INFORMATION SHARING ON GENOTYPE SCREENING FOR PREVENTION OF SICKLE CELL DISEASE AMONG UNDERGRADUATE STUDENTS OF FEDERAL UNIVERSITY BIRNIN KEBBI, KEBBI STATE, NIGERIA

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Abstract:
The study investigated about Information Sharing on Genotype Screening for the prevention of sickle cell among Undergraduates students of Federal University Birnin Kebbi, Kebbi State, Nigeria. The objectives was aimed to find out the types of information shared on genotype screening, the channels used, and also some of the challenges faced when sharing information on genotype screening for the prevention of sickle cell disease among undergraduates students of Federal University Birnin Kebbi. Quantitative methodology was adopted for this study, using a cross-sectional survey research design. A sample size of three hundred and seventy (370) was chosen from the total population of 11550 as suggested by Krejcie and Morgan Table. A self-developed Questionnaire named a questionnaire of genotype information sharing (QGIS) was administered to the respondents through a simple random sampling and 92.9% questionnaire was retrieved. Data were analysed using descriptive statistics (Frequency distribution, percentages, mean and standard deviation). The study revealed that the types of information shared most by the respondents includes; information on matched & mismatched genotype, information for public awareness on the process of genotype screening and availability of test centre. The channels used were hospitals/healthcare centres, class lecture and social media. The study concludes that respondents mostly shared information on genotype screening. The researcher recommended for more awareness on the importance of genotype screening and introduction of compulsory genotype screening to encourage individuals to go for the screening.

Keywords; Genotype, Genotype Screening, Information Sharing, Undergraduate Students, Federal University Birnin Kebbi.

Introduction

Information sharing is essential to enable early intervention and preventive work, for safeguarding and promoting welfare and for wider public protection. It was generally viewed by Savolainen (2017) as a set of activities by which information is provided to others, either proactively or upon request, such that the information has an impact on another persons' image of the world … and creates a shared, or mutually compatible working, understanding of the world. Information sharing can be seen as the voluntary act of making information possessed by one entity available to the other. This will increase the awareness of the other entity and established mutual relationship between the two entities. According to Masele (2021) the ability to work well with others is a function of effective information sharing. Hence, it is an essential activity in all collaborative works, and helps to bind groups and communities together. Traditionally information sharing as viewed by Mohammed and Jaber (2017) to means exchange of the information between one person and another, in other word, it is an exchange of information between a sender and receiver. Meanwhile, information sharing is depending on the personal behaviour and self-interest of an individual to share his or her information to others. Individuals are encourage to share information to create awareness and enlighten the public to be conscious on the danger around them in order to safe their life and properties. Most of the time information sharing is a reciprocal, meaning that, the information you shared may come back to the sharer in either the same or different way all in forms of making the information circulated.

Information sharing is a paramount means of communication that create awareness to the public for effective health utilization. People awareness on the existence of any disease depend largely on the level of information sharing on that particular disease. Today, the development of many societies or countries depend largely on the information literacy level of their citizens. In such countries people have access to numerous information and the opportunity to obtain, utilize and share to others to facilitate knowledge and awareness in that organizations or society. Therefore, information sharing can also serve as first aid to control the prevalence of any disease in the society particularly sickle cell disease, which is a heredity disease that can be transferred from parents to their children. Information sharing is also a vital element in improving outcomes for all. Where you have concerns that the actions of some may place others such as children at risk of significant harm or adults at risk of serious harm, it may be possible to justify sharing information with or without consent for the purposes of identifying people for whom preventative interventions are appropriate. Meanwhile, there is an increasing emphasis on integrated working across services with the aim of delivering more effective intervention at an earlier stage. Early intervention aims to prevent problems escalating and increase the chances of achieving positive outcomes. In a nutshell, appropriate information sharing is an essential part of the provision of safe and effective care (Kim, 2017). Information sharing is one of the easiest means to improve information access to users and the process of information sharing incorporates two major aspects, i.e., giving information to others, and receiving information that has been provided by the information giver via some channel.

