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Original Article

Premarital Screening for Sickle Cell Trait among Unmarried Adults Attending Outpatient Department at Busiu Health Centre IV, Mbale District. Cross-sectional study.

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Abstract

Background:

Health care system factors, including service availability, accessibility, affordability, and quality of counseling, influence uptake of premarital SCT screening. This study aims to determine the healthcare system factors associated with premarital screening for sickle cell trait among unmarried adults attending the outpatient Department at Busiu Health Centre IV, Mbale District.

Methodology:

A cross-sectional survey was conducted among 53 participants, with 50 completing structured questionnaires. Data were analyzed descriptively using the Microsoft Excel software and presented as tables, charts, and graphs.

Results:

The majority of the respondents, 62%, were aged between 18 and 25 years, 68% were females, and 56% of them had attained tertiary education, which varied between degree, diploma, and certificate levels. The majority of them 38% reported unstable sources of income. Religiously, 92% were Christians. 54% had never been counselled about SCT screening. 52% thought screening services were accessible. 88% had never heard about any campaign directed towards educating about sickle cell screening in their community. 48% rated the cost of a screening test as very expensive. Only 30% of the respondents reported having ever screened for sickle cell. Of these, 6.67% reported an excellent experience, 53.33% had a good experience in terms of counselling services provided before and after screening. Challenges reported by respondents included high costs of the screening, lack of knowledge and awareness about the disease, and the screening services were another challenge, fear and anxiety of screening results, and associated stigma and accessibility were also problems.

Conclusion:

Health care system barriers, such as high costs, limited counseling, poor community awareness, and accessibility challenges, limit the uptake of premarital SCT screening among unmarried adults.

Recommendation:

Strengthening community education, improving access to affordable screening, and providing quality counseling can enhance utilization of premarital SCT screening services.

Keywords: *Sickle cell disease, sickle cell trait, premarital screening, health care system factors, Busiu Health Centre.*
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Background of the study

The structure and accessibility of the health care system significantly influence the uptake of premarital screening for SCT. Factors such as availability of testing facilities, proximity of health centers, affordability of screening, quality of services, and the presence of trained health personnel all affect whether individuals access screening services (Dilli et al., 2024; Agbozo et al., 2023).

In Uganda, while government initiatives like the National Sickle Cell Survey and the establishment of testing laboratories have increased screening opportunities, challenges remain. Limited resources, high patient-to-staff ratios, and inadequate community outreach reduce effective access to premarital screening services, especially in rural and semi-urban areas (Kawuki et al., 2019; Namukasa et al., 2024). Studies suggest that integrating premarital SCT screening into routine outpatient services, providing on-site counseling, and reducing financial barriers can enhance participation rates (Oluwole et al., 2022; WHO, 2024).

Examining health care system-related factors is essential to identify structural barriers and facilitators that influence the decision to undergo screening. This knowledge informs policymakers and healthcare providers in designing interventions that improve access, equity, and efficiency of premarital screening services (Dilli et al., 2024). This study aims to determine the healthcare system factors associated with premarital screening for sickle cell trait among unmarried adults attending the outpatient Department at Busiu Health Centre IV, Mbale District.

Methodology

Study Design

The study employed a cross-sectional study design to collect data at a single point in time without following up on participants.

Study Area
The study was conducted at Busiu health centre IV, a government health facility servicing approximately 100,000 people, located along the Mbale-Tororo Highway, approximately 257kilometers from Kampala city.

Study population
The study targets both male and female adults aged 18years and above at OPD Busiu health center IV during the period of study, and are freely willing to participate in the study.

Selection Criteria
Inclusion Criteria
The study included all individuals aged 18years and above, at Busiu health center IV, mentally alert individuals able to communicate effectively, and provide voluntary informed consent.

Exclusion Criteria
All persons under 18 years of age and mentally unstable individuals were excluded from participating in the study.

