

## Original Research Article

# Knowledge And Attitude Towards Premarital Sickle Cell Disease Screening Among Students Attending Federal College of Education, Kano, Nigeria

### ABSTRACT

**Background:** Sickle cell disease is a condition in which an individual inherit two abnormal haemoglobin genes from both parents  $\beta\text{s}/\beta\text{s}$  (HbSS), resulting in a pathological state which is attributed to the sickling phenomenon, vasoocclusion crises, infection and other complications. About 5% of the world's population carries genes responsible for haemoglobinopathies and each year about 300 000 infants are born with major haemoglobin disorders including more than 200,000 cases of sickle-cell disease in Africa. Sickle cell disease 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 anaemia in Nigeria alone. The study aimed to explore the knowledge and attitude of students attending the Federal College of Education, Kano ~~students~~ about premarital screening for sickle cell disease.

**Methods:** A descriptive, cross-sectional study was conducted using interviewer-administered structured questionnaire among 305 students. Descriptive statistics of frequency count and percentages were used to describe the demographic data, while the non-parametric statistics of chi-square set at  $P=0.05$  level of significance were used to test the hypotheses.

**Results:** Majority of respondents had ~~ve~~ low knowledge sickle cell disease and ~~also had~~ ~~ve~~ negative attitude towards premarital sickle cell screening 45.9% and 40% respectively, although up to 9.1% selected blood group as their genotype. Predictors of knowledge from the study ~~were~~ ~~are~~ programme of study, religion and age which ~~were~~ ~~as~~ seen a significant relationship between knowledge of premarital sickle cell screening and the variables with  $p$ -value  $< 0.05$  while those predictors for attitude towards premarital sickle cell screening include religion, knowledge of sickle cell disease and marital status  $p$ -value  $< 0.05$  as indicated in the results.

**Conclusion:** ~~The study shows tha~~ ~~The students t~~ ~~the respondents~~ have poor knowledge and attitude towards sickle cell disease and premarital screening. ~~The results of this study reflect~~ ~~t~~ the importance of health education as a keystone is necessary in improving knowledge and attitude towards premarital screening for sickle cell disease.

**Keywords:** Attitude, Knowledge, Premarital, Screening, Sickle Cell Disease

### 1. INTRODUCTION

Pre-marital genetic screening as health services targeted at individuals and families which try to enable people with a genetic disadvantage, and their families to live and reproduce as

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20 normally as possible, assuring access to relevant medical services (diagnostic, therapeutic,  
21 counseling, rehabilitative and preventive) and social support systems, helping them to adapt  
22 to their unique situation and providing information to enable educated and voluntary choices  
23 in health and reproductive matters [1]. Pre-marital genetic screening can identify and modify  
24 behavioural, medical and other health risk factors known to impact pregnancy outcomes  
25 through prevention and management. It is capable of reducing the burden that birth defects  
26 and genetic disorders impose on most couples and people [2].

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27 One of the biggest health challenges to the human race is sickle cell disorder [1]. It is a  
28 genetic disorder transmitted from parents to their offspring's. The disorder is associated with  
29 many challenges resulting from frequent hospitalization of the affected individual due to  
30 vasoocclusion crises or other forms of complications. Despite major advances in our  
31 understanding of the molecular pathology, pathophysiology, and causes of the inheritable  
32 disorders, thousands of infants and children are dying through lack of appropriate preventive  
33 measures such as lack of premarital sickle cell screening by intending couples to know their  
34 haemoglobin genotype before marriage [3].

35 Some of the objectives of pre-marital genetic screening includes: early recognition of  
36 disorder for intervention that prevents or reverses the disease process; or to ensure optimal  
37 management of the patient, that is, appropriate referrals to specialists when symptoms are  
38 anticipated and, informed reproductive decisions or disease management [4]. It has been  
39 recommended that it is time to start ascertaining the compatibility of intending couples to  
40 make marriages work better, and on more realistic grounds by way of premarital screening  
41 and testing [1]. There is need to encourage the practice of premarital sickle cell screening.  
42 Prevention of sickle cell disorder and risk minimization through screening and carrier  
43 identification remains the only realistic approach to reduce the impact of the disease  
44 especially in an adult population. Tertiary institutions have large concentration of adult  
45 population and they form important sub groups of the population since they are at a relatively  
46 high level of education and in the manageable age group [5], thus the aim and target of the  
47 study.

