KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS PREMARITAL SCREENING FOR SICKLE CELL DISORDER AMONG UNIVERSITY OF BENIN STUDENTS.

BY

OHIS MUHAMMED OHIOMA	**MED1304560**
OLATEJU SAMUEL	**MED1304565**

DEPARTMENT OF COMMUNITY HEALTH
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN,
BENIN CITY.

JUNE, 2021.

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BEING A ONE YEAR PROJECT PRESENTED TO THE DEPARTMENT OF COMMUNITY HEALTH, SCHOOL OF MEDICINE, COLLEGE OF MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN-CITY, EDO STATE.

PROJECT SUPERVISOR: PROF. (MRS) A.N OFILI
DEPARTMENT OF COMMUNITY HEALTH
COLLEGE OF MEDICAL SCIENCES

UNIVERSITY OF BENIN, BENIN CITY.

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (MBBS) DEGREE IN UNIVERSITY OF BENIN, BENIN CITY.

JUNE, 2021.

DECLARATION

We hereby declare that this work is original and was carried out by the under-listed researchers under appropriate supervision.

OHIS MUHAMMED OHIOMA
MED1304560
08131257840

Ohisohioma64@gmail.com

OLATEJU SAMUEL
MED1304565
07054684556

Psalmteju@gmail.com

CERTIFICATION

I hereby certify that this research is original and was carried out under my supervision in the Department of Community Health, College of Medicine, University of Benin as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS).

PROF. (MRS) A.N OFILI.
MBBS, MD, FWACP, FMCPH
Professor/Consultant (Project Supervisor)
Department of Community Health,
University of Benin Teaching Hospital.

DR. (MRS) E.O OGBOGHODO
MBBS, FWACP, FMCPH
Head of Department,
Department of Community Health,
University of Benin Teaching Hospital.

DEDICATION

We dedicate this work to God Almighty for his grace and blessings towards us which have sustained and enabled us to reach the successful conclusion of this project. We also dedicate this work to our respective families whose immense moral and financial support have brought us this far. We also want to dedicate our project to our very good friend and colleague Glory Aimufua whom we lost to Sickle Cell Disorder in 2016, may your soul rest in perfect peace dear friend. This work is also dedicated to our Teacher and Mother who has guided us through this work, words are not sufficient enough to describe how kind, loving and sweet you have been to us. May God Almighty bless you abundantly Ma.

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ABSTRACT

BACKGROUND: Hemoglobinopathies are the commonest inherited genetic disorders worldwide. Sickle cell disorders were discovered by Dr J.B Herrick in 1904. There are some hopes for a definitive cure for sickle cell disorders in the form of stem cell transplantation. However premarital screening for intending couples seem to be an important primary preventive method. Pre-marital medical screening is a panel of tests that couples preparing to get married undertake so as to detect any genetic or infectious disease that may be transmitted to each other of their offspring.

OBJECTIVES: This study aims to add to the existing body of knowledge on sickle cell disorder and to access the knowledge, attitude and practice of premarital screening for sickle cell disorder among students of University of Benin.

METHOD: A descriptive cross-sectional study was carried out among 393 students using multi-stage sampling technique from six selected faculties (Physical Sciences, Life Sciences, Education, Management Sciences, Law, Pharmacy.) from the 13 faculties in the University. The time duration of this study spanned from August 2019 to June 2021. Data was collected using an self-administered questionnaire. Data was obtained and analyzed using IBM SPSS version 25.0. Analysis employed descriptive and inferential statistics. Level of significance was set at 5%.

RESULTS: Out of the 393 participants, Female students constituted 219 (55.7%) of our respondents while male students constituted about 174(44.3%). Findings from this study showed a large proportion of the respondents 272(72.0%) had a poor overall knowledge about sickle cell disorder, while those with good knowledge made up about 106(28.0%). A high proportion 203(51.7%) had a good knowledge of premarital genotype screening, while 190(48.3%) of had poor knowledge of premarital genotype screening. Our results also showed that showed a large proportion of respondents 206(52.3%) had a poor practice of premarital genotype screening, while about 187(47.7%) respondents had good practice of premarital genotype screening.

CONCLUSION/RECOMMENDATIONS: The study concluded that the undergraduates of this institution had poor knowledge of sickle cell disorder and genotype status, they however had good attitude towards premarital genotype screening as more than half of the participants showed positive attitude towards premarital screening. The study also showed that there was poor practice of premarital screening among the participants. We recommend increase participation of the undergraduates towards premarital screening.

KEYWORDS: Premarital genotype screening, Knowledge, Attitude, Practice, undergraduates

LIST OF ABBREVIATIONS

SCD: Sickle Cell Disorder

UN: United Nations

WHO: World Health Organization

DEFINITION OF TERMS

SICKLE CELL DISORDERS: Group of disorders characterized by the presence of an abnormal form of hemoglobin in red blood cell of humans.

GENOTYPE: The genetic makeup of an organism or group of organisms with reference to a single trait.

SCREENING: Active ongoing search and surveillance for a disease in apparently healthy individuals with the aid of a rapid investigative tool or kit.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Sickle cell disorder is a very common medical condition in sub-Saharan African, many individuals who are not medically inclined believe that sickle cell anemia, sickle cell disorder and sickle cell trait all mean the same thing. “Sickle cell disorder” is a term that connotes a group of conditions in which the red blood cells have an abnormal type of hemoglobin called hemoglobin S[1]. While the sickle cell anemia is the manifestation of the disorder. It is the most widely recognized hereditary disorder in Africa. Sickle cell trait is simply having an abnormal or altered genes that allows one to come down with the disorder. Knowledge of these basic terms are key in understanding the concept of this project work. Generally, Hemoglobinopathies are the commonest inherited genetic disorders worldwide. Sickle cell disorder was discovered by Dr J.B Herrick in 1904[2]. It is postulated that the geographical distribution of sickle cell trait is very similar to that of malaria and this may explain why it has been maintained at such high prevalence level in tropical Africa[3].

The clinical effect on individuals with sickle cell disorder (SCD) can be devastating as many deaths are recorded yearly in Nigeria and in extension Africa. Studies have shown that Nigeria has the highest burden of sickle cell anemia in the world[1]. These statistics are fairly under reported considering the country does not have adequate diagnostic equipment and methods and many individuals who live in the rural areas as well as some urban setting are not aware of their genotype[2].

There are some hopes for a definitive cure for sickle cell disorder in the form of stem cell transplantation. However premarital screening for intending couples seems to be an important primary preventive method. The disorder (SCD) is characterized by chronic destruction of red blood cells in the body leading to varying symptoms such as yellowness of the eyes, leg ulcers, effort intolerance[2].

Many youths are in federal and state universities across Nigeria advancing through their academic pursuits and one of the most effective ways to prevent the ever increasing incidence of sickle cell disorder, mortality and morbidity associated with disorder is by public enlightenment policies and health lectures about the existences of such hereditary conditions and how it can be prevented[3].

Over the years, lots of funding have been put into methods of treatment and less emphasis on methods of prevention; thus, a need for this research especially in the famous University of Benin. With the advent of the internet one could expect that the knowledge about the disorder should have been on the increase, however myths and misinformation surrounding the disorder still continue to exist.

There is a lot of stigmatization concerning patients suffering from sickle cell disorder[8]. It affects the individual physically, mentally, and all other domains of health[4]. It has a very huge socioeconomic effect on the family, society and country at large. There is therefore a need for all the right stakeholders both private and public sectors to make sure the burden of the disorder is reduced. Screening as a preventive measure cannot be overemphasized, Premarital medical screening is a panel of tests that couples preparing to get married undertake so as to detect any genetic or infectious disease that may be transmitted to each other or their offspring. This forms an integral part of genetic counselling. This screening process remains one of the most important strategies of preventing genetic disorders like sickle cell[3]. The history of premarital screening dates back to 1970s in countries such as the United States for conditions such as sickle cell disorder. It has been successfully implemented in countries like Canada, United Kingdom, Greece, Italy with a variety of medical conditions peculiar and endemic to those regions[3].

1.2 STATEMENT OF THE PROBLEM

Despite the several interventions both at the international and national levels the incidence of sickle cell anemia is still on the rise. It is an unfortunate thing to behold because Nigeria, Democratic Republic of Congo and India contribute about 57% of the total newborns with sickle cell anemia[5]. Nigeria has the highest pool of individuals with sickle cell anemia, and there are reduced facilities and specialists to take care of the health need of the individuals affected by this disorder.

The problem of sickle cell disorder is that it is inherited and as such one of the ways of preventing it is by genetic counselling, in Nigeria 45000 to 90000 babies are delivered with sickle cell disorder yearly[6]. These numbers are frightening and it seems a panacea is far-fetched and it is compounded by the fact that there is deficient knowledge among graduates and undergraduates. The World Health Organization and the United Nations have designated sickle cell disorder as a major public health concern in West Africa. The average prevalence rate is 2% of the population, while 10-30% of the population is estimated to carry the sickle cell trait[3].

The disorder is recognized among the ten priority non communicable medical conditions and it contribute significantly to both adult and child mortality, Nigeria has the highest prevalence at birth 2% and 0.05% for adult. In Africa more than 200,000 infants are born with sickle cell disorders[7], the disorder affects all sexes and races (but more common among blacks)[7] and more common among younger children. These individuals require blood transfusion especially during life threatening crises. Many teaching hospitals and medical centers across Nigeria do not have adequate health personnel and facilities to take care of these individuals, most of these individuals come from a very poor background and can't even afford the bills for the medical care.[7] Premarital counselling and screening is an integral part of the process leading to marriage, yet most African traditional homes do not usually emphasize on pre-martial screening for sickle cell disorder thus some couples are not even aware of their genotype till after they are married[3]. despite the legal implementation of premarital screening and counselling in Saudi Arabia, the incidence of sickle cell disorder has not changed .Over the last 15 years, studies have revealed that the reason for this may be due to the high level of consanguinity between first cousins(>50% of total marriages) and the population's lack of awareness of inherited hematological disorders[5].

1.3 JUSTIFICATION

Nigeria is one of the many countries with the highest prevalence of sickle cell disorders, this study aims to add to the existing body of knowledge on sickle cell disorder and how pre-marital screening is a cost-effective tool in reducing the growing burden of the condition[9].

This work is meant to act as an eye opener to individuals who have never heard about sickle cell disorders. The consequences of the disorder are deadly but the good news is that the condition is very much “preventable”.

The death tolls are alarming in Africa and many governments have swung into action by building screening and treatment centers, investing a lot of funds into the elimination of the disorder. But prevention is the most effective way of battling the disorder, it has no vaccine and the only way of curing it is through stem cell transplantation which is very costly for citizens of a third-world country such as Nigeria[9]. The pain a parent goes through knowing his or her child would die from sickle cell disorder is sometimes devastating.

This study aims to assess how well the youth and students in this glorious federal university know about this disorder, the prevention, socioeconomic burden of the disease on the individual, family, society, country and the world at large.

1.4 RESEARCH QUESTION

1. What is the level of knowledge of the students of University of Benin towards Sickle cell disorder?
2. What is the attitude and belief of the students of University of Benin towards Sickle cell disorder?
3. What is the knowledge of the students of University of Benin towards premarital screening for sickle cell disorder?
4. How does the knowledge of genotype affect the incidence of the disorder?
5. How does the knowledge of their genotype and sickle cell disorder influence their premarital decision?

1.5 AIM AND OBJECTIVES

GENERAL OBJECTIVES

To access the level of knowledge, attitude and practice of premarital screening for sickle cell disorder amongst students of University of Benin, Edo State.

SPECIFIC OBJECTIVES

1. To access the level of knowledge of sickle cell disorder among students of University of Benin.
2. To access the knowledge of premarital screening for sickle cell disorder among students of University of Benin.
3. To access the attitude and practice towards premarital screening for sickle cell disorder among students of University of Benin.