With the development of information technology (ICT) and the prevalence of internet, the ways through which people communicate, obtain and share information was transformed. Information can be shared through the use of Internet, email, phone, mobile, and database or websites. Muhammed and Jaber (2017) emphasized that today social networking tools such as Facebook, WhatsApp, twitter, YouTube, telegram etc. facilitate information sharing among undergraduate student in tertiary institution. These makes information sharing faster and it reaches a larger audience within a short period of time. This electronic mode of information sharing increases and doubled up the transfer of information from one person to another. Masele (2021) also testified that current technology offers much more possibilities not only for archiving, processing and retrieving information, but also sharing information among individuals or people at work or non-work settings, from different disciplines as well as culture irrespective of their location. Therefore, using the available technologies information sharing on genotype screening will increase the awareness of individuals on sickle cell disease and the implication of not going for genotype screening.

Genotype screening is one of the reliable preventive measures against sickle cell disease. Medical professional offers genotype screening as a tool for diagnosis, and through genetic counseling, individuals will be provided with an accurate understanding of genetic inheritance and what it means to be at risk (Otevwoyere, 2014). Meanwhile, the usefulness of genotype screening relates to the effectiveness of sickle cell disease prevention and the right of a person to know his or her own genetic heredity. This will bring about a substantial impact on health improvement. World Health Organization report (2016) suggested that the prevention of the genetic disease particularly sickle cell disease through carrier identification and genetic counselling remains the only realistic approach to reduce the impact of the disease. Azuka (2014) stresses that genotype screening will help to provide information about an increased risk of specific genetic condition.

Statement of the problem

The functions of information sharing in health promotion cannot be over emphasized. effective information sharing on genotype screening will help to identify sickle cell carrier easily, as it will facilitates the genetic diagnosis of vulnerabilities to inherited diseases to determine a child's parentage or a person's ancestry, and the result of a genotype screening will determine a person's chance of developing or passing on a sickle cell disease. According to the WHO, (2017) Genotype screening is the most reliable approach to control the increase in the prevalence of sickle cell Disease.

The prevalence of sickle cell disease is a global concern. It is estimated that more 300,000 children in the world are born with sickle cell disease annually, with more than 200,000 case in Africa. Nigeria bears the highest burden of the disease, where about 25% of the population, are the carriers of the disease while 2%-3% living with the disease. The prevalence of the disease is also projected to increase by 75% in 2050 Manga et-al, (2019) in Abdulhameed and Yalma (2021). As such, the researcher investigated information sharing on genotype screening for prevention of sickle cell disease among undergraduate students of Federal University Birnin Kebbi, Kebbi State as one of the Universities in the country from which the result can be transferred to other similar Universities because of the dearth of knowledge in the context, focusing on 'Information sharing on genotype screening for prevention of sickle cell disease among undergraduates of Federal University Birnin Kebbi, Kebbi State, Nigeria.'.

Research Questions

The following research questions was guided the study:

1. What are the types of information mostly shared on genotype screening among undergraduates of federal university Birnin Kebbi?
2. What are the Channels used to share information on genotype screening among undergraduates of Federal University Birnin Kebbi?
3. What are the challenges of sharing information on genotype screening among undergraduates of Federal University Birnin Kebbi?

Literature Review

Information is paramount important for the development of any nation or individuals. The development of many nations today rely heavily on information literacy level of their citizens. As described by Masele (2021) information is power, with which, one can control his/her own destiny, career, and money. It is knowledge accumulated from information that gives one the power of decision making. Through information one can confidently devise strategies, make decisions, and implement action. It keeps one ahead, making him/her knowledgeable, it is valuable brings respect, control and guide ones action. Information sharing in other hand, is a core human activity that catalyzes innovation and development. The concepts of information sharing is associated with concepts of innovative behaviour which is explained by Neiva (2017) as “ innovative behaviour is defined by individuals to generate creative ideas, promote ideas for others, develop plans for implementing these new ideas and uncovered new technologies, processes, techniques, or ideas about a product”. However, it is noted that individual who actively exercises his/her right to access different information sources irrespective of the contextual differences, have access to required information, and not all the information are equal, only required and useful information need to be shared with others.