48 Healthy manpower is vital to national development. Nigeria is a developing country yearning  
49 for development. The health and wellbeing of students from tertiary institutions as potential  
50 manpower of the nation should be of great concern. Therefore, this study was designed to  
51 find out the ~~kk~~knowledge and attitude of students of Federal College Education, Kano,  
52 towards pre-marital genetic screening.

## 54 2. MATERIAL AND METHODS

### 55 2.1 Respondents recruitment and Sample collection

56 First how to recruit respondents...The instrument used for data collection was a self-  
57 administered structured questionnaire. Questions were drawn based strictly on the stated  
58 objectives and literatures reviewed on premarital sickle cell screening. REFF? Following  
59 reception of patients, consent and ethical clearance from appropriate authorities, a total  
60 number of 305 venous blood samples were aseptically collected in anticoagulated sodium  
61 heparin universal container from both sexes of students of various age groups offering  
62 different programmes (Pre-NCE, NCE, B. Ed and PGDE) at the institution. The  
63 corresponding blood samples were transported and analyzed at Hematology laboratory,  
64 Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria for haemoglobin genes genotyping  
65 using the methods of Bello *et al* [6].

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Comment [a7]: Provide the name of the institution

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### 66 2.2 Method of data analysis

67 | How to describe knowledge?  
 68 | How to describe attitude  
 69 | Questionnaire used?

70 | The quantitative raw data were collated and tallied. Descriptive statistics including  
 71 | frequencies, percentages, were used to present the data. Chi-square was used to test the  
 72 | hypotheses at 95% confidence interval 0.05 levels of significant. All the statistical analyses  
 73 | were performed using statistical package for social sciences (SPSS), version 18.  
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75 | **3. RESULTS → USE PAST TENSE**

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 77 | A total of 305 respondents data were collected for the study from students offering different  
 78 | programmes (Pre-NCE, NCE, B. Ed and PGDE) at the institution, consisting of: Out of the  
 79 | total respondents, 59.0% are females, and 41% are males, aged Majority of the  
 80 | respondents' age between 21 to 25years (which make up 32.5%), while the least are 46  
 81 | years and above (4.9%). Marital status?? Muslims (Islamic Religion) constitutes 68.9% of  
 82 | the respondents which predominates and 31.1% are Christians (Table1).

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Comment [a9]: Marital status, but this is religion?

83 | Table 1 shows that less than half of the total (about 124 respondents; about 40.7%)  
 84 | were assessed with positive attitudes towards premarital sickle cell screening through  
 85 | graded scale questionnaire; while the rest showed negative attitude, and 181 respondents  
 86 | about 59.3 were having negative attitudes towards premarital sickle cell screening.

87 | **Table 1. Demographic Characteristics of the students (n=305) attending the ...**  
 88 | **institute. Respondents (n=305)**  
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	Demographic Variables	Frequency	Percentage (%)
Gender	Male	125	41.0
	Female	180	59.0
	<b>Total</b>	<b>305</b>	<b>100.0</b>
Age	16 – 20	70	23.0
	21 – 25	100	32.8
	26 – 34	50	16.4
	35 – 40	45	14.8
	41 – 45	25	8.2
	46 and Above	15	4.9
Marital Status	<b>Total</b>	<b>305</b>	<b>100.0</b>
	Unmarried	100	32.8
	Married	150	49.2
	Divorced	25	8.2
	Widowed	30	9.8
Religion	<b>Total</b>	<b>305</b>	<b>100.0</b>
	Islam	210	68.9
	Christianity	95	31.1
Programme of Studies	<b>Total</b>	<b>305</b>	<b>100.0</b>
	Pre-NCE	70	23.0
	NCE	95	31.1
	B. Ed	90	29.5
	PGDE	50	16.4
Knowledge Assessment	<b>Total</b>	<b>305</b>	<b>100.0</b>
	High Level Knowledge	140	45.9
	Low Level Knowledge	165	54.1
Attitude	<b>Total</b>	<b>305</b>	<b>100.0</b>
	Positive Attitude	124	40.7

