

EFFECTS OF HEALTH EDUCATION ON KNOWLEDGE AND ATTITUDE OF YOUTH CORPS MEMBERS TO SICKLE CELL DISEASE AND ITS SCREENING IN ENUGU STATE

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Abstract

Sickle cell disease remains a significant public health problem especially in Nigeria where there is low level of knowledge, poor attitudes to the disease and prevalence (at birth) is 20 per 1000 births. This study was carried out to determine the effect of health education programme on the knowledge and attitudes to sickle cell disease and its screening among unmarried NYSC members in Enugu State. Quasi-experimental study was used Multistage sampling technique was also used to determine 239 respondents in the intervention and 212 in the control groups. Baseline information was followed by health education programme on sickle cell disease and screening; after which genotype screening was offered free of charge for willing participants in the intervention group. Three months later, post intervention data using the same questionnaire was collected from both groups. The finding among others showed that at baseline, the proportion of the respondents who had good level of knowledge was low (25%), while the attitudes of the respondents were positive to most aspects of the disease considered. Post- intervention, the level of knowledge of sickle cell disease increased (64.1%), attitudes improved in most aspects considered and the proportion who knew their genotypes increased (11.9%) significantly only in the intervention group. Based on the findings recommendations were made pertinent among which are Health education of youth corps members was significantly effective in improving their level of knowledge, attitude to sickle cell disease and screening uptake. Sustained health education through school curriculum, mass media and health institutions is relevant to influence new graduates to have better knowledge and attitudes towards sickle cell disease; hence enable them to make informed decisions about pro-creation later in life.

Keyword: Knowledge; Attitude; Sickle cell disease; Screening; Health education.

Sickle cell disease is an inherited disorder of the blood in which large proportions of the erythrocytes (red blood cells) assume distorted sickle-like or crescent shapes. In this condition the normal haemoglobin in the red blood cell (erythrocytes) is entirely replaced by an abnormal one. This abnormal haemoglobin is less soluble than the normal one and begins to crystallize when oxygen concentration falls as it normally does in the capillary blood. (Nwizu 2002).

Two genes control the production of haemoglobin. If both genes contain the sickle cell structure the person will have sickle cell anaemia. If only a gene contains the sickle cell structure and other gene is normal, the person will not have sickle cell anaemia. He or she will have a condition called sickle cell trait.

Sickle cell trait occur in people with one sickle cell gene and one normal gene and such people can transfer the disease to their offspring though they do not have any clinical manifestation of the illness. (Ekeke 2007). About 5% of the world's population carries genes responsible for haemoglobinopathies (Akiyanju 2006). Sickle-cell anaemia is particularly common among people whose ancestors come from sub-Saharan Africa, India, and Saudi Arabia and Mediterranean countries. Over 300,000 babies are born worldwide with SCD mostly in low and middle income countries, with the majority of these births in Africa. Sickle cell disease is the commonest genetic disorder in Nigeria, about 24% of the populations are carriers of the mutant gene and its prevalence (at birth) is 20 per 1000 births; i.e. 150,000 children are born with sickle cell disease genotype annually in Nigeria alone (WHO 2006).

Symptoms of sickle cell anaemia appear early in life. They include tiredness, pains in arms, legs, back and stomach, loss of appetite, yellow colour in the eyes, swollen joints, slow rate of body growth and low resistance to infections (Lesi 2009).

Complications of sickle cell disease include serious infections, damage to vital organs, stroke, kidney damage, respiratory problems, bone marrow failure, growth failure, cognitive impairment, maturational delay in children as well as high maternal and fetal morbidity and mortality (Zemel et al 2007).

In sub-Saharan Africa, most of the affected children do not survive childhood largely because of malaria and bacterial infections as well as lack of access to appropriate care. The median survival age of patients with sickle-cell anaemia on the African continent is estimated to be less than 5 years (Serjeant 2005).

Sickle cell anemia contributes to equivalent of 5% of under-five deaths on the African continent, more than 9% of such deaths in West Africa, and up to 16% of under-five deaths in individual West Africa countries. If left untreated, and its effect on the burden of health care is being recognized as a global issue in terms of chronic

disease. Sickle-cell disease also has major psychological, social and economic implications for the affected child as well as the family (Anie 2005).

The disease runs a chronic course but is now curable using gene therapy and bone marrow transplantation. In Africa however, overall treatment of patients is still poor and in some places, inadequate (Duncombe et al 2008).

