International Journal of Community Medicine and Public Health
Maigoro AM et al. Int J Community Med Public Health. 2024 Jan;11(1):57-67
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20234108

Original Research Article

Knowledge and utilization of premarital screening for sickle cell disease among residents of semi-urban community, Bauchi State, Nigeria

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Received: 25 October 2023
Revised: 08 December 2023
Accepted: 11 December 2023

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ABSTRACT

Background: Sickle cell disease is a major genetic disease that manifests early in life and may lead to significant morbidities. It is an inherited disorder resulting from an abnormality in the structure of a protein in the red blood cell called haemoglobin characterized by the presence of crescent-shaped erythrocytes. Sickle cell disease is one of the most prevalent genetic disorders among the African populations. This study assessed the knowledge and utilization of premarital screening for sickle cell disease among residents of semi-urban community of Bauchi State, Nigeria.
Methods: A descriptive cross-sectional design was used for the study. A multistage sampling technique was used in selecting 308 participants and a semi structured questionnaire was used in collecting data for the study. Data was analyzed using SPSS version 26 at 5% significance level and 95% confidence interval and presented in tables of frequencies and percentages.
Results: The result revealed that 73.1% of the participants had good knowledge of premarital screening for sickle cell disease and their commonest sources of information were family and friends (45.6%). More than half of the respondents (66.8%) had good utilization.
Conclusions: Majority of the respondents had good knowledge and utilization of premarital screening for sickle cell disease. We recommend that there should be more emphasis on health education and awareness programmes at community level on premarital screening for sickle cell disease. Also, genetic screening services should be made available in all primary health care centers.

Keywords: Knowledge, Nigeria, Premarital screening, Sickle cell disease, Utilization

INTRODUCTION

Sickle cell disease (SCD) is a common and life-threatening hematological disorder that affects millions of people worldwide.[1] It is an inherited hematological or blood disorder caused by substitution of valine for glutamic acid at the sixth position of the beta-globin subunit of the hemoglobulin (Hb) molecule. It promotes polymerization of hemoglobin S and sickling of erythrocytes.[2] The normal shape of red blood cells is disc-like shape, but in sickle cell disease there is a tendency that the red blood cells will go out of shape and become sickle-shaped (like crescent moon).[1] There are several types of SCD, the most common are; sickle cell anemia (SS), sickle hemoglobin-C disease (SC), sickle beta-plus thalassemia and beta-zero thalassemia.[3]

Sickle cell disease is a major genetic disease that manifests early in life and may lead to significant morbidities.[4] SCD is one of the most prevalent genetic disorders among the African descent.[5] Sickle cell disease have been in human population for thousands of year.[6]

One long-held theory as to why it was so common in the tropics was its association with malaria.[7] In the 1940s, E. A. Beet, a British Medical officer stationed in northern Rhodesia (Now Zimbabwe) observed that blood from malaria patients who had sickle cell trait had fewer malaria parasites than blood from patients without the trait. Following the observation, a physician in Zaire reported that there were fewer cases of severe malaria among people with sickle cell trait than among those without it.[7]

In 1954, Anthony Allison continued to build on these observations and hypothesis that sickle cell trait offered protection against malaria. He suggested that those with the trait did not succumb to malaria as often as those without it; but when they did, their disease was less severed.[7]

Sickle-cell disease covers a wide spectrum of illness. Most affected people have chronic disease with a haemoglobin concentration of around 8 gm/dl. The main problems arise from the tendency of the red blood cells to become sickle-shaped and block capillaries at low oxygen tension.[8] In children, sickle-shaped red blood cells often become trapped in the spleen, leading to a serious risk of death before the age of seven years from a sudden profound disease associated with rapid splenic enlargement or because lack of splenic function permits an overwhelming infection. Between 6 and 18 months of age affected children most often present with painful swelling of the hands and/or feet (hand-foot syndrome).[8] Survivors may also suffer recurrent and unpredictable severe painful crises, as well as "acute chest syndrome" (pneumonia or pulmonary infarction), bone or joint necrosis, priapism or renal failure. For most patients the incidence of complications can be reduced by simple protective measures such as prophylactic administration of penicillin in childhood, avoiding excessive heat or cold, dehydration, and contact as early as possible with a specialist centre.[8] These precautions are most effective if susceptible infants are identified at birth. Some patients have such severe problems that they need regular blood transfusion and iron-chelation therapy. These situations together with the changing manifestations of sickle-cell disease in Africa create an urgent need to develop models of care appropriate to the management of the disease in sub-Saharan Africa.[8]