Negative Attitude	181	59.3
<b>Total</b>	<b>305</b>	<b>100.0</b>

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This study was conducted with the aim of assessing the knowledge and attitude of the student of Federal College of Education Kano regarding premarital screening for sickle cell disease. Total number of respondents are 305 for the study of which majority are females and Muslims. The respondents cut across various socio-demographic characteristics with their age ranging from 16-46 and above years. Majority of the respondents are between 21years and 25years. The fact that a reasonable number of the respondents are single makes the study most appropriate for the study group because the respondents need to be aware of the importance of premarital sickle cell screening before they get married (Table 1).

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**Table 2. Relationship between Attitude and Knowledge Level of Premarital Sickle Cell Screening and Gender of Respondents**

Gender	Knowledge Assessment		Total
	High Level Knowledge	Low Level Knowledge	
Male	53	72	125
Female	87	93	180
<b>Total</b>	<b>140</b>	<b>165</b>	<b>305</b>

Marital Status?? Marital status must be married vs. unmarried, not gender?	Attitude		Total
	Positive Attitude	Negative Attitude	
Male	49	76	125
Female	75	105	180
<b>Total</b>	<b>124</b>	<b>181</b>	<b>305</b>

Comment [a11]: Statistical analyses?

Table 2 shows the Relationship between attitude and knowledge level of premarital sickle cell screening and gender of respondents. Higher percentage of female students having better knowledge and attitude greater than that of the male students was recorded.??

**Table 3. Relationship between Attitude and Knowledge Level of Premarital Sickle Cell Screening and Marital Status of students ..., pls refer on how to make table informative Respondents**

Comment [a12]: Statistical analyses?

Marital Status	Knowledge Assessment		Total
	High Level Knowledge	Low Level Knowledge	
Unmarried	41	59	100
Married	80	70	150
Divorced	9	16	25
Widowed	10	20	30
<b>Total</b>	<b>140</b>	<b>165</b>	<b>305</b>

Marital Status	Attitude		Total
	Positive Attitude	Negative Attitude	
Unmarried	27	73	100
Married	74	76	150
Divorced	13	12	25
Widowed	10	20	30

<b>Total</b>	<b>124</b>	<b>181</b>	<b>305</b>
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110 Married and Unmarried respondents shows high level of knowledge 53.3% and 41.0%  
 111 respectively as regard to Divorced and Widowed Marital status group with prevalence of  
 112 36.0% and 33.3%. Attitude of the respondents is in disparity with knowledge assessment as  
 113 Divorced marital status group showed highest positive attitude 52.0% followed by the  
 114 married and widowed individuals 49.3% and 33.3% respectively, the least being Unmarried  
 115 marital status group 27.0% (Table 3).

116 A prevalence of 45.9% was observed for high knowledge about premarital sickle cell  
 117 screening, respondents in the study based on age, showed that age group 35 – 40 were  
 118 observed to have the highest prevalence of 66.7% followed by 41 – 45 and 21 – 25 age  
 119 groups having 60.0% and 49.0% prevalence respectively. The lowest prevalence 31.4%  
 120 was observed in the age group 16 – 20, age groups of 26 – 34 and 46 and above had a  
 121 prevalence of 38.0% and 33.3% respectively (Table 4). Table 4 shows the attitude of the  
 122 respondents towards premarital sickle cell screening with reference to age. Age groups 46  
 123 and Above and 35 – 40 shows high attitude of the respondents 66.7% and 53.3%  
 124 respectively compared to age groups 16 – 20 and 21 – 25 with lowest attitudes 31.4% and  
 125 39.0% respectively.