Therefore for Africans and in particular Nigerians, according to Diallo et al (2002) an important approach for controlling the disease is preventive; and this depends upon education, the detection of carriers, genetic counseling, prenatal screening for fetal genotype done in couples who are both carriers and newborn screening for sickle cell genotype. There is, however, a palpable lack of information and education about the disorder which, with the increasing prevalence, has encouraged the growth of myths, misinformation, inappropriate treatment, frustration and stigmatization.

Studies from Nigeria have shown different levels of perception of the disease among family members caregivers and among enlightened members of the public. In fact a study among health professionals in Enugu showed that only 24.3% of the respondents knew most of the complications of sickle cell anaemia and 48.2% of the respondents were not aware that prenatal screening for SCA is available in Nigeria (Anionwu et al 1992).

Barlow-Stewart et al (2003) maintained that Genetic education provides individuals and society with the autonomy to make informed decisions. Informed decisions are important for any genetic test including carrier screening so that individuals can make the best decision about testing for themselves. Genetic conditions such as sickle cell disease, cystic fibrosis, and Tay-Sachs disease are some of the most common conditions where genetic education has had public health significance. Educating risk populations about carrier status, providing them with the information to make informed decisions, and educating them on the benefits and limitations of testing can inform these individuals. The result creates autonomous individuals who can make informed decisions.

New graduates of higher institutions are a suitable group for such genetic education and screening because people at that age (20-30 years) are within the reproductive age group and usually give much thought to issues about marriage compared to younger people. The National Youth Service Corps (NYSC) programme offers a unique access to a good sample of such unmarried new graduates. Most of the "corps members" are usually between 20 and 30 years of age and represent different ethnic, socio-economic, cultural and religious groupings in Nigeria. It is part of the objectives of the NYSC that such a group of youths assigned to work together are representative of Nigeria as far as possible (Copen et al 2012)

According to Gustafson (2006) Studies among African Americans showed that a brief educational intervention regarding sickle cell disease is effective in Educating the public about the risks associated with sickle cell trait can help individuals make

informed decisions about trait testing and reduce the larger population of Africans that enter child-bearing age with no knowledge of their risk.

The effect of health education on knowledge and attitudes towards sickle cell disease and its screening has not been studied in Nigeria. This study was conducted to determine the effect of health education on the level of knowledge and attitudes towards sickle cell disease and its screening among unmarried Youth Corps members in Enugu State. The result will be useful for health care providers and policy makers regarding health education of unmarried undergraduates and new graduates of higher institutions concerning sickle cell disease and screening. This will in turn enhance making informed decisions about marriage and procreation among them.

Methods

The study was a quasi-experimental study conducted among the National Youth Service Corps members in Enugu State, Nigeria. A sample size of 451 participants (239 from intervention and 212 from control groups), obtained by using the formula: for sample size estimation, was used.

A multistage sampling technique was used to determine the respondents. Two divisions were selected from the five administrative divisions in Enugu State while one Local Government Area (LGA) was selected from each division using simple random sampling. They were Enugu North and Ude LGAs. Each of the two Local Government Areas was assigned to either intervention or control group through the process of simple balloting. Enugu North emerged as the intervention group and Ude, the control group. The two Local Government Areas are far apart enough to minimize contamination of the control group by the intervention group. Corps members are usually two groups in a year, known as Batch A and Batch B. In Enugu North LGA, the corps members in batch A (who would be available throughout the study) were two hundred and eighty (280), out of which two hundred and thirty nine (239) were eligible (being unmarried was the inclusion criteria for the study); therefore all the eligible corps members in that batch were recruited for the study. In Ude LGA, the corps members in batch B in the field group selected were two hundred and fifty (250) out of which two hundred and twelve (212) were eligible, therefore all the eligible corps members there were recruited as controls.

A pre-test was carried out at Oji Local Government Area which was analyzed and corrected before the study commenced. Data was collected using semi-structured self administered questionnaire with the assistance of the field/zonal inspectors on one general 'Community Development' day when all 'National Youth Corps' members in the Local Government Area assembled at the secretariat for 'Community Development'. Data collection which took place in February 2012, was followed by an health education programme on sickle cell disease and screening for the intervention group. Genotype screening was offered free of charge for willing participants immediately

after the health education at the venue. Three months later, post intervention data using the same questionnaire was collected from both groups.