Information sharing generally means ‘a set of activities by which information is provided to others, either proactively or upon request, such that the information has an impact on another person's (or persons') image of the world, and creates a shared, or mutually compatible working, understanding of the world’. Scholz and Falk (2020) define interpersonal information sharing broadly in terms of facts, ideas, preferences, and knowledge that are communicated from a sharer to a receiver in a single interaction. Henshaw and Okechukwu (2020) state that effectiveness of any achievement or activities today dependent largely on the effectiveness of information sharing in an organization because information furnishes an individual with the knowledge desirable to triumph over confrontations and take the proper step timely. Information sharing also as viewed by Savolainen (2017) is an activity through which ideas, opinions, facts and documents are transferred from an individual (or group) to other people. Moreover, information sharing refers to interpersonal communication or exchange of idea among individuals. Means to exchange the information between one person and another, which is the exchange of information between a sender and receiver through a specified medium such as the use of Internet, email, phone, mobile, and database or websites. Muhammed and Jaber (2017) emphasized that today social networking tools such as Facebook, WhatsApp, twitter, YouTube, telegram etc. facilitate information sharing among undergraduate student in tertiary institution.

Genotype as defined by Panawala (2017) is the genetic constitution of a cell, an organism, or an individual. It carries the instructions for development and functioning of a cell. Hence, it is referred to as the blueprint of a cell. Genotype screening means the process of testing individuals to identify the traits that people inherited from their parents. National Cancer Institute, (N.D.) defined genotype Screening as the process of testing individuals in a given population to identify those who have an increased risk of having or developing a particular genetic disorder or carrying a genetic variant for a particular disorder.

Different studies shows that people has good knowledge of genotype screening for example a study conducted by Yalma and Awodiji (2021) On Knowledge, Attitude and Practice of Genotype Screening among Undergraduate Students of the University of Abuja, reported that majority of respondents had a good knowledge of genotype screening. Another study conducted by Oyedele, Emmanuel, Gaji and Ahure (2015) on awareness and acceptance of premarital genotype screening among youth in Nigerian community, revealed that 50.7% of the respondents are aware of premarital genotype screening but only 52.7% have been screened for their genotype. Ugwu (2016) on sickle cell disease: awareness, knowledge and attitude among undergraduate students of a Nigerian tertiary educational institution, find out that majority of participants have adequate knowledge about Genotype Screening. Innocent, Ezejindu, Vasavada and Duruji (2022) on awareness, knowledge and attitude of undergraduates towards sickle cell disease in south-eastern Nigeria, which revealed that all of the participants (100%) were aware of the presence of Sickle Cell Disease and Genotype Screening. A study conducted by Oyedele et-al (2015) on awareness and acceptance of premarital genotype screening among youths in a Nigerian community using a descriptive design indicated that 50.7% are aware of premarital genotype screening and 52.7% of the respondents have been screened for their genotype.

Methodology

Quantitative research methodology was adopted for this study to save time and resources. A cross-sectional survey research design was adopted for this study. This design was used dominantly in the literature reviewed under study. The study focuses on undergraduates' of Federal University Birnin Kebbi, Kebbi State Nigeria. The total number of the study population is eleven thousand, five hundred and fifty (11,550). The eligible respondents were undergraduates both male and female. The sample size of three hundred and seventy (370) was selected for this study. This is in accordance with Krejcie & Morgan table (1970), which suggested that in a population of 10,000 to 14,999 a sample size of 370 should be selected. A simple random sampling technique was used to select respondents across the six faculties in Federal University Birnin Kebbi. However, to determine the sample size allocated to each faculties the proportionate sampling procedure was used through average and percentage. The instrument used for data collection for this study was questionnaire developed by the researcher and named it "Questionnaire of Genotype Information sharing" (QGIS). The instrument was validated by the expert in the field of this study and the reliability of the instrument was obtained through a pilot study conducted in Federal University Gusau, with a reliability coefficient of 0.773. Introductory letter was collected from the head of the department for easy identification of the researcher, in order to help the researcher to collect the data successfully. The administration of data was done by the researcher with the help of three research assistants. The questionnaire was self-administered since the research respondents could read and write in English language. Data were analysed using descriptive statistics (Frequency distribution, percentages, mean and standard deviation).

