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Original Research Article

Assessment of knowledge, attitudes, and practices regarding premarital genotype counselling and testing for sickle cell disease among African international students at universities in Gujarat state, India

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ABSTRACT

Background: Sickle Cell Disease (SCD) is a common inherited blood disorder, especially in sub-Saharan Africa, where over 300,000 infants are born with SCD each year, with 75% of these cases occurring in Africa. This study aimed to evaluate the knowledge, attitudes, and practices regarding premarital genetic counselling and testing for SCD among African international students in Gujarat State, India.
Methods: A cross-sectional descriptive design was adopted, involving a sample of 99 students who were selected through convenience sampling. Data were collected through questionnaires. Analysis was performed using IBM SPSS version 20.
Results: Most respondents (92.9%) were aware of SCD, with 66.7% citing media (TV, radio, internet) as their source of information. About 69.6% recognized genetic mutation or inheritance as a cause. A significant majority (72.7%) agreed that SCD can be diagnosed through blood tests, and 78.8% believed that couples with AS genotypes should avoid marriage. However, 61.6% had not undergone genotype testing, and the same proportion lacked education or counselling about SCD.
Conclusions: Although awareness of SCD is high, many participants do not know their genotype and have not received sufficient information or counselling regarding the disease.

Keywords: Attitude, Knowledge, Practice, Premarital genetic counselling, Sickle cell disease

INTRODUCTION

Sickle Cell Disease (SCD) ranks among the most common inherited blood disorders worldwide, mainly affecting sub-Saharan Africa. Reports show that over 300,000 infants are born with SCD each year globally, with about 75% of these births occurring in Africa.[1] This chronic condition is characterized by red blood cells adopting an abnormal shape, leading to complications such as anemia, severe pain episodes, strokes, and an increased risk of infections.[2] Although SCD can be prevented through informed reproductive choices, it continues to have a significant health and social impact on individuals and healthcare systems across the continent.

Premarital genotype counselling and testing are essential in reducing the spread of sickle cell disease (SCD). These methods enable individuals to determine their hemoglobin genotype before making marriage decisions, particularly in regions where the sickle cell trait is prevalent.[3] Despite awareness campaigns and national policies promoting premarital screening across different African countries, a lack of understanding and cultural beliefs still hinders their effectiveness.[4] Therefore, understanding the knowledge, attitudes, and practices

(KAP) of high-risk groups, especially among youth and young adults, is crucial for developing more effective interventions.

African international students studying abroad form a distinct and under-researched group in terms of awareness and preventive practices related to SCD. In Gujarat, India, the number of African students enrolled in undergraduate, master's, and Ph.D. programs is increasing. Many of these students are single and of reproductive age, making them an important group for premarital genotype counselling research. However, their time away from home may limit their access to health information, cultural practices, and healthcare services, including genotype screening. This highlights the need to assess their awareness and behaviors regarding SCD prevention while abroad.

The findings will provide valuable insights into the awareness and preventive health behaviors of African youth in the diaspora, thereby enhancing the global understanding of strategies to prevent sickle cell disease (SCD). Furthermore, the results may guide health initiatives in universities, cross-cultural education programs, and policy development to encourage genetic screening among international student communities.

Statement of the problem

Sickle Cell Disease (SCD) remains a significant public health issue, especially in populations of African descent where the sickle cell gene is common. Despite ongoing global awareness efforts, many people still do not know their hemoglobin genotype status, which increases the risk of unintentional marriages between carriers, potentially leading to children with SCD.[2,3] To reduce this risk, premarital genotype counselling and testing are vital strategies; however, their success mainly depends on individuals' knowledge, attitudes, and cultural beliefs.

African students studying abroad may face distinct challenges related to health education, access to genetic counselling, and health-seeking behavior due to cultural dislocation, limited institutional support, or insufficient integration into the healthcare systems of their host countries. Many public universities in Gujarat State admit a substantial number of international African students across various academic programs under the ICCR Scholarship scheme, with additional students attending private universities through self-financing routes. Many of these students are of marriageable age and may soon need to make reproductive decisions. However, there is currently a lack of empirical data on their knowledge, attitudes, and practices regarding SCD and premarital genotype testing.