CHAPTER TWO

LITERATURE REVIEW

Companionship, support and procreation usually forms the basis for any marriage.[8] This makes the act of choosing a partner quite challenging as it is necessary for a balance to be formed between these basis of marriage and the enormous responsibilities associated with them include the time factor and financial commitments.[9,8] In the event of an unfortunate situation in marriage where a couple has a child or children with a chronic medical illness like sickle cell disease, the responsibilities of marriage becomes even more severe on the couples. Sickle Cell Disorder can be prevented through premarital screening of intending partners. However, as previous studies have shown, due to poor attitude and practice, the incidence of children with sickle cell disorder still remains high.[10,]

2.1 Knowledge of Sickle Cell Disorder

Knowledge of sickle cell disorder is very important for intending couples. Due to the remarkable public health implication of sickle cell disorder in Africa, it has been acknowledged by the World Health Organization to have a global impact.[11] In Nigeria, previous studies have shown a sporadic increase in the number of babies born with the disorder annually. However, the level of knowledge of sickle cell disorder still remains low even amongst people with tertiary level of education.[12,13]

A Cross sectional observational study was done during the period of June 2010 to May 2011 among 276 subjects with sickle cell including those with the disorder and those with the trait who were registered at the primary health centers of Bardoli region of Surat district, Gujarat, India. The study included only subjects within the ages of 18 to 30 years. A pretested semi structured questionnaire was administered to subjects. The study aimed to test the subjects on their awareness and knowledge of SCD. The data gotten was then analyzed using Epi Info 7, MS excel. The result of the study revealed that only 9% of the subjects knew that SCD can be inherited. There was no significant difference in the knowledge of SCD between the male and female subjects. Only 16% of the subjects had good knowledge of the features of SCD while 78.6% of the subjects had a fair knowledge of its features. Another remarkable result was the fact that only 2.5% of the subjects knew their genotype.[14] This study is in contrast to other studies carried out in West Africa where there is a large burden of sickle cell patients.[12,13] The was also carried out without considering the level of education of subjects with makes it less suitable for comparison with other similar studies. The purposive sampling of subjects within the age of 18 to 30 years was necessary as they form a major bulk of the reproductive population of the community and are a major determining factor of further spread of SCD in the future.

There was a slightly improved level of knowledge in a similar Cross-sectional study done in 2016 over a period of two months at the Acharya Vinobha Bhave Rural Hospital (AVBRH), Maharashtra, India.[15] The sample size was gotten by purposive sampling for 50 subjects with sickle cell disorder who attended the AVBRH clinic and were within the age group of 3-33years. Patients who were uninterested in participating in the study and patients with sickle cell trait or other haemoglobinopathies were excluded from the study. Ethical clearance for the study was obtained from appropriate authorities. Data was collected with the aid of a self-administered questionnaire which was written in their local language. Only thirty two (64%) subjects knew that they had SCD and of the other eighteen subjects that knew their sickle cell status, only fourteen of them were aware that SCD is due to some abnormalities in the blood cells.[15] This shows the need for adequate education to be done even amongst patients with sickle cell to improve their level of awareness. This study however, did not take into consideration the level of education of the subjects as their level of awareness might just have been attributable to their little or no level of formal education.

A Descriptive Cross-sectional Study was carried out in 2015 amongst 329 undergraduate students of Ebonyi State University which is located in Abakaliki, Ebonyi State, Nigeria.[12] The sample size for the study was determined using the kish's formula and was based on a 95% confidence interval and a prevalence of knowledge gap of 73.4% with the degree of accuracy set at 0.05 level. A multistage sampling technique consisting of a cluster sampling and simple random sampling method was employed in selection of the faculties and departments for the study. A pretested, semi-structured self-administered questionnaire was used for data collection. This study adopted several variables to access the respondent's knowledge about sickle cell disorder including its modes of inheritance and methods of prevention. Permission to conduct the study was taken from appropriate authorities. The data were analyzed using the statistical package for social sciences (SPSS) software version 20. The result of the study showed that one hundred and ninety one (58.1%) of the respondents had adequate knowledge of the disorder. The respondents showed high levels of knowledge in its mode of inheritance and methods of diagnosis. However, only ninety seven (29.4%) of the respondents had knowledge of the features associated with sickle cell disorder. Thirty four (10.3%) of the respondent believed that SCD is contagious and some other respondents also believed that SCD is caused by witchcraft, evil spirit, curse by enemies and punishment from God.[12] The study added enough variables to access the knowledge respondents which further increased the probability of a valid conclusion to the study. The study then recommended that health education should be reinforced to impact adequate knowledge about SCD as this will help equip people to make informed decisions and actions towards prevention and control of SCD.

A Similar cross-sectional, analytical study was also carried between April and June, 2014 among 370 members of the National Youth Service Corps in Benin City, Edo state, Nigeria.[13] A structured interviewer-administered questionnaire was used for data collection and data collected were subjected to statistical analysis using the statistical package for social sciences (SPSS) version 16. The questionnaire elicited various variables to assess the knowledge of participants on SCD including its etiology, clinical manifestations, control measures and treatment. Approval to carry out the study was gotten from appropriate authorities. The result of the study showed that most (98.4%) of the participants were aware of the existence of SCD. Mass media/health talks was the major source of information and only forty nine (17.8%) of the participants had good knowledge of SCD. Most of the participants (63.5%) had a fair knowledge of SCD.[13] The study also showed that those who studied health related courses had better knowledge of SCD. The study then recommended that certain policies should be put in place by the government to improve health education of the public and ensure prevention and control of SCD.

2.2 Knowledge of Premarital Screening

Pre-marital genetic screening presents a good chance for individuals to predict the genetic predisposition to disease and also provides an idea on the genetic imagery of their newborns.[16] The aims of the Premarital genetic screening are mainly to reduce the burden of genetic disorders on the persons, families and the community, improve the knowledge of the community on the types of inheritance and genetic disorders and the appropriate way of selection.[17] The level of awareness of the population regarding various aspects of the relevant disorders included in the

Premarital Screening is a vital determinant of the success of such a program.[15] It is therefore important to conduct studies among the community to assess this level of knowledge.

A cross sectional study carried out in 2014 among female students of Hail University, Saudi Arabia.[18] Selection of the participants was done randomly among female students aged between 18 and 30 years. Close-ended questions were chosen to fill the questionnaire that was designed after review of the literature on knowledge and attitude of the National Premarital Screening program. The questionnaire was originally created in English language then translated to Arabic to be easy for the whole university students to fill. A pilot study was performed on a group of 50 students to test its clarity and validity. Difficult questions were then modified or replaced. The questionnaire consisted of 4 main parts; the first part was on the socio-demographic data including age, nationality, college, academic year, marital status and parents' consanguinity. The second part tested the students' knowledge regarding the National Premarital Screening. The third part was about the disease included in the National Premarital Counselling. The forth part included questions about the attitudes and beliefs about the Premarital Screening program. A brief explanation about the main objectives of the study was done before giving the questionnaires. Six hundred and forty students received questionnaires that cover all aspects of the study. The questionnaire was distributed to seven colleges inside Hail University, Saudi Arabia. Ethical considerations were followed throughout the study steps.[18]

In Nigeria, several studies have also been done to access the level of knowledge as regards premarital screening even though there is no national program on premarital screening.[19,20,21] A descriptive cross sectional study and was carried out in 2016 at School of Nursing and Midwifery Sokoto, located in Sokoto, the capital of Sokoto State, in the North Western geopolitical zone of Nigeria.[19] The study population comprised of the nursing students 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 characteristics, knowledge and attitude regarding premarital screening for Sickle Cell Disorder among the study subjects. Data was collected and sorted manually. Computer data processing was done using SPSS version 21 statistical software package. Frequency runs were done for further editing and cleansing of the computerized data. All statistical analysis was set at 5% level of significance which is a p-value of 0.05 or less. A total of one hundred and sixty five Nursing and Midwifery students with correctly filled questionnaires participated in the study. About 97% of respondent claimed to know about Sickle Cell Disorder and the major source of information was school (86.3%). Only about 75% knows normal hemoglobin. Majority (97%) responded that SCD could be inherited genetically, 36.6% of the respondents reported that it could be inherited genetically if both parent are either SS or AS, 20.6% of the respondents reported that it can only be inherited genetically if both parent are AS, Others (15.7%) during child birth etc. Majority (96.4%) of respondents said Sickle Cell Disorder is a serious medical condition, 45.0% of them said because it led to death, 18.5% because of anaemia, 6.6% because it was not curable, others (29.8%) always patient is bedridden or sick. Up to 83% of respondents said SCD could 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% reported through others means. Only 21.2% of the respondents correctly knew Hemoglobin genotype as a test for Sickle cell disorder confirmation. In general, the respondents had a fairly good knowledge of what sickle cell disorder and premarital screening entailed.[19] The study however did not give an extensive explanation of their method of sample size determination as well as the sampling technique used.

A much improved level of knowledge of sickle cell disorder and premarital screening was noticed in another study done in South-South Nigeria. It was a descriptive, cross-sectional study done in 2013 amongst full time degree students in the University of Benin, Benin City, located in Ovia North East Local Government Area of Edo State, Nigeria was done to assess awareness and acceptability of premarital screening.[21] All male and female undergraduate students who had completed at least their first year were included in the study while the part-time and diploma students were excluded because they were not always available. The Cochran's formula which is the standard formula for sample size determination in a cross-sectional study was used to calculate the sample size. A prevalence of 63.6% was used to calculate, a minimum sample size of 356. An addition of 10% error margin brought the sample size to 392. However, a total of 400 questionnaires were completed and returned. The multistage sampling technique was used in selecting the respondents. In the first stage, six Faculties (Agricultural Sciences, Education, Law, Life Sciences, Pharmacy and Social Sciences) were selected from the 13 Faculties in the University using simple random sampling method. Then two Departments were selected from each of the 6 Faculties by balloting, and from these, simple random sampling method was used to select three levels (200, 300 and 400) for those faculties studying a four year course and in addition, 500 level for those studying 5 and 6 years course. Systematic sampling technique was then used to select participants in each level. Data was collected by means of a pretested, self-administered structured questionnaire where Information was sought on socio-demographic characteristics, knowledge of the cause and transmission of SCD as well as their acceptability of pre-marital screening for SCD. Data collected were cleans for inconsistencies and then was analyzed using the Statistical Package for Social Sciences (SPSS) version 16.0 and level of significance was set at 0.05 or less. Due ethical consideration was taken from appropriate authorities to conduct the study. The undergraduate students showed a very impressive knowledge of premarital screening and sickle cell disorder. Almost all (95.8%) of the respondents were aware of the haemoglobin genotype and 98.8% had heard of Sickle cell disorder. Of those who had heard of sickle cell disorder, majority of them (93.2 %) had correct knowledge of genotype that cause sickle cell disorder. 78.9% were aware of premarital screening for sickle cell disorder and 96.2% of them had correct knowledge of what it entailed. [21]

2.3 Attitude and Practice of Premarital Screening

One of the best ways of preventing sickle cell disorder is through premarital screening for the identification of carriers of the sickle cell gene, especially for couples who are heterozygous or homozygous for the disorder.[22] The high burden of sickle cell disorder in the developing countries such as Nigeria makes premarital screening an ideal method of identifying at risk couples and reducing the burden of the disorder as it requires less technical expertise, less financial implication and less ethical burden than other more expensive and invasive procedures like intrauterine diagnosis and in-vitro selection and implantation of normal embryo.[23,24] In Nigeria, there is currently no formal premarital screening programme for the sickle cell gene, however churches and other institutions that solemnize marriage increasing require of intending couples to be screened for the disorder.[25] These screening programs have helped to detect a large proportion of at-risk couples, and therefore played a significant role in reducing the number of children born with sickle cell disorder. Several studies have also been done in the past to review and assess the attitude of people towards the uptake of premarital screening for the sickle cell disorder.[25, 26]

