Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Knowledge and Attitude Regarding Premarital Screening for Sickle Cell Disease among Students of State School of Nursing Sokoto.

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ABSTRACT

Background: Sickle cell disease is a condition in which an individual has inherited two abnormal hemoglobin genes at least one of which is hemoglobin S (HbS) and the resulting symptomatology or pathology is attributed to the sickling phenomenon. About 5% of the world's population carries genes responsible for hemoglobinopathies and each year about 300 000 infants are born with major hemoglobin disorders including more than 200 000 cases of sickle-cell anemia in Africa. Sickle cell anemia is a very common disorder in Nigeria with birth rate of about 1 in 50 and about 150,000 children are born annually with sickle cell anemia in Nigeria alone. The study aimed to explore the knowledge and attitude of nursing students about premarital screening for sickle cell disease. **Methods:** A descriptive, cross-sectional study was conducted using self-administered semi-structured questionnaire among 176 students. **Results:** Majority of respondents knew sickle cell disease and also knew their genotype 97.6% and 71% respectively, although up to 9.1% selected blood group as their genotype. More than half of respondent (51.7%) said sickle cell disease can be transmitted through blood, 55.1% of respondent said they think government should prohibit marriage between incompatible couples with regard to sickle cell disease, Only about one third (34.1%) of respondent have good knowledge of SCD, and 34.3% of respondent have good knowledge of premarital screening for SCD, More than half (55.4%) of respondent have good attitude regarding premarital screening for SCD. **Conclusion:** The study shows that the respondent have poor knowledge of sickle cell disease and premarital screening though more than half of the respondent have good attitude towards premarital screening. The results of this study reflect the importance of health education as a keystone in improving knowledge and attitude towards premarital screening for sickle cell disease.

Keywords: Sickle cell disease Knowledge; Premarital Screening; Attitude.

INTRODUCTION

Sickle cell disease is a condition in which an individual has inherited two abnormal hemoglobin genes at least one of which is hemoglobin S (HbS) and the resulting symptomatology or pathology is attributed to the sickling phenomenon.[1] Sickle cell disease was discovered by DR J.B. Herrick in 1904 (published in 1910)[2]. Hemoglobinopathies are among the most common genetic disorders worldwide, typically inherited as autosomal recessive disorders from healthy-carrier parents, the most common are the sickle cell disorders and the thalassemia syndromes. Sickle cell disorders result from an abnormal chemical characteristic, rather than abnormal quantity, of the beta globins chains of the hemoglobin, homozygous sickle cell anemia (HbSS) is the most common of the over one hundred serious hemoglobinopathies described in the literature.[3] Hemoglobin gives blood its color and is responsible for carrying oxygen from lung to different part of the body.[4]

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Sickle cell disease is a genetically inherited blood disorder that causes red blood cells to become sticky and sickle shape. Sickle cell trait occurs in people with one sickle cell gene and one normal gene (HbAS) and such people can transfer the disease to their offspring though they do not have any clinical manifestation of the illness.[5] It is the inheritance of the sickle genes that causes red blood cell (RBC) abnormality, all complications of Sickle Cell Disease can be traced to changes in the make-up of the RBC, Normal RBC have smooth surface, enabling them to change their shape and flow through small blood vessels, and under certain conditions such as acidosis, dehydration, infection, and low oxygen, RBC containing Sickle Hemoglobin becomes rigid, elongated, and sickle shaped. Some RBC sickle immediately, while others remain normal for hours before sickling, most RBC containing Sickle Hemoglobin can sickle and then unsickled, after repeated cycles of sickling and unsickling, the RBC become irreversibly sickled.[6] Age at which sickle cell disease is diagnosed range from three months to 12 years, with a mean age of 27.33 (±26.36) months and a median age 18 months.[7] The hallmark clinical manifestation of SCD is the acute vaso-occlusive event, or painful episode, this unique type of pain can start as early as 6 months of age, recurrence is unpredictable over a lifetime, and may require treatment with opioids, Painful events are the top cause of emergency room visits and hospitalizations, and are a major focus of home management.[8]