Sample Size Determination
The sample size was determined using Kish Leslie's method, as stated below
$n = z\text{^}2pq/e\text{^}2$
Where n = desired sample size, z = 1.96 (assuming a standard 95% confidence interval),
p = estimated percentage prevalence of sickle cell screening (a prevalence of 14.6% was used, obtained from a cross-sectional study done in Kampala (Namutale, 2024), q = 1-p, and
e = 0.05 (permissible error within the estimate of 5%)
n = {(1.96^2)*(0.146) (1-0.146)}/ (0.05^2)= 191, dividing the calculated sample size by 4, 191/4= 48, new sample size = 48 adjusting for the non-response rate of 10% as seen in previous studies, final sample size=desired sample size/1-non response rate, 0.1, final sample size = 48/1- 0.1 =53 Therefore 53 respondents was considered for the study.

Sampling Technique
The consecutive sampling method was used.

Sampling Procedure
All adults who met the inclusion criteria were recruited into the study. Some adults attending OPD at the facility during the study period were approached, and the relevance of the study was explained to them to gain consent. Those who were willing to participate were given a consent form to sign. This was done until the desired sample size was achieved.

Data Collection Technique
Data was collected by the primary data collection technique involving the administration of questionnaires to respondents through face-to-face interaction. This approach is applicable due to the varying levels of literacy among participants; it allowed for clarification of questions by a trained research assistant.

Data Collection Tools
The primary data collection tool was a structured questionnaire, which consisted of closed-ended questions written in English language. The questions were translated into a local language well understood by the respondents for those who are incompetent in English.

Data Collection Procedure
Questionnaires were administered to the participants who were available at the selected site during the study and consented to participation. The purpose of the study was explained to the participants to enable them to make an informed decision, and instructions on how to answer the questions were given by the research assistants.

Quality Controls
To ensure the validity and reliability of the study findings, the questionnaire was designed and then reviewed for approval. A sample of adult individuals in a similar setting who are not part of the main study was selected to fill out the questionnaires. This enabled the identification of complex and unsuitable questions; adjustments were made before the main study. Research assistants were also trained on the objectives of the study to enable them to guide the respondents accordingly and check for completeness of the questionnaires before the departure of the participants. Also, the questions were translated by research assistants into a local language best understood by the respondents to ensure clarity of the questions and accurate responses. All questionnaires were double-checked for completeness by the researcher before storage in a safe place.

Data Analysis and Presentation
After data collection, it was checked for completeness, clarity, and accuracy. Grossly incomplete questionnaires and those with unclear responses, jargon, and abbreviations were discarded, while the complete ones were analyzed and discussed. Data was presented in tables and graphs.

Ethical Considerations
The proposal was submitted to the Mildmay Research Committee for approval. An approval letter was presented through the office of the Dean of the School of Clinical Officers at Mildmay Institute of Health Sciences, which was presented to the office of the District Health Officer, introducing the topic and the researcher to the authorities to get permission to start collecting data. Participants were required to provide informed consent by signing a consent form that was provided in the presence of witnesses. The names of participants were not captured to ensure confidentiality.

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Results

Socio-demographic characteristics of respondents

Table 1: socio-demographic characteristics (n=50)

Variable	Categories	Frequency,	Percentage(%)
Age	18-25	31	62
	26-35	17	34
	36-45	2	4
Sex	Male	16	32
	Female	34	68
Level of education	No formal education	1	2
	Primary level	4	8
	Secondary level	17	34
	Tertiary education	28	56
Occupation	Civil servant	9	18
	Self employed	10	20
	Student	12	24
	Others	19	38
Religion	Christian	46	92
	Muslim	2	4
	Others	2	4

The majority of the respondents, 62%, were aged between 18 and 25 years, 68% were females, and 56% of them had attained tertiary education, which varied between degree, diploma, and certificate levels. The majority of them 38% reported unstable sources of income. Religiously, 92% were Christians.

