# Knowledge and Attitude of Sickle Cell Disease Among Students of Federal University, Lokoja In Kogi State

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## *Abstract*

*Sickle Cell Disease is an inherited abnormality of the red blood cell characterized by chronic haemolytic anaemia with numerous clinical consequences. The aim of the study was to assess the knowledge and attitudes of Sickle Cell Disease among students of Federal University, Lokoja in Kogi state. The sample for the study was six hundred (600) Students selected through simple random technique from the three departments selected from the three faculties used for the study. A self-structured questionnaire validated and tested for reliability was used for data collection. Data collected was analyzed using descriptive and inferential statistics of percentage and Chi-square to analyze the research questions and hypotheses respectively. The study concluded that students of the Federal University have good knowledge about Sickle Cell Disease and also expressed positive attitude towards Sickle Cell Disease. The author recommended that more education should be done as this will help equip students to take informed decision and action as well as to instil into the students and the society in general the right attitude towards Sickle Cell Disease.*

**Keywords:** Knowledge, Attitude, Sickle Cell Disease, Students, Lokoja.

## *Introduction*

Sickle Cell Disease remains one of the most common genetic blood disorder in tropical and Sub-tropical regions. However, forced migration and ongoing population movement have spread it throughout the world, with estimated birth rates reaching 0.49 per 1,000 in America, 0.07 per 1,000 in Europe, 0.68 per 1,000 in South and South East Asia and 10.68 per 1,000 in Africa (Vaughn et al 2011; Karadag, Gungormus & Olcar, 2018). It is estimated that around 400,000 Sickle Cell Disease babies are born globally each year with almost 300,000 children babies in Africa Countries alone (Aloni and Nkee, 2014; Boadu & Addoah 2018). Although, Sickle Cell Disease is seen in all race, prevalence is higher in African-Origin individuals (Oludare & Ogili 2013; Adewoyin, Alagbe, Adedokun & Idubori, 2015).

Sickle Cell Disease is a group of autosomal recessive hemoglohinopath is characterized by the presences of hemoglobin in the red blood cells (Aloni and Nkee 2014; Uche et al, 2017) Sickle Cell Disease is one of the most common hereditary Disease occurring worldwide, which may affect any organ or system of human body. It is an irreversible manageable health problem predominantly seen amongst various tribes, worldwide (Olarewaju, Enwere, Adebimpe & Olugbenga-Bello, 2013; Gbenol, Brisibe & Ordinioha, 2015; Tusunbira et al 2018). In Africa, three forms of Sickle Cell Disease are present which include Sickle Cell anaemia (HBSS), Sickle Cell hemoglobin-C (Hb-SC) and Sickle Cell thalasaemia (HB-Ssthal) (Olarewaje et al; 2013; Kambale-Komb et al, 2020).

In Nigeria, the prevalence of Hbss is 1-3 percent and it possesses a severe burden on the affected individuals and their families (Olarewaju et al, 2013). Children born to two parents with Sickle Cell trait have a 25percent chance of having Sickle Cell Disease and a 50percent chance of having Sickle Cell trait. Therefore, it is highly important for people of reproductive age group to understand the genetics of Sickle Cell Disease, know their own blood type, if they carry the S gene choose in advance of selecting partners of future marriage (Owolabi et al, 2011; Alkind, Salha& Al-Ken, 2012 & Olarewaju, et al, 2013).

Despite the large number of people affected with Sickle Cell Disease, the level of knowledge about Sickle Cell Disease is still low (Ugwu, 2016). In Nigeria, various studies have reported poor

knowledge of Sickle Cell Disorder among students. A study conducted by Adewuyi, 2000 among fresh University graduates in Ilorin, Nigeria as cited by Ugwu (2016) reported poor knowledge of Sickle Cell Disease, as only 43 percent of the respondent showed little understanding of the Disease. Similar study conducted in Benin city, Nigeria by Bazuaye and Olayemi, (2009) reported that majority of the students (55.1%) do not know their genotype and only 18% have some correct ideas about sickle Cell Disease. Knowledge gap has also been shown by a similar study conducted in Jos, Nigeria by Olarewaju et al, (2013) who reported that many of the students (25.5%) had wrong belief that Sickle Cell Disease is caused by evil spirit, the study from Ghana and Uganda as also indicated knowledge gap despite the high prevalence of Sickle Cell carrier status approaching 25 percent and the universal newborn screening programme being introduced recently in Ghana (Ross et al. 2011, Boadu and Addoah, 2018 &Tusunbira, and Nakaying 2018). Also, study by Ugwu (2016) among Undergraduates reported lack of adequate comprehensive knowledge about Sickle Cell Disease. Most of the respondents exhibited some misconception about Sickle Cell Disease mentioning Witchcraft, germs, evil spirit and curse by enemies as the causes of the Disease. However, study by Uche et al; (2017) among undergraduates toward Sickle Cell disease in Lagos, Nigeria reported a high level of adequate, knowledge about Sickle Cell disease.