In most countries where SCD is a major public health concern, its management has remained inadequate, national control programmes do not exist, the basic facilities to manage the patients are usually absent, systematic screening is not a common practice and the diagnosis is usually made when a patient presents with a severe complication. Simple, cheap and very cost-effective procedures such as the use of penicillin to prevent infections are not widely available in many countries.[8] The most important challenge is, thus, to improve the prospects for the patients with sickle-cell disease in developing countries.[8]

Premarital screening

Premarital screening is defined as testing couples who are planning to get married soon for common genetic blood disorders like sickle cell disease and infectious diseases like HIV/AIDs, hepatitis B and C.[9,10] It is one of the most important strategies to prevent and curb the prevalence of genetic disorders including SCD.[11] The major aim of premarital screening is to give medical consultation on the chances of transmitting genetic diseases from parents to children, also the health conditions and disease already mentioned to the other partners/spouses or children and to provide spouses/partners with options that help them plan for a healthy family. Premarital screening is aimed at early recognition of disorder for intervention that prevents or reverses the disease process; or to ensure optimal management of the patient, that is, appropriate referrals to specialists when symptoms are anticipated and, informed reproductive decisions or disease management.[11]

One study classified the objectives of pre-marital genetic screening into two, viz: primary objective of identifying carriers among prospective couples to enable carriers to be better informed about genetic risks and reproductive options, and secondary objective of prevention of morbidity due to genetic disease and alleviation of the suffering that this would impose. Genetic screening is a public health initiative that has been used interchangeably with genetic testing.[10]

Problem statement

About 5% of the world's population carries genes responsible for haemoglobinopathies.[8] Each year about 300 000 infants are born with major haemoglobin disorders- including more than 200,000 cases of sickle-cell disease in Africa. Globally, there are more carriers (i.e. healthy people who have inherited only one mutant gene from one parent) of thalassaemia than of sickle-cell disease, but the high frequency of the sickle-cell gene in certain areas leads to a high rate of affected newborns.[8] SCD is particularly common among people whose ancestors come from sub-Saharan Africa, India, Saudi Arabia and Mediterranean countries. Migration raised the frequency of the gene in the American continent.[8]

In developing countries, the child mortality rate associated with SCD is very high and also the survival rate for adults with this condition is poor. Nigeria has the most cases of sickle cell disease among new-borns in Africa and one of the leading cases in the world. Genetic diseases are chronic, difficult and expensive to treat.[9] SCD is a birth defect, the global report on birth defects ranked Sudan as the country with highest birth with 82.0 per 1000 population and Rwanda, Greece, Belarus and Viet Nam the lowest with 50.0 per 1000 population, Nigeria has birth defects of 73.5 per 1000 population (Global report on birth defects, 2021). Frequencies of the carrier state determine the prevalence of sickle-cell disease at birth.[12]

The national strategic plan of action on prevention and control of non-communicable diseases under Nigeria's Federal Ministry of Health has estimated that approximately 24% of Nigerians have sickle cell traits (SCT).[8] Also, it is estimated that when the prevalence of SCT is above 20%, SCD can be as high as 2%. An estimation of over 3.4 million Nigerians currently have SCD. In Nigeria alone, about 150,000 children are born annually with sickle-cell disease.[8] SCD are a major public health problem in the Mediterranean area, the Middle East, Indian Subcontinent, Asia, Tropical African and the Caribbean.[11] Homozygous sickle cells can be prevented by premarital genotype screening. An estimated number of 150 000 babies are born with SCD annually and the sickle cell mortality among children with sickle cell disease is about 50 to 80 percent.[13]