126 **Table 4. Relationship between Attitude and Knowledge Level of Premarital Sickle Cell**  
 127 **Screening and Age of Respondents**

Comment [a13]: Statistical analyses?

Age	Knowledge Assessment		Total
	High Level Knowledge	Low Level Knowledge	
16 – 20	22	48	70
21 – 25	49	51	100
26 – 34	19	31	50
35 – 40	30	15	45
41 – 45	15	10	25
46 and Above	5	10	15
<b>Total</b>	<b>140</b>	<b>165</b>	<b>305</b>

Age	Attitude		Total
	Positive Attitude	Negative Attitude	
16 – 20	22	48	70
21 – 25	39	61	100
26 – 34	19	31	50
35 – 40	24	21	45
41 – 45	10	15	25
46 and Above	10	5	15
<b>Total</b>	<b>124</b>	<b>181</b>	<b>305</b>

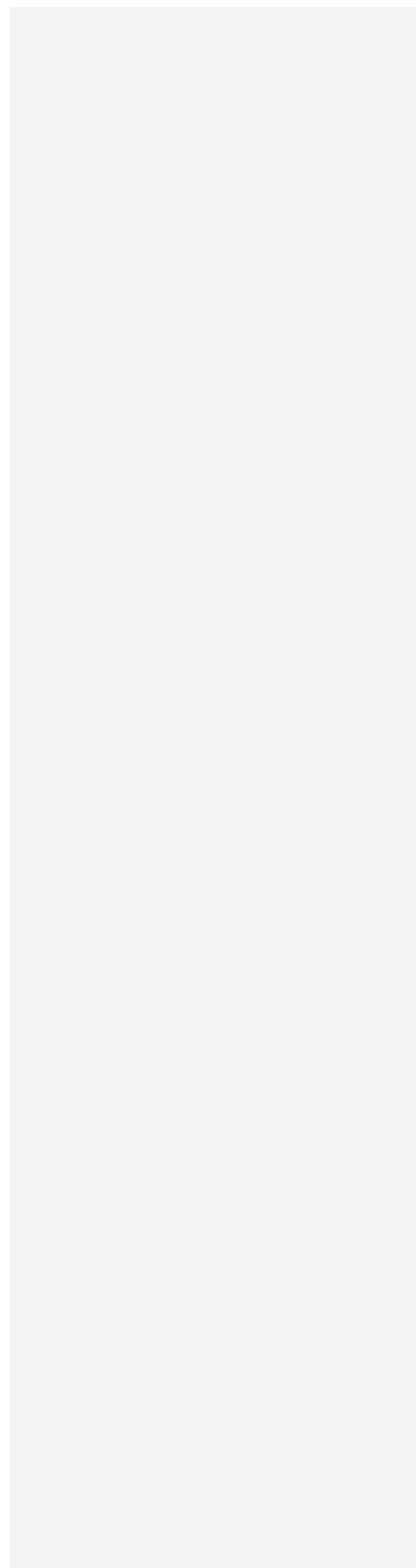
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129 The results of table 5 shows that Pre-NCE students has the least knowledge about the topic  
 130 followed by NCE students 35.8% while PGDE and B. Ed students shows higher prevalence  
 131 about knowledge of premarital sickle cell screening 70.0% and 50.0% respectively. The  
 132 attitude of the respondents shows that PGDE students are the only group with positive  
 133 attitude 50.0% towards premarital sickle cell screening while all the other group of students  
 134 in other programme of studies have negative attitude toward premarital sickle cell screening  
 135 as follows NCE (45.3%), Pre-NCE (30.0%), and B. Ed (38.9%) with statistical significance (p  
 136 = 0.109), Therefore, there is no significant difference in positive attitude towards premarital  
 137 sickle cell screening between students of different programmes at FCE, Kano (Table 5).