Result and Discussion

Table 1 Presents the Types of Information on Genotype Screening and Sickle Cell Disease mostly shared

		HS	S	UD	NS	HNS	Mean	SD
S/N	**Information Shared on Genotype Screening & SCD**	**Frequency (%)**						
1	Information for public awareness on the process of genotype screening	8 (2.3)	323 (93.9)	7 (2.0)	6 (1.7)	0	3.96	0.32
2	Information on the availability of genotype screening/test centre	9 (2.6)	329 (95.6)	6 (1.7)	0	0	4.00	0.19
3	Information on the cost & benefits of going for genotype screening	5 (1.4)	339 (98.6)	0	0	0	4.01	0.10
4	Information on the importance of genotype screening in prevention of SCD	2 (0.5)	11 (3.1)	22 (6.3)	309 (89.8)	0	2.14	0.43
5	Information on the burden of SCD (financial, educational & psychological burden)	8 (2.3)	329 (95.6)	5 (1.4)	2 (0.5)	0	3.99	0.22
6	Information on Health Implication of SCD	3 (0.8)	80 (23.2)	51 (14.8)	210 (61.0)	0	2.63	0.87
7	Information on Inheritance Pattern of SCD	137 (39.8)	202 (58.7)	2 (0.5)	3(0.8)	0	4.37	0.50
8	Information on Genetic Counselling	101(29.5)	241 (70.0)	2 (0.5)	0	0	4.28	0.46
9	Information on Blood group	4 (1.1)	252 (73.2)	51 (14.8)	37 (10.7)	0	3.64	0.68
10	Information on Match and Mismatch Genotype	186 (57.2)	151 (40.9)	7 (1.9)	0	0	4.52	0.53

Source: Field work (2024)

From table 1 it can be seen that, information on matched and mismatched genotype with the frequency and percentage 186 (57.2%) was the information on genotype screening for prevention of sickle cell disease mostly shared among undergraduates of Federal University Birnin Kebbi, Kebbi State, Nigeria. This findings has established a literature on the types of information mostly shared by undergraduates in the tertiary institutions in Nigeria. This implies that,when this information is properly shared the prevalence of sickle cell disease can easily be control in Nigeria but more need to be done from both government and healthcare workers to ensure that the information sharing on matched and mismatched genotype is maintained. In conclusion the analysis revealed that the respondents highly shared information on genotype screening and sickle cell disease but only few information were not adequately shared.

Table 2 Channels used to share Information on Genotype Screening and Sickle Cell Disease

S/No	Channels	Frequency(F)	Percentage (%)
1	Hospitals/healthcare centres	133	38.7
2	Facebook	53	15.4
3	WhatsApp	29	8.4
4	Television	12	3.5
5	Radio	20	5.8
6	Students' hostels	11	3.2
7	Lecture hall	49	14.2
8	Worship centre	6	1.7
9	Social centre	10	3.0
10	Libraries	13	3.8
11	Internet Café	8	2.3

Source: Field work (2024)

Table 2 shows that Hospitals/Healthcare Centres and class lecture, with higher frequency and percentage of 133 (38.7) and 49 (14.2) respectively, was the major channels used to share information on genotype screening for prevention of sickle cell disease among undergraduates of Federal University Birnin Kebbi, Kebbi State, Nigeria. This finding is in agreement with Innocent, Ezejindu, Vasavada and Duruji (2022) which revealed that undergraduates in south-eastern Nigeria, shared information in hospital and school for prevention of sickle cell disease. This implies that sickle cell disease can be prevented when appropriate channels was used to share information. But it still indicate a need by the undergraduates to employ other media such as Newspapers, Libraries, Radio, Television, Social centres etc. to facilitate information sharing on genotype screening in order to control the prevalence of sickle cell disease.

