**A COMPARATIVE STUDY OF SICKLE CELL DISEASE AND RHESUS FACTOR COMPARABILITY AMONG COUPLES IN YENEGOA AND PORT HARCOURT**

**ABSTRACT**

The study on a comparative study of sickle cell disease and Rhesus factor comparability among couples in Yenegoa and Port Harcourt aimed at evaluating the media campaign in creating awareness on sickle cell and Rhesus factor among couples in Yenegoa and port Harcourt, to examine whether counseling before marriage will help control the prevalence of sickle cell and Rhesus factor among couples in Nigeria, to determine whether low standard of living will increase the mortality rate among children with sickle cell disease, to determine the effect of Rhesus factor and sickle cell on child mortality rate in Yenegoa and port Harcourt and to determine the extent to which availability of drugs and medical facilities controls sickle cell disease and Rhesus factor in Yenegoa and Port Harcourt. The study made use of primary data which are gotten from the distribution of the research questionnaires; the sample size for the study is 101. The study made use of the Pearson correlation method and paired sample t-test for the analysis. However there is a statistically significantly **(0.00)** strong relationship **(0.819)** between the responses of the respondents that said that Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt and those that said that broadcast media reaches higher number of audience in creating awareness for sickle cell and Rhesus.The study therefore concluded that there is significant the difference in effectiveness of media campaign on sickle cell and Rhesus factor. The study also made useful recommendation to assist the federal government in decision making.

**CHAPTER ONE**

**INTRODUCTION**

**1.1 BACKGROUND OF STUDY**

The prevalence of sickle cell anemia and Rhesus factor comparability have increased overtime time in Nigeria; thus causing an increase in mortality rate among children especially those below twenty (20) years of age (Kulkarni, 2007). It is widely believe that the causes of sickle cell anemia and Rhesus factor incompatibility is due to a high level of ignorance on the dangers posed by these disease. The federal government of Nigeria through the NGOs and the media has put in so much effort on awareness campaign on how to control the occurrence of these diseases especially for the young ones that are about the ages of getting married.

Sickle cell disease (SCD) can simply be defined as a hereditary disorder in which an individual has inherited two abnormal Hb genes, at least one of which is responsible for the production of sickle Hb (HbS) (Creary et al., 2007). The most common clinical phenotype is the homozygote, i.e. HbSS, also known as sickle cell anaemia. Compound heterozygotes include HbSC, SD, SO-Arab and Sbthal, which are all collectively (in addition to SS) referred to as SCD.

The sickle-shaped red blood cells described by Herrick caused several complications, including chronic anemia, vaso-occlusive pain episodes, ischemic organ damage, infections, small stature, and delayed puberty (Barakat et al., 2008). For many generations sickle cell disease has been a prevalent disorder in Nigeria. Reports show that sickle cell disease was a well-known disorder in most states in Nigeria and that the natives in Nigeria had several local names for this disease before it was discovered in America (Reid & Rodgers, 2007).

According to Modell B, (2007) stated that the HbS gene became prevalent in different parts of the world following selective pressure because the heterozygote (HbAS) is protected against some of the deleterious effects of malaria. Therefore, SCD is found at its highest frequencies in parts of the world where malaria is or was endemic. In the same vein, Fleming AF, (2008) stated that because of slave trade and recent migrations, it is now found even more widely including in Europe and the USA. Nonetheless, the prevalence is highest in tropical Africa and, indeed, the country with the highest burden is Nigeria where the trait occurs in 25–30% and sickle cell anaemia occurs in approximately 2% of all births

The most common features of SCD are chronic haemolytic anaemia and recurrent vaso-occlusion. The latter is responsible for the painful crises that characterise the disease. There is also a chronic vasculopathy triggered by free heme resulting in nitric oxide scavenging and upregulation of adhesion molecules in reticulocytes, neutrophils and endothelial cells (Wood KC, 2008). This is further complicated by a procoagulant state following the activation of platelets. There is smooth muscle dystonia and eventual hyperplasia, which contributes to vascular occlusions (Morris CR, 2009). This explains the plethora of features and complications seen in SCD. The major cause of mortality in childhood is overwhelming bacterial infections especially due to encapsulated organisms, principally pneumococcus.

On the other hand Rh is short for Rhesus blood group system. The Rh blood type contains parts called antigens including the D antigen. If the D antigen is present, a person is considered to be Rh positive. If the D antigen is absent, the person is said to be Rh negative. About 85% of Nigerians have an Rh positive blood type, while the remaining 15% are Rh negative. The Rhesus factor is very important to the human body; however there might variation in compatibility which results to Rhesus disease.

A study of Rh disease deepens our understanding of historical infant mortality in general and perinatal mortality in particular. The decline of infant mortality in Nigeria started around 1800, which is earlier than in most other countries. At that time, rates were very high even if the Nigerians as well as other African countries levels were low in international comparison (Edvinsson et al. 2008). However there have been several awareness campaigns on the sickle cell disease and Rhesus factor comparability among couples in Nigeria. The use of mass media and other medium may help in the dissemination of information on sickle cell and Rhesus factor among couples in Nigeria.

**1.2 STATEMENT OF PROBLEM**

Sickle cell disease and Rhesus factor issue has been prevalent in Nigeria for a very long time now. Families and friends have lost lives to these ailments as a result of lack of awareness on the preventive measures to be taken to control the ailments. The federal government of Nigeria has channeled lots of funds to the medical centers in Nigeria to help salvage the situation but the incidence is still on the increase. Take yenegoa and portharcourt for example, there are several factors that can lead to the increase in sickle cell disease and Rhesus factor disease; Viz:

1. high level of illiteracy
2. lack of awareness campaign on the effect of sickle cell disease and Rhesus factor among couples
3. low standard of living
4. poor medical facilities and
5. lack of counseling before marriage

It is to this regard that the researcher desire to carry out a comparative study on sickle cell disease and Rhesus factor awareness campaign using mass media.

**1.3 AIM AND OBJECTIVES OF STUDY**

The main aim of the research work is to carry out a comparative study of sickle cell disease and Rhesus factor comparability among couples in Yenegoa and Port Harcourt. Other specific objectives of study are:

1. to examine whether media campaign has a role to play in the level of awareness on sickle cell and Rhesus factor among couples in Yenegoa and port Harcourt
2. to examine whether counseling before marriage will help control the prevalence of sickle cell and Rhesus factor among couples in Nigeria
3. to determine whether low standard of living will increase the mortality rate among children with sickle cell disease
4. to determine the effect of Rhesus factor and sickle cell on child mortality rate in Yenegoa and port Harcourt
5. to determine the extent to which availability of drugs and medical facilities controls sickle cell disease and Rhesus factor in Yenegoa and Port Harcourt

**1.4 RESEARCH QUESTIONS**

The study came up with research questions so as to ascertain the above stated objectives. The research questions for the study are:

1. What is the difference in effectiveness of media campaign on sickle cell and Rhesus factor?
2. Does media campaign play a role in the level of awareness on sickle cell and Rhesus factor among couples in Yenegoa and Port Harcourt?
3. Does counseling before marriage help control the prevalence of sickle cell and Rhesus factor among couples in Nigeria?
4. What is the effect of standard of living on mortality rate among children with sickle cell disease?
5. to determine the effect of Rhesus factor and sickle cell on child mortality rate in Yenegoa and port Harcourt
6. To what extent does availability of drugs and medical facilities controls sickle cell disease and Rhesus factor in Yenegoa and Port Harcourt?

**1.5 STATEMENT OF RESEARCH HYPOTHESIS**

**Hypothesis 1**

**H0:** there is no significant the difference in effectiveness of media campaign on sickle cell and Rhesus factor

**H1:** there is significant the difference in effectiveness of media campaign on sickle cell and Rhesus factor

**Hypothesis 2**

**H0:** Rhesus factor and sickle cell have no significant effect on child mortality rate in Yenegoa and port harcourt

**H1:** Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and port harcourt

**1.6 SIGNIFICANCE OF STUDY**

The study on a comparative study of sickle cell disease and Rhesus factor comparability will be of immense benefit to couples in Yenegoa and Port Harcourt and the media because the study will compare the effectiveness of media campaign on sickle cell and that of Rhesus factor. The study will also serve as a source of literature for other researchers that desire to carry out similar research on the above topic. Finally the study will contribute to the body of existing literature and knowledge in this field of study and provide a basis for further research

**1.7 SCOPE OF STUDY**

The study on a comparative study of sickle cell disease and Rhesus factor comparability will be limited to the media house and the couples in Yenegoa and Port Harcourt. The study will cover for a period of seventeen years (2000-2017).

**1.8 LIMITATION OF STUDY**

The only problem the researcher had in getting information from the respondents on sickle cell and Rhesus factor was the unwillingness of the respondents to give information about their health status. The might affect the information provided by the respondents but the researchers however was able to get good information as regard the research topic by making the respondents feel safe with whatever information they provided to the researcher.

**1.9 DEFINITION OF TERMS**

**Sickle cell:** A group of disorders among couples in Yenegoa and Port Harcourt that cause red blood cells to become misshapen and break down

**Rhesus factor:** Rhesus factor in accordance to the study isan antigen occurring on the red blood cells of couples in Yenegoa and Port Harcourt (around 85 per cent) and some other primates

**Antigen:** a toxin or other foreign substance which induces an immune response in the body, especially the production of antibodies

**Genetic counseling**: Communication process between health care provider and client that emphasizes and provides accurate and up-to-date information about a genetic disorder in a sensitive and supportive, non-directive manner (SCDAA, 2005).

**Hemoglobin**: Chemical substance (an iron containing protein) of the red blood cell, which carries oxygen to the tissues, and gives the cell its red color (SCDAA, 2005).

**Hemoglobin A (HbA):** Hemoglobin is composed of two alpha globins and two beta globins, normally produced by children and adults (Jones, 2008).

**Hemoglobin C trait (AC):** Inheritance of one gene for the usual hemoglobin (A) and one gene for hemoglobin (C). A person who has the hemoglobin C Trait (AC) is a carrier of the hemoglobin C gene, and is not affected by the gene (SCDAA, 2005).