Knowledge about sickle cell disease is a way of preventing and controlling scourge, since people will be better equipped to take informed decision concerning marriage and also student's attitude towards Sickle Cell disease is one of the contributing factors that is important to plan educational programme as well as determine level of stigmatization towards patient affected with Sickle Cell disease. The youths are good entry point for interventions aimed at controlling the disease since University students are usually in relationship that may eventually lead to marriage in future, so issue of premarital screening may be of concern, as this maybe be affected by existing knowledge and attitude to Sickle Cell Disease. This is central to prevention efforts since the disease is preventable. Therefore, understanding knowledge about Sickle Cell inheritance, its health and reproductive health implications as well as behavior towards individual with Sickle Cell Disease particularly among university students is important as this will limit the spread of the disease. Although, several published studies have given varying reports about the knowledge of Sickle Cell Disease among students but there is paucity of published data on the knowledge and attitudes towards Sickle Cell Disease among students in our locality. The aim of this study is therefore to assess the knowledge and attitude of students of Federal University, Lokoja in Kogi State, Nigeria towards Sickle Cell Disease.

**Purpose of the Study**

The general purpose of this study is to determine the level of knowledge and type of attitude possessed by students of Federal University, Lokoja in Kogi State. Specifically, the study is to:

Determine whether students of Federal University, Lokoja in Kogi State will possess adequate level of knowledge about Sickle Cell Disease.

Determine whether students of Federal University, Lokoja in Kogi State will express positive attitude towards Sickle Cell Disease.

**Research Questions**

The study intent to answer the following research question:

I. What is the level of knowledge about Sickle Cell Disease possessed by students of Federal University, Lokoja in Kogi State?
II. What are the attitudes expressed by students of Federal University, Lokoja towards Sickle Cell Disease?

**Research Hypotheses**

Based on the above research questions, the following hypotheses were formulated;

Ho1: Students of Federal University, Lokoja will not significantly possess high level of knowledge about Sickle Cell Disease.

Ho2: Students of Federal University, Lokoja will not significantly express positive attitude towards Sickle Cell Disease.

**Methodology**

**Area of Study**

This study was carried out at Federal University, Lokoja in Kogi State. Respondents were recruited from various faculties in the University.

**Research Design**

A Cross-sectional survey design was used for this study. An earlier report (Bowling, 2005) revealed that survey design enables the collection of detailed and factual information. It also describes existing phenomenal and justifies current conditions and practices.

**Population**

The population for the study comprises all students of Federal University Lokoja in Kogi state.

**Sample and Sampling Techniques**

A sample of six hundred (600) students were selected for this study. In selecting the sample, there are five (5) faculties in the University, out of which three (3) were randomly selected through balloting. Simple random sampling technique was employed to select three departments, one department each from the three (3) selected faculties, as well as to select two hundred (200) students each from the selected department.

**Instrumentation**

The research instrument used in this study was structured questionnaire developed by the researcher. Information sort in the questionnaire included demographic characteristics, knowledge about Sickle Cell Disease and students' attitude towards Sickle Cell Disease. In order to ensure face and content validity of the instrument, the researcher structured set of questionnaire was submitted to five experts in the field of Health Education and Community Medicine for vetting so as to ensure their appropriateness, relevance and clarity. This help in the face and content validity process of the instrument. A test re-test method was used for re-ability of the instrument and 0.72r was obtained using Pearson Product Moment Correlation.

**Data Collection**

The researcher with the help of two trained research assistants administered copies of the instrument with on the-spot collection after it has been filled. The consent of each respondent was sought and confidentiality pledged.