The lack of awareness is concerning because it prevents university health services and public health practitioners from creating targeted interventions or awareness campaigns. If African international students in India are unaware of their genotype status or misunderstand its significance, it could undermine global efforts to lower SCD incidence. Furthermore, without data for this group, the healthcare needs and preventive strategies for African students abroad might be overlooked within the wider context of SCD management.

Literature gap and justification

Premarital genotype screening and counselling are considered essential preventive measures in the fight against sickle cell disease (SCD), a persistent public health problem in both Africa and India.[5,6] Several studies conducted in these regions have examined different levels of awareness, knowledge, attitudes, and practices related to SCD and premarital screening. While general awareness of SCD is relatively high, significant gaps remain in knowledge, particularly concerning the genetic transmission of the disease and the importance of avoiding unions between carriers.[7,5] Additionally, research shows that factors such as educational level and age are positively associated with higher levels of knowledge and more favourable attitudes towards premarital genotype counselling and testing.[8,6] Despite these findings, research consistently shows that although many individuals have positive views on premarital screening, this attitude does not necessarily lead to increased testing behavior.[7,6] For example, although most respondents in various studies support premarital testing, misconceptions about sickle cell disease (SCD) persist, such as confusion about its transmission and the belief that carriers will always pass on the disease.[5,7] Furthermore, knowing someone with SCD appears to raise awareness and encourage a more proactive approach to testing.[9,6] These findings emphasise the urgent need for ongoing public health education aimed at clarifying misunderstandings about genetic inheritance and the impact of carrier status on disease prevention.[9,6,7] An increasing number of studies from African contexts, including university lecturers in Sokoto, youth populations in Yaba and final-year undergraduates in Ibadan, provide valuable insights into the knowledge, attitudes, and practices surrounding SCD, These investigations generally show a high level of awareness of the disease, but also reveal a gap between knowledge and regular screening activities.[10,8,6] Furthermore, research findings found that, although there was strong awareness of premarital screening in a semi-urban community in Bauchi State, the actual utilization of testing services remained limited. Such findings highlight the need for targeted health education programs and the integration of genetic counselling services within broader community and university health systems in African countries.[11]

Despite extensive research involving African populations, a significant gap remains in understanding how African students studying abroad, especially in culturally diverse environments like India, engage with premarital genotype counselling and Sickle Cell Disease (SCD) prevention. These students encounter various health systems, cultural customs, and educational structures that can influence their knowledge, attitudes, and health-seeking behaviors. Although their genetic risk for SCD remains unchanged, access to and availability of genotype testing, along with culturally appropriate health information, may differ considerably from what they experience in their home countries. This lack of context-specific research limits our ability to determine whether African students in diaspora locations such as India receive adequate outreach from existing public health education and screening programs.

Furthermore, universities offer unique opportunities for early intervention, especially for young, unmarried individuals facing important health decisions regarding partner choice and family planning. However, if research does not focus on African students in host countries like India, university health services might fail to recognize or adjust their outreach to meet this group's health needs. This oversight not only hampers disease prevention efforts but also prevents the development of culturally relevant and equitable health education strategies.

This study is essential for assessing the knowledge, attitudes, and practices related to premarital genotype counselling and testing for SCD among African international students at universities in Gujarat State, India. By focusing on this underrepresented and geographically diverse group, the research aims to raise global awareness of SCD prevention and provide empirical data to inform targeted health education and screening programs within international academic settings.

This study aimed to assess the level of knowledge, attitudes, and practices regarding premarital genetic counselling and testing for sickle cell disease among African international students studying at universities across Gujarat State, India.

METHODS

Study design

The study employed a cross-sectional descriptive survey design, collecting data at a single point in time to examine the prevalence and characteristics of academic staff's knowledge, attitudes, and practices concerning premarital genetic counselling. Although this approach cannot establish causality, it helps identify patterns and guide policy development and intervention planning.[12,13]

Study period

This present study was conducted from January 2025 to October 2025.

Target population

The population consists of all African International Students in Gujarat State Universities, but since no official and accessible database exists that records the total number of African international students enrolled in universities across Gujarat State, India, a target sample size of 99 participants was determined across universities in Gujarat State.

Sampling technique

Due to the lack of an official database for the total population of African International Students, a non-probability convenience sampling technique was used, resulting in a final sample size of 99 participants who were available and willing to participate during the study period.