A Cross-sectional study was done from January to April, 2011 among 590 students of Saltan Qaboos University (SQU) who visited the school's clinic during the period of the study.[26] The study targeted mainly students who were unmarried whether male or female and who were also willing to participate in the study. Using the EPI Info statistical package version 6, a minimum sample size of 500 was calculated for use. A structured questionnaire with close-ended questions which was first written in English but later translated to Arabic for better comprehension was used as the tool for data collection. The questionnaire was then pretested among a group of 32 students to check for its validity. Errors noticed during the pretest were removed or modified. The students involved in the pretest were excluded from the final study. The questionnaire was self-explanatory and tested the knowledge of students towards premarital screening programs as well as their attitude towards them. A section of the questionnaire also contained the socio-demographic characteristics of the participants. The students were assured of confidentiality even before filling the questionnaire and due ethical considerations for the study were made from the appropriate authorities in January 2011. There was 590 valid questionnaire of the 600 questionnaires that was initially shared. These questionnaire were subject to descriptive statistical analysis using the STATA Version 11.0. The fisher's exact tests for cells less than 5 was used to test for significance when necessary and a p-value of <0.05 was considered significant. Of the 590 students who participated in the study, 311(53%) of them were females while 279(47%) of them were males. Their age ranged from 18-27. Forty nine (8%) of the students claimed to have a personal history of hereditary disease while two hundred and ten (36%) of them reported to have a family history of hereditary disease. The attributed disorders were sickle cell disorder, B thalassemia and G6PD deficiency. Most of the students who participated in the study (92%) acknowledged that it was important for premarital screening to be conducted for unmarried couples and agreed to do so before they get married. Most of them (88%) believed it was necessary to do a premarital screening test to avoid transmitting inherited disorders to their children, some others (50%) gave reason that it was to ensure partner is healthy or fit for marriage (41%). Those who thought carrying out premarital screening for SCD was not important gave their reasons to be that outcome of the result may not be in their favor, may interfere with God's will for them, may be degrading of their socio-political status, prevent their continuation of marriage or terminate their engagement.[26]

Another descriptive Cross-sectional study was carried out in 16 Primary Health Care centers in the South Batinah Governorate of Oman to investigate the knowledge and attitude of patients towards premarital carrier screening.[27] The study was conducted during the period of September to December 2011. The sample size for the study was estimated using EPI Info version 6.0 computer program. With a type-1 error of 5% level of significance (p-value = 0.05) and 95% confidence interval, it was estimated that 460 subjects will be required for the study. Therefore, the target was set to reach 460 participants in order to achieve the objective of the study. Selection of the participants was done by simple random sampling among Omanis, aged 20–35 who visited the health centers for various reasons during the study period. The age-range selection criterion was set to reflect the expected marital age in Oman. Potential candidates among visitors to health centers who fulfilled the inclusion criteria were approached and invited by four staff nurses who were trained to be the research assistants. The purpose of the study, as well as the methodology were explained in details. All potential participants received an information sheet that covers all aspects of the study, and their inquiries were responded to. Candidates who agreed to participate in the study were asked to sign a consent form, and were provided with contacts of the investigators for any further inquiries. A self-administered questionnaire was used to collect the data under the supervision of qualified nurses and health educators. A total of 460 persons were approached, and 428 (93.0%) consented to participate in the study. Nonetheless, 28 questionnaires were excluded from the study due to incomplete responses. A total of 400 subjects were therefore included in the analysis. Based on available literature on Knowledge, Attitude and Perception paradigm on Premarital Carrier Screening, a questionnaire was developed with items that would not contravene Oman's socio-cultural teaching. Firstly, an English language version of the questionnaire was developed in order to elicit Knowledge, Attitude and Perception towards Premarital Carrier Screening. The questionnaire included both close and open-ended questions. Close-ended questions written in a checklist format were designed to investigate the knowledge of people towards Premarital Carrier Screening, while open-ended questions were designed to explore the opinion of people towards the reasons for their answer selection. The questionnaire was composed of three main parts: socio-demographic data, participants' knowledge, and reasons that prevented them from taking the test in cases where they did not take it. The first part: socio-demographic data was concerned about age, gender, marital status, and educational level. The second part was concerned about the attitude towards Premarital Carrier Screening. The third part consisted of open ended questions which helped investigate reasons that prevented them from taking the test as well as their beliefs. In addition, the questionnaire addressed the options available after Premarital Carrier Screening, namely the options of choosing not to get married, getting married but not having a child with the screened partner, and Pre-conceptual Genetic Diagnosis. The questionnaire was first pretested on 30 randomly-selected participants to assess its clarity, as well as to modify and update certain linguistic and succinct issues. The finalized questionnaire was then translated into Arabic. The participants who were included in the pilot study were also included in the whole study sample. In order to assess the reliability and validity of the developed questionnaire, the newly-modified Arabic version was further pretested on 30 randomly selected subjects. Consent was taken from the participants by getting their signature before they filled the questionnaire. The data collected was then subjected to various statistical analysis using the statistical package for social sciences (SPSS) version 19. Ethical consideration for the study was approved from the appropriate bodies. Of the 400 participants of the study, the majority of the participants (84.5%) believed that Premarital Carrier Screening is necessary and about half of them supported the view of making Premarital Carrier Screening compulsory. The majority (83.8%) also reported that they would advise their spouse to take the premarital screening test. More than 60% of the participants also reported that they would consider results of Premarital Carrier Screening before marrying a partner. About one third of the participants reported that they will not take the test. Over a third of the married participants who did not perform premarital test prior to marriage gave lack of awareness as the reason. Others indicated that lack of testing centers (13%), no interest (10%), or lack of hereditary disease in the family (9%), not important (7%), or no relationship with partner (6%) as the reasons behind their failure to have sought Premarital Carrier Screening.[27]

A cross-sectional descriptive study was carried out among 290 married couples in Choba, a semi-urban community in south-south Nigeria, to assess the knowledge, attitude and uptake of premarital screening.[25] The study was designed to detect a 5% difference in the knowledge of premarital screening for sickle cell trait, with a type 1 error of 5% and using a prevalence of 78.9% as seen in a similar study done among the undergraduate students of the University of Benin, south-south Nigeria.[20] The sample size for the study was determine using the Cochran's formula which is usually used for sample size determination for descriptive studies. The minimum required sample size was thus determined to be 256, but was made up to 300, to take care of non-responses. The participants for the study were selected using a multi-stage sampling technique. The first stage of the sampling process involved the random selection of two extended families, from each of the four villages that make up the Choba community, using the list provided by a trusted traditional chief. The second stage is the selection of respondents from the chosen extended families, carried out using the list provided by the secretary of the extended family. A participant is included in the study only if he is male, and has married within the past ten years, to coincide with the commencement of the premarital screening programme of churches in the community. The data for the study was collected using a structured, interviewer-administered questionnaire that was administered on married male members of the selected extended families of the community. The questionnaire was used to gather information on the socio-demographic characteristics of the respondents, their knowledge and attitude towards sickle cell disease and premarital screening for the disease, and if they were screened for the sickle cell trait, when they got married. The collected data were cleaned and entered into a database, and then analysed using Statistical Package for Social Sciences (SPSS) version 20. The test of significance was conducted using chi square tests, set at 95% confidence interval, with p-value of 0.05 or less considered statistically significant. Most of the respondents had positive attitude towards premarital screening for sickle cell disorder. Nearly all 278 (95.86%) of the respondents considered premarital screening as a very important public health measure, that should be taken over by the government; while 258 (88.97%) felt that the screening should be made compulsory for all intending couples. Most 211 (72.76%) of the respondents carried out the premarital screening when they got married, and most (87.20%) of the screenings were instigated by their churches. About 9% of the respondents that went through the screening were of the same HbAS genotype as their intended spouses, out of which 4 (21.05%) went ahead and got married, citing as reasons the difficulty of forsaking their spouses and the power of God to prevent a child with sickle cell disorder.[25]

CHAPTER THREE

MATERIALS AND METHOD

3.1 Study Area

This study was carried out in the University of Benin, Benin City, Edo State. Edo State was created in 1991 out of the former Bendel state. It is bordered by Delta State to the South, Ondo State to the West, Kogi State to the North and Kogi and Anambra States to the East[28].Bendel was one of the oldest political entities, excised from the then Western region. It was known as the Midwest state, and afterward as Bendel state. Bendel state was part of a protectorate of Southern Nigeria from 1900-1954 and the Western Region from 1955-1963. It was split during the Babangida regime on the 27th August, 1991 into Edo State and Delta State[29].Benin City is a metropolitan city and lies on latitudes 60 06'N, 60 30'N of the Equator, and longitudes 50 30'E, 50 45'E of the Greenwich Meridian and 25 miles north of the Benin River[28].It has a population of 1,147,188 as at the 2006 census and a projected population for 2015 of 1,385,848. The City is comprised of 3 major Local Government Areas of Edo State, namely: Oredo, Egor and Ikpoba-Okha Local Government Areas. The most populous indigenous ethnic group is Benin. The two major businesses of the city include transportation and petty trading; however, there are two brewing factories, a petroleum storage depot, an oil pipeline, a battery assembly factory, four small-scale pharmaceutical production factories, etc. Benin City is home to some of Nigeria's institutions of higher learning, namely: the University of Benin, College of Education, Ekiadolor, and Benson Idahosa University[29].The University of Benin was founded in 1970. It started as an institute of technology and was accorded the status of a full-fledged university by National Universities Commission on 1st July, 1971. The University offers courses at various levels: undergraduate, postgraduate, 19 JUPEB and certificate. Presently, the total student enrolment stands at over 40,000, made up of both full-time and part-time shared among the 13 faculties of the institution[5]. The faculties in UNIBEN include Agriculture, Arts, Education, Engineering, Law, Life Sciences, Management Sciences, Pharmacy, Physical Sciences, and Social Sciences and a College of Medical Sciences which comprises the Schools of Medicine, Dentistry, Basic Medical Sciences and Institute of Child Health[30].

The study was carried out in University of Benin, Ugbowo campus which is located in Benin City, the capital of Edo State.

3.2. Study Design

A descriptive cross-sectional study design was adopted for the study. The study described the knowledge, practice and attitude towards premarital screening for sickle cell disease among University of Benin students.

3.3. Study Population

The study population consisted of full-time undergraduate students who were currently studying at the University.

3.4 Selection Criteria

Inclusion Criteria

The eligible respondents that participated in the study were undergraduate students who were studying in the university and gave consent.

Exclusion Criteria

The undergraduates who refused to give their consent, the part time students and JUPEB students and undergraduates who were not present as at the time of this study.

3.5 Duration of Study

The study duration from August 2019 to June 2021.

3.6 Sample Size Determination

Sample size determination formula

$n=z^2pq/d^2$

Where

n= minimum sample size (when total population is greater than 10000).

z= standard normal variable set at which correspond with the 95% confidence interval

p= prevalence (63.6%) this is the prevalence of the study[7].

q=1-p

=1-0.636=0.364

d=level of accuracy=0.05

Therefore, $n= 1.96^2 \times 0.636 \times 0.364 \div 0.05^2$

This is approximately 356

A non-response of 10% was added. Thus:

$10/100 \times 356= 35.6$

Thus non-response of 35.6 was added

$356 + 35.6 = 391.6$

Thus sample size =391.6

3.7 Sampling Technique

The multistage sampling method was used in selecting the respondents. In the first stage, six faculties were selected (physical sciences, life sciences, education, management sciences, law, pharmacy.) from the 13 faculties in the university using the simple random sampling method. Then three departments were selected from each of the 6 faculties by simple random sampling (balloting); and from these, simple random sampling method was used to select two levels (300 and 400).for those running a 4 year programme and in addition,500 level for those running 5 and 6 years programme. Systemic sampling technique was then used to select participants in each level.