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141 **Table 5. Relationship between Attitude and Knowledge Level of Premarital Sickle Cell**  
 142 **Screening and Programme of Studies of Respondents**

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Programme of studies	Knowledge Assessment		Total
	High Level Knowledge	Low Level Knowledge	
	26	44	70
NCE	34	61	95
B. Ed	45	45	90
PGDE	35	15	50
<b>Total</b>	<b>140</b>	<b>165</b>	<b>305</b>

Programme of studies	Attitude		Total
	Positive Attitude	Negative Attitude	
Pre-NCE	21	49	70
NCE	43	52	95
B. Ed	35	55	90
PGDE	25	25	50
<b>Total</b>	<b>124</b>	<b>181</b>	<b>305</b>

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144 Knowledge assessment of premarital sickle cell screening shows that most of the  
 145 respondents that are Muslims (Islamic Religion) have low knowledge (31.4%) while majority  
 146 (77.9%) of the Christians (Christianity Religion) have high knowledge (Table 6).  
 147 Respondents with Christianity religion shows majority 68.4% of them with positive attitude  
 148 towards Premarital Sickle Cell screening and the respondents with Islamic religion have  
 149 negative attitude 28.1% towards premarital sickle cell screening having statistical  
 150 significance of  $p= 0.00$ , which indicates the rejection of the null hypothesis (H2) and  
 151 accepting the alternate, therefore there is significant difference in the attitude towards  
 152 premarital sickle cell screening due to religion among students of FCE Kano (Table 6).

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154 **Table 6. Relationship between Attitude and Knowledge Level of Premarital Sickle Cell**  
 155 **Screening and Religion of Respondents**

Comment [a15]: Statistical analyses?

Religion	Knowledge Assessment		Total
	High Level Knowledge	Low Level Knowledge	
Islam	66	144	210
Christianity	74	21	95
<b>Total</b>	<b>140</b>	<b>165</b>	<b>305</b>

Religion	Attitude		Total
	Positive Attitude	Negative Attitude	
Islam	59	151	210
Christianity	65	30	95
<b>Total</b>	<b>124</b>	<b>181</b>	<b>305</b>

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157 The relationship between knowledge of premarital sickle cell screening and attitude shows  
 158 that majority 60.0% of the students who have high knowledge on premarital sickle cell  
 159 screening also shows positive attitude towards it, likewise majority 75.8% of the students  
 160 with negative attitude are seen to have low knowledge on the subject matter, giving a  
 161 statistical significance of  $p= 0.00$ , indicating the rejection of the null hypothesis (H4), therefore  
 162 is significant difference between knowledge of premarital sickle cell screening and attitude  
 163 towards premarital screening (Table 7).  
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**Table 7. Relationship between knowledge of premarital sickle cell screening and Attitude towards premarital sickle cell screening**

Comment [a16]: Statistical analyses?

Knowledge Assessment	Attitude		Total
	Positive Attitude	Negative Attitude	
High Level Knowledge	84	56	140
Low Level Knowledge	40	125	165
<b>Total</b>	<b>124</b>	<b>181</b>	<b>305</b>

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**4. DISCUSSION → do not mention all the authors in manuscript, but put into reffeences.**

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Majority of the respondents have low knowledge about sickle cell anaemia and is consistent with the position? of Isah [7] where about 65.7% of the population have poor knowledge about premarital sickle cell screening in Sokoto, where.. among school of nursing students and inconsistent with that of Arulogun [8]. Most of the respondents who have heard of genetic disease knew the cause. However, a reasonable proportion demonstrated a poor knowledge about the cause of genetic diseases. This indicates the need for enlightenment about the causes of genetic diseases. Most of the respondents demonstrated poor knowledge on premarital sickle cell screening. However, reasonable proportions of the respondents have higher levels of knowledge on premarital sickle cell screening. Similar lower level of awareness of genotype have been reported from studies among youths in selected areas in Lagos [3], while in contrast with findings that have been reported from studies among undergraduate students in Yobe State, Nigeria by Animasahun [9].