**Hemoglobin C disease**: A person has both HbS and HbC and is often referred to as “HbSC.” Hemoglobin C causes red blood cells to develop. Having just some hemoglobin C and normal hemoglobin, a person will not have any symptoms of anemia. However, if the sickle hemoglobin S is combined with the target cell, some mild to moderate anemia may occur (UMMC, 2010).

**Hemoglobin E disease**: Similar to sickle cell-C disease except that an element has been replaced in the hemoglobin molecule under certain conditions, such as exhaustion, hypoxia, severe infection, and/or iron deficiency

**Sickle cell trait:** A person carrying the defective gene, HbS, but also has some normal hemoglobin HbA. Persons with the sickle cell trait are usually without symptoms of the disease, but mild anemia may occur under intense, stressful conditions, exhaustion, hypoxia (low oxygen), and/or severe infection. The sickling of the defective hemoglobin may occur and result in some complications associated with sickle cell disease.

**CHAPTER TWO**

**REVIEW OF RELATED LITERATURE**

**2.0 INTRODUCTION**

This chapter gives an insight into various studies conducted by outstanding researchers, as well as explained terminologies with regards to a comparative study of sickle cell disease and Rhesus factor comparability among couples in Yenegoa and Port Harcourt. The chapter also gives a resume of the history and present status of the problem delineated by a concise review of previous studies into closely related problems

**2.1 CONCEPTUAL FRAME WORK**

**2.1.1 Genetics**

Sickle cell disease is one of the many hemoglobin variants that cause mutations to alter amino acids in the hemoglobin molecule (Popma, 2006). Normal adult hemoglobin HbA is a heterogeneous mixture of approximately 90% Hb A, 2.5% Hb A2, 3.5% Hb Alc, and small quantities of fetal hemoglobin (Popma, 2006). All normal hemoglobin molecules consist of four polypeptide chains in which two are globin β chains and α globin chains (Popma, 2006). Sickle cell disease occurs when the hemoglobin produced is HbS instead of HbA. Genetically, sickle cell disease occurs when valine replaces glutamic acid at position 6 of the β globin chain (Popma, 2006). In the United States, three prevalent genotypes of sickle cell disease occur. The genotypes are abnormal hemoglobins designated by their mutations within the globin chain. Homozygous SCD, HbSS, or sickle cell anemia, is known as one of the more common types of sickle cell beta genes inherited by both parents (SCDAA, 2005). Sickle cell hemoglobin SC is known as one of the milder traits formed by one S-globin chain and one β-globin chain. This gene is found among West Africans (Bloom, 2005). Also, the Sβ°-thalassemia and HbSS are classified as being more severe compared with other genotypes, and they are found among populations from the Mediterranean region (Bloom, 2005).

**Inheritance Patterns**

Sickle cell disease is a recessive gene if two parents have two copies of the Hb S gene. Children born to parents with these genes (see Figure 2-2) will have sickle cell disease.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | S | | | S |
| S |  | | | SS |
|  | SS |  |
| S | SS | | | SS |

Figure 2-2: Two parents with sickle cell disease (Bloom, 2005).

* + 1. **One Parent has Sickle Cell Disease and Sickle Cell Trait**

Figure 2-3 shows that one parent has the sickle cell disease Hb S genes; therefore, all of that parent’s gametes will carry the Hb S gene. The other parent has one Hb S gene and one Hb A gene. The chances for that parent with both the Hb S gene and the Hb A gene transmitting either gene are equal, or 50/50 (Bloom, 2005). All children born to these parents will have either sickle cell disease or sickle cell trait children with the chances being 50/50 for each (see Figure 2-3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | S |  |  |  |
| S |
| A | AS | AS | | |
| S | SS | SS | | |

Figure 2-3: One parent has sickle cell disease and sickle cell trait (Bloom, 2005).

* + 1. **One parent has sickle cell disease and the other parent carries normal genes**

Figure 2-4 illustrates that the Hb A gene is carried by the normal parent and the gametes from this parent will carry this particular gene, as well as the sickle cell disease parent carrying the Hb S gene (Bloom, 2005). All children conceived from these parents will inherit one normal and one sickle cell gene. All children will have the sickle cell trait

|  |  |  |
| --- | --- | --- |
|  | S | S |
| A | AS | AS |
| A | AS | AS |

Figure 2-4: One parent has sickle cell disease and the other parent carries normal genes (Bloom, 2005).

**Two parents has sickle cell trait**

This case (see Figure 2-5) illustrates that both parents have an equal chance of transmitting the two genes. If both parents have the sickle cell trait, they will have a 25% chance of having children with sickle cell disease, as well as a 50% chance of carrying the sickle cell trait (Bloom, 2005). Also, a slight 25% chance occurs of children with normal genes. In this case, 50% of the time one parent will transmit an Hb S gene, and the other half of the time the other parent will transmit an HbA gene (Bloom, 2005).

|  |  |  |
| --- | --- | --- |
|  | A | S |
| A | AA | AS |
| S | AS | SS |

Figure 2-5: Two Parents has Sickle Cell Trait (Bloom, 2005).

**One parent has sickle cell trait and the other is normal**

All children from this couple (see Figure 2-6) will display the sickle cell trait or have normal genes because half of the gametes of the parent who carries the sickle cell trait will carry the Hb S gene, and the other half will carry the Hb A (Bloom,2005). This combination will result in a 50/50 chance of producing a child with normal genes or inheriting sickle cell traits.

|  |  |  |  |
| --- | --- | --- | --- |
|  | A | | S |
| A |  | | AS |
|  | AA |
|  | |
| A | AA | | AS |

Figure 2-6: One parent has the sickle cell trait and the other is normal (Bloom, 2005).

**2.1.2 Complications and problems associated with sickle cell disease**

According to University of Maryland, Medical Centre (2013), there is still no cure for sickle cell disease other than experiment transplantation procedures but treatments for complications of sickle cell have prolonged the lives of many patients who are now living into adulthood. The hallmark of sickle cell diseases is the sickle cell crisis which is an episode of pain. It is the most common reason for hospitalization in sickle cell disease. In general, the risk for a sickle cell crisis is increased by any activity that boosts the body‘s requirement for oxygen such as illness, physical stress or being at high altitudes. In more than half of episodes, however, the trigger is unknown. Episodes typically begin at night and last 3 – 14 days, accelerating to a peak over several days and then declining. Pain most commonly occurs in the lower back, leg, hip, abdomen or chest, usually in two or many locations. Pains in the bones are common because blood obstruction can directly damage bone and because bone marrow is where red blood cells are manufactured. Acute Chest Syndrome (ACS) occurs when the lung tissues are deprived of oxygen during a crisis. It can be very painful, dangerous and even life threatening. It is a leading cause of illness among patients with sickle cell disease and is the most common condition at the time of death. The pain often lasts for several days. In about half of patients, severe pain develops about 2 – 3 days before there are any signs of lung or chest abnormalities. Acute Chest Syndrome is often accompanied by infections in the lungs, which can be caused by viruses, bacteria or fungi. Pneumonia is often present. Infections are common and an important cause of severe complications. Before early screening for sickle cell disease and the use of preventive antibiotics in children, 35% of infants with sickle cell died from infections. Fortunately with screening tests for sickle cell now required for newborns, and with the use of preventive antibiotics and immunizations in babies who are born with the disease, the mortality rate has dropped significantly. Such infections pose a serious threat to infants and very young children with sickle cell disease. They can progress to fatal pneumonia with devastating speed in infants, and death can occur only a few hours after onset of fever. Infections are also common in older children and adults with sickle cell disease, particularly respiratory infections such as pneumonia, kidney infections and osteomyelitis, a serious infection in the bone. About 30% of patients with sickle cell permanent partial or complete erectile dysfunction can occur. Enlargement of the liver occurs in over half of sickle cell patients and acute liver damage occurs in up to 10% of hospitalized patients. Because sickle cell patients often need transfusions, they are at higher risk for viral hepatitis, an infection of the liver. This risk, however, has decreased since screening procedures for donated blood have been implemented. Gallbladder disease is common among sickle cell patients. About 30% of children with sickle cell disease have gallstones, and by age 30, 70% of patients have them. In most cases gallstones do not cause symptoms for years. When symptoms develop patients may feel overly full after meals, have pain in the upper right quadrant of the abdomen, or have nausea and vomiting. Acute attacks can be confused with a sickle cell crisis in the liver. Ultrasound is usually used to confirm a diagnosis of gallstones. If the patient does not have symptoms, no treatment is usually necessary. In some children with SCD, excessive production of blood cells in the bone marrow causes bones to grow abnormally, resulting in long legs and arms or misshapen skulls. Sickling that blocks oxygen to the bone can also cause bone loss and pain. Sickling that affects the hands and feet of children causes a painful condition called hand foot syndrome. A condition called avascular necrosis of the hip occurs in about half of adult sickle cell patients when oxygen deprivation causes tissue death in the bone. Eventually adult patients may need surgery to remove diseased and dead bone tissue. Patients with severe causes may need joint replacement.