3.8 Method of Data Collection

Data for this study was collected using a standardized structured self- administered questionnaire. The questionnaire contains both open and close ended questions. The questions are grouped into five sections which seek to gather the following information:

Section A: Socio- demographic characteristics.

This section sought to know about the respondents' age, sex, ethnic group, religion and marital status, faculty, department and year of study.

Section B: Knowledge of sickle cell disease (cause, transmission,) and genotype status.

This section sought to assess knowledge of definition, causes, mode of transmission and prevention of sickle cell disorder as well as the knowledge of their genotype status.

Section C: Knowledge of premarital screening for Sickle Cell Disorder

Section D: Attitude and practice towards premarital screening for Sickle Cell Disorder.

3.9 Data Collection Methods

3.9.1 Questionnaires

A Faculty to Faculty survey was carried out to interview the students, a quantitative data collection tool was used to elicit information in line with the objectives of the study. The tool was structured self-administered questionnaire which focused on the objective of the study. A virtual training session lasting 3-4 days was organized for the about 7 undergraduate students (these interviewers are 200 level students of the selected department) from the 6 selected faculties. These 7 undergraduate students were the interviewers. During the virtual training, they were taught how to administer the questionnaires and how to observe COVID-19 protocols while administering the questionnaires, also reviewing the questionnaire with them in details so as to ensure uniformity of criteria, enhancement of validity and reliability of the research tool.

The interviewers were carefully instructed about ethical behaviour and the administration of the questionnaires was taken in an open field in keeping with COVID-19 guidelines. Verbal informed consent was elicited from the participants and participants' anonymity and confidentiality was maintained throughout the study.

3.9.2 Pre-Testing

The pre-testing of the questionnaire which evaluates the reliability, clarity of language, validity and sensitivity of data collection tool was carried out in Ambrose Alli University, Ekpoma Edo State. Ten percent of the sample size was used for the pre- testing.

3.10 Data Management

3.10.1 Data Analysis

All data were coded, entered, and analyzed using the statistical package for social sciences (SPSS) version 20.0. Descriptive data were expressed as frequencies, percentage and means ± standard deviation. The level of significance was p= 0.05 test of association such as chi square, among others was utilized for this study. Information was presented in figures and tables.

3.10.2 Scoring

Age

Age of respondents was grouped for convenience of analysis into:

15-19

20-24

25-29

30-34

Knowledge of Sickle Cell Disorder

The knowledge of Sickle Cell Disorder among Undergraduate students of the University of Benin was assessed using a total of 9 questions that addressed all knowledge domains (awareness, cause, mode of transmission, symptoms, effects/complications and prevention of Sickle Cell Disorder). A score of 1 was given for correct response and 0 for wrong response. The maximum achievable score was 18 and a minimum of 0.

The scores were converted to percentages and respondents with score of ≥ 70.0% were grouped as Good knowledge while those with score of <70% were grouped as Poor Knowledge.

Knowledge of Premarital Screening for Sickle Cell Disorder

The knowledge of Premarital Screening was assessed using a total of 8 questions with 20 domains that addressed all knowledge domains (awareness, cause, mode of transmission, symptoms, effects/complications and prevention of Sickle Cell Disorder). A score of 1 was given for correct response and 0 for wrong response. The maximum achievable score was 20 and a minimum of 0.

The scores were converted to percentages and respondents with score of ≥ 70.0% were grouped as Good knowledge while those with score of <70% were grouped as Poor Knowledge.

Attitude towards Premarital Screening for Sickle Cell Disorder

A total of 6 questions were used to assess the attitude of the respondents towards Premarital Screening for Sickle Cell Disorder using a 2-point likert scale.

The most correct response was given a score of 1 and the least correct response was given a score of 0, giving a minimum score of 0 and a maximum score of 8. The overall attitude score obtained was converted to percentages and those with scores 70% or greater have a positive attitude while those with scores less than 70% have a negative attitude.

Practice of Premarital Screening for Sickle Cell Disorder

Any respondent who agreed that Prematurity Screening is important and had done a premarital screening in the past or intend to do in future was adjudged to have a good practice of premarital screening while those who have never did not do a premarital screening test before marriage or who do not intend to do where adjudged to have a poor practice.

3.11 Limitation of the Study

Some respondents had difficulty remembering specific answers to certain questions. Some respondents were reluctant to participate in the study.

3.12 Ethical Considerations

Institutional Approval

Permission was obtained from the Department of Community Health and the study was carried out under the supervision of a project supervisor from the department.

Individual Informed Consent

Individual consent was obtained from the respondents. Purpose and benefits of the study of study was explained.

CHAPTER FOUR

RESULTS

A Total of 393 undergraduate students of University of Benin participated in the study, giving a response rate of 100%. The results were presented in the following sections in line with the specific Objectives.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

SECTION B: KNOWLEDGE OF SICKLE CELL DISORDER OF RESPONDENTS

SECTION C: KNOWLEDGE OF PREMARITAL SCREENING FOR SICKLE CELL DISORDER

SECTION D: ATTITUDE AND PRACTICE OF RESPONDENTS TOWARDS PREMARITAL SCREENING FOR SICKLE CELL DISORDER

Table 1: Socio-demographic Characteristics of Respondents

Variables	Frequency (n=393)	Percentage (%)
Age (years)		
15-19	76	19.3
20-24	249	63.4
25-29	63	16.0
30-34	5	1.3
Sex		
Male	174	44.3
Female	219	55.7
Marital Status		
Single	388	98.7
Married	5	1.3
Others	0	0.0
Religion		
Christianity	363	92.3
Islam	27	6.9
African Traditional Religion	2	0.5
Atheism	1	0.3
Faculty		
Education	118	29.8
Basic Medical Sciences	82	20.9
Management Sciences	61	15.3
Life Sciences	60	15.3
Social Sciences	51	13.5
Physical Sciences	21	5.3

Among our total respondents, A greater proportion of them 249 (63.4%) were within the 20- 24 years age group, 76 (19.3%) were within the 15-19 years age group, 63 (16.0%) in 25-29 years age group. While those within 30-34 years age group made up the least proportion of students of 5 (1.3%).

Female students constituted 219 (55.7%) of our respondents while male students constituted about 174(44.3%)

A vast majority of our respondents were Single 388(98.7%), while Married individuals made up about 5(1.3%).

Christians made up a greater proportion of our respondents 363 (92.4%), Muslims constituted 27(6.9%), persons who practiced African traditional religion made up 2(0.5%), Atheist made up 1(0.3%).

The Faculty of Education constituted a large proportion of the respondents 118(29.8%), while 82(20.9%) were from Basic Medical Sciences, Management Sciences 61(15.3%), Life Sciences 60(15.3%) Social Sciences 51(13.5%), Physical Sciences had the least respondents 21(5.3%).

About 244(62.1%) of our respondents were in 300 level, 114(29.0%) in 400 level, 24(6.8%) were in 500 level, 11(2.1%) were in 600 level.

A large proportion of the respondents 222(56.5%) resides at halls of residence within the school campus, while about 171(43.5%) of our respondents resides at hostels outside the university campus.

A higher proportion of the respondents were Benin 150(38.2), followed by Igbo 70(17.8), Esan 67(17.0%), Yoruba 45(11.5%), Urhobo 18(4.6%), and others consisting of Idoma, Ijaw, Hausa Efik, Ibibio, Tiv, made about 43(10.9%).

SECTION B: KNOWLEDGE OF SICKLE CELL DISORDER OF RESPONDENTS

Table 2: Knowledge of sickle cell disorder among undergraduates of university of Benin

Variables	Frequency	Percentage (%)
Have you heard of SCD	(n=393)	
Yes	381	96.9
No	12	3.1
Source of information	(n=381)	
School	100	26.2
Health Facilities	88	23.1
Internet	63	16.5
Television	35	9.2
Friends	27	7.1
Family	25	7.0
Religious center	21	5.3
Radio	13	3.3
Newspaper	9	2.3
SCD is caused by	(n=393)	
Genetic mutation	343	87.2
Virus	19	4.8
Prions	12	3.1
Bacteria	6	1.5
Fungi	1	0.3
Unaware	12	3.1
Route of Transmission	(n=393)	
Hereditary Transmission	370	94.1
Contact with skin	7	1.8
Faeco-oral	3	0.8
Exposure to cold	1	0.2
Unaware	12	3.1
Symptoms of SCD	(n=393)	
Body weakness	268	68.2
Difficulty in breathing	55	14.0
Headaches	54	13.7
Others	16	4.1

*Others; anaemia, body pains, fatigue

A vast majority of the respondents had heard about sickle cell disorder 381(96.9%), while about 12(3.1) had not heard about sickle cell disorder.

Among our respondents, a large proportion of them got their source of information in school 100(25.4%), of all our respondents 88(25%), 63(16%), 37(9.5%), 32(8.1%), 30(7.6%), 21(5.3%), 13(3.3%), 9(2.3%) identified their source of information as health facilities, internet, television, friends, family, religious centers, radio, newspaper respectively.

Among our respondents a vast majority of them 343(87.3%) identified genetic mutation to be responsible for the disorder, 19(4.3%) identified the etiological factor to be viral, 12(3.1%) selected prions to the etiological agent, 6(1.5%) selected bacteria as the etiological agent, only 1(0.3%) selected fungi to be the etiological agent, 12(3.1%) did not know the cause of the disorder.

A vast majority of our respondents 370(94.1%) identified the route of transmission to be hereditary, 7(1.8%), 3(1.3%), 1(0.3%) all identified the route of transmission to be skin to skin, feaco-oral, exposure to cold respectively. Only 12(3.1%) were not aware of the route transmission.

A large number of respondents selected body weakness as the cardinal symptom of sickle disorder were 268(68.2%). About 55(14.0%) and 54(13.7%) respondents selected difficulty in breathing and headaches as cardinal symptoms respectively.

Table 3: Knowledge of genotype status of respondents.

Variable	Frequency	Percentage (%)
Genotype	(n=393)	
AA	252	64.1
AS	78	19.8
SS	25	6.4
I don’t know	38	9.7
Knowing Genotype is Important	(n=393)	
Yes	374	95.2
No	18	4.6
I don’t know	1	0.2
Overall Knowledge	(n=378)	
Good	106	28.0
Poor	272	72.0

About 252(64.1%) of our respondents had an AA genotype, respondents who were AS and SS constituted about 77(19.8%) and 25(6.4%) respectively. The remaining 38(9.7%) respondents were not aware of their genotype status.

Majority of the respondents 374(95.2%) believed knowing their genotype status was important while 18(4.6%) of the respondents did not believe knowing your genotype status was important. Only one person was indifferent about knowing his/her genotype status.