Malaria is a major morbidity associated with SCD and accounts for high mortality rate.[14] In developed countries or high-income countries, the survival rate for sickle SCD is improved, whereas the case is opposite in developing countries. This may be due to lack of utilization of services; premarital genotype screening for SCD and other interventions like screening at birth.[14] SCD causes serious complications to victims. Complications can be episodes of pain also called pain crises or vaso-occlusive crisis which can be mild or severe, acute chest pain; infections from certain germs (bacteria) which can cause pneumonia, meningitis, septicemia or bone infections and can be life threatening.[15] Anemia is also a common consequence of the disease; the anemia can be serious. The cost of treatment of the disease is also a factor, though the disease does not distinguish poor from rich.[15] Any or all major organs of the body are affected by the disease; the liver, kidney, heart, gallbladder, eyes, bones, and joints can suffer damage from abnormal function of the sickle cell and their inability to flow through the small vessels correctly. Hand-foot syndrome characterized by swelling of hand and feet accompanied by fever is caused by sickle cells getting stuck in the blood vessels and blocking the flow of blood in and out of hands and feet.[15]

Family members, caregivers of individuals with SCD and patients may be psychologically affected with repeated suffering from complications associated with the disease.[16] It affects the health status of a community in general, leading to poor health and less productivity. With poor care, patients will die.[16] The prevalence of SCD in Nigeria undermines the attainment of millennium development goals (MDGs), 4, 5 and 6. SCD is particularly associated with increased maternal, neonatal, infant, and child mortality.[17] It is also occasionally associated with HIV and viral hepatitis (mainly B and C) infections due to frequent blood transfusion. Other problems associated with SCD include failure to thieve in children, stunting, stigmatization, job discrimination, illness related absenteeism from school or work, poverty related inaccessibility to standard treatment, depression.[17] Factors that triggers sickle cell disease may include; sudden change in temperature which can make the blood vessels narrow, very strenuous or excessive exercise due to shortage of oxygen, dehydration due to low blood volume, infections, stress, high altitudes due to low oxygen concentrations in air, alcohol, smoking, pregnancy and other medical conditions like diabetes.[18]

The Nigerian government has shown commitment toward improving condition of SCD and reducing the prevalence of this disease.[17] By 2014, a national guideline for the control and management of SCD was published by the Nigerian federal ministry of health, the document outlined that the federal ministry of health in line the president Goodluck Jonathan's transformation agenda in collaboration with the millennium development goals (MDGs) office 2011 and 2012 empowered six federal medical centers in all the six geopolitical zones in the country to run dedicated clinics and programs for the management of SCD.[17] Thus, this study assessed knowledge, and utilization of the premarital services for sickle cell disease among residents in Misau town, a semi urban area of Bauchi State, Northeastern Nigeria.

METHODS

Study area

The study was conducted in Misau local government area (LGA) of Bauchi State, Nigeria. It has an area of 1,226 km² and a population of 263,487 at the 2006 census. The projected population as at December, 2022 was 536,211 using the Nigerian population respective growth rates for the years 2007-2022 and using 2006 census as reference value.[19] Misau local government area is one of the 20 local government areas of Bauchi state, Nigeria and has been in existence before the creation of Nigeria as a town. It has two (2) districts which are: Chiroma and Hardawa districts and sixteen (16) wards namely: Kukadi A, Kukadi B, Gundari, Ajili, Gugulin, Kafin Sule, Sirko, Beti, Hardawa, Zadawa, Akuyam, Gwaram, Jarkasa, Tofu, Sarma and Dunkurmi.[20] The main economic activities of the area are farming and small to medium scale enterprises. The main languages spoken by the people are Hausa-Fulani, Kare-Kare and Kanuri.[21]

Study design

We used a descriptive cross-sectional study design. A total sample size of 308 was calculated using Fisher's formula for estimating the minimum sample size for descriptive studies assuming a prevalence of 24% being the prevalence of sickle cell trait in Nigeria.[22] The minimum sample size was inflated by 10% to compensate for non-responses. The study population included residents (above 18 years) of selected wards in Misau LGA who were present during the data collection processes and consented to participating in the study. A multi-stage sampling procedure was employed in selecting the participants for the study. In the first stage, all (2) of the districts in Misau LGA were selected. In the second stage, four (4) wards were selected out of eight (8)

wards in each districts (representing 50%) using simple random sampling by balloting. In the third stage, settlements were selected. 50% of the settlements were selected using simple random sampling by balloting from each of the selected wards. In the final stage, the respondents were selected. From the selected settlements, a proportionate number based on the population of the settlement were selected for the administering of the questionnaire. A systematic sampling technique was used to select respondents in each sampled settlement. In each sampled settlement, mapping and house numbering was done. A sampling fraction and interval was determined separately for each of the settlements. The first house that the questionnaire was administered was selected by using random number table. Where there are more than one household in the house, one was selected using balloting. For a house without eligible participant, the next house in series was selected and the interval continued from this last house. At the end of the sampling procedure, 308 respondents were selected for the study.