Leg sores and ulcers may occur in the sufferers of SCD. They usually affect patients older than 10 years. SCD can also damage blood vessels in the eye and cause scarring and detachment of the retina, which can lead to blindness. Women with SCD who become pregnant are at higher risk for complications such as miscarriage and premature birth, and their babies may have low birth weight. SCD symptoms often worse during pregnancy and pain crises become more frequent. However with careful prenatal care and monitoring, serious problems can be avoided. Older children and adult patients with SCD are subject to other medical problems, disease have pulmonary hypertension. Stroke is the second most common killer of patients with sickle cell disease who are older than 3 years old. Between 8 – 10% of patients suffer strokes, typically at about age 7. Strokes are usually caused by blockages of vessels carrying oxygen to the brain. Patients with sickle cell disease are also at high risk for strokes accused by aneurysm, a weakened blood vessel wall that can rupture and haemorrhage. Multiple aneurysms are common in sickle patients but they are often located where they cannot be treated surgically. Anaemia is a significant characteristic in sickle cell disease commonly referred to as sickle cell anaemia. Because of the short lifespan of the sickle red blood cells, the body is unable to replace red blood cells as quickly as they are destroyed. This causes a particular form of anaemia called haemolytic anaemia. Most patients with sickle cell disease have haemoglobin levels of about 8gldL, much lower than healthy people. Chronic anaemia reduces oxygen levels and increases the demand on the heart to pump more oxygen bearing blood through the body. Eventually, this can cause the heart to become dangerously enlarged, with an increased risk for heart attack and heart failure. The kidneys are particularly susceptible to damage from the sickling process. Persistent injury can cause a number of kidney disorders, including infection. Problems with urination are very common, particularly uncontrolled urination during sleep. Patients may have blood in the urine, although this is usually mild and painless and resolves without damaging consequences. Kidney failure is a major danger in older patients and accounts for 10 – 15% of deaths in sickle cell patients. About 40% males, including children with SCD suffer from priapism. Priapism causes prolonged and painful erections that can last from several hours to days. There was a caption, pain, pain and pain‘ in the widely read News Paper, Sunday Punch‘ of 24th September 2006. This was an expression of some Nigerians, parents of sickle cell disease patients who met and lamented on the agony they go through and the discrimination that goes with it. In a rare display of emotions, many of them narrated the pain they have had to suffer for harbouring a dysfunctional genotype. Some of the women who spoke with Sunday Punch however claimed that they were not ignorant of the disease, but were victims of wrong and faulty laboratory diagnosis.

**2.1.3 Symptoms of sickle cell disease**

Sickle cell disease is usually diagnosed during childhood. However, some milder form of the disease can be missed if certain blood tests are not complete. One should be concerned about having sickle cell disease if one has:

i. Unexplained pain in abdomen, chest, back, joints and muscles fatigue.

ii. Anaemia that does not respond to iron supplements.

iii. Family history of sickle cell disease or sickle cell trait.

iv. Medical Laboratory Test.

If one has been diagnosed with sickle cell disease, one can decrease the frequency of pain crisis by following some simple guidance.

i. Maintain good nutrition, including supplement of folic, zinc and vitamin E.

ii. Drink plenty of fluids, especially during hot weather, exercise or when travelling.

iii. Plain water and fruit juices are best choices

iv. Use over the counter medication, warm baths, heating pads, fluids and bed rest at the first indication on onset of a pain episode. v. Use of acupuncture, between feedback and relaxation to reduce the stress of the disease.

Another treatment given to sickle cell anaemia patients is Bone Marrow Transplanting (BMT). It is being reported with increasing frequency but remain controversial in spite of encouraging results. The type of BMT done for sickle cell anaemia patients is Alogenic Bone Marrow Transplantation. The concern raised by opponents to this treatment for sickle cell anaemia are the acute and long term complications, morbidity, and costs compared with traditional therapy of disease Mirabel tea is also used to boost Haemoglobin levels among people who have anaemic conditions such as SCD. Mirabel tea has tremendous anti-sickling properties. Regular consumption of Mirabel tea has been associated with the prevention of the crisis and pain in people living with SCD. There is also a control measure, which is the termination of early pregnancy. The foetus is tested at the embryonic stage, and if found to be a carrier, the pregnancy is terminated at the early stage before three months. However, the woman is subjected to carrying many pregnancies in which only few that are tested to be non-carriers will be allowed to live. As a matter of fact, this is also expensive and it can endanger the life of the woman in question. The best option to embark on is total eradication.

**2.1.4 Implication for social welfare counselling/ solution and recommendations**

Counselling and prevention of causes and infections are simple measures not readily accessible to most patients. As a result, the majority of children with the most severe form of the disease die before the age of five, usually from an infection or severe anaemia. The survivors remain vulnerable to exacerbations of the disease and the complications mentioned above. SCD has major social and economic implications for the affected child as well as the family. Recurrent sickle-cell crises interfere with the patient‘s life, especially with regard to education, work and psychosocial development. The prevention and control is indeed what can eradicate and combat the disease in this century. Unfortunately, the area of sickle cell disease has been known many decades ago, but people don‘t seem to show interest in the eradication. It has drained the purses of many and destroyed many homes and yet people show nonchalant attitude about it. Hundreds and thousands are dying daily due to this incurable disease. It is right time to educate and create awareness for people to know about sickle cell disease and avoid it like a plague, just as people avoid HIV/AIDS today. All newly born babies should be tested for sickle cell disease, because all forms of sickle cell disease are inherited. The test should be done in recognized and well-equipped medical laboratories or any health institutions. Children inherit the genes for the disease from their parent, hence there is need to encourage everyone to know more about it. Eradication of sickle cell disease now depends on the awareness of the disease and guide against the elongation by the masses. The awareness should be done in various organizations such as religious, social, health and academic sectors of our society. Specifically, SCD can be eradicated through the following measures.

**2.1.5** **Rh Blood Groups**

**Genetics**

While many blood group systems are known other than the ABO system, the Rh system is of special importance,. This was originally defined by a rabbit antibody directed against the red blood cells of Rhesus monkeys, an antibody which turned out to be capable of distinguishing between the red blood cells of different human individuals. In simple terms, this system is defined by the presence or absence of a single red blood cell antigen, representing the two blood types Rh+ and Rh-. These are determined by two alleles at a single locus, which segregate independently of the ABO blood group locus. Thus an Rh+ individual may be homozygous (+/+) or heterozygous (+/-), while an Rh- individual must be homozygous (-/-). The Rh- blood type is relatively uncommon, representing less than 15% of the population. Since Rh segregates independently of ABO, one can readily calculate the frequency of any given combination of ABO type and Rh type. If type A represents 40% of the population, and Rh- only 15%, then the frequency of type A, Rh- individuals is given by: 0.40 x 0.15 = 0.06 or ~6% of the population.

So-called "natural" antibodies to Rh do not exist in humans, as they do for the AB antigens. However, Rh+ cells infused into an Rh negative recipient can give rise to a strong antibody response, mainly of the IgG class, which can result in dangerous reactions to subsequent transfusions. Blood typing and cross-matching are therefore important to ensure compatibility for the Rh factor as well as ABO. However, unlike the A and B antigens, the Rh antigens are present only on red blood cells. Therefore, while they are important for blood transfusion, they do not normally play a role in organ transplantation, and Rh typing of organ donors and recipients therefore not a significant consideration.

**2.1.6 Rh-incompatibility; RhoGAM Therapy**

The Rh factor assumes a special importance in maternal-fetal interactions. A mother who is Rh- can bear an Rh+ child if the father is Rh+ (either homozygous or heterozygous). Since there are no natural anti-Rh antibodies, this generally poses no special risk for the first pregnancy. At the time of birth, however, tissue damage resulting from the separation of the placenta from the uterine wall can result in a significant amount of fetal blood entering the maternal circulation; which may stimulate a strong IgG anti-Rh response in the mother. If the same mother then bears a second Rh+ child, the existing anti-Rh antibodies can cross the placenta during the pregnancy and destroy fetal red blood cells. The ensuing damage to various organs results in the potentially dangerous condition Erythroblastosis Fetalis (also known as Hemolytic Disease of the Newborn, or HDN). This can be diagnosed prenatally by carrying out amniocentesis, and examining the amniotic fluid for the presence of free hemoglobin and its degradation products. Various approaches can be used during and after birth to rescue the infant, including exchange transfusion, complete replacement of the infant's blood to remove the anti-Rh antibodies and provide undamaged red blood cells. However, the production of anti-Rh antibodies in an Rh- mother can often be prevented by administering anti-Rh immune globulin (e.g. RhoGAM) into the mother, typically at around 28 weeks of gestation and again within 72 hours of the birth of her Rh+ baby. By mechanisms which are still not fully understood, these antibodies greatly reduce the likelihood of sensitization of the mother's immune system by the Rh+ erythrocytes. If this procedure, developed in the 1960’s, is successfully carried out during each Rh+ pregnancy, anti-Rh antibodies are not produced by the mother, and subsequent pregnancies will not be at risk. While Rh incompatibility is of considerable clinical significance, it should be noted that not all untreated incompatible pregnancies result in disease. Only a small fraction of incompatible pregnancies actually result in the production of maternal anti-Rh antibodies, and in only a fraction of these cases is there significant damage to the newborn.

**2.1.7 The role of media in public education on sickle cell and Rhesus factor**

Accurate, current and clearly written information about sickle cell disease should be produced and made widely available in a credible form, to people. Different forms of communication can be used such as mass media, newspapers, magazines, flier, seminars and workshops in schools, hospitals, organizations, among others. Parents should be educated to educate their wards to know the danger inherent in having children that are sickle cell disease carriers; the same also goes to Rhesus factor. They should advice their wards not to allow love to blindfold them into future problems, whereby they will not be able to enjoy their marriage as a result of offsprings that will make go in and out of the hospital. Parents can cite examples and educate their children with vivid experiences of people involved in this type of problems. The public awareness should start from the grass root, involving the N.G.Os and local government. There are three things that are extremely hard, steel, diamond and knowing one self. Public self consciousness has good effect on people. As with situationally induced public self-awareness, persons who are high in public self-consciousness tend to be more concerned about how others judge them (Fenigstein & Vanable, 2002) and are more likely to withdraw from embarrassing situations than those low in this trait (Yoshitake, 2000). The tendency to comply with external standards encompasses physical appearance as well. A number of studies have found out that individuals high in public self-consciousness are more concerned about their physical appearance and believe appearance is important for smooth societal interaction (Striegel-Moore, Silberstein, Rodin 2003). There should be outpatient clinic which should provide a setting for patients to be seen by a physician specializing in sickle cell disease. Clinic care should include the services of nurses and certified counselors as well as a social service assessment. Recommendations for care to be coordinated with the patient primary care physician. And follow up visit should be scheduled for medical management and pain control. Partnerships should be fostered between health professionals, patients, parents, relevant community interest groups and the media, where appropriate. Partnerships will facilitate public education, identification of genetic risks in the community by recording family disease histories, genetic counselling, awareness and active participation prevention and care programmes. Nevertheless, the dissemination of information can be made in a very simple language that people will understand the concept of sickle cell disease and Rhesus factor. They can be informed in this manner:

*What is sickle cell disease? It is a genetic disorder that results in abnormally shaped red cells. It is inherited from the genes of the parents that are carriers. These distorted cells live only 10 – 20 days, compared to normal red blood cells which live about 120 days. This chronic undersupply of red blood cells makes the sickle cell patient anaemic. When the cells clump together, they cause blockages leading to a very severe pain, tissue and organ damage*

*what is Rhesus factor? An antigen occurring on the red blood cells of many humans (around 85 per cent) and some other primates. It is particularly important as a cause of haemolytic disease of the newborn and of incompatibility in blood transfusions.*

The above assertion can be meaningful to the individuals. They should also be intimated with its economic waste, the life of the individual involved is under jeopardy coupled with daily stress

**2.1.7.1 Transition programme**

To expel this problem from our society, the system of catching them young can be adopted. This is better done at the beginning of late childhood, which is usually the beginning of secondary school education in many societies. To make the awareness rooted, it can be inculcated in the curriculum of the secondary school students especially in their biology subject, but the area of sickle cell disease should be emphasized. They should also be made to understand the implication of the disease in daily living. The awareness should be thorough at the tertiary level because it is actually from this stage many of the youngsters meet their spouse. Proper counselling is very necessary at this stage.

**2.1.7.2 Premarital counseling**

Marriage institution is the bedrock of every society. Premarital counselling is the type of counselling given to youths or couple-to-be to guide against what can erupt in marital life which can lead to endured marriage and even divorce as the case may be. Among many things that can lead to marriage breakdown is health issue. If the marriage is producing unhealthy children, peace and joy that a marriage is meant to witness will be evaded (Olayinka, 2000). Premarital counselling is better given early enough before the two love birds get so enlarged, becoming inseparable as they usually perceive it. Parents should also be bold enough to take their wards for premarital counselling before it is too late. The Counsellor will discuss so many issues in which blood compatibility in terms of genotype can be expatiated. This is a serious issue that the parents should not handle it with levity. It is better for the parents of the two to take their wards for the test themselves in order to avoid deceit. There are also some clergy that are trained Counsellors who should be ready to use their expertise to save mankind. The truth would have to be said whether sweet or bitter if the couple-to-be have AS as their genotype, they should be made to understand the repercussion, the high probability of having children with sickle cell disease and the associated problems, with the pains they are likely to encounter in the area of rearing children. Many of our youths are love intoxicated. The advice may not be meaningful to them, but the experiences of other people that have suffered such menace can be shared with them.

**2.2 THEORETICAL FRAMEWORK**

This study is guided by the Health Belief Model which is an example of behavioral change theories.

**2.2.1 Health Belief Model**

The Health Belief Model was first developed in the 1950s by social psychologists Hochbaum, Rosenstock and Kegels working in the United States Public Health Services.

The Health Belief Model (HBM) is an intrapersonal (within the individual, knowledge and beliefs) theory used in health promotion to design intervention and prevention programs. It was designed in the 1950’s and continues to be one of the most popular and widely used theories in sanitation and intervention science. The model was created in reaction to a failed, free tuberculosis screening program. The focus of the Health Belief Model is to assess health behavior of individuals through examination of perceptions and attitudes someone may have towards sanitation and its practices and also towards disease and negative outcomes of certain actions. The Health Belief Model assumes that behavior change occurs with the existence of three ideas at the same time: An individual recognizes that there is enough reason to make a health concern relevant (perceived susceptibility and severity), that person understands he or she may be vulnerable to a disease or negative health outcome. (Perceived threat) and lastly the individual must realize that behavior change can be beneficial and the benefits of that change will outweigh any costs of doing so even as related to health.

**Individual Perceptions**

Individual perceptions speak directly to the knowledge and beliefs that a person has about his or her behaviors to health practices and the outcomes they could have. This section of the paper includes two main sections; Perceived Susceptibility and Perceived Severity.

**Perceived Susceptibility**

Within the health field susceptibility refers to the risk a person has to a particular disease or health outcome. Within the context of the Health Belief Model, perceived susceptibility examines the individual’s opinions about how likely the behaviors they partake in are going to lead to a negative health outcome.

One of the Goals of the Health Belief Model is to change perceptions of susceptibility in order to move towards behavior change.

**Perceived Severity**

Most people are familiar with the word severity as how serious a situation or action can be. The Health Belief Model seeks to increase awareness of how serious the outcomes of behaviors can be in order to increase the quality of one’s life. Now that there is an understanding of Individual Perceptions it is important to understand how Modifying Factors can affect some ones decision to change.

**Modifying Factors**

While Individual Perceptions were internalized, In the Health Belief Model modifying factors step outside the body to examine and use outside influences to affect how threatened a person feels by the outcomes of continuing the same behaviors that put him at risk. It was further stated that perceived susceptibility and severity do have their own impact on threat as well.

**Cues to Action**

Finally, cues to action are reasons why an individual realizes he could be threatened by serious disease. These could be media or concerned loved ones. Cues to action are anything that triggers a decision to change behavior.

The previous two categories have built on each other and lead to Likelihood of Action.

**Likelihood of Action**

After becoming aware of the potential for developing a disease if behavior does not change towards health practices, it is important to weigh out the benefits and the barriers to taking action and determine if it is worth it.

**Perceived Benefits**

In the Health Belief Model, the goal is greater quality of life for an individual both mentally and physically. Clearly a benefit to change would be increased health but there could be other factors that exist on an individual level.

**Perceived Barriers**

Barriers could be anything from losing friends, ego, to not having enough money or even self-efficacy problems such as not believing in one’s self. For change to take place the benefits must be stronger than the barriers.

A number of behavioral change theories exist to explain why people do and do not adopt certain health behaviors especially in adopting the act of hostel sanitation practices amongst Nigeria students. Often, these theories examine the predictors and precursors of health behavior. Many of these theories have common elements such as self-efficacy and motivation. Self efficacy is one’s belief in their ability to do something, such as change a health related behavior, and it is grounded in one’s past success or failure in the given activity. One’s self efficacy is seen as predicting the amount of effort one will expend in trying to change (Bandura, 1977).

Criticism of many of the behavioral change theories focuses on their emphasis on individual behavior while excluding the influence of environment, sociocultural factors, economic issues, and policy level mandates. Constraints such as chronic exposure to violence, political upheaval, and poor sanitation are ignored in favor of paying greater attention to individual cognitive processes (Stokols, 2006).

**2.3 EMPIRICAL REVIEW**

**2.3.1 Empirical studies on sickle cell**

Sickle cell disease is a genetic disorders characterized by chronic haemolytic anaemia due to adverse effects of oxygen transport by the red blood cells. This leads to a decrease in oxygen supply to peripheral tissues. Because of the reduced oxygen tension, the red blood cells become sickle shape and sticky under condition of hypoxia, dehydration or acidosis. These sickled red blood cells clump inside large and small blood vessels leading to ischemia, pain and infarction. The pathogenesis of SCD is due mainly to polymerization of sickle red blood cells causing chronic haemolytic anaemia, vasoocclussive crisis and intravascular haemolysis. In this regard, many workers have reported their noteworthy contributions as: Kaul, D.K. et al (2000) concluded in their study, that after temporary exposure to hypoxia followed by reoxygenation, transgenic mice exhibited an excessive inflammatory response with leukocyte adhesion to endothelium, emigration and evidence of oxidant production in vascular endothelium. Brugnara C.et al (2000) reported that, Oxidative damage to cells is believed to be responsible for the activation of KCL-cotransport in sickled erythrocytes. Sickle cell erythrocytes are fragile and dehydrated and it is important that minerals and anti–oxidants are constantly supplied to maintain hydration and membrane integrity.

Benerjee et al (2001) noted that the clinical spectrum of sickle cell disease ranges from mild liver function test abnormalities in asymptomatic patients, to dramatic clinical crises with marked hyperbilirubinemia and liver failure. The study also reported that the patients with sickle cell anemia have hyperzincuria and systemic zinc deficiency.

Mutay Aslan et al (2001) reported that the episode of hypoxia – reoxygenation associated with SCD leads to the release of xantine oxidase into the circulation from hepatic cell replete in the activity of this source of O2 - and H2O2. This significantly contributes to the vascular disease that is the hallmark of sickle cell anemia.

Nath et al (2001) suggested that alterations in cellular redox occur in the sickle kidney. These redox alterations are countered by the induction of HO-1, a system that, quite remarkably, possesses attributes that may oppose many of the pathogenetic mechanisms underlying renal and other complications of sickle cell disease. Elizabeth S Klings et al (2001) concluded that Reactive oxygen species may play an important role in the vascular dysfunction that is observed during ACS and VOC of SCD. Elizabeth m barden et al (2002) summarised that Children with SCD have impaired growth, delayed puberty, and poor nutritional status.

S Richard et al (2002) demonstrated that the majority of patients with sickle cell disease have normal liver function as measured by standard biochemical parameters, despite transfusion and exposure to transfusion transmitted viruses.

Viktória Jeney et al (2002) suggested that heme derived from free Hb in plasma may threaten vascular endothelial cell integrity via oxidative modification of LDL this lipoprotein, in turn, induces the cytoprotectants heme oxygenase and Ferritin.

A V. Shrikhande et al (2003) reported that no significant correlation was found between HbF and total hemoglobin. The study showed that both the sexes are have more or less similar and higher HbF levels but total haemoglobin is low in females as compared to males.

Jyoti Titus et al (2004) concluded that it is clearly evident that both homozygous as well as heterozygous patients are exposed to enhanced oxidative stress as compared to controls. It is also evident that the antioxidant system is imbalanced in these patients and is probably unable to effectively counteract the augmented oxidative stress.