From the table above, a large proportion of the respondents 272(72.0%) had a poor overall knowledge about sickle cell disorder, while those with good knowledge made up about 106(28.0%)

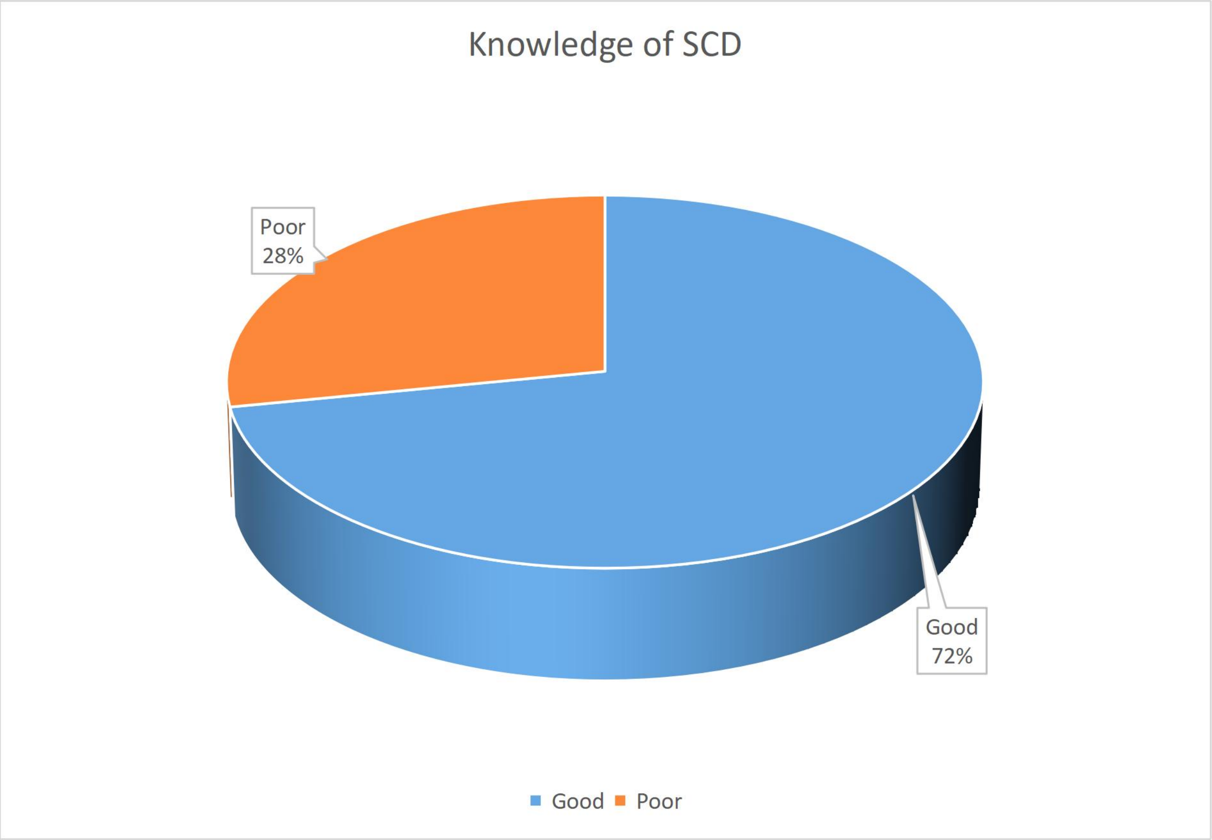

Figure 1: Pie Chart showing Respondents Knowledge of Sickle Cell Disorder.

From the Pie Chart above, two hundred and seventy two respondents (72.0%) had Good Knowledge Sickle Cell disorder while One hundred and six respondents (28.0%) had Poor Knowledge Sickle Cell disorder.

Table 4: Age group, sex, faculty and level of study of the respondents and knowledge of sickle cell disorder.

Variable	Overall Knowledge		Test Statistics	P – value
	Poor	Good		
Age Group				
15-19	18(25.3)	53(74.7)	X^2	0.246
20-24	67(27.5)	177(72.5)		
25-29	16(27.6)	42(72.4)		
30-34	5(100.0)	0(0.0)		
Sex				
Male	52(31.0)	116(69.0)	X^2	0.246
Female	54(25.7)	156(74.3)		
Faculty				
Basic Medical Science	30(38.0)	49(62.0)	X^2	0.111
Education	23(21.1)	86(78.9)		
Life Science	14(23.3)	46(76.7)		
Management Science	15(26.8)	41(73.2)		
Physical Science	5(23.8)	16(76.2)		
Social Science	19(35.8)	34(64.2)		
Level of Study				
300 Level	77(31.8)	165(68.2)	X^2	0.154
400 Level	24(22.0)	85(78.0)		
500 Level	4(22.2)	14(77.8)		
600 Level	1(11.1)	8(88.9)		

From the table above, Majority, 53(74.7%) of respondents with age group 15-19 had a good Knowledge of Sickle Cell Disorder while 18(25.3%) had poor knowledge. One hundred and seventy seven (72.5%) respondents within the age group of 20-24 had good knowledge while sixty seven (27.5%) of them had a poor knowledge. All five of the respondents within the age group of 30-34 had a poor knowledge of sickle cell disease. This test was however not statistically significant has it has a P-value of 0.246.

One hundred and sixteen (69.0%) male respondents had a good knowledge of sickle cell disorder while one hundred and fifty six (74.3%) female respondents had a good knowledge. This test was also not statistically significant with a p-value of 0.246.

Eighty six (78.9%) of respondents from Faculty of Education had a good knowledge of Sickle Cell Disorder while twenty three (21.1%) of them had a poor knowledge. Forty six(76.7%) of respondents from Faculty of Life science had a good knowledge of Sickle Cell Disorder while fourteen (23.3%) of them had a poor knowledge. Forty nine(62.0%) of respondents from Faculty of Basic Medical Sciences had a good knowledge of Sickle Cell Disorder while thirty (38.0%) of them had a poor knowledge. Sixteen (76.2%) of respondents from Faculty of Basic Medical Sciences had a good knowledge of Sickle Cell Disorder while five (23.8%) of them had a poor knowledge. This test was however not statistically significant has it has a P-value of 0.111.

One hundred and sixty five (68.2%) respondents who were in 300 level had a good knowledge of Sickle Cell Disorder while seventy seven (31.8%) of them had a poor knowledge. Eighty five (78.0%) respondents who were in 400 level had a good knowledge of Sickle Cell Disorder while twenty four (22.0%) of them had a poor knowledge. Fourteen (77.8%) respondents who were in 500 level had a good knowledge of Sickle Cell Disorder while four (22.2%) of them had a poor knowledge. Eight (88.9%) respondents who were in 600 level had a good knowledge of Sickle Cell Disorder while one (11.1%) of them had a poor knowledge. This test was however not statistically significant has it had a P-value of 0.111.

SECTION C: KNOWLEDGE OF PREMARITAL SCREENING FOR SICKLE CELL DISORDER

Table 5: knowledge of premarital screening for sickle cell disorder of respondents

Variable	Frequency	Percentage (%)
Awareness of PMS	**(n=393)**	
Yes	297	75.6
No	96	24.4
Source of Information	**(n=297)**	
Internet	68	22.9
Health facilities	63	21.2
Family	41	13.8
Television	39	13.1
Religious center	24	8.1
Friends	23	7.7
Newspaper	20	6.7
Radio	19	6.5
PMS can be defined as	**(n=297)**	
Checking your genotype before marriage	131	44.1
Checking the genotype of intending couples before marriage for compatibility	111	37.4
A counselling that is done for couples before marriage.	55	18.5
Overall Knowledge	**(n=393)**	
Good	203	51.7
Poor	190	48.3

Among our respondents a majority of them 297(75.6%) were aware of premarital genotype screening, while 96(24.4%) of our respondents are not aware of premarital genotype screening.

Out of the 297 respondents who were aware of premarital genotype screening, a high proportion of them 68(17.3%) identified the internet as their source of information, while 63(16%), 41(10.4%), 39(9.9), 24(6.1%), 23(5.9%), 20(5.1%), 19(4.8%), identified their source of information as health facility, family, television, religious centers, friends, newspapers, radio, respectively.

Among the respondents who took part in the study, 131(44.1%) of them defined it as a screening process to check their genotype before marriage, 111(37.4%) of them defined it as a screening process to check the genotype of intending couples for compatibility, while 55 of them defined it as a form of counselling that is done for couples before marriage.

Among the respondents who took part in the study, a high proportion 203(51.7%) had a good knowledge of premarital genotype screening, while 190(48.3%) of had poor knowledge of premarital genotype screening.

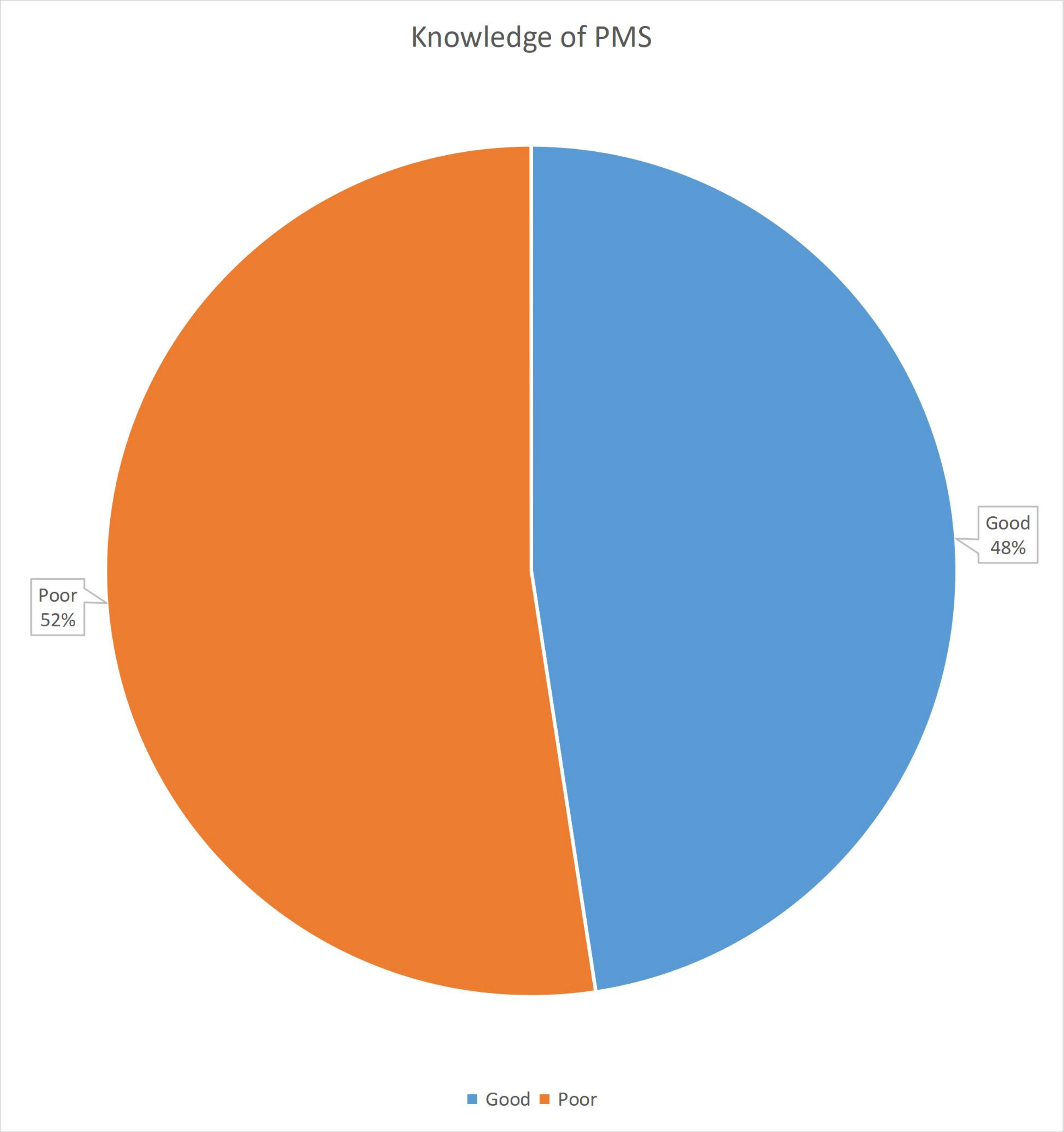

Figure 2. Pie Chart showing Respodent's knowledge of Premarital Screening for Sickle Cell Disorder.

From the Pie Chart above, Two hundred and three respondents (51.7%) had Good Knowledge of Premarital Screening for Sickle Cell disorder while One hundred and ninety respondents (48.3%) had Poor Knowledge of Premarital Screening for Sickle Cell disorder.