Inclusion criteria

All African International Students who enroll in both public and private universities for bachelors, masters, and Ph.D. degrees across Gujarat State were included in this study.

Exclusion criteria

Those who have graduated and are waiting for the result, and those who have been expelled from their respective universities, were excluded from this study.

Statistical methods and tools used for the study

A questionnaire was used for data collection in this present study, including both closed-ended and multiple-choice questions were applied. The collected data were analyzed using IBM SPSS Statistics version 20. Descriptive statistics, including frequencies and percentages, were used to summarize the demographic characteristics of the participants and their knowledge, attitudes, and practices regarding premarital genotype counselling.

Ethical considerations

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was granted by the Maharaja Sayajirao University of Baroda Institutional Ethics Committee for Human Research (IECHR). Consent to Participate Declaration: All participants were informed about the aims and procedures of the study and were required to sign a written informed consent form before participating.

RESULTS

Table 1 showed that out of the 99 respondents, the majority (67.7%) were between 20 and 29 years old, and 30.3% were between 30 and 39 years old. In terms of gender, 58.6% of the participants were male, and 41.4% were female. Most participants, 35.4%, were students at MS University of Baroda, 18.2% attended Gujarat University in Ahmedabad, and 14.1% studied at Gujarat

Technological University in Ahmedabad. A total of 65.7% of respondents were enrolled in undergraduate programs (Bachelor's), 20.2% in postgraduate programs (Master's), and 14.1% in Ph.D. programs. Regarding the respondents' country of origin in Africa, 18.1% came from Nigeria and 10.1% from Tanzania.

Table 1: Demographic details of respondents (n=99).

Variables	Frequency, N (%)
Age group (in years)	
10-19	1 (1.0)
20-29	67 (67.7)
30-39	30 (30.3)
40-49	1 (1.0)
Gender	
Male	58 (58.6)
Female	41 (41.4)
Name of the respondents' universities	
Anand Agricultural University, Anand	1 (1.0)
Central University of Gujarat	3 (3.0)
Gujarat Technological University, Ahmedabad	14 (14.1)
Gujarat University, Ahmedabad	18 (18.2)
MS University of Baroda, Vadodara	35 (35.4)
National Forensic Science University, Gandhinagar	1 (1.0)
Parul University, Vadodara	11 (11.1)
Rashtriya Raksha University, Gandhinagar	1 (1.0)
Sadar Patel University, Anand	5 (5.1)
Saurashtra University, Rajkot	1 (1.0)
Sigma University, Vadodara	3 (3.0)
Veer Narmad South Gujarat University, Surat	6 (6.1)
Program of study	
Undergraduate (Bachelor)	65 (65.7)
Postgraduate (Master's)	20 (20.2)
Ph.D. (Doctoral)	14 (14.1)
Country of origin in Africa	
Algeria	1 (1.0)
Angola	1 (1.0)
Botswana	1 (1.0)
Burundi	2 (2.0)
Cameroon	1 (1.0)
Ivory Coast	1 (1.0)
Egypt	3 (3.0)
Eswatini	3 (3.0)
Ethiopia	4 (4.0)
Gambia	7 (7.1)
Ghana	6 (6.1)
Kenya	4 (4.0)
Lesotho	1 (1.0)
Madagascar	3 (3.0)
Malawi	1 (1.0)
Mauritius	4 (4.0)
Morocco	1 (1.0)
Mozambique	4 (4.0)
Nigeria	18 (18.1)
Sierra Leone	3 (3.0)
South Africa	3 (3.0)
South Sudan	3 (3.0)
Sudan	4 (4.0)

Continued.

Variables	Frequency, N (%)
Tanzania	10 (10.1)
Uganda	2 (2.0)
Zambia	2 (2.0)
Zimbabwe	6 (6.1)

Table 2: Respondents' knowledge of Sickle Cell Disease (SCD).