**Data Analysis**

Data collected was subjected to descriptive statistics of frequencies count and percentage to answer research questions. Therefore, any percentage of response that is 50 percent and above is positive or acceptable and any percentage of response that is less than 50 percent is negative and not acceptable. While inferential statistics of Chi-square was used to test the hypotheses at 0.05 alpha level of significance.

## *Results*

Research Question1; What is the level of knowledge about Sickle Cell Disease \

Table 1: **Respondent views on knowledge about Sickle Cell Disease?**

| STATEMENT | YES % | NO % | REMARK |
|---|---|---|---|
| Are you aware of the Sickle Cell Disease? | 506 84.3 | 94 15.7 | Positive |
| Sickle Cell Disease is inherited | 464 77.3 | 136 22.7 | Positive |
| Sickle Cell Disease is contagious | 224 37.3 | 376 62.7 | Negative |
| One of the signs of Sickle Cell Disease is frequent illness | 420 70 | 180 30 | Positive |
| Sickle Cell Disease can be diagnosed through blood test | 520 86.7 | 80 13.3 | Positive |
| There is a chance of Sickle Cell Disease in a child if both parents have sickle Cell-traits or carriers | 495 82.5 | 105 17.5 | Positive |
| There is a chance of Sickle Cell Disease in a child if one parent is carrier | 328 54.3 | 274 45.7 | Positive |
| Sickle Cell Disease can be prevented through genetic counseling | 358 59.7 | 242 40.3 | Positive |
| Premarital genotype testing and avoidance of marriage between two parents with haemoglobin S genotype or Sickle Cell traits is a means of preventing further spread of Sickle Cell Disease. | 490 81.7 | 110 18.3 | Positive |

From the above table, 506 (84.3%) agreed that they are aware of Sickle Cell Disease while 94 (15.7%) respondents disagreed. Also, the table indicated that 464 (77.3%) of the respondents agreed that Sickle Cell Disease is inherited while 136 (227%) respondents disagreed. The 224 (37.3%) of the respondents agreed that sickle Cell Disease is contagious while 376 (62.7%) disagreed. 420 (70%) of the respondents agreed that one of the sign of Sickle Cell Disease is frequent illness while 180 (30%) disagreed. 520 (86.7%) of the respondent agreed that Sickle Cell Disease can be diagnosed through blood test while 80 (13.3%) disagreed. Furthermore, 495 (82.5%) respondents agreed that there is a chance of Sickle Cell Disease in a child if both parents have Sickle Cell trait while 105 (17.5%) disagreed. 326 (54.3%) agreed that there is a chance of Sickle Cell Disease in a child if one parents is a carrier while 274 (45.7%) disagreed. 358 (59.7%) respondents affirmed that Sickle Cell Disease can be prevented through genetic counseling while 242 (40.3) disagreed. Finally, 490 (81.7%) respondents agreed that premarital genotype testing and avoidance of marriage between two persons with haemoglobin S genotype is a means of preventing further spread of Sickle Cell Disease while 110 (18.3%) disagreed. This implies that most of the respondents have a high level of adequate knowledge of Sickle Cell Disease.

**Research Question 2;** What are the type of attitude expressed by students of Federal University Lokoja towards Sickle Cell Disease?

**Table 2:** Respondents' view on attitude towards Sickle Cell Disease

| **STATEMENTS** | **YES** | **%** | **NO** | **%** | **REMARK** |
|---|---|---|---|---|---|
| Do you think everybody should know their genotype. | 365 | 60.8 | 235 | 39.2 | Positive |
| Will your partner genotype influence your decision to marry him/her. | 418 | 69.7 | 182 | 30.3 | Positive |
| If your partner has Sickle Cell Disease, will you go ahead to marry him or her. | 124 | 20.7 | 476 | 79.3 | Negative |
| I will end my relationship if I discover that our genotypes predispose us to having children with Sickle Cell Disease. | 540 | 90 | 60 | 10 | Positive |
| Intending couples who are carriers of Sickle Cell Disease should not continue with their marriage. | 485 | 80.8 | 115 | 19.2 | Positive |
| I will consider genetic testing before marriage. | 390 | 65 | 210 | 35 | Positive |
| I will feel sympathetic for people with Sickle Cell Disease. | 405 | 67.5 | 195 | 32.5 | Positive |
| We should be worried about people with Sickle Cell Disease since they may die soon. | 382 | 63.7 | 218 | 36.3 | Positive |
| Intending couples should seek genetic counselling and make informed consent about their relationship. | 420 | 70 | 180 | 30 | Positive |