Table 6: Age group, sex, faculty and level of study of respondents and knowledge of premarital screening for sickle cell disorder

Variable	Knowledge of Premarital screening		Test statistics	P-value
	Poor	Good		
Age Group				
15-19	34(44.7)	42(53.3)	X^2	0.455
20-24	122(48.8)	128(51.2)		
25-29	33(53.2)	29(46.8)		
30-34	1(20.0)	4(80.0)		
Sex				
Male	87(50.0)	87(50.0)	X^2	0.559
Female	103(47.0)	116(53.0)		
Faculty				
Basic Medical Science	20(24.4)	62(75.6)	X^2	0.001
Education	62(53.0)	55(47.0)		
Life Science	21(35.0)	39(65.0)		
Management Science	47(78.3)	13(21.7)		
Physical Science	12(57.1)	9(42.9)		
Social Science	28(52.8)	25(47.2)		
Level of Study				
300 Level	131(52.8)	117(47.2)	X^2	0.001
400 Level	56(47.9)	61(52.1)		
500 Level	3(15.8)	16(84.2)		
600 Level	0(0.0)	9(100.0)		

From the table above, forty two (53.3%) of respondents within age group 15-19 had a good Knowledge of Sickle Cell Disorder while 34(44.7%) had poor knowledge. One hundred and twenty eight (51.2%) respondents within the age group of 20-24 had Good knowledge while one hundred and twenty two (48.8%) of them had a poor knowledge. This test was however not statistically significant as it has a P-value of 0.455.

Eighty seven (50.0%) male respondents had a good knowledge of sickle cell disorder while Eighty seven (50.0%) male respondents had a good knowledge. One hundred and sixteen (53.0%) female respondents had a good knowledge. This test was also not statistically significant with a p-value of 0.559.

Fifty five (47.0%) of respondents from Faculty of Education had a good knowledge of Sickle Cell Disorder while sixty two (53.0%) of them had a poor knowledge. Thirty nine (65.0%) of respondents from the Faculty of Life Sciences had a good knowledge of Sickle Cell Disorder, while twenty one (35.0%) of them had poor knowledge. thirteen (21.7%) of respondents from the Faculty of Management Sciences had a good knowledge of Sickle Cell Disorder while Forty seven (78.3%) of them had a poor knowledge. Twenty (24.4%) of respondents from faculty of Basic Medical Sciences had good knowledge of Sickle Cell Disorder while sixty two (75.6%) of them had poor knowledge. This test was statistically significant with a P-value of 0.001.

One hundred and seventeen (47.2%) respondents who were in 300 level had a good knowledge of Sickle Cell Disorder, while one hundred and thirty one (52.8%) of them had poor knowledge. Sixty one (52.1%) respondents who were in 400 level had a good knowledge of Sickle Cell Disorder while fifty six (47.9%) of them had a poor knowledge. Sixteen (84.2%) respondents who were in 500 level had a good knowledge of Sickle Cell Disorder while three (15.8%) of them had a poor knowledge. All eight respondents from 600 level had a Good knowledge of Sickle Cell Disorder. This test was however not statistically significant as it had a P-value of 0.111.

SECTION D: ATTITUDE AND PRACTICE OF RESPONDENTS TOWARDS PREMARITAL SCREENING FOR SICKLE CELL DISORDER.

Table 7: Attitude of respondents towards premarital screening for sickle cell disorder.

Variable	Frequency	Percentage (%)
Why people don't do PMS	**(n=393)**	
Ignorance	271	69.0
Negligence	78	19.8
Cost	31	7.9
Inadequate test center	9	2.3
Peer Pressure	4	1.0
Will you do PMS	**(n=388)**	
Yes	373	96.1
No	15	3.9
PMS affect marriage decision	**(n=393)**	
Yes	236	60.1
No	39	9.9
Undecided	118	30.0
Religion affect PMS	**(n=393)**	
Yes	129	32.8
No	187	47.6
I don't know	77	19.6

About 271(69.0%) of the respondents identified ignorance as the main reason people did not carry out premarital genotype screening, while 78(19.8%), 13(7.9%), 9(2.3%), 4(1.0%), identified negligence, cost, inadequate testing center, peer pressure as the reason why people did not carry out premarital genotype screening respectively.

A vast majority of our respondents 373(96.1%) said they would do the premarital screening, while 15(3.9%) said they would not do the premarital genotype screening.

A large proportion of the respondents 236(60.1%) would change their marriage decision based on their premarital genotype screening result, while 39(9.9%) would not change their marriage decision based on their premarital genotype screening result, 118(30%) are uncertain about changing their decision based on their premarital screening genotype result.

Table 8: Respondents practice of premarital screening for sickle cell disorder.

Variable	Frequency (n=393)	Percentage (%)
Willingness to do PMS		
Yes	370	94.1
No	23	5.9
Make PMS affordable		
Yes	355	90.3
No	38	9.7
Make PMS compulsory		
Yes	364	92.6
No	29	7.4
Will you continue with a relationship despite the risk of having a child with SCD		
Yes	14	3.5
No	282	71.8
Undecided	97	24.7
Encourage your relatives to do PMS		
Yes	348	88.5
No	14	3.6
I don’t know	31	7.9
Overall Practice		
Good	187	47.7
Poor	206	52.3

A large proportion of the respondents 187(47.6%) did not think their religious beliefs affect the practice of premarital screening, while 129(32.8%) of them thought their religious beliefs affect the practice of premarital genotype screening, about 77(19.6%) of them did not know if religious beliefs affects the practice of premarital genotype screening.

A vast majority of our respondents 373(96.1%) would do the premarital screening if they had the opportunity, while 15(3.9%) would not do the premarital genotype screening.

A vast majority of the respondents 355(90.3%) identified that making premarital genotype affordable would reduce the incidence of Sickle cell disorder, while 38(9.7%) of them highlighted making the premarital genotype affordable would not reduce the incidence of sickle cell disorder.

A vast majority of the respondents 364(92.6%) identified that making premarital genotype compulsory would reduce the incidence of Sickle cell disorder, while 29(7.4%) of them highlighted making the premarital genotype compulsory would not reduce the incidence of sickle cell disorder.

A large proportion of the respondents 282(71.8%) highlighted that they would not continue with a relationship despite knowing that there is a risk of having a child with sickle cell disorder, while 97(24.7%) are uncertain as to whether they would continue the relationship despite the risk of having a child with sickle cell disorder, 14(3.6%) of them would continue the relationship despite the risk of having a child with sickle cell disorder.

Majority of the respondents 348(88.5%) would encourage their relatives to do the premarital genotype screening, 31(7.9%) were undecided as to whether they would encourage their relatives to do the premarital screening, respondents who would not encourage their relatives to do the premarital screening constituted the least proportion which is about 14(3.6%.)

From the table above, it showed a large proportion of respondents 206(52.3%) had a poor practice of premarital genotype screening, while about 187(47.7%) respondents had good practice of premarital genotype screening.

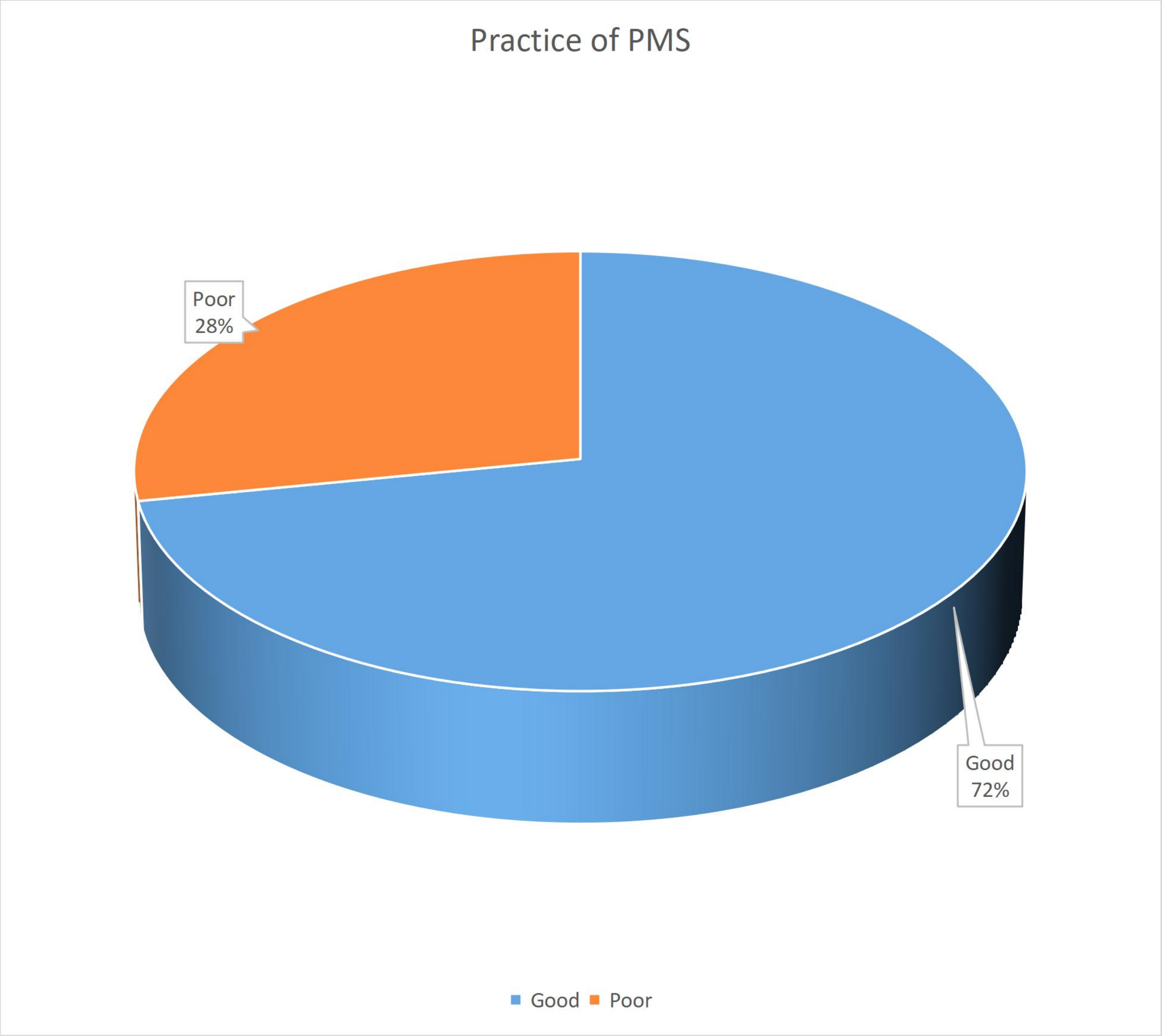

Figure 3: Pie Chart showing Respondents Practice of Premarital Screening for Sickle Cell Disorder.

From the Pie Chart above, One hundred and eighty seven respondents (47.7%) had Good Practice of Premarital Screening for Sickle Cell disorder while Two hundred and six respondents (52.3%) had Poor Practice of Premarital Screening for Sickle Cell disorder.

Table 9: Relationship between overall knowledge and overall attitude of respondents

Overall knowledge	Overall Attitude		Test Statistics	P-value
	Poor (%)	Good (%)		
Poor	26(24.5)	80(75.5)	X^2	0.699
Good	72(26.5)	200(73.5)		

From the table above, twenty six (24.5%) of the respondents had poor attitude and knowledge of premarital screening while two hundred (73.5%) of the respondents had a good knowledge and attitude of premarital genotype screening.