Infections, Splenic Sequestration, Acute Chest Syndrome, Acute Aplastic Crisis, Strokes, Gall Stones and Jaundice, Growth and Development Retardation, Retinopathy, Priapism are some of the complication of sickle cell disease.[6] The Management of Sickle Cell Disease (SCD) is organized into four parts: Diagnosis and Counseling, Health Maintenance, Treatment of Acute and Chronic Complications.[4] Survival of children with SCD has been improved largely through prevention of overwhelming bacterial infections. Preventive measures include newborn screening, protective vaccinations, and teaching caregivers to recognize early signs of illness, and prompt treatment of suspected infections.[9] Problem Statement: About 5% of the world's population carries genes responsible for hemoglobinopathies and each year about 300 000 infants are born with major hemoglobin disorders including more than 200 000 cases of sickle-cell anemia in Africa. Globally, there are more carriers (i.e. healthy people who have inherited only one mutant gene from one parent) of thalassemia than of sickle-cell anemia, but the high frequency of the sickle-cell gene in certain areas leads to a high rate of affected newborns.[10]Sickle cell anemia is a very common disorder in Nigeria with birth rate of about 1 in 50 and in Nigeria alone; about 150,000 children are born annually with sickle cell anemia.[10] In Africa, sickle cell disease (SCD) is reported to be associated with a very high rate of childhood mortality 50%–90%, yet there is a lack of reliable, up-to-date information.[11] In Nigeria, there is no doubt that the prevalence of the condition is increasing, especially among the urban educated elite and in other communities with access to effective basic health care, there is however, a palpable lack of information and education about the disorder within our communities, there is also growth of misconception, misinformation, inappropriate treatment, frustration and stigmatization about this condition as well as the confusion and controversy even among doctors and other health care workers about this condition.[12] The study aims to assess the knowledge and attitude of the student of state school of Nursing Sokoto about premarital screening for sickle cell disease.

MATERIALS AND METHODS

The study is a descriptive cross sectional study and was carried out at School of Nursing and Midwifery Sokoto, located in Sokoto, the capital of Sokoto State, in the North Western geopolitical zone of Nigeria. The study population comprised of the nursing student studying at the time of the research. Multi stage sampling technique was used in selecting the study subjects. Data was collected using a self-administered, standardized structured questionnaire to obtain information on; socio-demographic data, knowledge and attitude regarding premarital screening for Sickle Cell Diseases among the study subjects. Data collection and sorting was done manually. Computer data processing was done using SPSS version 21 statistical software package. Frequency runs were done for further editing and cleansing of e-data. Frequency distribution tables were constructed; cross tabulations were done to examine the relationship between the categorical variables. Chi-square test was used to compare differences between proportions. All statistical analysis was set at 5% level of significance, $p \leq 0.05$ (i.e 95% confidence level) and a total of 165 Nursing and Midwifery students with correctly filled questionnaire were enrolled into the study out of the 175 instrument shared.

RESULTS

Table 1: Socio-Demographic Characteristics (N=165).

Age range	Frequency(%)
16-20	77 (46.6)
21-25	70 (42.4)
26-30	12 (7.3)
31-35	5 (3.1)
36-40	1 (0.6)
Gender	
Male	54 (32.7)
Female	111(67.3)
Department	
Nursing	110(66.7)
Midwifery	55(33.3)
Level of study	
Level 1	76(46.1)
Level 2	64(38.7)
Level 3	25(15.2)
Marital status	
Married	27(16.4)
Single	137(83.1)
Divorced	1(0.6)
Tribe	
Hausa	106 (64.2)
Fulani	23(13.9)
Yoruba	19(11.5)
Igbo	11(6.7)
Others	6(3.6)
Religion	
Islam	147(89.1)
Christianity	18(10.9)

About 88% of respondent were between 16-25 years of age respectively with mean age of 22.2(±3.1). About 67% of respondent were females; one-thirds were midwifery students and about 41% of them were year one students. About 84% of the respondents were not married and most of the respondents were Hausa's (64.2%) and majority Muslims (89.1%) [Table 1].

About 97% of respondent claimed to know SCD, major source of information was school (86.3%). Only about 75% knows normal haemoglobin. Majority (97%) responds that SCD can be inherited: genetically (36.6%), if both parent are either SS or AS (20.6%), if both parent are AS (15.7%) others during child birth etc Majority (96.4%) of respondent said SCD is serious disease, 45.0% of

them said because it lead to death, 18.5% because of anaemia, 6.6% because it is not curable, others (29.8%) always patient is bed ridden or sick.

Table 2: Knowledge of Sickle Cell Disease (N=165).