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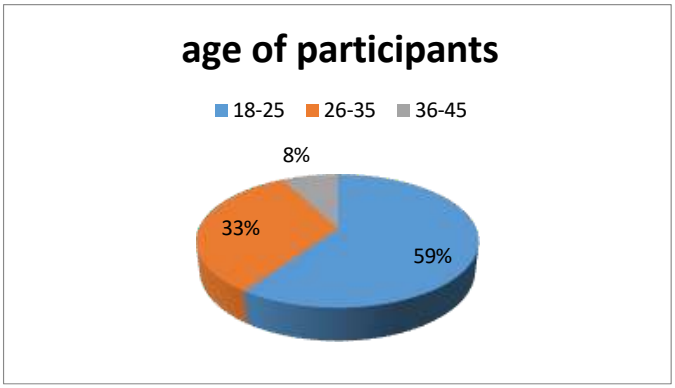
Figure 1: Age distribution of respondents



Health care system-related factors associated with premarital sickle cell trait screening.

Table 4: Health care system-related factors associated with premarital sickle cell screening.

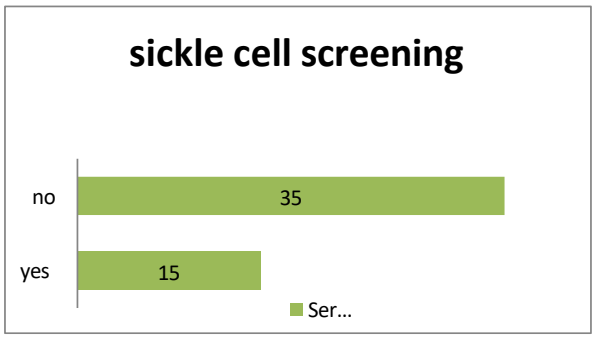
Parameter assessed	Response	Frequency(%)
Have you ever been advised by a health care provider to screen for sickle cell?	Yes	23(46%)
	No	27(54%)
How accessible are screening services	Very accessible	6(12%)
	Moderately accessible	20(40%)
	Not accessible	17(34%)
	I do not know	7(14%)
Are you aware of any campaigns directed towards sickle cell screening in your community?	Yes	6(12%)
	No	44(88%)
What is your perception of the cost of a screening test	Very expensive	24(48%)
	Affordable	12(24%)
	Very affordable	1(2%)
	I do not know	13(26%)
Have you ever screened for sickle cell	Yes	15(30%)
	No	35(70%)
What was your experience in terms of pre- and post-counselling services provided	Excellent	1(6.67%)
	Very good	3(20%)
	Good	8(53.33%)
	Fair	3(20%)

A slightly larger number of respondents, 54%, had never been counselled about SCT screening. 52% of the respondents thought screening services were accessible. The majority of the participants, 88%, had never heard about any campaign directed towards educating about sickle cell screening in their community. 48% of the people rated the cost of a screening test as very expensive. Only 30% of the respondents reported having ever screened for sickle cell. Of these, 6.67% reported an excellent experience, 53.33% had a good experience in

terms of counselling services provided before and after screening. Challenges reported by respondents included high costs of the screening, lack of knowledge and awareness about the disease, and the screening services were another challenge, fear and anxiety of screening results, and associated stigma and accessibility were also problems.

Some participants suggested that sickle cell screening should be made a routine test for everyone, efforts should be put into programs to enhance awareness about the issue to local communities, screening services should be extended to local health facilities, and the government should provide free screening services in all health facilities.

Figure 2: Sickle cell screening status of respondents



Discussion

Health care system-related factors associated with premarital sickle cell screening.