Saika S. Somjee et al (2004) summarised in their study that high circulating AGE levels in patients with SCA suggest that AGEs have a role in the vascular pathology of the disease. Further they suggested that AGEs could also have a role in the acute vascular pathology of SCA.

Anil Pathare et al (2004) reported that sickle cell from Oman showed a significant elevation in IL-1β , INF-ᵧ and IL-6 in steady state, when compared to normal controls. Malaria appeare to have played a role in precipitating some of the hyper haemolytic episodes. The authors have further studied to elucidate this role are required so that appropriate recommendations regarding malaria porphylaxis can be made in patients with sickle cell anemia

Joan L et al (2004) found that the alteration in vitamin A, Hb%, hematocrit, and BMI in their study.

Filiz Şimşek et al (2005) concluded that SOD (a preventive antioxidant) values and plasma MDA (the breakdown product of lipid peroxidation) levels were found to be higher in beta-thalassemic patients than healthy children,and suggested that The administration of selective antioxidants such as vitamin E with an appropriate diet or appropriate treatment might represent a promising way of counteracting with the oxidative damage and its deleterious effects on the progression of the disease.

Claudia R. Morris et al (2005) observed that dysregulated arginine metabolism is associated with intravascular hemolysis, inflammation, and endothelial cell activation. Alterations in the normal balance of arginine and its catabolic byproducts ornithine, citrulline and proline are associated withnpulmonary hypertension and prospective risk of death.

Yoshihito Iuchi et al (2005) studied that anemia is caused by oxidative stress, have implicated oxidative stress in anemia complicated with some infectious diseases. For example, malaria infection results in decreased antioxidant enzymes and substances such as catalase, GPx, SOD, GSH, ascorbate, and plasma tocopherol. The development of new antioxidant drugs with a function based on ROS reduction might constitute a promising tool not only for hereditary anemia but also for the control of the infection-mediated anemia.

Taiwo Kotila et al (2005) reported that the minimal elevation of the tramsaminases which is not gender or age dependent were observed in steady state sickle cell disease, higher levels of alkaline phosphatase may be due to associated vasoocclussive crises involving the bones rather than a pathology of liver.

Switzer, J.A. et al (2006) suggested that oxidants and cytokines result in up regulation of endothelial adhesion molecules and increased sickle cell adhesion.

Kaul, D.K. et al (2006) summarized in their study that the reactive oxygen species induced by reperfusion can react with nitric oxide to form the toxic peroxynitrite radical, increasing vasomotor tone. In an ex-vivo study in the rat mesocecal vasculature, PAF induced sickle cell adhesion was reduced by antioxidants.

R marouf et al (2006) concluded in their study that Evaluation of renal function is essential in patients with SCD. The unreliability of the ubiquitously used creatinine makes the assessment of GFR in patients with SCD difficult in clinical practice and estimates derived from cystatin C could replace creatinine based methods for routine assessment of renal function in patients with SCD.

Patrick B. et al (2006) investigated that Malondialdehyde levels were higher in thalassaemia compared with SCD., several inflammatory markers appeared higher in SCD. This inflammation in SCD may generate increased levels of γ- tocopherol, leading to decreased tissue peroxidation and injury.

Rana M.W. Hasanato et al (2006) reported that that plasma level of the antioxidant vitamins (A, C and E) and serum levels of zinc are significantly lower in patients with sickle cell disease as compared with a control group.

Vanessa Cumming et al (2006) concluded that asymptomatic becteriuria is a significant problem in individual with SCD and may be the source of pathogens in urinary tract infection.

Debes ray et al (2007) described that antioxidants vitamin level in heterozygous and homozygous sickle cell disorder in their study. They have analyse vit C , Vit E and beta carotene in sickle cell anemia and found the level of antioxidant vitamin are low in subjects with sickle cell disorder.

Katherine et al (2007) reported that the mounting evidence implicating an imbalance between reactive oxygen and nitrogen species in the pathogenesis of SCD. Further, stated that Decreased anti-oxidant defences in SCD patients and the emerging role of reactive oxygen and nitrogen species in the pathogenesis of SCD provides a platform for the development of novel agents to treat this painful and lethal disease.

Joanne Thompson et al (2007) observed that albuminuria and renal function in homogygous sickle cell disease. They further studied that the low level of serum creatinine in sickle cell disease.

Mariane de Montalembert et al (2007) concluded that the impaired flow mediated dilation of the brachial artery, probably related to endothelial dysfunction, is observed in children with SCA who lack evidence of arterial stiffness or intimal thickening. they further suggested that therapies intended to increase NO, such as arginine administration should be considered in children with SCA.

Foluke Fasola et al (2007) demonstrated that the current evidence of oxidative stress has important role in the pathophysiology of the deleterious association crisis in sickle cell patients and also reported that total antioxidant effect in the sickle cell patients with view to improve their health.

Sylvie A. Akohoue et al (2007) suggested that Low-grade inflammation and increased oxidative stress are present in adolescents with HbSS in the absence of acute crisis, and their markers are correlated with elevated resting energy expenditure (REE).

Vanusa Manfredini et al (2008) in their study determined oxidative stress has an important role to play in the pathophysiology of sickle cell disease. Sickle cell anemia patients in steady state show oxidative damage in spite of increased defence and suggested that the use of agent that increase the antioxidant capacity of these patients with a view to improving their clinical status.

Petra Niklowitz et al (2008) concluded that the oral administration of CoQ10 in sufficient doses leads to the incorporation of CoQ10 into platelets and white blood cells. Thus, blood cells may provide suitable targets for assessing intracellular CoQ10 concentrations. Intracellular enrichment may support cellular antioxidative defense mechanisms.

Richard Rokyta et al (2008) assessed biochemical marker like C reactive protein, total protein, albumin, total cholesterol, HDL and LDL cholesterol, glucose, triglycerides, reduced glutathione, malondialdehyde (MDA), and total antioxidative capacity in patients with pain in vascular region. They described biochemical changes in blood plasma components might play an important role in pain assessment and pain management.

Enika Nagababua et al (2008) examined that fluorescence arising from heme degradation increases in RBCs with unstable HbS. They further suggested that degradation of the heme moiety in intact hemoglobin and/or degradation of free heme by peroxides are higher in pathological RBCs.

Joy Okpuzor et al (2008) suggested the intervention of medicinal plant in management of sickle cell disease by traditional healer and underlying principal of their usage. They also mentioned the sickle cell erythrocytes are fragile and dehydrated and it is important that minerals and antioxidants are constantly supplied to maintain hydration and membrane integrity.

O. G. Arinola et al (2008) observed that, significantly lower result of total antioxidants and certain trace elements is common in sickle cell disease.

Manfredini V et al (2008) observed that the production of MDA was observed in the serum of sickle cell anemia patients. They also demonstrated that patients with sickle cell are subjected to chronic oxidative stress and are able to oxidative damage in biological macromolecule such as in male and female patients.

Ren H et al (2008) suggested that the lower level of membrane EPA and DHA in blood cell of the HbSS patients, and concluded that due to lipid peroxidation resulting form comprised antioxidants competence.

Claudia R. Morris et al (2008) concluded that, decreased glutathione and glutamine levels occur in SCD and may contribute to alterations in the erythrocyte redox environment, leading to compromised erythrocyte integrity.

Nayma Sultana et al (2009) studied that increased in osmotic fragility and decreased red cell indices in glucose 6 phosphate dehydrogenase deficiency and vitamin E supplementation help to return these value toward normal.

Radha Raghupathy et al (2009) reported that Oral L-glutamine has been shown to significantly increase NAD redox potential and NADH concentration in sickle RBCs, thereby reducing oxidative damage. Xiaomei Niu et al (2009) found that the etiology of pulmonary hypertension in sickle cell disease is multi-factorial, and that proinflammatory and angiogenic pathways may interact with the degree of hemolysis in contributing to the development of pulmonary hypertension.

Suba Krishnan et al (2009) demonstrated that a strong association between the inflammatory biomarker hs-CRP and hospitalization for Vasso Occlusive Crisis events in paediatric Sickle Cell Disease . and suggested hsCRP as a potential biomarker for predictive modelling of clinical outcomes in paediatric SCD. Abhay Bhave et al (2009) noted that every hypochromic microcytic anemia with or without is not always an iron deficiency.

Trine juul et al (2010) summarized ex vivo evidence from mammalian cell culture experiments and in vivo evidence from A. thaliana point to two direct HU targets, RNR and Catalase. Between them, they have the potential to explain many of the pharmacological effects of HU, and the separation of HU effects mediated by these two targets now becomes an important task. they further concluded in their finding the hydroxyurea act as a Catalase activation pro drug. Clinically they have found Catalase activity in circulating cells from untreated chronic myeloid leukaemia.

Nitin John (2010) et al written a review article of clinical profile in sickle cell trait in his article he has mentioned the levels of Superoxide dismutase, Vitamin C, haemoglobin and albumin in sickle cell patients and control. Also given endogenous antioxidants status in patients and control.

Darcielle Bruna Dias Elias et al (2010) showed that during pathogenesis of SCA it is possible to observe an increase in lipid peroxidation. On the other hand, during treatment with HU we did not detect any abnormality in the oxidative parameters, probably due to the short period of treatment of the patients studied.

**2.3.2 Empirical studies on Rhesus factor**

The appearance of the disease is dependent on the frequency of the blood group Rh negative. Without such mothers, there would be no risks of Rh disease. We do however not find the blood group all over the world; instead there are large geographical differences. It is mainly related to the white population of the world. In America, it is present in 15% of the Caucasian population, while only 1 % of those of Asian or native background have it. Some groups in Europe have a very large proportion of Rh negative in their populations. One example is the Basques where there is around 50%. In other parts of Europe, the proportion is around 15 %. There are however other parts with comparatively many Rh negative persons. In a study of blood groups in Lagos, Beckman et al. (2002) found that the Rh negative individuals were quiet common in the northern parishes along the coast of the county. For those born in the early 20th century around 22% of the population were Rh negative.