Table 10: Relationship between overall knowledge and overall practice

Overall knowledge	Overall Practice			
	Poor (%)	Good (%)	Test Statistics	P-value
Poor	56(29.5)	134(70.5)	X^2	0.191
Good	48(23.6)	155(76.4)		

From the table above, fifty six (29.5%) of the respondents had poor practice and knowledge of premarital screening while one hundred and fifty five (76.4%) of the respondents had a good knowledge and practice of premarital genotype screening.

CHAPTER FIVE

DISCUSSION

This study was carried out among Third, Fourth, Fifth and Sixth year students of 6 selected faculties, three of this faculties are science oriented (Life Science, Basic Medical Science, Physical Science) and the remaining 3 are not science oriented(Management Sciences, Social Sciences, Education). The belief may then be that both penultimate students and final year students of the various faculties should be assessed about the implications of premarital genotype screening and sickle cell disorder as it affects the community. Most of the respondents fell with age group 20-24 years. Most of the respondents were above 18 years and thus giving a more factual data or response to this study, more of the respondents were females and specifically most of them were above 18 years and were adults. From the study, it showed majority of our respondents which accounts for 98.7% were single, which is beneficial because sickle cell is to a large extent very much preventable and thus making this study very relevant for mostly intending couples who have not heard of premarital genotype screening and sickle cell disorder. It is also relevant to those who are married or recently married but don’t know about premarital genotype screening. Over 92.3% of our respondents were Christians reasons being that the University is located in Ugbowo which has predominantly Christians, the study showed that the Faculty of Education had the highest number of respondents this may be due to willingness of respondents to participate in the study. A large number of the respondents about 62.1% were in their 3rd year of study, this may probably be due to short semester and the hectic academic schedule of the final year students in those selected faculties. Most of the students who participated in this study resided at the halls of residence within the school campus, the majority of respondents were

Benin, majority of student who are currently having their tertiary education in the university are from Benin.

A vast majority of the students were aware of sickle cell disorder (SCD) about 96.9% of them, this is similar to a study done in Ghana which showed that almost all students 98.6% were aware of the disease[1] .This is also similar to a study done in Sokoto which showed majority of students 97.6% were aware of sickle cell disease[2]. This high awareness of the disease may be due to global movement and campaigns towards the eradication of the disease such as the world sickle cell day which is celebrated on the 19th of June every year and secondly Benin is an urban area were the literacy level is a bit high and it is a federal institution that houses some of the brightest minds across the country.

A greater proportion of the respondents got their source of information from school (26.2%) and health facilities (23.1%) within the school campus respectively, this is in contrast to a study done in Ghana which showed most of the respondents got their information from social media (internet and television)[3]. This is in a way similar to another study done in Sokoto which showed that majority of the respondents (83.6%) got their source of information from school[2].

Our study showed that majority of the respondents (87.4%) knew that sickle cell disorders are caused by a genetic mutation in the hemoglobin gene and 94.1% of the respondents also knew it can be inherited genetically. This is similar to a study done in Sokoto which showed that a large proportion of respondents (97%) and (96.7%) knew it is caused a genetic mutation and it can be inherited genetically respectively[2].

Majority of the respondents (68.2%) highlighted that body weakness is key feature of sickle cell disorders. The probable reason was because of the current widespread knowledge base on the clinical presentation of the disorder that some students may have been to exposed to in seminars, public health talks, and outreach.

A large proportion of the respondents had an AA genotype about 95.2% of the them knew their genotype which was commendable and similar to another study done in Sokoto which showed that 87% of the respondents were AA[2]. An interesting finding of this study was that about 6.4% were affected by the disorder because they had homozygous SS gene for the disorder. this in contrast to a study done in Ghana that showed that 21.4% of the respondents were affected by the disorder, the reason may not be surprising as Africa has one of the highest prevalence of the disorder. A similar study done in a tertiary institution in the western part of country showed that 2.5% were affected by sickle cell disorders and about 36.2% did not know their genotype status[5]. The most effective way of preventing sickle cell disorder is by making more people see the need to know their genotype status, this is hinged on the prevention of sickle cell disorder. These statistics is still discouraging and shows the journey towards achieving this goal of prevention. Another study done showed those who didn’t know their genotype made up about 47.3% of the respondents[6], again just to buttress my point.

From our study the general knowledge score of genotype status amongst respondents was poor as majority 67.2% had inadequate or no knowledge of sickle cell disorder and their genotype status combined. This is similar to a study done in Sokoto that showed 65.9%% of the respondent had good knowledge of the disease[2].

From our study, a majority of the respondents within the predominant age group of this study (20-24 years) had a good knowledge score, which is similar to a study done in Yaba which also showed majority of respondents aged 25-29years (predominant age group in the study) had a good knowledge score on SCD. While in our study respondents within the age group 30-34 had the poorest score, the study done in Yaba showed that similar findings[4].

Female respondents had a generally good knowledge score (74.3%) when compared to male respondents in our study, this is in contrast to the study done in Yaba which showed males had a better knowledge score (45.6%)[4].

The Faculty of Education had the highest percentage of respondents who had good knowledge score overall and in the non-science inclined disciplines, this is in contrast to a study done which showed majority of respondents from the faculty of law had a good score overall and among the non-science inclined disciplines[7], it is quite surprising that the respondents in the science inclined disciplines should had a relatively bad knowledge score, their strong scientific knowledge and background is expected to tilt the knowledge balance in their favor.

From our study, it is observed that the students in the final year (4th and 6th for those studying a 4 years and 6 years course respectively) had a relatively better knowledge score when compare to those in their penultimate year in school. A larger percentage of respondents who had the highest knowledge score were in their 6th year in school and were science inclined.

Majority of the respondents were aware and had a good knowledge score on premarital genotype screening, the reason may be as a result of increased awareness both physically and online and some students may have attended seminars online. This is in contrast to a study done in Sokoto which shows that 65.7% of respondents had poor knowledge[2]. This is also similar to a study done in Accra which showed that 57% had a good knowledge score of premarital genotype[3]. A large proportion of respondents had their source of information from the internet, because most individuals may prefer to seek for medical information from the internet than ask health professionals this is contrast to a study that was done which showed most respondents got their source of information from school[6].

A large proportion of the respondents have a relatively fair idea of what premarital genotype screening is, as majority of the respondents actually thought it is just a screening exercise to check genotype status before marriage, however the essence is to check genotype compatibility for intending couples.

Majority of the respondents aged 30-34 had a good score on knowledge of premarital screening, the reason being most of them within that age group are married. Female respondents had a good score on knowledge of premarital genotype screening as compared to males this is probably due to the fact more females participated actively in the study.

The Faculty of Life Science had a greater proportion of respondent who had a good score on the knowledge of premarital genotype screening, while the respondents from the faculty of management sciences had the poorest score on knowledge of premarital genotype screening.

The final year respondents in their 6th year of study had the best knowledge of premarital genotype screening, most of the students are already at the end of their academic sojourn and as such are actually interested in settling down hence probable the increased knowledge.

From our study, it was observed that majority of the respondents highlighted that ignorance played a major role as to why most people didn’t do the screening.it is quite simple if you are not aware, you will not know how to avoid a particular disease. About 19.8% of the respondent highlighted that negligence plays a significant, this is particular important especially in the Middle East where consanguinity is practiced (marrying of cousins) hence the transmission of genetic abnormalities to their offspring despite adequate knowledge[8].

A large proportion of the respondent about 96.1% agreed that they will do premarital genotype screening. This is similar to a study done in Accra where majority of students agreed to do premarital genotype screening before marriage. Another study in Sokoto showed majority of respondents about 75.7% will do premarital screening along with their partner before going into marriage[2].

Less than two-third of the respondents agreed that they will change their marriage decision based on their premarital genotype screening result, this is commendable as it is the first steps towards prevention of the disease, some respondents didn't want to have the physical, financial, and emotional burden of catering for a child with the disease. A similar study done in Choba, which showed that 40% had a negative attitude to premarital genotype screening. Some respondents (75.0%) in that study also believed that miracles and prayers can suffice, it is not really surprising about one-third of our respondents believe their religion affect their attitude towards the premarital screening. The study in Choba also showed that 25.0% of the respondents would not change their marriage decision based on results as it may pose great difficulty jettisoning their partner, hence the negative attitude towards the screening[9].

More than three-quarter of respondents generally agreed that making it affordable and compulsory will improve the practice and reduce the incidence of the disease. This is similar to a study done in Sokoto which showed that 57.6% of respondents believed that the government should prohibit marriage between incompatible couples[2]. The only drawback to this law is that is impracticable.

From our study the practice of premarital genotype screening is poor (52.3%). Just less than half of the total respondent had good practices of Premarital genotype screening.

Conclusion

The knowledge of sickle cell disorder and genotype status was poor. Factors that may be responsible for this included source of information and department of study. The knowledge and attitude towards premarital genotype screening among respondent was relatively good. Factors affecting this maybe sex and level of study and religious beliefs. From our study the practice of premarital genotype screening was poor (52.3%). Just less than half of the total respondents had good practices of premarital genotype screening.

Recommendations

To the Government

1. The government should enforce policies that makes premarital genotype screening an essential criterium before marriage and issuance of marriage certificates to ensure genotype compatibility for intending couples
2. The government should reinforce the current public awareness against sickle cell disorder and hamper more on the prevention of the disease as well as the importance of premarital screening.
3. The government should make the premarital genotype screening easily accessible and affordable especially in the rural settings because most eventually migrate to the urban settings.
4. The government should enact laws that help with provision of incentives for those who are willing to carry out the test and those who may be affected.
5. They should collaborate with the religious institution and try to make them aware of why it is important to do premarital genotype screening

To the University

1. The university management should provide functional testing equipment for the health center to carry out these tests.
2. The university management should re-enforce premarital genotype screening as part of the health clearance after gaining admission and after conclusion of academic program.

3. The university managements should collaborate with relevant stakeholders in the health sector to create seminars, programs and campaigns to increase the awareness of the disease and importance of premarital screening

To The Students

1. The students should regularly seek medical advice and improve their health-information seeking behavior
2. They should try as much as possible to participate in health talks, and seminars about the disease and the method of screening and prevention

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APPENDIX I

QUESTIONNAIRE

THE DEPARTMENT OF COMMUNITY HEALTH, UNIVERSITY OF BENIN TEACHING HOSPITAL

Assessment of The Knowledge, Attitude & Practice Towards Pre-Marital Screening for Sickle Cell Disease (SCD) among Undergraduates of University of Benin

We are final year medical students of the university of Benin, Benin-city. This questionnaire is designed to assess the knowledge, attitude & practice of premarital screening for sickle cell disease (SCD) among undergraduates of University of Benin, Benin-city. All information given will be treated as confidential. Thank you.

SECTION A: SOCIODEMOGRAPHIC CHARACTERISTICS

1. Age (in years) …………
2. 2.) Sex: Male [ ]   Female [ ].
3. Ethnicity.
4. Marital status: single [ ] married [ ] divorced [ ] widowed [ ] co-habiting [ ] separated [ ].
5. Religion: Christianity [ ] lslam [ ] African traditional religion [ ] others, specify……..
6. Faculty:
7. Department:
8. Level of study: 100 [ ] 200 [ ] 300 [ ] 400 [ ] 500 [ ] 600[ ].
9. Address:

SECTION B: KNOWLEDGE OF SICKLE CELL DISEASE AND GENOTYPE STATUS

10. Have you heard of sickle cell disease (SCD) yes[ ] no if no skip to question 28
11. How do you know about it (source of information)? Radio [ ] television [ ] newspapers [ ] health facilities [ ] religious center [ ] family [ ] friends [ ] internet [ ] others, specify___________________.
12. Sickle cell disease is caused by a ……… fungi [ ] bacteria [ ] virus[ ] protozoa [ ] genetic mutation in the hemoglobin pigment in red blood cell [ ] prions [ ].

