female SCD patients receive specialized guidance and support, promoting better management of their condition (Erusiafe & Awunor, 2023).

5.4. Educational qualification

The respondents are 85(12.5%) primary school pupils, 467 (69.5%) secondary school students and 120 (17.9%) tertiary students (Table 6). This shows there is some level of education among the participants. While sickle cell disease (SCD) doesn't cause learning difficulties, fatigue and pain can impact school performance and attendance, potentially leading to lower GPAs and higher absence rates (Crosby et al., 2015; Heitzer et al., 2021). On the contrary, another school of thought indicated that academic performance of children with SCD is influenced by their intelligence capacity, age and socio-economic status and not negatively affected by their increased school absenteeism (Ezenwosu et al., 2021).

However, with proper support, individuals with SCD can still achieve their educational goals (Heitzer., 2021). Improving educational attainment in adolescents with SCD requires understanding risk beyond disease severity (Harris et al., 2019). Educating sickle cell patients and caregivers empowers them to manage the disease effectively, understand treatment options, and potentially reduce clinical complications (Plett et al., 2023). This is crucial for effective disease management, enabling them to recognize symptoms, understand treatments, and potentially reduce complications, ultimately improving their quality of life and health outcomes.

In Delta State, improving health outcomes and quality of life for Sickle Cell Disease (SCD) patients involves addressing barriers and promoting facilitators. Health education is crucial, particularly within a family-centered approach, and the state has introduced Universal Health Coverage to bolster SCD patient care. This includes educating patients and their families

on pain management, stress reduction, and infection prevention (Ajala-Damisa & Agbaoye, 2021; Ochei, 2024).

5.5. Religion

Religion appears to be important within African cultures, and the effects of religious practices on health outcomes are important (Dennis-Antwi et al., 2018). There is a high prevalence of this disease in Nigeria mainly attributed to lack of adequate knowledge about SCD (Isa et al.,2020).

From the religious distribution in Fig 5, it can be deduced that less 17% of the respondents practice Islam and traditional worship while over 83% are Christians. Christians were more in this study. However, Individuals with sickle cell disease (SCD) who are Christians often find religion and spirituality helpful in coping with the challenges of living with the condition, seeking comfort, hope through faith practices like prayer (Ehwarieme et al.,2021), church attendance, and religious readings according to some studies (Bediako et al., 2011). It helps them find meaning and purpose, seek comfort and hope, strengthen social support, manage pain and stress and belief in faith healing. Moslems often believe in the use of Nigella sativa a prophetic medicine which exerts many promising hematological benefits in treating many blood diseases (Mogharbel et al., 2023). In his study, it was reported that Nigella sativa caused promising therapeutic benefits in treating hemolytic anemia, due to its ability to increase the blood hemoglobin levels. For traditional worship even though the percentage of participants in this study is less, data exist on the role of Western medicine and traditional medicine in the management of several diseases including sickle cell anaemia but not much is known about faith therapy (Lawal et al., 2024).

According to Lawal, treatment techniques in SCD include prayer, application of herbs, divination, and counseling and both Christian and Muslim clerics used prayer and fasting as treatment techniques, even though they acknowledge modern medical treatment. Traditional healers diagnosed the disease with divination and applied herbs (Ameh et al., 2012) and charms as well as appease the perceived spirit causing the disease (Lawal et al., 2024). Many health care practitioners recognize emotional trauma as a significant issue for individuals with SCD and their care givers, impacting treatment adherence and

often accommodate prayer and fasting as coping mechanism. Coping with SCD in Delta State, Nigeria involves a multifaceted approach, including medical care, community support, and personal strategies. Delta State has made strides in establishing SCD clinics (Adurokiya, 2022) and implementing a sickle cell control law (Ahon, 2017; Ochei, 2023) which is helpful. However, there's a continued need for enhanced public awareness and education, particularly in rural areas. Individuals can also benefit from staying hydrated, engaging in physical activity, and seeking social support from friends and family.