Study instruments description/data collection

A semi structured, self-administered questionnaire was used for the study which was adapted from the previous study with modifications to suite the objectives of this study.[23] The questionnaire was translated into the main local language (i.e. Hausa) and was administered by four Hausa speaking trained research assistants. The questionnaire consisted of three (3) sections (A, B and C that elicited information on the respondents). Section A consisted of socio-demographic data which contained seven (7) items, section B contained nineteen (19) items on knowledge of premarital screening for SCD, while section C contained fifteen (15) items on utilization of premarital screening for SCD. Informed consent was obtained from all prospective respondents. The consent form was translated into the main local language, and literate respondents indicated acceptance by signing the consent form, while illiterate participants affixed their thumbprint. Ethical clearance for the study was obtained from the Ethics committee, Bauchi State University Gadau. The permission of the local authorities and traditional community leaders (of the selected wards) was obtained before commencement of data collection.

Data analysis

Data collected was stored in a computer using Microsoft excels. The data was analyzed using Statistical Package for the Social Science (SPSS) 24 version 26 at 5% significance level and 95% confidence interval. Nineteen questions on knowledge of SCD and premarital screening were asked, a correct response was scored one point, while a wrong response was allocated a zero point. Respondents with knowledge score of (0-6), (7-12) and (13-19) were considered to have poor, fair and good knowledge of SCD and premarital screening respectively. Similarly, fifteen questions on utilization of premarital screening for SCD were asked, a correct response was scored one point while a wrong response was allocated a zero point. Respondents with attitude score of (0-5), (5-10) and (11-15) were considered to have poor, fair and good utilization of premarital screening for SCD respectively. Data analysis was done using frequencies and percentages which were displayed in tables under the result findings.

RESULTS

Out of 308 questionnaires distributed to various respondents (being the total sample size), 283 questionnaires were dully filled and returned giving a response rate of 91.9%.

Table 1: Distribution of socio-demographic information of the respondents.

Variables	Frequency (n=283)	Percentage
Age (years)		
10-19	4	1.4
20-29	34	12.0
30-39	81	28.6
40-49	110	38.9
50-59	20	7.1
60-69	24	8.5
70 and above	10	3.5
Total	283	100.0
Mean age	42	
Gender		
Male	91	32.2
Female	192	67.8
Total	283	100.0
Marital status		
Single	8	2.8
Married	249	88.0
Divorced	24	8.5

Continued.

Variables	Frequency (n=283)	Percentage
Widowed	2	0.7
Separated	0	0
Total	283	100.0
Level of education		
None	64	22.6
Primary	52	18.4
Secondary	67	23.7
Tertiary	100	35.3
Total	283	100.0
Religion		
Islam	283	100
Christianity	0	0
Others	0	0
Total	283	100.0
Ethnicity		
Hausa	117	41.3
Fulani	166	58.7
Others	0	0
Total	283	100.0
Occupation		
None	26	9.2
Trading	223	78.8
Civil work	34	12.0
Total	283	100

Majority of the respondents were aged 40-49 years (38.9%) with mean age of 42 years. 192 (67.8%) were of female gender and 249 (88.0%) of the respondent were married. 100 (35.3%) had tertiary level of education, 166 (58.7%) were of Fulani ethnicity and 223 (78.8%) were traders by occupation (Table 1).

Table 2 shows the distribution of knowledge of premarital screening of SCD among the respondents. Majority of the respondents (73.1%) reported knowing what SCD is as well as genotype testing and out of these, only 26.9% described it as a blood disorder. Their commonest sources of information were family and friends 45.6%, followed by social media 28.3% and health worker 12.0%. Only 26.1% of the study participants identified sickle cell trait as having recessive sickle cell gene. 26.9% indicated that having dominant sickle cell trait causes SCD, also 26.9% reported that SCD is transmitted by inheritance of sickle cell gene. 73.9% did not know that SCD can be cured, while 26.1% said that it can be prevented and identified premarital screening as an intervention to prevent it.