13. The route of transmission of sickle cell disease is……… Feaco-oral[ ] by inhalation of respiratory droplets[ ] exposure to cold [ ] contact with bare skin [ ] hereditary transmission [ ].
14. What are the symptoms of sickle cell disease (SCD)? headaches [ ] difficulty in breathing [ ] body weakness [ ] other symptoms specify______________________.
15. Sickle cell anemia and sickle cell disease trait all mean the same thing? Yes [ ] no [ ] I don't know [ ].
16. If the answer to 15 is No what is the difference_________________________
17. Sickle cell disease causes shortage of blood in individuals affected by the disease? yes [ ] no [ ]] I don't know [ ].
18. Sickle cell disease is a highly preventable disease ……. Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
19. Sickle cell disease has a cure……….. Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
20. Sickle cell disease can cause death……….. Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
21. Sickle cell disease can disrupt the academic performance of a child. True[ ] False[ ] .
22. Sickle cell disease can strain the financial resources of the family True[ ] False[ ].
23. It is better not to have a child with SCD because it can cause stigmatization of the child. True [ ] false [ ]. I don't know [ ].
24. Sickle cell disease affects all age groups? yes [ ] no [ ] I don't know [ ].
25. Sickle cell disease can affect all socio-economic class? yes [ ] no [ ] I don't know [ ].
26. Are you affected by the disease? Yes [ ] no [ ] if no skip to question 27
27. Do you go for your routine medical check up or follow up? Yes [ ] No [ ]
28. If yes to question 24, How frequently do you go for your check up________________
29. Do you know anyone affected by the disease? yes [ ] No [ ]
30. If yes to question 26 tick appropriately………… brother [ ] sister [ ] father [ ] mother [ ] uncle [ ] aunt [ ] cousin [ ] friend [ ] colleagues.
31. Do know what genotype screening is? yes [ ] no [ ] .
32. Did you do genotype screening as part of your medical clearance after gaining admission? Yes [ ] No [ ]

33. If no to question 29 why______________________?
34. What is your genotype? AS [ ] AA [ ] SS [ ] I don't know [ ].
35. Is knowing your genotype status important? Yes [ ] no [ ]. I don't know
36. Which of the following genotype is ideal for couples? AS + AA [ ] AA + AA [ ] AS + AS [ ] I don't know [ ]

SECTION C: KNOWLEDGE OF PRE-MARITAL SCREENING

37. Do you know what premarital genotype screening is ? yes [ ] no [ ].
38. If yes to question 37 what is premarital genotype screening___________________?
39. How did you know about it (source of information) ? Radio [ ] television [ ] newspapers[ ] health facilities [ ] religious center [ ] family [ ] friends [ ] internet [ ] others, specify____________________
40. Will you do a premarital genotype screening if you had the opportunity? Yes [ ] No [ ]
41. If No to question 40 why_________________________?
42. Pre-marital screening will help me to find out if am I am compactible with my partner? Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
43. Doing pre-marital genotype screening maybe painful? Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
44. Doing genotype screening will make me prone to blood borne disease e.g infection? Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
45. If I do pre-marital screening, it will decrease my chance of having a child with SCD? Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
46. Pre-marital genotype screening can increase my worries about SCD? Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
47. The result of my genotype test is to be kept private and confidential. Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].
48. Pre-marital genotype screening will help me make an informed decision if I want to marry a person with an SS trait. Strongly agree [ ] agree [ ] undecided [ ] disagree[ ] Strongly disagree [ ].

ATTITUDE AND PRACTICE TOWARDS PRE-MARITAL SCREENING.

49. Why do you think people don't do premarital genotype screening? Ignorance [ ] cost [ ] negligence [ ] inadequate testing center[ ] peer pressure [ ]. Others specify____________________
50. Do you think making premarital genotype screening affordable would reduce the incidence of sickle cell disease? Yes [ ] No [ ]
51. Do you think making premarital genotype screening compulsory would reduce the incidence of sickle cell disease? Yes [ ] No [ ]
52. Are you married? Yes [ ] No [ ]
53. If Yes to question 52 did you do premarital screening________________ ?
54. If No to question 52 would you want to do it before marriage? Yes [ ] No [ ]
55. How do you think the Government can encourage people to do premarital genotype screening_____________________?
56. Do you think our religious beliefs affect our attitude towards premarital screening? Yes [ ] No [ ] I don't know
57. Will you be willing to continue with a relationship despite the risk of having a child with sickle cell disorder? Yes [ ] No [ ] undecided [ ]
58. Are you willing to change your marriage decision based on you premarital genotype screening results? Yes [ ] No [ ] undecided [ ]
59. Will you encourage your relatives, spouse or kids to do premarital genotype screening? Yes [ ] No [ ] I don't know

APPENDIX II

INFORMED CONSENT FORM

TITLE OF RESEARCH: KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS PREMARITAL SCREENING FOR SICKLE CELL AMONG UNIVERSITY OF BENIN STUDENTS.

NAMES AND AFFILIATIONS OF INVESTIGATORS:

Ohis Muhammed Ohioma & Olateju Samuel
Department of Community Health,
University of Benin Teaching Hospital,
PMB 111,
Benin City,
Edo State.
Email**:** ohisohioma64@gmail and profpsalm32@gmail.com
Cell: +2348131257840 and +2347054684556

PURPOSE OF RESEARCH

This study aimed to assess knowledge, attitude and practice towards premarital screening for sickle cell disease among University of Benin students with a view to improving the body of knowledge.

PROCEDURES INVOLVED IN THE STUDY: In this study questions were asked regarding the knowledge, attitude and practice towards premarital screening for sickle cell disease among University of Benin students

CONFIDENTIALITY: All data collected were treated with utmost confidentiality. Students who volunteer to take part in this study were given a unique study number and data were collected. Participants' information would be stored safely and secured by codes in computers using only the study identification number. All those handling data would be not at any time reveal participants' identity.

FINANCIAL COMPENSATION: There would be no financial compensation for participation in this study.

VOLUNTARY PARTICIPATION: Your participation in this study is entirely voluntary and if you desire to withdraw out of this study at any time, no punitive measures will be meted out against you on account of your withdrawal. Your refusal to participate or withdraw from the study will not involve any negative consequences or loss of benefits to which you are otherwise entitled to.

RISK: It is not expected that any harm will come to you because of your participation in this study. The study does not entail any activity that would result in harm to you.

BENEFIT: The study will help assess the knowledge, attitude and practice towards premarital screening for sickle cell disease among University of Benin students.

FINANCIAL SPONSORSHIP: This study would be sponsored by both principal investigators. The under-listed may be contacted in case you have any clarifications to make.

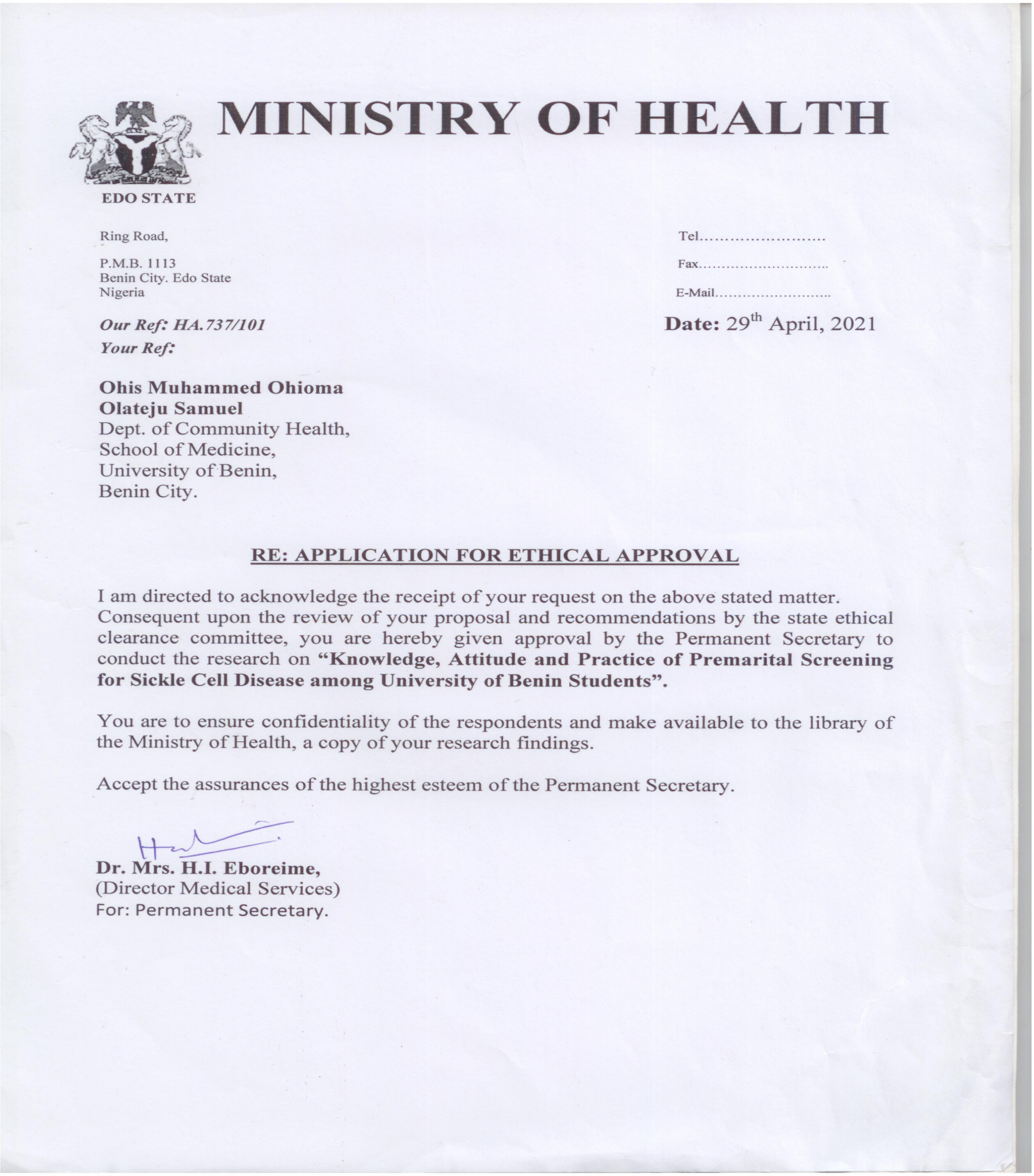
Ohis Muhammed Ohioma
Department of Community Health,
University of Benin Teaching Hospital,
P. M. B. 1111,
Benin City. Nigeria.
Email: ohisohioma64@gmail.com
Cell: +2348131257840

OR

Olateju Samuel
Department of Community Health,
University of Benin Teaching Hospital,
P. M. B. 1111,
Benin City. Nigeria.
Email: profpsalm32@gmail.com
Cell: +2347054684556

APPENDIX III

ETHICAL APPROVAL



MINISTRY OF HEALTH

EDO STATE

Ring Road,

P.M.B. 1113
Benin City. Edo State
Nigeria

Tel……………………
Fax………………………
E-Mail……………………

Our Ref: HA.737/101
Your Ref:

Date: 29th April, 2021

Ohis Muhammed Ohioma
Olateju Samuel
Dept. of Community Health,
School of Medicine,
University of Benin,
Benin City.

RE: APPLICATION FOR ETHICAL APPROVAL

I am directed to acknowledge the receipt of your request on the above stated matter. Consequent upon the review of your proposal and recommendations by the state ethical clearance committee, you are hereby given approval by the Permanent Secretary to conduct the research on **"Knowledge, Attitude and Practice of Premarital Screening for Sickle Cell Disease among University of Benin Students".**

You are to ensure confidentiality of the respondents and make available to the library of the Ministry of Health, a copy of your research findings.

Accept the assurances of the highest esteem of the Permanent Secretary.

Dr. Mrs. H.I. Eboreime,
(Director Medical Services)
For: Permanent Secretary.