This study identified several health care system-related factors that influence the uptake of premarital sickle cell trait (SCT) screening. Only 46% of respondents reported having ever been advised by a health worker to undergo SCT screening, suggesting that health providers are not fully engaged in educating the population about SCT and its preventive measures. This aligns with previous research in Sub-Saharan Africa, which found that limited engagement of health care workers contributes to low utilization of genetic screening services (Oluwole et al., 2022; Agbozo et al., 2023). Accessibility of screening services was moderate, yet a significant portion of participants indicated that services were difficult to reach, particularly in rural areas. Uneven distribution of facilities has been noted as a common barrier in Uganda and other East African countries, where rural populations often have reduced access to health interventions (Kawuki et al., 2019; Adigwe et al., 2023). Similarly, the absence of community awareness campaigns was striking, with 88% reporting no knowledge of any educational programs about SCT screening. This lack of outreach contributes to low knowledge, misconceptions, and subsequently low screening uptake, as highlighted in prior studies emphasizing the role of health education in improving preventive behaviors (Dilli et al., 2024; Namukasa et al., 2024). Nearly half of respondents (48%) perceived SCT screening as very expensive, while only 26% considered it affordable. Cost has consistently been reported as a limiting factor in accessing premarital screening services in low-resource settings (Piel et al., 2023; Oluwole et al., 2022). Despite these barriers, the observed screening uptake in this study was 30%, which is relatively higher than the <20% reported in previous Ugandan studies (Peninah et al., 2025a). This difference could be attributed to the smaller sample size in the present study or increased awareness among certain sub-populations. Participants who had undergone screening rated counseling services positively, indicating that the quality of services, when available, can encourage utilization. Challenges such as high costs, fear, stigma, and limited awareness were consistent with findings from other African studies that reported psychosocial and structural barriers to premarital SCT screening (Agbozo et al., 2023; Dilli et al., 2024). Suggested solutions, including making screening routine, enhancing community awareness programs, expanding services to local health facilities, and offering free screening, reflect interventions that have been recommended in prior literature to improve uptake (Oluwole et al., 2022; WHO, 2024). Overall, these findings underscore the importance of strengthening the health care system through provider engagement, wider accessibility, community sensitization, and financial support to enhance premarital SCT screening in Uganda.

Limitations

The study being cross-sectional in nature prevents the establishment of a cause-and-effect relationship between the identified factors and premarital screening practice. The sample size was not a good representative for the entire population. The sampling procedure did not give equal opportunity to all individuals meeting the criteria, thus introducing sampling bias.

Conclusion

Awareness of sickle cell trait (SCT) is high among unmarried adults, but gaps in knowledge, misconceptions, and health system barriers limit premarital screening uptake. Socio-demographic factors, fear, and stigma further reduce participation despite recognition of its importance.

Recommendation

Health education, community awareness campaigns, accessible counseling, and subsidized or free screening should be strengthened to improve premarital SCT screening uptake. Health workers should actively engage in promoting informed decision-making among unmarried adults.

Acknowledgement

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List of Abbreviations

Hb: Hemoglobin
HbA: Normal hemoglobin gene
HbS: Gene for sickled hemoglobin
MOH: Ministry of Health
PMS: Premarital screening
SCA: Sickle cell anemia
SCD: Sickle cell disease
SCT: Sickle cell trait
WHO: World Health Organization

Data availability

The data is available upon request.

Informed consent

All the respondents consented to this study.

Source of funding

The study did not receive any external funding.

Conflict of interest

The author did not declare any conflict of interest.

Author contributions

Laureen Christine Khaukha was the principal investigator. Okadapaoo Imwangan Alois, Hasifah Nansereko, Franscisco Ssemuwemba, Immaculate Prosperia Naggulu, and Jane Frank Nalubega supervised the research project.

Author Biography

Laureen Christine Khaukha holds A Diploma in Clinical Medicine and Community Health from Mildmay Institute of Health Sciences.
Francisco Ssemuwemba is the dean of the School of Allied Health
Hasifah Nansereko is the chairperson of the Institutional Review Council (IRC)
Okadapaoo Imwangan Alois, Immaculate Prosperia Naggulu, and Jane Frank Nalubega are tutors at Mildmay Institute of Health Sciences.

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