Table 2: Knowledge on premarital screening for sickle cell disease among the respondents.

Variables	Frequency (n=283)	Percentage
Are you aware of what sickle cell disease is?		
Yes	207	73.1
No	76	26.9
Total	283	100.0
If yes to question, describe sickle cell disease		
Blood disorder	76	26.9
Others	131	46.2
Not applicable	76	26.9
Total	283	100.0
Are you aware of what genotype testing is?		
Yes	207	73.1
No	76	26.9
Total	283	100.0
Where did you hear about genotype testing/sickle cell disease?		
Health worker	34	12.0

Continued.

Variables	Frequency (n=283)	Percentage
Social media	80	28.3
Family and friends	129	45.6
Other media (TV, newspaper etc)	40	14.1
Total	283	100.0
What is sickle cell trait?		
Having recessive sickle cell trait	74	26.1
Others	2	0.7
Not applicable	207	73.2
Total	283	100.0
What causes sickle cell disease?		
Having dominant sickle cell trait	76	26.9
Others	0	0
Not applicable	207	73.1
Total	283	100.0
How is sickle cell disease transmitted?		
Inheritance of sickle cell gene diseases	76	26.9
Others	0	0
Not applicable	207	73.1
Total	283	100.0
List symptoms of sickle cell disease known to you		
Chest pain and edema diseases	76	26.9
Others	0	0
Not applicable	207	73.1
Total	283	100.0
Is sickle cell disease hereditary?		
Yes	76	26.9
No	0	0
No idea	207	73.1
Total	283	100.0
Can sickle cell disease be cured?		
Yes	74	26.1
No	0	0
No idea	209	73.9
Total	283	100.0
Can sickle cell disease be prevented?		
Yes	74	26.1
No	0	0
No idea	209	73.9
Total	283	100.0
If yes, how?		
Premarital screening	74	26.1
Others	0	0
Not applicable	209	73.9
Total	283	100.0
List effect of having a child born with sickle cell disease in the family		
Frequent sickle cell crisis	76	26.9
Others	0	0
No idea	207	73.1
Total	283	100.0
How severe is Sickle cell disease?		
Not severe	0	0
Not certain	0	0
Severe	74	26.1
Not applicable	209	73.9
Total	283	100.0
What are the benefits of knowing whether an individual has sickle cell disease/traits?		
Having healthy family/ marriage life	74	26.1

Continued.

Variables	Frequency (n=283)	Percentage
Others	0	0
Not applicable	209	73.9
Total	283	100.0
Genotype testing helps predetermine the carrier status of couple planning marriage?		
Yes	74	26.1
No	0	0
No idea	209	73.9
Total	283	100.0
Genotype test can enable couple to decide if the risk of having a child with certain genetic makeup is advantageous?		
Yes	74	26.1
No	0	0
No idea	209	73.9
Total	283	100.0
Pre-marital genotype testing can help determine the compatibility of couples.		
Yes	74	26.1
No	0	0
No idea	209	73.9
Total	283	100.0
Genotype testing can indicate if the individual is predetermined to develop a disease or trait?		
Yes	74	26.1
No	0	0
No idea	209	73.9
Total	283	100.0

Table 3 shows the distribution of utilization of premarital screening services among respondents. Majority of the respondents 66.8% had undertaken genotype test, 66.1% had done it at a health facility, 58.7% did it within the year and 39.2% were of AA genotype. 25.1% decided undertake the test by themselves, 26.5% did it because of their parents, 6.7% were encouraged by their partners to do the test, while 7.1% did it because of religious authority. 65.0% were counselled for the test, and it was done by a health worker 60.4%. Majority of them 61.1% informed their partner about the result of the test. About half of the respondents 48.4% reported that their partners had undertaken genotype test and 28.0% were of their results were of AA genotype. Most of the respondents 62.2% indicated that genotype test does not influence their selection of spouse. Majority of respondents 98.6% reported that their parents didn't have genotype before their own marriage. 77.0% said that their parent behavior of undertaken test did not affect their decision to do it, and 26.1% reported that the best time for premarital screening for SCD is at the beginning of the relationship.