The data collected were analysed using the Epi Info (version 6.04) statistical software package. In determining the level of knowledge about sickle cell disease and screening a twenty two (22) point scale developed by the researcher was used. Those who scored eight points or less (≤ 8) were considered as having poor knowledge; those who scored between nine and thirteen points (9-13) were considered as having fair knowledge, while those who scored between fourteen and twenty two points (14-22) were considered as having good knowledge.

Results

A total of 220 and 198 valid questionnaires were analyzed from intervention and control groups respectively. More than half of all the respondents were females; 45.7% in intervention and 59.1% in the control groups were Igbos followed by Hausa. Majorities were Christians, had university education and are within the age group 24-29 years. The mean age of the respondents was 25.0+2.2 years in the intervention group and 25.1+2.4 years in the control group. There was no statistically significant difference between the socio-demographic characteristics of the two groups ($p > 0.05$).

Only 25.3% of respondents in intervention and 23.5% in the control group had good level of knowledge about SCD and screening pre-intervention. The observed difference was not statistically significant ($p = 0.866$). The proportion of respondents who had good level of knowledge about sickle cell disease and screening increased (by 64.1%) significantly ($p = 0.000$) in the intervention group only.

Post intervention, the proportion of respondents who identified SCD as a major problem increased (by 18.2%) and the proportion who believed that SCD can exist in their nuclear or extended family increased (by 11.0%) significantly in the intervention group only ($p < 0.05$). Among those whose partners had never done genotype, the perception of risk of their partners being carriers increased statistically significant ($p = 0.000$); however among those who didn't know their genotype, the increase in the perception of risk of SCD in their children was not significant in both groups ($p = 0.301$).

Post-intervention, there was a significant decrease (2.46%) in the proportion who would accept to be childless and those who would freely accept if child has SCD (8.5%) in the intervention group ($p < 0.05$). However the increase in the proportion who would accept prenatal screening and selective abortion was not significant. There was no significant change in the control group.

Post-intervention, the proportion who supported mandatory newborn screening increased significantly (by 9%) only in the intervention group but the difference between the two groups, post-intervention was not significant. The change in the proportion that supported prenatal screening and selective abortion was not significant. However, the increase (3.6%) in the proportion of respondents willing to ask their partners to do genotype was not statistically significant amongst both the intervention

and the control groups. The proportion of respondents who believed that individuals should not pay; government should pay for testing decreased (by 49%) significantly.

Post intervention, the proportion who knew their genotypes increased (by 11.9%) significantly only in the intervention group ($p=0.000$). Moreover the difference between the two groups post-intervention was statistically significant ($p=0.000$).

Discussion

The mean age of the respondents was 25.0±2.2 years in the intervention group and 25.1±2.4 years in the control group. This was expected since most people would not have graduated from higher institution until they are about twenty years old and the age limit for compulsory service in the NYSC is 30 years. The NYSC members in the two local government areas were similar because there was no statistically significant difference between their socio-demographic characteristics.

Only 25.3% of respondents in intervention and 23.5% in the control group had good level of knowledge about SCD and screening before intervention. The observed difference was not statistically significant. However, there was a significant change ($p=0.000$) in the level of knowledge about sickle cell disease and screening in the intervention group, post-intervention. The proportion of respondents who had a good level of knowledge increased by 64.1%. This shows that the health education intervention was effective in increasing the knowledge of the respondents. This is similar to a study in Pittsburgh which showed that there was a significant overall knowledge gain after intervention. Average score was 92% after education compared with 62% before education. The result also agrees with another study among African Americans which showed that a brief educational intervention regarding sickle cell disease was effective in significantly increasing knowledge about sickle cell trait ($p\text{-value}<0.001$).

Concerning the respondents' likely decisions to be taken if they discover that they and their proposed marriage partners are carriers, there was a significant decrease (2.46%) in the proportion who would accept to be childless and those who would freely accept if child has SCD (8.5%) in the intervention group. The findings may be due to the fact that having gained more knowledge about the disease, some of those who would have accepted to be childless or accepted to have children with SCD now saw hope in the different options available. The change in the proportion of respondents who would do prenatal diagnosis was not statistically significant. This is likely to be because termination of pregnancy is involved in this mode of control and this makes it widely unacceptable majorly because of religion (Adeola et al 2012).