Variables	Frequency, N (%)
Have you heard of sickle cell disease before?	
Yes	92 (92.9)
No	7 (7.1)
Through which means you heard about SCD	
Media (TV, radio, internet)	66 (66.7)
Family members & friends	59 (59.6)
School/university	26 (26.3)
Healthcare providers	20 (20.2)
Community awareness campaign	5 (5.1)
Causes of Sickle Cell Disease (SCD)	
Genetic/mutation/inheritance	61 (61.6)
Do not know/not sure/no idea	38 (38.4)
Do you think SCD is common in your home country?	
Yes	32 (32.3)
No	33 (33.3)
Maybe	34 (34.3)
Is SCD diagnosed through a blood test?	
Yes	72 (72.7)
No	8 (8.1)
Maybe	19 (19.2)
Is SCD inherited?	
Yes	71 (71.7)
No	3 (3.0)
Maybe	25 (25.3)
Genotype at risk of having children with SCD	
AS + AS	53 (53.5)
AS + AA	1 (1.0)
AA + SS	14 (14.1)
AA + AA	3 (3.0)
Don’t know	28 (28.3)
Can SCD be cured?	
Yes	22 (22.2)
No	32 (32.3)
Don’t know	45 (45.5)
Can SCD cause complications like anemia and pain crises?	
Yes	75 (75.8)
No	24 (24.2)

Note: The total percentages for sources of knowledge about sickle cell disease add up to more than 100% because respondents reported hearing about it from multiple sources. The same applies to the causes of sickle cell disease

Table 3: Respondents' attitude toward genotype testing.

Variables	Frequency, N (%)
Do you think premarital genotype testing is important?	
Yes	98 (99.0)
No	1 (1.0)
Should a couple avoid marriage if both partners have the AS genotype?	
Yes	78 (78.8)
No	21 (21.2)
Advise children or relatives to undergo a genotype test before marriage	
Yes	94 (94.9)
No	0 (0.0)
Maybe	5 (5.1)
Do you believe that love should override genotype incompatibility?	
Yes	34 (34.3)
No	65 (65.7)

From Table 2, statement one showed that 92.9% of respondents have heard of sickle cell disease, statement two indicated that 66.7% of respondents learnt about SCD through media (TV, radio, internet), 59.6% through family members and friends, 26.3% through schools or universities, and 20.2% of respondents heard about SCD through health providers. Statement three shows that 61.6% of the respondents identified genetic, mutation, or inheritance as the cause of SCD, while 38.4% do not know the cause. Statement four revealed that 32.3% of respondents indicated that SCD is common in their countries, 33.3% indicated that it is not, and 34.3% do not know whether it is common. Furthermore, statement five revealed that 72.7% of respondents stated that sickle cell disease is diagnosed through a blood test, and statement six showed that 71.7% indicated that SCD is inherited. Additionally, statement seven indicated that 53.5% of respondents identified AS+AS, AS+SS, and SS+SS as genotypes at risk of having children with SCD. In comparison, 46.4% did not know the genotypes at risk of having children with sickle cell disease. Statement eight showed that 32.3% of respondents believed SCD cannot be cured, and 45.5% were unsure whether it can be cured. Lastly, statement nine revealed that 75.8% of respondents indicated that sickle cell disease can cause complications such as anemia and pain crises.

According to Table 3, statement one revealed that 99.0% of respondents believe premarital genotype testing is important, and statement two shows that 78.8% of respondents indicated that couples should avoid marriage if both partners have the AS genotype. Statement three revealed that 94.9% of respondents advised their children or relatives to undergo genotype testing before marriage, and statement five revealed that 65.7% do not believe that love should override genotype incompatibility.

Table 4: Respondents' practices on genotype testing.

Variables	Frequency, N (%)
Have you done a genotype test before?	
Yes	38 (38.4)
No	61 (61.6)
If yes, what is your genotype?	
AA	23 (23.2)
AS	11 (11.1)
Don't know	65 (65.7)
Do you ever receive any form of education or counselling about SCD?	
Yes	38 (38.4)
No	61 (61.6)
Would you consider genotype before consenting to marriage?	
Yes	82 (82.8)
No	17 (17.2)
Perception that religious centers should require genotype testing before marriage	
Strongly disagree	9 (9.1)
Disagree	5 (5.1)
Neutral	27 (27.3)
Agree	31 (31.3)
Strongly agree	27 (27.3)

According to Table 4, statement 1 showed that 61.6% of respondents had not undergone genotype testing before, and statement two revealed that 65.1% of respondents do not know their genotype. Statement three revealed that 61.6% of respondents do not receive any form of education or counselling about SCD, and four indicated that 82.8% of respondents would consider genetic testing before consenting to marriage. Additionally, statement five revealed that 9.1% of respondents strongly disagree, 5.1% disagree, 27.3% are neutral, 31.3% agree, and 27.3% strongly agree with the statement that religious centers should require genotype testing before marriage, with an intensity index of 3.626 indicating a favorable view.