Do you know SCD	**Frequency (%)**
Yes	160(97%)
No	5(3%)
Source of information	
School	138(83.6%).
Friend	4(2.4%)
Media	10(6.1%)
Family	13(7.8%)
What is normal Hb	
O	13(7.8%)
AS	2(1.2%)
AB	4(2.4%)
A	5(3.0%)
B	12(7.3%)
SS	13(7.9%)
AA	116(70.3%)
Can SCD be inherited	
Yes	161(97.6%)
No	4(2.4%)
How is SCD inherited	
Both parent AS or SS	34(20.6%)
Both parent AS	36(21.8%)
Genetically inherited	39(23.6%)
Others	56(33.9%)
What causes SCD	
Genetic errors	54(32.7%)
RBC deficiency	15(9.0%)
marrying AS	9(5.5%)
Others	59(35.8%)
Don't Know	28(17%)
Is SCD serious disease	
Yes	159(96.4%)
No	6(3.6%)
What make SCD serious disease	
Lead to death	68(45.0%)
Result in anaemia	28(18.5%)
Not curable	24(6.6%)
Others	45(29.8%)
Do you think SCD can be cured	
Yes	53(32.1%)
No	105(63.6%)
Don't know	7(4.3%)
How is SCD been cured (N=53)	
Bone marrow transplant	10(18.9%)
Avoid marrying SS	5(9.4%)
Using drugs	18(34%)
Others	20(37.7)
Can SCD be prevented (N=165)	
Yes	137(83%)
No	28(17%)
How is SCD prevented (N=137)	
Premarital screening	58(42.3%)
Knowing your genotype	12(8.8%)
No marriage between carriers	25(18.2%)
Others	42(30.7%)
How will you know if you have SCD	**Frequency**
Laboratory investigation	43(26%)
Blood test	18(10.9%)
Genotype testing	35(21.2%)
Don't know	69(41.8%)

Only one third (32.1%) said SCD can be cured; through bone marrow transplantation (18.9%), by avoiding marrying SS (9.4%) , by medication (34%), and others 37.7% [Table 2].

Up to 83% of respondent said SCD can be prevented, 42.3% of them said through premarital screening, 8.8% through knowing your genotype, 18.2% by avoiding marriage between carriers and 30.7% others. Only 21.2% of the respondents correctly knew Hb genotype as a test for Sickle cell disease confirmation [Table 2].

Table 3: Knowledge of Pre-Marital Screening.

Premarital screening is	**Frequency** (%)
Screening for relevant diseases before marriage	154(93.3%)
Screening for relevant diseases after marriage	10(6.1%)
Don't know	1(0.6%)
Do you think premarital screening is only for SCD	
Yes	17(10.3%)
No	148(89.7%)
If not for only SCD which other diseases (N=148)	
HIV	87(58.8%)
Hepatitis	1(0.7%)
HIV and Hepatitis	47(31.8%)
Ebola	13(8.8%)
Do you think premarital screening help in prevention of SCD	
Yes	153(92.2%)
No	12(7.3%)
How Premarital screening Help in Prevention of SCD (N=153)	
Knowing status helps in avoiding incompatible partner	56(36.6%)
Determine ones Hb status	11(7.2%)
Carriers can transmit disease	25(16.3%)
Others	61(39.9%)

Majority (93.3%) of respondent knows that premarital screening is done before marriage as well as 89.7% also knows that premarital screening is also use for other diseases such as; HIV(58.8%), Hepatitis(0.7%), HIV & Hepatitis(31.8%) and Ebola(8.8%). Most of the respondent (92.2%) responds that premarital screening helps in preventing SCD: 36.6% said through knowing your genotype, 16.3% said carriers can transmit the disease, 7.2% said to determine your status, others responds differently [Table 3].

About 71% of respondent claimed to know their Hb genotype, 73.1% of them claimed to be AA, 10.1% AS, 0.9% AC and about 16% misconceive blood group as their Hb genotype [Table 4].

About 80% of respondent agreed to screen themselves and their partners before marriage, 9.7% said they will not screen neither themselves nor their partners, 10.3% said they will screen only themselves. With respect to reasons for not screening their partner, 75.8% of them said because community are not informed, 6.1% said their partners may not understand, 3% said their partners should do their own, others (15.2%) stated different

reason such as it will lead to ending of their relationship.