In Table 2 above, results revealed 365 (60.8%) respondents agreed that everybody should know their genotype while 235 (60.8%) disagreed. A total of 418 (69.7%) of respondents agreed that their partner genotype influence their decision to marry him or her while 182 (30.3%) disagreed. Also, one 124 (20.7) respondents agreed that if their partner have Sickle Cell Disease, they will marry him or her while 476 (79.3%) disagreed. A total of 372 (62%) respondents maintained that they would end their relationship if they discovered their partner genotype predispose them to having children with Sickle Cell Disease while 226 (38%) responded negatively. A total of 483 (80.8%) agreed that intending couples who are carriers of Sickle Cell Disease should not continue with their marriage while 115 (19.2%) disagreed. Also 390 (65%) respondents maintained that they will consider genetic testing before marriage while 210 (35%) disagreed. A total of 405 (67.5%) respondents agreed that they would feel sympathetic for people with Sickle Cell Disease while 195 (32.5%) disagreed. A total of 382 (63.7%) respondents agreed that they would worry about people with Sickle Cell Disease while 218 (36.3%) disagreed. Also, 420 (70%) respondents agreed to seek genetic counseling and make informed consent about their relationship before marriage while 180 (30%) disagreed. It can therefore be inferred from the table that most respondents have positive attitude towards Sickle Cell Disease.

**Testing the Hypotheses**

**Hypothesis One**: Students of Federal University, Lokoja will not significantly possess high level adequate knowledge about Sickle Cell Disease.

**Table 3:** Chi – Square Analysis on students' level of knowledge about Sickle Cell Disease.

| Variable | N | df | $X^2$ – Cal Value | P – value | Alpha Level | Remark | Decision |
|---|---|---|---|---|---|---|---|
| Students' knowledge about Sickle Cell Disease | 600 | 598 | 2.845 | 0.00001 | 0.05 | Sig | Rejected |

Table 3: Shows the Chi – Square Analysis on students' level of knowledge about Sickle Cell Disease. The result shows $X^2$ – calculated value of 2.845, with the degree of freedom of 598, while the probability value is 0.00001 at 0.05 Alpha level of significant. Since the P – value of 0.00001 is less than 0.05 level of significance; the null hypothesis of no significant high level of knowledge about Sickle Cell Disease among students of Federal University, Lokoja is rejected. This implies that students of Federal University, Lokoja have high level of adequate knowledge about Sickle Cell Disease.

**Hypothesis Two:** Students of Federal University, Lokoja will not significantly express positive attitude towards Sickle Cell Disease.

**Table 4:** Chi Square Analysis of students' attitude towards Sickle Cell Disease.

| Variable | N | df | $X^2$-Cal Value | P-value | Alpha Level | Remark | Decision |
|---|---|---|---|---|---|---|---|
| Attitude of students towards Sickle Cell Disease. | 600 | 598 | 2.768 | 0.0003 | 0.05 | Sig | Rejected |

From table 4, the result of the analysis shows that the calculated Chi-Square value is 2.768 with degree of freedom of 598, while the probability value is 0.0003 at 0.05 alpha level of significance. Since the P – value is less than 0.05 level of significance, the null hypothesis of no significant positive attitude expressed towards Sickle Cell Disease by student of Federal University, Lokoja is rejected. The implication is that there is significant positive attitude expressed towards Sickle Cell Disease by the students of Federal University, Lokoja in Kogi State.

## *Discussion*

The result of the findings of hypothesis one revealed that students of Federal University, Lokoja have high level of adequate knowledge about Sickle Cell Disease. Questions on the assessment of knowledge about Sickle Cell Disease included awareness, mode of inheritance and diagnosis, signs and symptoms as well as preventive measure. Majority of the respondents in this study reported to have heard (84.3%) and aware (77.3%) of Sickle Cell Disease as a inherited genetic disorder. This finding is in support of studies by Owolabi et al (2011), Oludare and Ugili (2013), Adewumi et al (2015) and Ugwu, (2016) where (81.89), percent 82.6 percent, 95 percent and 84 percent of the respondents respectively claimed to have heard about Sickle Cell Disease. This is however at variance with a study among high school students in Jamaica and another study among adolescents in India where 49 percent and 46.2 percent respectively knew that the disease is genetically transmitted (Olarewaju et al, 2013). The higher level of awareness of this study population maybe due to the fact that our respondents are likely to be exposed to opportunities e.g. mass media which could widen their knowledge base about Disease, most especially the ones that have genetic bases since the study is done among city dwellers. Also, there is a high comprehensive knowledge on mode of diagnosis, signs and symptoms as well as preventive measures reported in this study. This is however contrary to the finding by Owolabi et al (2011), Olarewaju et al (2013), Uche et al (2017),