**CHAPTER THREE**

**RESEARCH METHODOLOGY**

**3.1 Introduction**

This chapter covers the description and discussion on the various techniques and procedures used in the study to collect and analyze the data as it is deemed appropriate

**3.2 Research Design**

For this study, the survey research design was adopted. The choice of the design was informed by the objectives of the study as outlined in chapter one. This research design provides a quickly efficient and accurate means of assessing information about a population of interest. It intends to carry out a comparative study of sickle cell disease and Rhesus factor comparability among couples in Yenegoa and Port Harcourt.

**3.3 Study area**

The research on a comparative study of sickle cell disease and Rhesus factor comparability among couples in Yenegoa and Port Harcourt was carried out in Port Harcourt. Port Harcourt is the capital and largest city of Rivers State, Nigeria. It lies along the Bonny River and is located in the Niger Delta. As of 2016, the Port Harcourt urban area has an estimated population of 1,865,000 inhabitants, up from 1,382,592 as of 2006.

**3.4 Population of the Study**

A total of 200 questionnaires were distributed. Although only 135 were returned and completed. This will serve as the Population of the study.

**3.5 Selection of Sample/sample Techniques**

The researcher used Yaro Yammane’s formular to determine the sample size from the population.

Yaro Yamane’s formula is given

As n = N

1+N (e) 2

Where N = population of study (135)

n = sample size

e = level of significance at 5% (0.0025)

1 = constant

The sample size of the study is 101 respondents.

**3.6 Sources of Data**

Data for this study was collected from primary and secondary sources. The primary sources of data collected was mainly the use of a structured questionnaire which was designed to elicit information on a comparative study of sickle cell disease and Rhesus factor comparability among couples in Yenegoa and Port Harcourt

The secondary source of data collections were textbooks, journals and scholarly materials.

**3.7 Validity of Instrument**

The validity of the instrument was determined through field work. The study was a test-retest procedure where twenty (20) respondents were randomly selected and the questionnaire was administered to them twice with a two-week internal allowed between the two tests. The questionnaire used in the test was marked for ease of pairing the first set with the second set. The scores of the responses on the two tests were subjected to correlation to obtain the test coefficient of approximately 0.81.

**3.8 Reliability of Instrument**

The coefficient of 0.81 was considered a reliability coefficient because according to Etuk (1990), a test-retest coefficient of 0.5 will be enough to justify the use of a research instrument.

**3.9 Techniques of Data Analysis**

Having gathered the data through the administration of questionnaire, the collected data will be coded, tabulated and analyzed using SPSS statistical software according to the research question and hypothesis.

In order to effectively analyze the data collected for easy management and accuracy, the Paired sample t-test and Pearson correlation method was used.

**CHAPTER FOUR**

**4.0 DATA PRESENTATION, DATA ANALYSIS AND INTERPRETATION**

**4.1 INTRODUCTION**

This chapter is devoted to the presentation, analysis and interpretation of the data gathered in the course of this study. The data are based on the number of copies of the questionnaire completed and returned by the respondents. The data are presented in tables and the analysis is done using the chi-square test and Pearson correlation.

**4.2 DEMOGRAPHIC DATA OF THE RESPONDENTS**

TABLE 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **AGE GRADE OF THE RESPINDENTS** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | LESS THAN 30 | 42 | 41.6 | 41.6 | 41.6 |
| 30-40 YEARS | 46 | 45.5 | 45.5 | 87.1 |
| ABOVE 40 | 13 | 12.9 | 12.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 1 above shows the age grade of the respondents; 42 of the respondents which represent 41.6 percent of the total population are less than 30 years old. 46 of the respondents which represent 45.5 percent of the total population are 46 years old. 13 of the respondents which represent 12.9 percent of the total population are above 4o years old.

TABLE 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **GENDER OF THE RESPONDENTS** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | MALE | 47 | 46.5 | 46.5 | 46.5 |
| FEMALE | 54 | 53.5 | 53.5 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 2 above shows the gender of the respondent; from the result of the data analysis, 47 of the respondents which represent 46.5 percent of the total population are male while 54 of the respondents which represent 53.5 percent of the total population are female

TABLE 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EDUCATIONAL LEVEL** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | BSC | 42 | 41.6 | 41.6 | 41.6 |
| MSC | 48 | 47.5 | 47.5 | 89.1 |
| PhD | 11 | 10.9 | 10.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 3 above shows the educational level of the respondents; from the result of the data analysis, 42 of the respondents which represent 41.6 percent of the total population have BSC qualification. 48 of the respondents which represent 47.5 percent of the total population have MSC qualification while 11 of the respondents which represent 10.9 percent of the total population have PhD.

TABLE 4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **How long have being in the media campaign group for community health?** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | LESS THAN 1 YEAR | 35 | 34.7 | 34.7 | 34.7 |
| 1-5 YEARS | 30 | 29.7 | 29.7 | 64.4 |
| 5-15 YEARS | 26 | 25.7 | 25.7 | 90.1 |
| ABOVE 15 YEARS | 10 | 9.9 | 9.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 4 shows the shows the responses of the respondents on how long have being in the media campaign group for community health. 35 of the respondents which represent 34.7 percent of the total population said they have being in the media campaign group for community health in less than 1 year. 30 of the respondents which represent 29.7 percent of the total population said they have being in the media campaign group for community health for 1-5 years. 26 of the respondents which represent 25.7 percent of the total population said they have being in the media campaign group for community health for 5-15 years while 10 of the respondents which represent 9.9 percent of the total population said they have being in the media campaign group for community health for above 15 years.

TABLE 5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **How long have you been working in your current premise?** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | LESS THAN 1 YEAR | 47 | 46.5 | 46.5 | 46.5 |
| 1-2 YEARS | 18 | 17.8 | 17.8 | 64.4 |
| 2-4 YEARS | 27 | 26.7 | 26.7 | 91.1 |
| 4-6 YEARS | 3 | 3.0 | 3.0 | 94.1 |
| ABOVE 6 YEARS | 6 | 5.9 | 5.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 5 above shows the responses of the respondents on how long they have been working in their current premises. 47 of the respondents which represent 46.5 percent of the total population said that they have been working in their current premises for less than 1 year. 18 of the respondents which represent 17.8 percent of the total population said that they have been working in their current premises for 1-2 years. 27 of the respondents which represent 26.7 percent of the total population said that they have been working in their current premises for 2-4 years. 3 of the respondent which represent 3 percent of the total population said that they have been working in their current premises for 4-6 years while 6 of the respondents which 5.9 percent of the total population said that they have been working in their current premises for more than 6 years

TABLE 6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **How long has media campaign for sickle cell and rhesus factor campaign been on in port Harcourt and Bayelsa?** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | LESS THAN 1 YEARS | 29 | 28.7 | 28.7 | 28.7 |
| 1-5 YEARS | 37 | 36.6 | 36.6 | 65.3 |
| 5-10 YEARS | 22 | 21.8 | 21.8 | 87.1 |
| 10-15 YEARS | 8 | 7.9 | 7.9 | 95.0 |
| ABOVE 15 YEARS | 5 | 5.0 | 5.0 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 6 above shows the responses of the respondents on how long media campaign for sickle cell and Rhesus factor campaign been on in Port Harcourt and Bayelsa. 29 of the respondents which represent 28.7 percent of the total population said that media campaign for sickle cell and rhesus factor campaign been on in port Harcourt and Bayelsa for less than a year. 37 of the respondents which represent 36.6 percent of the total population said that media campaign for sickle cell and rhesus factor campaign been on in port Harcourt and Bayelsa for 1-5 years. 22 of the respondents which represent 21.8 percent of the total population said that media campaign for sickle cell and rhesus factor campaign been on in port Harcourt and Bayelsa for 5-10 years. 8 of the respondents which represent 7.9 percent of the total population said that media campaign for sickle cell and rhesus factor campaign been on in port Harcourt and Bayelsa for 10-15 years while 5 of the respondents which represent 5 percent of the total population said that media campaign for sickle cell and rhesus factor campaign been on in port Harcourt and Bayelsa for more than 15 years

TABLE 7

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **What type of media campaign do you use in creating awareness on sickle cell and Rhesus factor?** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | PRINT MEDIA | 54 | 53.5 | 53.5 | 53.5 |
| BROADCAST MEDIA | 32 | 31.7 | 31.7 | 85.1 |
| BOTH | 15 | 14.9 | 14.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 7 shows the responses of the respondents on the type of media campaign they use in creating awareness on sickle cell and Rhesus factor. 54 of the respondents which represent 53.5 percent of the total population said they use print media in creating awareness on sickle cell and Rhesus factor. 32 of the respondents which represent 31.7 percent of the total population said they use broadcast media in creating awareness on sickle cell and Rhesus factor while 15 of the respondents which represent 14.9 percent of the total population said they use both.