Table 4: Attitude of respondents regarding Premarital Screening for SCD

Do you know your Hb genotype	Frequency (%)
Yes NO	119(71.3%) 46(28.7%)
What is your Hb genotype (N=119)	
AA AS AC Blood group	87(73.1%) 12(10.1%) 1(0.8%) 19(16%)
Would you screen yourself and partner before marriage	
Yes NO myself only	132(80%) 16(9.7%) 17(10.3%)
Why not your partner (N=33)	
community are not informed He/She may not understand He/She will do His/her own Others	25(75.8%) 2(6.1%) 1(3%) 5(15.2%)
Would you encourage others to screen for SCD	
Yes NO	156(94.5%) 9(5.5%)
If you and your partner are AS would you go ahead with your marriage	
for sure we will we will never we may not known	22(13.3%) 87(52.7%) 37(22.4%) 19(11.5%)
Do you think government should prohibit marriage between incompatible couple	
Yes No	95(57.6%) 70(42.4%)
Have you been tested for any disease before marriage (N=27 for married respondents only)	
Yes No	12(44.4%) 15(55.6)
Screened for which disease/s (N=12)	
HIV And SCD HIV and Hepatitis HIV, Hepatitis and SCD	4(33.3%) 6(50%) 2(16.7%)

Majority (94.5%) of respondent said they will encourage others to screen before marriage, About 22.4% of respondent said they may go ahead and marry their incompatible partners, 13.3% said for sure they will go ahead with their marriage, 52.7% said they will never go ahead, 11.5% were undecided [Table 4].

Majority 57.6% of respondents agree that government should prohibit marriage between incompatible couples while the rest think otherwise

Only 12 i.e 44% of married respondents have been tested for some diseases before marriage and 6 i.e 50% tested for HIV and Hepatitis only.

Knowledge and Attitude Score

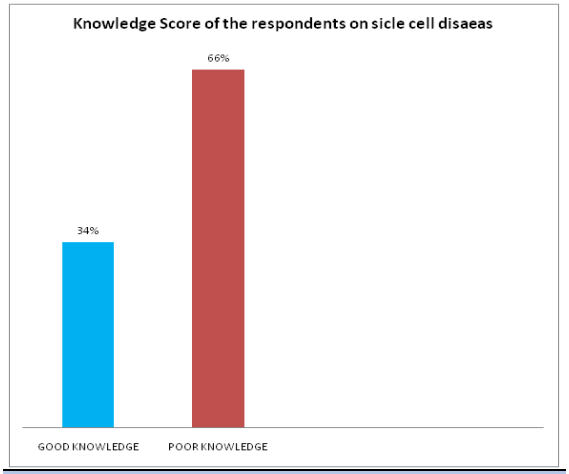

Figure 1: A Bar chart of knowledge score for SCD.

Only about one third (34.1%) of respondent have good knowledge of SCD, majority (65.9%) have poor knowledge of SCD [Figure 1].

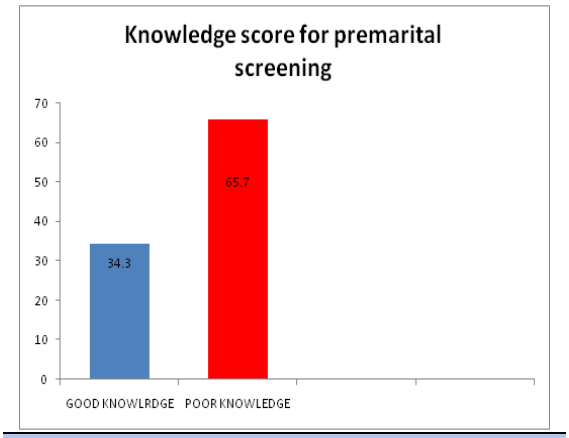

Figure 2: A Bar chart on Knowledge of premarital screening for SCD.

Only 34.3% of respondent have good knowledge of premarital screening for SCD, majority have poor knowledge of premarital screening for SCD [Figure 2].

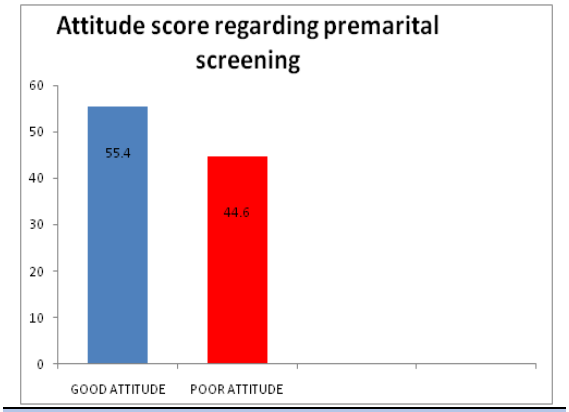

Figure 3: A Bar chart on Attitude regarding premarital screening.