Boadu and Addoah (2018) &Tusuubira et al (2018) who reported a relative low level of adequate knowledge about Sickle Cell Disease by students on causes, mode of diagnosis, signs and symptoms as well as preventive measures. This indicates a much larger problem which may hinder control strategies. It was opined that because Undergraduates are involved in numerous relationships, increased education and Sickle Cell Disease Screening among them are key to reducing the prevalence of Sickle Cell Disease. Therefore, premarital genetics screening and counseling should be the focus of effort of controlling Sickle Cell Disease among Undergraduate because screening is relatively cheap and far less invasive than pre-natal diagnosis. The difference in the level of knowledge seen among different research could be attributed to indices used in knowledge assessment, the sample size used in the study, as well as the study population.

The results of the findings in hypothesis two showed that students have positive attitudes towards Sickle Cell Disease. Most of the respondents (69.7%) agreed that their partners genotype will play a significant role in their choice of marriage partners and would consent to premarital genetic testing. This is a positive attitude and indicates the realization of the potential importance and benefits of genetic testing as a preventive measure to control Sickle Cell Disease. This supports earlier findings by Uche et al (2017) and Boadu and Addoah, (2018) where (77%) and (85.4%) of their study respondents respectively agreed to consider genetic testing before marriage as a preventive care and pre-symptomatic detection of genetic disorder. Those who declined pre-marital genetic testing (35%) of respondents may have this negative attitude as a result of fear of losing potential life partners. Again, this brings to the fore the importance of proper health education in the primary prevention of Sickle Cell Disease.

Also, most students demonstrated positive attitude towards people affected with Sickle Cell Disease. Most strongly expressed worry (63.7%) and felt sympathetic (67.5%) for sufferers of the genetic disorder. This positive attitude is similar to the studies of Olatona, Odeyemi Onajone and Asuzu, (2012), Olarewaju et al, (2013) and Boadu and Addoah, (2018). Contrast to the positive attitudes by most of the respondents, 90% admitted to be unwilling to continue or end their relationship if they discovered their genotypes predisposed them to having children with Sickle Cell Disease. Similar findings has been reported by Alkeem, (2012), Ameade, Muhammad, Helegbe and Yakubu (2015) and Uche, (2017). Infact Ameade et al (2015) noted that (78% respondents) in Ghana agreed to call off marriage if they become aware of genetic incompatibility. The negative attitude may be due to the fact that many of them are aware of the physical, psychological and social trauma experienced by patients living with Sickle Cell Disease as well as the financial and emotional toll it takes on the family. Thus, they would most likely want to avoid such experiences.

## *Conclusion*

It is concluded from this study that most students demonstrated high level of adequate about knowledge Sickle Cell Disease. Also, a higher proportion of students reported a positive attitude towards Sickle Cell Disease. However, information dissemination about the disease should be intensified both by the government and private sectors as well as religion bodies. In these ways, intending couples will be encouraged to go for premarital genetic testing and thus make better decision based on test results.

## *Recommendation*

Based on the findings of the studies, the following recommendations were made:

- More education about Sickle Cell Disease is recommended. Thus, it is essential for inclusion of Sickle Cell Disease in existing health education programmes in the school. This will help equip students to take informed decisions and actions as well as to instil into the students and the society in general the right attitude towards living with Sickle Cell patients.
- The use of persons with Sickle Cell Disease as peer educators / Counselor should be explored.
- Sickle Cell Disease screening and testing should be mandatory as entry requirement for students entering University.
- Government should establish more Zonal Sickle Cell Centre as mandated by the World Health Organization (WHO) in every geopolitical zone of Nigeria. Furthermore, awareness about the centre and the services offered should be created to enable the general public avail themselves of the facilities.

## *References*


Adewoyin, AS, Alagbe, AE, Adedokun, O & Idubori, N T. (2015). Knowledge, attitude and control practice of Sickle Cell Disease among Youth Corps members in Benin city, Nigeria. *Annals of Ibadan Post-graduate Medicine, 13* (2), 100- 107.