DISCUSSION

The discussion of findings on the knowledge of SCD showed that 92.9% of respondents had heard of sickle cell disease. These findings indicate a generally high level of awareness among the study population and are consistent with previous studies that have reported similarly high awareness levels among comparable populations.[10,8,14]

This study also showed that 66.7% of respondents learnt about SCD through media (TV, radio, internet), 59.6% through family members and friends, and 26.3% through schools or universities. This pattern of information dissemination contrasts with some earlier studies in which formal educational settings were identified as the primary source of information on sickle cell disease. However, it also aligns with other studies that reported family members, friends, and informal networks as major channels of information dissemination.[6,11,7]

Another finding of this study was that 61.6% of respondents identified genetic mutation or inheritance as the cause of SCD, while 38.4% were unsure of the reason. This finding aligns with previous studies that reported similar levels of understanding regarding the inherited nature of sickle cell disease, although varying degrees of uncertainty have also been documented among respondents in different settings.[6,1]

The results further revealed that most respondents correctly indicated that sickle cell disease can be diagnosed through a blood test. This finding is consistent with earlier studies that reported high levels of awareness regarding blood-based diagnostic methods for sickle cell disease.[6]

In addition, a considerable proportion of respondents, 71.7% acknowledged that sickle cell disease is inherited, particularly when both parents carry abnormal genotypes. This finding is in agreement with previous studies that demonstrated a strong understanding of the hereditary transmission of sickle cell disease among respondents.[7,10]

The study also revealed that just over half of the respondents correctly identified genotype combinations such as AS+AS, AS+SS, and SS+SS as being associated with a risk of having children with sickle cell disease, while a substantial proportion were unaware of the genotypes that pose such risks. This finding both contrasts with and aligns with previous studies, some of which reported higher levels of awareness, while others documented similar gaps in knowledge regarding genotype compatibility.[15,7]

Regarding curability, the findings indicated that many respondents believed that sickle cell disease cannot be cured, while others were unsure whether a cure exists. These perceptions are consistent with previous studies that reported similar levels of uncertainty and misconceptions regarding the curability of sickle cell disease.[7,15]

Furthermore, the study showed that a high proportion of respondents recognized that sickle cell disease can cause complications such as anemia and pain crises. This finding aligns with earlier studies that reported widespread awareness of the clinical complications associated with sickle cell disease.[6]

The discussion on attitudes towards premarital genotype testing revealed that the majority of respondents believed premarital genotype testing is important and that couples should avoid marriage if both partners have incompatible genotypes. This finding is consistent with previous studies that reported strong support for premarital genotype screening as a strategy for reducing the incidence of sickle cell disease.[6,7]

The study also found that most respondents indicated they would advise their children or relatives to undergo genotype testing before marriage and did not believe that love should override genotype incompatibility. These findings align with earlier studies that emphasized the importance of informed marital decision-making in the prevention of sickle cell disease.[7]

With regard to practices related to genotype testing, the findings revealed that a significant proportion of respondents had not previously undergone genotype testing. This contrasts with some studies that reported higher uptake of genotype testing but aligns with others that documented low testing rates despite high awareness levels.[11,6,7]

Additionally, the study showed that many respondents had not received education or counselling on sickle cell disease, although most indicated they would consider genetic testing before agreeing to marriage. This finding aligns with previous studies that reported similar gaps between awareness and access to structured counselling services.[11]

Finally, the study revealed mixed opinions regarding the role of religious centers in requiring genotype testing before marriage. While a notable proportion of respondents supported this practice, others disagreed. This finding aligns with previous studies that reported divided opinions on the involvement of religious institutions in premarital genetic screening.[15]

This study has few limitations. This research was limited to African international students enrolled in various universities across the state of Gujarat, India. These students were young and unmarried. Awareness about genetic testing and premarital counselling is crucial for them at this age. The study cannot be generalized to all African international students in India because it was conducted solely in one state.