The increase in the proportion of respondents who would limit child bearing was not significant. This is probably due to the fact that many people still place value on having many children in spite of their health condition. The fertility rate in Nigeria according to the most recent data from World Bank is still 5.6 births per woman (www.indexmundi.com)

Post-intervention, there was a significant increase in the proportion of respondents who now identified SCD as a major problem (increase: 18.2%) and believed that SCD can exist in their nuclear or extended family (increase: 11.0%). Among those whose partners had never done genotype, those who believed that their partners can be carriers increased statistically significant ($p=0.000$) in intervention group only. However, among respondents who didn't know their genotype, the increase in the proportion who believed that it is possible to have children with SCD was not significant in both groups. This finding agrees with the study among African American women where the health belief model revealed that majority of the participants did not feel that they were personally at risk to have a child with sickle cell disease, regardless of sickle cell disease knowledge (Adeyemi et al 2007).

Post-intervention, the proportion of respondents who agreed that genotype test is useful to the society, and supported mandatory newborn screening increased significantly only in the intervention group ($p=0.001$). This is similar to the study in Pittsburgh where participants found that after education their outlook was more positive on carrier screening in communities ($p=0.015$).

The health education intervention did not have a significant impact on the attitude towards prenatal screening and selective abortion probably because of the termination of pregnancy involved. Fear of the complications of abortion and religious convictions are the two most probable reasons for negative attitude towards prenatal diagnosis and selective abortion. In a study in Enugu, Nigeria, 42.1% of the respondents said they would not allow preventive termination of pregnancy if prenatal screening confirms sickle cell anaemia and among those who would not allow preventive termination, up to 79% of them decided on the basis of their religious beliefs (Gilani et al 2007).

The percentage who believed in couples having genotype testing done before marriage increased significantly only in the intervention group. The result is similar to the study in Pittsburgh where participants found that after education, they decipher the importance of trait testing for their partner if they were found to be a carrier ($p=0.012$). However, the increase (3.6%) in the proportion of respondents willing to ask their partners to do genotype was not statistically significant amongst both groups post intervention. This lack of significant increase in the intervention group could have been due to the fact that the proportion that supported the idea was very high before the intervention (Moronkola et al 2006).

The proportion of the respondents who believed that individuals should not pay for tests; rather the government should pay, also decreased significantly ($p=0.008$) in the intervention group but not in the control group. This means that if people are enlightened, they may not expect the government to do everything concerning their health but take responsibility for areas they have control over and this will lead to better health status for the nation as a whole.

Pre-intervention, a large percentage of the Youth Corps members (83%) knew their genotype. This is much higher than the result obtained among secondary school students in Onitsha where less than half (48.7%) of the respondents knew their genotype and among Ghanaian women where 53% of the women who had been tested did not know their carrier status. Post intervention, health education resulted in uptake of screening by 11.88% of the respondents, who had genotype test done after the health education programme. Only twenty two people participated in the free genotype testing conducted at the venue; the remaining two people did it elsewhere. The result is in consonance with the study among African Americans which showed that a brief educational intervention regarding sickle cell disease is effective in significantly increasing acceptance of screening for sickle cell trait (p-value<0.001). However another study conducted in barbershops and salons among African Americans is in contrast with the result because concern about trait testing remained low for both pre and post questionnaires (Varkevisser et al 2003).

Management of Sickle Cell Cases

Management of sickle cell patients should not only aim at relieving the child of the symptoms but also provide for psychological, physical and mental well being of the patients parents/caretakers and members of the family, sicklers need care. All hands should be on deck in providing this needed care for sicklers.

Therefore, the parents/guardians, health workers teachers and other members of the society should assist meaningfully.

Health Maintenance Strategies for Sickle Cell Patients Include:

- ✓ Periodic medical checks and follow-up of treatment
- ✓ Prompt treatment of infections
- ✓ Immunization against six killer childhood diseases
- ✓ Protection against mosquito bite
- ✓ Avoidance of extreme cold
- ✓ Avoidance of alcoholic beverages
- ✓ Avoidance of strenuous sporting activities
- ✓ Avoidance of stress. Ross et al (2011)

Conclusion

The health education intervention caused a significant (p<0.05) increase (64.1%) in the level of knowledge in intervention group. The respondents' attitudes towards sickle cell disease also improved significantly in most areas but the perception of risk of the disease in children among those who didn't know their genotypes did not improve significantly. Generally the attitude of respondents to screening improved significantly after intervention except concerning pre-natal screening. Health education also resulted in uptake of screening significantly (p<0.05).

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