**SECTION B- A COMPARATIVE STUDY OF SICKLE CELL DISEASE AND RHESUS FACTOR COMPARABILITY AMONG COUPLES IN YENEGOA AND PORT HARCOURT**

TABLE 8

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Where you did first heard about sickle cell disease and Rhesus factor?** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | NEVERHEARD | 31 | 30.7 | 30.7 | 30.7 |
| UNDERGRADUATE LEVEL | 32 | 31.7 | 31.7 | 62.4 |
| POST GRADUATE LEVEL | 16 | 15.8 | 15.8 | 78.2 |
| PERSONAL READING | 13 | 12.9 | 12.9 | 91.1 |
| WORK | 4 | 4.0 | 4.0 | 95.0 |
| SEMINAR/WORKSHOP | 5 | 5.0 | 5.0 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 8 shows the responses of the respondents on where they first heard about sickle cell and Rhesus factor. 31 of the respondents which represent 30.7 percent of the total population said they never heard about sickle cell and Rhesus factor. 32 of the respondents which represent 31.7 percent of the total population said during their undergraduate level. 16 of the respondents which represent 15.8 percent of the total population said during their post graduate level. 13 of the respondents which represent 12.9 percent of the total population said through personal reading. 4 of the respondents which represent 4.0 percent of the total population said from their place of work while 5 of the remaining respondents which represent 5 percent of the total population said via seminar/workshop

TABLE 9

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **What are the role of media in creating awareness on sickle cell and Rhesus factor?** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | GENOTYPE AWARENESS CAMPAIGN | 22 | 21.8 | 21.8 | 21.8 |
| ADVERTISING DRUGS FOR TREATMENT OF SICKLE CELL | 44 | 43.6 | 43.6 | 65.3 |
| EDUCATING PEOPLE ON MATCH MAKING | 16 | 15.8 | 15.8 | 81.2 |
| PARTNER SCREENING | 8 | 7.9 | 7.9 | 89.1 |
| CLINICAL FOLLOW UP | 3 | 3.0 | 3.0 | 92.1 |
| PROVIDE EFFECTIVE TREATMENT | 4 | 4.0 | 4.0 | 96.0 |
| CASE REPORTING | 4 | 4.0 | 4.0 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 9 above shows the responses of the respondents on what are the role of media in creating awareness on sickle cell and Rhesus factor. 22 of the respondents which represent 21.8 percent of the total population said that they advice on genotype awareness campaign. 44 of the respondents which represent 43.6 percent of the total population said that they advertise drugs for treatment of sickle cell. 16 of the respondents which represent 15.6 percent of the total population said they notice their roles in the educating people on match making. 8 of the respondents which represent 7.9 percent of the total population said they help in partner screening. 3 of the respondents which represent 3.0 percent of the total population said media campaign helps in clinical follow up. 4 of the respondents which represent 4 percent of the total population said they provide effective treatment while 4 of the respondent which represent 4 percent of the total population said they provide case reporting

TABLE 10

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Age range of male patients as covered by media in most hospitals in Port Harcourt and Bayelsa** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 8-10 YEARS | 51 | 50.5 | 50.5 | 50.5 |
| 11-12 YEARS | 38 | 37.6 | 37.6 | 88.1 |
| ABOVE 13 YEARS | 12 | 11.9 | 11.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 10 shows the responses of the respondents on the age range of their male patients. 51 of the respondents which represent 50.5 percent of the total population said their male patients are from 8-10 years old. 38 of the respondents which represent 37.5 percent of the total population said their male patients are from 11-13 years old while the remaining 12 of the respondents which represent 11.9 percent of the total population said their male patient are above 13 years old.

TABLE 11

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Age range of female patients as covered by media in most hospitals in Port Harcourt and Bayelsa** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 8-10 YEARS | 56 | 55.4 | 55.4 | 55.4 |
| 11-13 YEARS | 31 | 30.7 | 30.7 | 86.1 |
| ABOVE 13 YEARS | 14 | 13.9 | 13.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 11 above shows the responses of the respondents on the age range of their female patients. 56 of the respondents which represent 55.4 percent of the total population said their female patients are from 8-10 years old. 31 of the respondents which represent 30.7 percent of the total population said their male patients are from 11-13 years old while the remaining 14 of the respondents which represent 13.9 percent of the total population said their male patient are above 13 years old.

TABLE 12

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Commonly encountered symptoms for sickle cell and Rhesus factor for male patients as reported by the media** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | YELLOW EYES | 14 | 13.9 | 13.9 | 13.9 |
| JOINT PAINS | 70 | 69.3 | 69.3 | 83.2 |
| SHORTAGE OF BLOOD | 13 | 12.9 | 12.9 | 96.0 |
| LOST OF WEIGHT | 4 | 4.0 | 4.0 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 12 above shows the responses of the respondents on the commonly encountered symptoms for sickle cell and Rhesus factor male patients as reported by the media. 14 of the respondents which represent 13.9 percent of the total population said that their male patients have yellow eyes. 70 of the respondents which represent 69.3 percent of the total population said their male patient have joint pains. 13 of the respondents which represent 12.9 percent of the total population said their male patients have shortage of blood while the remaining 4 of the respondents which represent 4 percent of the total population said that their male patients have lost of weight

TABLE 13

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Commonly encountered symptoms for female patients of sickle cell and Rhesus factor as reported by the media in Port Harcourt and Bayelsa** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | YELLOW EYES | 44 | 43.6 | 43.6 | 43.6 |
| JOINT PAINS | 32 | 31.7 | 31.7 | 75.2 |
| SHORTAGE OF BLOOD | 20 | 19.8 | 19.8 | 95.0 |
| LOST OF WEIGHT | 5 | 5.0 | 5.0 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 13 above shows the responses of the respondents on the commonly encountered symptoms for female patients of sickle cell and Rhesus factor as reported by the media in Port Harcourt and Bayelsa. 44 of the respondents which represent 43.6 percent of the total population said that their female patients have yellow eyes. 32 of the respondents which represent 31.7 percent of the total population said their female patient have joint pains. 20 of the respondents which represent 19.8 percent of the total population said their female patients have shortage of blood while the remaining 5 of the respondents which represent 5 percent of the total population said that their female patients have lost of weight

TABLE 14

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Commonly used drugs in the control of the symptoms of sickle cell anaemia** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | ANALGESIC | 28 | 27.7 | 27.7 | 27.7 |
| FOLIC ACID | 45 | 44.6 | 44.6 | 72.3 |
| VITAMIN B COMPLEX | 15 | 14.9 | 14.9 | 87.1 |
| VITAMIN C | 5 | 5.0 | 5.0 | 92.1 |
| OMEGA H3 | 2 | 2.0 | 2.0 | 94.1 |
| CHEMIRON CAPSCULE | 6 | 5.9 | 5.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 14 shows the responses of the respondents on the commonly used drugs in the control of the symptoms of sickle cell anaemia. 28 of the respondents which represent 27.7 percent of the total population said that the commonly used drug for the control of the symptoms of sickle cell anaemia is analgesic. 45 of the respondents which represent 44.6 percent of the total population said that the commonly used drug for the control of the symptoms of sickle cell anaemia is folic acid. 15 of the respondents which represent 14.9 percent of the total population said that the commonly used drug for the control of the symptoms of sickle cell anaemia is vitamin B complex. 5 of the respondents which represent 5 percent of the total population said that the commonly used drug for the control of the symptoms of sickle cell anaemia is vitamin c. 2 of the respondents which represent 2 percent of the total population said that the commonly used drug for the control of the symptoms of sickle cell anaemia is omega H3. 6 of the respondents which represent 5.9 percent of the total population said that the commonly used drug for the control of the symptoms of sickle cell anaemia is Chemiron capsculee

TABLE 17

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Opinion of current role of media campaign in sickle cell and Rhesus factor management** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | OVERUTILIZED | 28 | 27.7 | 27.7 | 27.7 |
| SATISFACTORY | 55 | 54.5 | 54.5 | 82.2 |
| UNDERUTILIZED | 12 | 11.9 | 11.9 | 94.1 |
| NOT SURE | 6 | 5.9 | 5.9 | 100.0 |
| Total | 101 | 100.0 | 100.0 |  |

**Source: field survey, August, 2018**

Table 17 shows the responses of the respondents on the current role of media campaign in sickle cell and Rhesus factor management. 28 of the respondents which represent 27.7 percent of the total population said that that media campaign in sickle cell and Rhesus factor management is over utilized

55 of the respondents which represent 54.5 percent of the total population said that that media campaign in sickle cell and Rhesus factor management satisfactory

12 of the respondents which represent 11.9 percent of the total population said that that media campaign in sickle cell and Rhesus factor management is underutilized

6 of the respondents which represent 5.9 percent of the total population said that that they are not sure if media campaign in sickle cell and Rhesus factor management is effective.

**RESEARCH HYPOTHESIS**

**Hypothesis 1**

**H0:** there is no significant the difference in effectiveness of media campaign on sickle cell and Rhesus factor

**H1:** there is significant the difference in effectiveness of media campaign on sickle cell and Rhesus factor

**Level of significance** (α=0.05)

**Decision Rule**: reject H0 if the p-value is less than the level of significance, otherwise accept the null hypothesis

Table 12

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Paired Samples Test** | | | | | | | | | |
|  | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
| Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | |
| Lower | Upper |
| Pair 1 | Broadcast media reaches higher number of audience in creating awareness for sickle cell and Rhesus factor management in Bayelsa and Port Harcourt – Print media creates awareness on sickle cell and Rhesus factor to passer by only | -.550 | .678 | .048 | -.645 | -.455 | -11.471 | 199 | .000 |

**CONCLUSION BASED ON DECISION RULE**

Since the p-value is less than the level of significance, we therefore reject the null hypothesis and conclude that there is significant the difference in effectiveness of media campaign on sickle cell and Rhesus factor.

**Hypothesis 2**

**H0:** Rhesus factor and sickle cell have no significant effect on child mortality rate in Yenegoa and Port Harcourt

**H1:** Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt

**Level of significance** (α=0.05)

**Decision Rule**

In taking decision for “r”, the following rules shall be observed;

1. If the value of “r” tabulated is greater than “r” calculated, accept the alternative hypothesis (H1) and .reject the null hypothesis (H0).
2. If the “r” calculated is greater than the “r” tabulated, accept the null hypothesis (H0) while the alternative hypothesis is rejected

Table 14

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt | Broadcast media reaches higher number of audience in creating awareness for sickle cell and Rhesus |
| Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt | Pearson Correlation | 1 | .819\*\* |
| Sig. (2-tailed) |  | .000 |
| N | 101 | 101 |
| Broadcast media reaches higher number of audience in creating awareness for sickle cell and Rhesus | Pearson Correlation | .819\*\* | 1 |
| Sig. (2-tailed) | .000 |  |
| N | 101 | 101 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | | |

**CONCLUSION BASED ON DECISION RULE**

From table 14 above, since the value of “r” tabulated is greater than “r” calculated, accept the alternative hypothesis (H1) and reject the null hypothesis (H0) and conclude that Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt

**NOTE:** There is a statistically significantly (0.00) strong relationship (0.819) between the responses of the respondents that said that Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt and those that said that broadcast media reaches higher number of audience in creating awareness for sickle cell and Rhesus

**CHAPTER FIVE**

**5.0 SUMMARY CONCLUSION AND RECOMMENDATION**

The main aim of the research work is to carry out a comparative study of sickle cell disease and Rhesus factor comparability among couples in Yenegoa and Port Harcourt. The study found out that the broadcast media is more effective than the print media in the awareness campaign for sickle cell and Rhesus factors. Most of the respondents believed that media campaign in sickle cell and Rhesus factor management satisfactory. There are several drugs which could help in the management of sickle cell anaemia some of the drugs are analgesic folic acid, vitamin B complex, vitamin C, omega H3 and chemiron capscule. The symptoms of sickle cell is most noticed from joint pain and yellowing of the eyes.