CONCLUSION

The study results showed that African international students at universities across Gujarat State in India are aware of SCD but tend to have a negative view of genotype testing. Most participants are unaware of the symptoms and do not know that sickle cell disease can be treated with bone marrow or stem cell transplants. Regarding education and counselling, most respondents are young, between 20 and 29 years old, but have not received any counselling on SCD. Although the study highlights the widespread SCD in African countries, most respondents were unaware of their genotype.

Recommendations

Enhance Health Education Programmes: Secondary schools across Africa should introduce health education initiatives that emphasise the genetics of SCD, the importance of screening, and compatibility with specific genotypes.

Establish genotype testing services in universities: Universities across Gujarat State should establish free on-campus genetic testing units to provide reliable genotype testing services to both local and international students.

Promote policy integration: African countries should establish policies that require genotype testing and counselling as part of their marriage support services for citizens.

Collaborate with religious and community leaders: Partnering with faith-based organisations can help raise awareness and introduce genotype compatibility checks into traditional marriage customs.

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REFERENCES

1. World Health Organization. Sickle cell disease, 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/sickle-cell-disease. Accessed 20 December, 2024.
2. Piel FB, Hay SI, Weatherall DJ. Reducing the global burden of sickle cell disease. Bull World Health Organ. 2017;95(7):482-90.
3. Ohene-Frempong K. Preventing sickle cell disease in Africa through premarital screening: challenges and strategies. Lancet Haematol. 2021;8(7):e455-6.
4. Adewoyin AS, Alagbe AE. Sickle cell disease: awareness, knowledge, and screening practices among undergraduates in a Nigerian tertiary institution. Ann Afr Med. 2020;19(1):51-7.
5. Bindhani BK, Devi NK, Nayak JK. Knowledge, awareness, and attitude of premarital screening with special focus on sickle cell disease: a study from Odisha. J Community Genet. 2020;11(4):445-9.
6. Adesina OA, Ogamba CF, Osibogun A. Premarital genotype screening for sickle cell disease: knowledge gaps, perception, and determinants of uptake among final year undergraduates of a tertiary

institution in South-West Nigeria. Niger Med J. 2022;63(1):50-8.

7. Isah BA, Musa Y, Mohammed UK, Ibrahim MTO, Awosan KJ, Yunusa EU. Knowledge and attitudes regarding premarital screening for sickle cell disease among students of the State School of Nursing, Sokoto. Ann Int Med Dent Res. 2016;2(3):29-34.
8. Oludarei GO, Ogili MC. Knowledge, attitude, and practice of premarital counselling for sickle cell disease among youth in Yaba, Nigeria. Afr J Reprod Health. 2013;17(4):175-182.
9. Boadu I, Addoah T. Knowledge, beliefs, and attitudes towards sickle cell disease among university students. J Community Med Health Educ. 2018;8(593):1-5.
10. Isah BA, Danmadami AM, Bello MM, Njidda G, Ibrahim KB, Magode SD. Knowledge of sickle cell disease, attitude, and practice regarding premarital genotype counseling and testing among the lecturers of Usmanu Danfodiyo University, Sokoto, Nigeria. Int Arch Med Med Sci. 2019;1:10-1.
11. Maigoro AM, Ibrahim AM, Usman US, Abdullahi IA. Knowledge and utilization of premarital screening for sickle cell disease among residents of semi-urban community, Bauchi State, Nigeria. Int J Commu Medi Publ Heal. 2024;11(1):57.
12. Aagaard EM, Hauer KE. A cross-sectional descriptive study of mentoring relationships formed by medical students. J Gen Int Medi. 2003;18(4):298-302.
13. Kesmodel US. Cross-sectional studies-what are they good for? Acta obstetricia et gynecologica Scandinavica. 2018;97(4):388-93.
14. Uche E, Olowoselu O, Augustine B, Ismail A, Akinbami A, Dosunmu A, et al. An assessment of knowledge, awareness, and attitude of undergraduates toward sickle cell disease in Lagos, Nigeria. Niger Med J. 2017;58(6):167-172.
15. Oluwadamilola AD, Akinreni TI, Adefisan MA, Olayiwola SD. Knowledge, attitude, and control practices of sickle cell diseases among senior secondary students in Osun State, Nigeria. Pan Afr Medi J. 2021;38(1).

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