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The result of this study showed that there is significant difference in the knowledge of premarital sickle cell screening due to gender among students of Federal College of Education, Kano. This is reflected in Table 2 of the study showing higher percentage of female students having more knowledge and attitude greater than that of the male students. This result is in contrast with the findings of Schmidt [10] which showed that males scored higher on knowledge and were more susceptible to fear of diseases than their female counterparts. Conversely in line with, Al-Aama et al [11] reported in a study on knowledge regarding the national premarital screening program among university students in Western Saudi Arabia, they found out that females have more knowledge than males. Sobhy et al [4] submit that there is a positive correlation between knowledge and attitude, hence, this study and similar studies like that of Abd-Al-Azeem et al [5] they demonstrated that females were more oriented and more knowledgeable with important health issues related to pre-marital genetic screening than males which they said later reflected on their better attitude. Al-Aama [11] in a study on attitudes towards mandatory national premarital screening for hereditary hemolytic disorders discovers that women also had better knowledge and stronger attitudes toward the implementation of screening with a significantly higher number of female respondents believing that the pre-marital screening should be mandatory and that marriage should not be allowed between two carriers of the same disorder.

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More than 50% of the PGDE and B. Ed respondents had good knowledge of sickle cell disease, and the premarital screening for the disease with a significance p-value <0.05 due to programme of study (Table 5). This is comparable to the 78.9% recorded among undergraduate students in Benin, south-south Nigeria as stated by Omuemu et al. [12] and the 80% recorded among youths in Yaba, a suburb of Lagos, Nigeria by Oludare [13]. It is



208 however higher than the levels recorded in various communities in the Middle East, El-  
209 Hamzi [14]. The high level of knowledge of these groups of the respondents in our study can  
210 be attributed to their high educational status. It can also be attributed to the higher  
211 prevalence of sickle cell disease in Nigeria, and the fact that these respondents in our study  
212 are older, married and were already exposed to premarital screening, in course of their  
213 getting married.

214 According to Al-Aama et al [11] and Abioye et al [3] the effectiveness of carrier screening  
215 programmes depends largely on the awareness of the target population. This is consistent  
216 with the current study because the analysis of the relationship between knowledge and  
217 attitude of pre-marital genotype screening shows that knowledge is a strong determinant of  
218 attitude of premarital genotype screening p-value <0.05 (At 5% significant level). This  
219 implies that the respondents ought to be aware of the importance of genotype screening for  
220 them to be screened (Table 7).

## 221 5. CONCLUSION

222 ~~The students at ..... his study shows that the respondents~~ have poor knowledge of sickle  
223 cell disease and premarital screening, ~~however, though~~ a reasonable number of the  
224 respondent have good attitude towards premarital screening. Reasons for non-adherence as  
225 identified by some students include; lack of knowledge of premarital sickle cell screening  
226 before getting married, and lack of knowledge of the consequences of not doing premarital  
227 sickle cell screening. ~~The results of this study reflect t~~The need for health education is  
228 necessary as a keystone in improving knowledge and attitude toward premarital screening  
229 for sickle cell disease.

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### 230 5.1 Recommendation

231 Based on the findings in this study, these recommendations were recommended:

- 232 1. Health education about sickle cell disease shall be intensified in the schools and  
233 also shall be made available for the community.
- 234 2. Premarital screening services should be made available for student and people in  
235 the community and shall be made affordable
- 236 3. Media shall be used as a way creating community awareness since only very few of  
237 the respondents knew sickle cell disease.
- 238 4. Government should institute strict policies on premarital sickle cell screening to  
239 ensure that individuals going into marriage knew their status before marriage.
- 240 5. Religious leaders should educate their youths on the importance of premarital  
241 genotype screening and should be made a criterion before marriages are conducted.

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## 242 243 COMPETING INTERESTS

244 Authors have declared that no competing interests exist.

## 245 246 247 248 ETHICAL APPROVAL

249 All authors hereby declare that all experiments have been examined and approved by the  
250 appropriate ethics committee and have therefore been performed in accordance with the  
251 ethical standards laid down in the 1964 Declaration of Helsinki.

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255 **REFERENCES**

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