**CONCLUSION**

In conclusion Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt. The result of the data analysis shows that there is a statistically significantly **(0.00)** strong relationship **(0.819)** between the responses of the respondents that said that Rhesus factor and sickle cell have significant effect on child mortality rate in Yenegoa and Port Harcourt and those that said that broadcast media reaches higher number of audience in creating awareness for sickle cell and Rhesus

**RECOMMENDATION**

The study recommends that:

1. the federal government should encourage media ownership by private individuals and NGOs to create awareness on sickle cell anemia and Rhesus factor
2. the federal government of Nigeria should improve on the health departments in general hospitals in Nigeria through provision of drugs and modern health care facilities
3. there is should be a programme to promote freedom of information in Nigeria so as to enable private media owners to share vital information on sickle cell disease and Rhesus factor comparability
4. parent should also play their role in educating their children on sickle cell and how it came about and the ways they can be stopped

**REFERENCE**

A V. Shrikhande et al (2003). Prophylaxis with oral penicillin in children with sickle cell anemia. A randomized trial N Engl J Med 2003; 314:1593- 9.

American Pain Society. Principles of Analgesic Use in the Treatment of Acute Pain and Cancer; 4th edition.

Anil Pathare et al (2004). Risk of recurrent stroke in patients with sickle cell disease treated with erythrocyte transfusions. J Pediatr 2004; 126:896-9.

Asika, L.K., (2009). *Essentials of Research Methodology.*Owerri: Spring Publishers. Pp.21

Barakat et al., 2008; Sickle cell disease clinical phenotypes in children from south-western. Nigeria.

Beckman et al. (2002). ‘Infant mortality in the nordic countries, 1870-1930’, Continuity and Change 23(3), 457–485.

Benerjee et al (2001). Natural history of sickle cell disease—the first ten years.

Bloom, (2005). Textbook of Clinical Haematology and Immunology. 2nd Edition.

Brugnara C.et al (2000). The irreversibly sickled cell: A determinant of haemolysis in sickle-cell anaemia.

Claudia R. Morris CR., (2008)Mechanisms of vasculopathy in sickle cell disease and thalassemia. Hematology Am Soc Hematol Educ Program

Claudia R. Morris et al (2005). A comparison of conservative and aggressive transfusion regimens in the perioperative management of sickle cell disease. N Engl J Med 2005; 333:206-13.

Creary et al., 2007; Beyond the definitions of the phenotypic complications of sickle cell disease: an update on management.

Edvinsson et al., (2008)., ‘Rh prevention: a report and analysis fo a national programme.’, Journal of medical genetics

Elizabeth S Klings et al (2001). Management of Cancer Pain. Clinical Practice Guideline No. 9. Rockville, MD: Agency for Health Care Policy and Research, Public Health Service, U.S. Department of Health and Human Services, 2004. AHCPR Pub. No. 94- 0592.

Fenigstein & Vanable, (2002). Bunn HF. Pathogenesis and treatment of sickle cell disease.N Engl J Med.

Filiz Şimşek et al (2005). The acute chest syndrome in sickle cell disease: Incidence and risk factors. Blood 2005; 84:643-9.

Fleming AF, (2008); Vasculopathy in sickle cell disease: biology, pathophysiology, genetics, translational medicine, and new research directions.

Joan L et al (2004). Causes and outcomes of the acute chest syndrome in sickle cell disease. N Engl J Med 2004; 342:1855- 65.

Jones, 2008). Nutrient insufficiencies/deficiencies in children with sickle cell disease and its association with increased disease severity.

Jyoti Titus et al (2004). Human parvovirus infection in homozygous sickle cell disease. Lancet 2003; 341:1237-40.

Kaul, D.K. et al (2000). Evidence for a direct reticulocyte origin of dense red cells in sickle cell anemia.

Kaul, D.K. et al (2006). De k¨arleksl¨osa m¨odrarna, PhD thesis, Ume˚a University.

Kulkarni, 2007; Prevalence of haemoglobins and relationships between sickle cell trait, malaria and survival. Ann Trop Med Parasitol

Modell B, Darlison M, Birgens H et al., (2007) Epidemiology of haemoglobin disorders in Europe: an overview. Scand J Clin Lab Invest Fleming AF, Storey J, Molineaux L et al. Abnormal haemoglobins in the Sudan savanna of Nigeria.

Mutay Aslan et al (2001). Lethbridge R, et al: The painful crisis of homozygous sickle cell disease: Clinical features.

Nath et al (2001). Prophylaxis with oral penicillin in children with sickle cell anemia: A randomized trial.

Olayinka, (2000).Postgraduate Haematology. 5th Edition.Blackwell.

Patrick B. et al (2006). The decline of fertility in Europe, Princeton University Press.

Popma, (2006). Management of sickle cell disease. N Engl J Med.

R marouf et al (2006). Clustering acorss generations: A comparative analysis of infant mortality in 19th century sweden. Annual meeting of the Social Science History Association, Chicago 2007.

Rana M.W. Hasanato et al (2006). ‘Death clustering, mothers’ education and the determinants of child mortality in rural punjab’, Population Studies 44(3), 489–505.

**REFERENCES**

Reid & Rodgers, 2007; Epidemiology of sickle cell disease hospital admissions in Brazil.

S Richard et al (2002). Mortality in children and adolescents with sickle cell disease. Cooperative Study of Sickle Cell Disease. Pediatrics 2002; 84:500-8.

Saika S. Somjee et al (2004). Effect of transfusion therapy on arteriographic abnormalities and on recurrence of stroke in sickle cell disease. Blood 2004; 63:162-9.

SCDAA, (2005). Mortality in sickle cell disease. N Engl J Med.

Stokols, (2006). Membrane abnormalities of irreversibly sickled cells.

Striegel-Moore, Silberstein, & Rodin (2003). Williams Hematology.6th Edition. McGraw-Hill.

Switzer, J.A. et al (2006). ‘Population studies in northern sweden iii. variations of abo and rh blood group gene frequencies in time and space’, Hereditas 72(2), 183–200.

Taiwo Kotila et al (2005), ‘Incidence of maternal rh immunization by ab0 compatible and incompatible pregnancies’, British Medical Journal .

Vanessa Cumming et al (2006). ‘High-risk families: The unequal distribution of infant mortality in nineteenth-century sweden’, Population Studies 59(3), 321–337.

Viktória Jeney et al (2002). Clinical events in the first decade in a cohort of infants with sickle cell disease. Cooperative study of sickle cell disease. Blood 2002; 86:776- 83.

Wood KC, Hsu LL, Gladwin MT, (2008). Sickle cell disease vasculopathy: a state of nitric oxide resistance. Free Radic Biol Med

Yoshihito Iuchi et al (2005). Demographic description of the Skellefte˚a and Sundsvall regions during the 19th century, Information from the Demographic Data Base, Demographic Data Base.

Yoshitake, (2000). Management and Therapy of Sickle Cell Disease. Bethesda, MD, National Institutes of Health, Heart, Lung and Blood Institute.

**QUESTIONNAIRE**

This research is focused on the use of sexually transmitted infection syndromic treatment among community pharmacies in Port Harcourt, Your cooperation would be highly appreciated and it would be confidential. Thanks.

**SECTION A-RESPONDENT DEMOGRAPHICS**

1. Age?

< 30 30-40 Above 40

1. Gender?

Male Female

1. Educational level?

BSc MSc PhD

Others, please specify……………………

1. How long have you been in community pharmacy practice?

Less than 1 year 1-5years 5-15years above 15 years

1. How long have you been working in your current premise?

Less than 1 year 1-2 years 2-4 years 4-6 years above 6 years

1. How long has media campaign for sickle cell and Rhesus factor campaign been on in Port Harcourt and Bayelsa?

Less than 1 year 1-5 years 5-10 years 10-15 years above 15 years

1. What type of mass media campaign do you use in creating awareness on sickle cell and Rhesus factor?

Print media broadcast media Both

**SECTION B- A COMPARATIVE STUDY OF SICKLE CELL DISEASE AND RHESUS FACTOR COMPARABILITY AMONG COUPLES IN YENEGOA AND PORT HARCOURT**

1. Where you did first heard about sickle cell disease and Rhesus factor**?**

Never heard Undergraduate level Post graduate level Personal reading Work Seminar/Workshop

1. What are the role of media in creating awareness on sickle cell and Rhesus factor.

genotype awareness campaign advertising drugs for treatment of sickle cell Educating people on match making Partner screening Clinical follow up Provide effective treatment Case reporting

1. Age range of male patients as covered by media in most hospitals in Port Harcourt and Bayelsa
   1. years 11-13 years above 13 years
2. Age range of male patients as covered by media in most hospitals in Port Harcourt and Bayelsa

8-11 years 11-13 years above 13 years

1. Commonly encountered symptoms for sickle cell and Rhesus factor male patients as reported by the media

Yellow eyes Joint pains Shortage of blood Lost of weight

1. Commonly encountered symptoms for female patients of sickle cell and Rhesus factor as reported by the media in Port Harcourt and Bayelsa

yellow eyes joint pains Lost of weight Lower abdominal pain

1. Commonly used drugs in the control of the symptoms of sickle cell anaemia

Analgesic folic acid Vitamin B complex Vitamin c Omega H3 Chemiron capscule others………………………..

1. Opinion of current role of media campaign in sickle cell and Rhesus factor management.

Over utilized Satisfactory Underutilized Not sure