5.6. Ethnicity:

The ethnic groups of the respondents can be seen at fig 6 above with Urhobo/Isoko accounting for 38.1%, Itsekiri/Ijaw 30.1%, Ibo 25% and others 6.8%. In Delta State, Nigeria, sickle cell disease, a genetic blood disorder, is particularly prevalent among people of African descent, with the sickle cell trait (HbAS) being common. SCD disproportionately affects certain ethnic groups, requiring a nuanced approach to care. Culturally sensitive care acknowledges and respects the unique beliefs, values, and practices of diverse communities (Joo & Liu, 2021). In a study conducted in Delta state it was acknowledged that even though there was a paucity of data in the number of sickle cell patients classified according to their ethnicity, the Ika ethnic nationality in Delta State, Nigeria and in Delta North Senatorial district has been recorded to have a significant prevalence of HbAS (Adu et al., 2014).

Considering ethnicity is crucial for tailoring treatment and management strategies to individual patients' needs, implement culturally sensitive care and develop interventions to address the specific needs of the diverse populations. Culturally tailored education emerges as a promising approach, addressing the unique needs of adolescents and their communities. By acknowledging ethnicity importance, health care providers can improve patient outcomes and researchers can develop effective treatments.

5.7. Marital status

SCD is a genetic disorder affecting hemoglobin production. It poses significant health challenges for individuals and family worldwide (Elendu et al., 2023). Fig 7 shows

that approximately 93.5% of the respondents are single while the others are married. As individuals with SCD navigate their lives they often face unique complexities when it comes to romantic relationships and marriage (Adesoye, 2024; Roberts et al., 2025). Marriage may be a source of emotional support, companionship for individuals with SCD (Adesoye, 2024).

On the contrary, it may present challenges in managing the physical and emotional demands, navigating reproductive decisions, coping with the financial constraints of SCD treatment and management and maintaining intimacy in the face of a chronic illness. Providing genetic counseling and testing for couples can help identify carriers of the S genes to prevent its transmission to offspring. (Oluwole et al., 2022). This will enable early diagnosis and treatment which improve quality of life for those affected.

In Delta State, marital status is relevant in the context of Sickle Cell Disease (SCD) prevention due to the significant risk of having children with SCD if both parents carry the sickle cell trait (AS). The Delta State Ministry of Health has introduced premarital genotype screening, a crucial tool for identifying carriers and reducing the risk of transmitting SCD to offspring in Delta State, Nigeria (Obareyesa & Agborh, 2024). This has supported and boosted prevention strategies and better management of the disease.

5.8. Occupational Status

Sickle cell disease (SCD) can significantly impact employment due to recurrent pain crises, fatigue, and other complications, potentially limiting job options and job retention (Osunkwo et al., 2022). Fig 8 shows percentage distributions of occupational status with 79.7% of the respondents' students while 27.1% are not students. Among the 27.1% are adults who are not students but employed.

These have high rates of employment loss and absenteeism related to hospitalization. Not living with a partner is also associated with increased employment loss and missed work for families affected by sickle cell disease (D'Amico Gordon et al., 2024; Franklin & Atkin, 1986).

SCD have a great impact on work performance, causing changes and interruptions in the work activity together with impaired productivity and even job loss.

It also triggers socioeconomic, emotional, and psychological problems which could lead to absenteeism and lack of productivity at work (Pires et al., 2022). SCD and occupational health are intertwined in Delta State. Occupational health programs in Delta State, Nigeria, primarily focus on protecting students', workers' physical, mental, and social well-being.

The Delta State Contributory Health Commission (DSCHC) plays a key role, offering different health plans, including those for formal and informal workers, and vulnerable populations SCD inclusive. Addressing the needs of SCD patients in the workplace, along with implementing robust occupational health programs is crucial for ensuring the well-being of all in the state hence the introduction of the universal health coverage and safety for SCD patients (Ochei, 2024).

6. Conclusion

Various studies have been conducted in various aspects of sickle cell disease, its diagnosis, management, and prevention but since the inception of setting up of various sickle cell clinics in Delta State, the demographic characteristics and assessment of sickle cell patients in Delta State Sickle cell clinics has not been highlighted or known. This study provides information and highlights the demographic characteristics of the sickle cell patients at these clinics to enable policy makers channel resources to targeted interventions, genetic counseling and education to address the specific needs of affected populations. By prioritizing these efforts, health care providers and policy makers can work towards improving the quality of life of those affected by sickle cell disease. In a culturally diverse State as Delta, it will be valuable and a reference for the Ministry of Health in shaping early genetic screening programs, identify context specific interventions that can aid the implementation of culturally sensitive health promotions and intervention strategies.

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