Alkind, M; Salha, AR & Al-Kend, M. (2012). Knowledge and attitude of University students towards premarital Sickle Cell screening programme. *Comar Medical Journal*.27 (4), 291- 296.

Aloni, MN &Nkee, L. (2014). Challenge of managing Sickle Cell Disease in a pediatric Population living in Kinshasa, Democratic Republic of Congo.A SickleCell Centre experience. *Hemoglobin 38* (3), 196- 200.

Ameade, EPK, Mohammad, BS, Heligbe, GK & Yakubu, S. (2015). Sickle Cell gene transmission. Do public servants in Tamale, Ghana have the right knowledge and attitude to curb it? *Open Journal to Preventive Medicine, 5*, 299- 308.

Bazuaye, GN, &Olayemi, E (2009). Knowledge and attitude of Senior Secondary School Students in Benin city, Nigeria to Sickle Cell Disease. *World Journal of Medical Science. 4* (1), 46- 49.

Boadu, I. &Addoah, T. (2018). Knowledge beliefs and attitude towards sickle Cell Disease among University students. *Journal of Community Health Education, 8* (1), 1-5.

Bowling, A. (2005). *Research methods in Health, investigating Health Services*. Buckingham University press.

Gbeneol, PK, Brisibie, SE & Ordinioha, B. (2015). Knowledge, attitude and uptake of Premarital screening for Sickle trait among married couples in semi-urban Community in South-South Nigeria. *European Journal of Medicine, 3* (3),49- 54.

Kambale-Kombil, P, Djangieing'e, RM, Opara, JA, Tonen-Wolyyec, S, Tshilumba, CK, &
Batina-Agasa, S. (2020). Students' knowledge on Sickle Cell Disease in Kisangani, Democratic Republic of Congo. *Journal of Hematology, 25* (1), 91- 94.

Karadag, G, Gun gormes, 2 &Okar, Z. (2018). Experience and problem encountered by Family of children with Sickle Cell anaemia. *Journal of Caring Science,7* (3), 125- 129.

Olarewaju, SO, Enwerem, K, Adebimpe, WO & Olugbenga- Bello A. (2013). Knowledge And attitude of Secondary School students in Jos, Nigeria and Sickle Cell Disease. *African Medical Journal, 15* (27), 1-9.

Olatona, FA, Odeyemi, KA, Onajole, AT 7 Asuzu, MC. (2012). Effects of health EducationOn knowledge and attitude of Youth Corps members to Sickle Cell Disease and its screening in Lagos state. *Journal of Community Medicine and Health Education 2*, (4), 114- 121.

Oludare, GO & Ogili, MC. (2013). Knowledge, attitude and practice of premarital counselling For Sickle Cell Disease among Youths in Yagba, Nigeria, *African Journal of Reproductive Health. 17*, 175- 182.

Owolabi, RS, Alabi, P, Olusoji, DA, Ajayi, S, Out, T & Ogundiran, A. (2011). Knowledge And attitude of Secondary School students in Federal Capital Territory (FCT) Abuja, Nigeria, towards Sickle Cell Disease. *Nigerian Journal of Medicine, 4*,497- 485.

Ross, PT, Lypson, ML, Ursu, DC, Everett, LA, Rochagues, O & Campbell, AD. (2011).Attitude of Ghanian women towards genetic testing for Sickle Cell traits. *International Journal of Gynecology and Obstetrics, 11* (3), 264- 268.

Tusuubira, SK, Nakayinga, R, Mwambai, B, Odda, J, Kiconco, S & Komuhangi, A (2018). Knowledge perception and practice towards Sickle Cell Disease, a community Among adults in Lubaga division, Kampala, Uganda. *BMC Public Health. 18*(561), 60-72.

Uche, E, Olowoselu, O, Augustine, B, Ismai, A, Akinbami, A, Dosunmu, A &Balongun, A(2017). An assessment of knowledge, awareness and attitude of Undergraduates students of Nigeria Territory Educational Institution. *Asian Journal of Medical Sciences. 7* (5), 87- 92.

Vaughn, LM, Mclinden, D, Tacquez, F, Crosty, L, Slaters, S & Mitchell, M. (2011). Understanding the social networks parents of children with Sickle Cell Disease. *Journal of Health care, 22* (3), 1014- 1029.