Table 3: Utilization of premarital screening of sickle cell disease among the respondents.

Variables	Frequency (n=283)	Percentage
Have you undergone genotype test?		
Yes	189	66.8
No	94	33.2
No idea	0	0
Total	283	100.0
If yes, where?		
Health facility	187	66.1
Others	0	0
Not applicable	96	33.9
Total	283	100.0
What year?		
Within the year	166	58.7
Last 5 years	21	7.4
No idea	0	0
Not applicable	96	33.9
Total	283	100.0
Which of this group do you belong?		

Continued.

Variables	Frequency (n=283)	Percentage
AA	111	39.2
AS	62	21.9
SS	0	0
Not applicable	110	38.9
Total	283	100.0
Who decided that you should have genotype testing done?		
Self	71	25.1
Partner	19	6.7
Parents	77	27.2
Religion authority	20	7.1
Others	96	33.9
Total	283	100.0
Why?		
Admission requirement	9	3.2
Done by parent	75	26.5
When donating blood	27	9.5
Clinical research	0	0
Curiosity	35	12.4
Guide on choice of partner	41	14.5
Others	0	0
Not applicable	96	33.9
Total	283	100.0
Were you counselled before the test?		
Yes	184	65.0
No	3	1.1
No idea	0	0
Not applicable	96	33.9
Total	283	100.0
If yes, by who?		
Health worker	171	60.4
Others	0	0
Not applicable	112	39.6
Total	283	100.0
Have you informed your partner (person you intend to marry) of the result of your genotype test?		
Yes	173	61.1
No	11	3.9
No idea	0	0
Not applicable	99	35.0
Total	283	100.0
Has your partner gone for genotype testing?		
Yes	137	48.4
No	142	50.2
No idea	4	1.4
Total	283	100.0
If yes, what is the result?		
AA	68	28.0
AS	75	26.5
SS	0	0
Others	11	3.9
Not applicable	129	45.6
Total	283	100.0
Does your partner genotype influence your selection as a spouse?		
Yes	103	36.4
No	176	62.2
No idea	0	0
Not application	2	0.7
Total	283	100.0

Continued.

Variables	Frequency (n=283)	Percentage
Did your parent undergo genotype testing before his or her own marriage?		
Yes	2	0.7
No	279	98.6
No idea	0	0
Not applicable	2	0.7
Total	283	100.0
Did your parent behaviour of undergoing genotype testing affect your own decision to go for genotype testing?		
Yes	63	22.3
No	218	77.0
No idea	0	0
Not applicable	2	0.7
Total	283	100.0
When do you think is the best time to undertake genotype test before marriage?		
At the beginning of the relationship	74	26.1
When dating	1	0.7
During courtship	19	6.7
Few weeks or month to the marriage	0	0
Others	138	48.8
Total	283	100.0

DISCUSSION

This study assessed the knowledge and utilization of premarital screening for SCD among residents of Misau town, Bauchi State. The results showed that the participants were mostly youth of 40-49 years i.e. 38.9% with a mean age of 42. 59% of the respondents were male, while 41% were females and majority of the respondents (61%) had a secondary school education as the highest educational qualification attained. Approximately half (53%) were students, while 30% were self-employed and 17% were civil servants.

This study found that majority of the respondents 73.1% are aware of SCD and 76% know that it is hereditary, but their level of knowledge on premarital screening of SCD is generally poor (26.1%). This is in contrast to a study among Nigerian immigrants in the United States which found good knowledge among participants (79%) on premarital screening.[16] This dispersion between this two may be due to demography of the population as this study is conducted in a developing country and the latter was in a developed country.[16]