Table 3 Challenges of information sharing on genotype screening

S/no	Challenges of information sharing	Frequency	Percentage
1.	Inadequate access to the information	32	9.3
2.	Privacy breach	5	1.5
3.	Lack of programs on SCD in the tertiary institutions	21	6.1
4.	Lack of awareness on the implication of not having genotype screening	113	32.8
5.	Fear of stigmatization	21	6.1
6.	Poor network connection	1	0.3
7.	Lack of concern on the effect of SCD	49	14.2
8.	In adequate Knowledge and skills for sharing information	8	2.3
9.	Unreliable power supply	7	2.1
10.	Lack of affordable internet services	8	2.3
11.	Lack of supportive sharing policies	2	0.6
12.	Resources constraints	77	22.4

Source: Field Work (2024)

The table 3 shows that lack of awareness on the implication of not going for genotype screening with frequency and percentage of 113 (32.8%) was the major challenges of sharing information on genotype screening for prevention of sickle cell disease among undergraduates of Federal University Birnin Kebbi, Kebbi State, Nigeria. This finding is in agreement with Abioye-Kuteyi, Oyegbade, Bello & Osakwe (2009) which revealed that 69% of study subjects had poor knowledge of SCD. But it contradicted the findings of Yalma and Awodiji (2021) and Ugwu (2016) who find out that majority of undergraduate students of a Nigerian tertiary educational institution, have adequate knowledge about Sickle Cell Disease and Genotype Screening This implies that information sharing is very necessary to increase the awareness of individuals on the implication of not going for genotype screening as the only reliable measure for the prevention of sickle cell disease. However, poor network connection, lack of supportive sharing policies and privacy breach were found to be the least challenges. The finding also testified that unreliable power supply is not a major challenge by these undergraduates in Kebbi state which is contrary to many research conducted in Nigeria.

Summary of the Findings

The summary of the major findings of the study includes the following:

1. The undergraduates of Federal University Birnin Kebbi mostly shared information on public awareness, availability of test centres, cost and benefit of genotype screening, burden of SCD, inheritance pattern of SCD, genetic counselling, blood group and matched & mismatched information. However, majority of the undergraduates do not share information on the health implications of sickle cell disease and the importance of genotype screening in prevention of SCD.
2. The undergraduates of Federal University Birnin Kebbi have identified hospitals/healthcare centres, Facebooks, lecture halls and WhatsApp as their major channels used to share information on genotype screening and sickle cell disease. However, Radio, Television, Libraries etc. not adequately utilized to share information on genotype screening.
3. The undergraduates of Federal University Birnin Kebbi have identified lack of awareness on the implication of not having genotype screening done, resources constraints and lack of concerned on the effects of sickle cell disease as the major challenges of information sharing on genotype screening and sickle cell disease among.
4.

Conclusion

It was concluded that the undergraduates' of Federal University Birnin Kebbi highly shared information on genotype screening but they are reluctant to share information on the implication of marrying a partner with mismatched genotype, this has contributed to the increase in those who present fake result of genotype screening among undergraduate in tertiary institutions. Hospitals/healthcare centre, lecture hall, Facebook and WhatsApp remained the major channels used by undergraduates to share information on genotype screening. However, Lack of Awareness on the Implications of not going for Genotype Screening, Resources Constraints and Lack of Concern on the Effect of SCD remains the major challenges for sharing information on genotype screening.

Recommendations

1. Undergraduates should be encouraged to share information on the health implications of sickle cell disease and the importance of genotype screening in prevention of SCD.
2. The undergraduate should employ other media such as Radio, Television, Newspaper, Libraries etc. to share information on genotype screening and sickle cell disease. However, for libraries to maintain its position as information centres, posters contained information on sickle cell disease and genotype screening need to be pasted on the library notice board regularly in order to attract the undergraduates to embrace libraries as a medium to share information on genotype screening and sickle cell disease.
3. More awareness is needed on the implication of not having genotype screening and some strategies need to be develop by the Government or healthcare providers to be able to encourage the undergraduates and the general public to be showing more concerned on the effects of sickle cell disease ant its preventive measures. For example, Government can introduce compulsory genotype screening in Nigeria and provide a punishment to those found guilty of presenting fake result on genotype screening.

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