More than half (55.4%) of respondent have good attitude regarding premarital screening for SCD [Figure 3].

DISCUSSION

This study was conducted with the aim of assessing the knowledge and attitude of the student of state school of nursing Sokoto regarding premarital screening for sickle cell disease. The study showed only about one third (34.1%) of respondent had good knowledge of SCD and this is similar with the study conducted in 3 major universities in Nigeria viz. ABU-Zaria, University of Nigeria Nssukka (UNN) and University of Ibadan (UI) where only 44% had knowledge of sickle cell disease.[15] The finding is also similar with what was found in a study done among African American where only 38.2% had good knowledge of SCD, though the study was not done in the school but the study population had similar age range (15-30 years) with respondent in this study 18-35 years.[14,17,18] But the finding differs from that of a study done in Benin City Nigeria conducted among senior secondary school student where only 18% had correct idea of sickle cell disease, this difference may be because the student in this study are from tertiary health institution and majority (86.3%) of respondent in this study knew SCD in school.[2] The finding also differs from finding in a study done among youth corps members in Lagos Nigeria 2012; where only 25.3% of respondents in intervention and 23.5% in the control group had good level of knowledge about SCD and screening pre-intervention, this may be because majority of the corps members are not graduate from health institutions.[5] The finding also differs from finding in study conducted in 30 hospitals in Lagos 2007 which shows that 86% of the respondents have knowledge of genetic diseases, this may be from the fact that the responders are hospital staffs that may have higher knowledge of SCD and may have come in contact with many patients with SCD.[13]

In this study, it was also found that only 34.3% of respondent have good knowledge of premarital screening for SCD. The finding differs from what was found in study conducted in sultan Qaboos University Oman 2012; where up to 79% were aware about the availability of premarital screening program.[19]

The study also showed 28.7% of respondent have poor knowledge of SCD, coincidentally, this is similar to what was found in a study conducted in 3 major universities in Nigeria ABU-Zaria, University of Nigeria Nssukka (UNN) and University of Ibadan (UI) where 32% are not aware of their genotype.[15]

In this study 57.6% thinks that government should prohibit marriage between incompatible couples. This differs from finding in a study conducted in Sultan Qaboos University Oman 2012; where 36% agreed with making laws and regulation to prevent marriage between non compatible couples.[19]

In this study 13.3% of respondent said for sure they will go ahead with their marriage when they are not compatible with their partner, 22.4% also said they may go ahead with their marriage when they are not compatible with their partners, this is similar to finding in Sultan Qaboos University Oman 2012; where 26% of the respondent said they will go-ahead with their marriage even if their couples are not compatible for various reasons.[19]

In this study 71.3% of respondent claim to know their Hb genotype though 16% of them wrote their blood group as their genotype, this differs from finding in study done among secondary student in Jos 2013; where only 59% knew their genotype.[20], this difference may be because the student in this study are from tertiary institution and majority (86.3%) of respondent in this study knew SCD in school. The finding also differs from that of a study conducted among senior secondary school student in Benin City Nigeria where only 32% of the respondent knows their genotype.[2]

About 42% of respondent in this study wrote premarital screening as a method of preventing SCD, this differs from finding in a study conducted among undergraduate of Ekiti state university 2013; where 72% of respondents' belief that premarital genetic counseling is a means by which sickle cell disease can be controlled.[16]

CONCLUSION

This study shows that the respondent have poor knowledge of sickle cell disease and premarital screening though more than half of the respondent have good attitude towards premarital screening, although majority of them agreed to carry out premarital screening, only about half of them agreed on making laws and regulation to prevent marriage in case of positive results. The results of this study reflect the need for health education as a keystone in improving knowledge and attitude towards premarital screening for sickle cell disease.

Recommendation

Base on my findings in this study I would like make this recommendations

1. Health education about sickle cell disease shall be intensified in the schools and also shall be made available for the community.
2. Premarital screening services should be made available for student and people in the community and shall be made affordable
3. Media shall be used as a way creating community awareness since only very few of the respondents knew sickle cell disease through media.

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How to cite this article: Isah BA, Musa Y, Mohammed UK, Ibrahim MTO, Awosan KJ, Yunusa EU. Knowledge and Attitude Regarding Premarital Screening for Sickle Cell Disease among Students of State School of Nursing Sokoto. Ann. Int. Med. Den. Res. 2016;2(3):29-34.

Source of Support: Nil, **Conflict of Interest:** None declared