Also, in this study only 26.9% of the participants identified that SCD is a blood disorder while reported 59% of the survey participants correctly identified that sickle cell is a disease that causes the red blood cell to become sickled.[16] In our study, only 26.9% correctly identified how sickle cell disease is acquired while a study in the United States found that 91% of the survey participants correctly identified how SCD is acquired.[16] In our study, question on what causes SCD was reported with a 26.9% correct response while that study in the United States found that 72% of the participants correctly identified the SS genotype as the genetic cause of SCD.[16] The level of awareness of premarital genotype screening reported by a study among youths in Plateau State, northern Nigeria was 50.7% among the respondents, also, it highlighted a more increase in awareness is needed in that area and this is slightly above half compared to this study.[26] Our study contradicts that of a study in Jos, Plateau State Northern Nigeria which found that 59% of the respondents knew their genotype and only 11 (1%) claimed AS genotype.[27] The same study also found that majority of the respondents 113 (97.4%) were aware of SCD while the remaining 3 (2.6%) were not aware.[27] 110 (80.0%) knew the disease as an inherited disorder and 81 (51.9%) responded that they knew someone having the disease. In terms of signs and symptoms, 61 (44.5%) do not know any of the signs and symptoms through which one can identify individual with the disease.[27]

This our study also contradicts the study in Sokoto North West of Nigeria which found 62.5% knowledge score indicating good knowledge, almost all, 269 (99.3%) of the respondents had heard of SCD, and the most common sources of information cited were schools 44.6% and family members 40.5%.[28] Most 248 (92.2%) of the respondents had good knowledge of SCD. Most of them 88.1% knew AA as normal hemoglobin (Hb) genotype, and that sickle cell disease can be inherited if both parents have SS or AS Hb genotype. Whereas, only 2 (0.7%) of the respondents knew that SCD can be cured through bone marrow transplant, majority of them (53.2%) knew that it can be prevented through premarital genotype counseling and testing.[28]

The result of this study is similar to that study conducted in Kano State, which found 45.9% knowledge score among respondents.[29] Despite having poor knowledge score on premarital screening, majority of the study participants 73.1% report knowing about what SCD and genetic testing. This is in line with the study30 in Kano

State which found that only 33% and 31% of the respondents knew their haemoglobin genotype and that of their serious fiancés respectively.[30] Response on some knowledge items in this study is similar to that of a study conducted in Gombe State, Nigeria which found that 205 (73.20%) have heard of premarital genotype screening with hospital being their source of information.[31] Furthermore, 87 (42.40%) of the respondents mentioned AA, AS, SS as type of genotype they know and majority 151 (73.70%) affirmed that patient with SS gene is said to be carrying the sickle cell genotype gene.[31]

This study found the level of utilization of premarital screening service for SCD to be 47.0%, 19.1% and 33.9% good, fair, and poor respectively. This is similar to the study in the United States also found that 57% of the survey participants responded that they would undergo premarital genetic screening and 19% of the survey participants indicated that they would end the relationship if both have sickle cell traits.[16] The level of utilization in this study is similar to that of a study in Lagos which found that 64.88% of the respondents had good practices related to SCD or SCD premarital counselling.[25] Majority of the respondents 62.1% knew their genotype status and 54.5% knew their own and that of their partner, 26.1% said it should be done at the beginning of a relationship. This is in line with the study in Anambra State, Nigeria which found that there is a high utilization of premarital genotype screening for SCD; 55.5% had knowledge of their genotype and that of their husbands.[32] 23.7% and 13.5% of them knew their genotypes before courtship and during courtship respectively. 34.3% knew theirs before wedding and only 7.2% knew after wedding.[32]

CONCLUSION

This study revealed that majority of the participants is aware of SCD, but about two-third didn't know that SCD is hereditary and can be prevented. Majority of the respondents knew their genotype status and that of their partners. In addition, utilization of premarital screening services among the respondents is good. This may be attributed to the law on compulsory premarital screening services in the state.

Recommendations

Based on the findings of this study we recommend for a continuous health education on premarital screening for SCD to the communities in semi-urban areas of Bauchi State and Nigeria. In addition, genetic counselling and testing should be made a mandate before every marriage. The community leaders should continue enforcement of the existing law on compulsory premarital screening for SCD. The policy makers at the state level should made genetic screening services available in all primary health care centers and more awareness programmes should be created at school programmes to enlighten students on premarital screening services for SCD. Finally, genetic test result should be made part of requirement for admission into schools so as to diagnose the disease early and for informed decision.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Maigoro AM, Ibrahim AM, Usman US, Abdullahi IA. Knowledge and utilization of premarital screening for sickle cell disease among residents of semi-urban community, Bauchi State, Nigeria. Int J Community Med Public Health 2024;11:57-67.