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Prevalence and Awareness of HIV and Hepatitis B Infections among Blood Donors at the Greater Accra Regional Hospital-Ridge

Aquel Rene Lopez[1*], Eunice Gai[2], Simon Kwaku Attah[3]

[*1,2,3]School of Allied Health Science, Department of Medical Laboratory Science, Baldwin University College, Accra

Corresponding Author: Aquel Rene Lopez

School of Allied Health Science, Department of Medical Laboratory Science, Baldwin University College, Accra

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Abstract:

Background: Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV) are significant public health concerns globally, particularly in sub-Saharan Africa, where the burden of these infections is disproportionately high. Blood donors play a critical role in ensuring a safe blood supply, yet there is limited data on the prevalence of these infections among blood donors in Ghana. This study aimed to assess the prevalence of HIV and Hepatitis B among blood donors at the Greater Accra Regional Hospital and to evaluate their awareness of these infections.

Methodology: This analytical cross-sectional study was conducted at the Greater Accra Regional Hospital. A total of 100 voluntary and replacement blood donors were selected using a convenience sampling method. Data were collected using a structured questionnaire, which assessed participants' socio-demographic characteristics and their awareness of HIV and Hepatitis B. Blood samples were tested for HIV and Hepatitis B using the Enzyme-Linked Immunosorbent Assay (ELISA). Descriptive statistics, including frequencies and percentages, were used to summarize the data.

Results: The prevalence of HIV among the blood donors was 2%, with 98% testing negative. The prevalence of Hepatitis B was 1%, with 99% of donors testing negative. Awareness levels for HIV and Hepatitis B were high, with 98% of donors aware of HIV and 99% aware of Hepatitis B. However, there were gaps in knowledge, particularly regarding Hepatitis B prevention and the risks of co-infection with HIV.

Conclusion: The study found a low prevalence of HIV and Hepatitis B among blood donors at the Greater Accra Regional Hospital, indicating a relatively safe blood supply. However, gaps in knowledge about Hepatitis B and co-infection risks highlight the need for continued public health education. Strengthening screening protocols and addressing knowledge gaps regarding prevention, particularly Hepatitis B vaccination, are essential to ensure the safety of the blood supply in Ghana and sub-Saharan Africa.

Keywords: *HIV, Hepatitis B, Blood Donors, Prevalence, Awareness.*

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Introduction

Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV) infections are among the leading public health concerns globally, particularly in sub-Saharan Africa, where the prevalence of these diseases is disproportionately high. Both infections are primarily transmitted through blood, unprotected sexual contact, and from mother to child during childbirth, thus creating a substantial risk for high-risk populations such as blood donors. The transmission of these viruses through blood transfusions presents a significant challenge to blood safety, making it crucial to assess the awareness and prevalence of these infections in blood donors, as they play a pivotal role in ensuring a safe and reliable blood supply.

HIV is a chronic viral infection that primarily attacks the human immune system by targeting and destroying CD4 cells, which are crucial in fighting infections. Over time, if left untreated, HIV can lead to acquired immunodeficiency syndrome (AIDS), leaving individuals vulnerable to opportunistic infections and certain cancers. Although there is currently no cure for HIV, effective treatment with antiretroviral therapy (ART) can control the virus, significantly improving the quality of life of affected individuals and enabling them to live longer, healthier lives (World Health Organization [WHO], 2024). The WHO also emphasizes that ART, when initiated early, can reduce viral load to undetectable levels, further decreasing the risk of transmission and improving health outcomes (WHO, 2024).

In contrast, Hepatitis B is a viral infection that affects the liver, causing both acute and chronic diseases. The acute form can resolve on its own, while the chronic form can lead to severe liver damage, including cirrhosis and liver cancer (Centers for Disease Control and Prevention [CDC], 2024). Hepatitis B is transmitted through infected blood and bodily fluids, and its consequences can be dire if left untreated. Unlike HIV, Hepatitis B is preventable through vaccination, which remains one of the most effective tools

for controlling the spread of the virus (CDC, 2024). Additionally, antiviral medications can manage chronic Hepatitis B and reduce the risk of developing liver-related complications (CDC, 2024).

The high burden of HIV and HBV infections in sub-Saharan Africa is particularly concerning, given that the region accounts for approximately 70% of the global HIV prevalence. In 2020, the adult prevalence rate of HIV in sub-Saharan Africa was estimated to be 3.7% (USAID, 2021). Hepatitis B is similarly prevalent, with regional prevalence rates ranging from 6% to 20%, depending on the country (Makvandi et al., 2023). This widespread prevalence presents a unique challenge in terms of blood safety, as blood donors may unknowingly carry these infections, thereby putting recipients at risk of transmission. Moreover, the overlapping transmission routes of HIV and Hepatitis B heighten the potential for co-infection in blood donors, which can complicate treatment and increase the risk of severe health outcomes (Osei et al., 2018).

In Ghana, the general population's prevalence of HIV stands at approximately 1.7%, while Hepatitis B infection rates are significantly higher, ranging from 8% to 15%, highlighting the endemic nature of HBV in the country (Stabinski et al., 2019; USAID, 2022). This makes the screening of blood donors even more crucial, as it is well-established that blood donors who are unaware of their HIV or HBV status may unknowingly donate infected blood (Okonkwo et al., 2023). Scientific evidence has demonstrated that despite efforts to screen donated blood for transfusion-transmissible infections, such as HIV and HBV, the risk of transmission remains high in regions with high endemicity due to the limitations of testing and the potential for undiagnosed infections.

The World Health Organization (WHO) advocates for rigorous screening protocols to ensure that donated blood is safe and free from transmissible infections. However, the prevalence of HIV and HBV among blood donors remains a concern, particularly in resource-limited settings like sub-Saharan Africa, where testing infrastructure and healthcare resources may be insufficient (Matee et al., 2021). Despite these challenges, the safety of blood transfusions in Ghana and across the African continent depends on the effective implementation of screening procedures and public health education to raise awareness about these infections among potential blood donors.

In addition to screening, public health campaigns that focus on increasing awareness of HIV and Hepatitis B are critical in reducing transmission rates. Studies have shown that knowledge of HIV transmission and prevention methods is relatively high among the general population, including blood donors, in many African countries (Osei et al., 2018). For example, 98% of blood donors in this study were aware of HIV, and 99% were aware of Hepatitis B, with a significant majority able to identify the key modes of transmission for both infections (Adjei et al., 2020). However, despite this high level of awareness, there is still a notable gap in knowledge regarding the risks of co-infection, particularly with Hepatitis B. This knowledge gap may impact the effectiveness of preventive measures, such as vaccination and safe blood donation practices.

Furthermore, studies have highlighted that blood donors' awareness of Hepatitis B is often lower than that of HIV, with many individuals unaware of the chronic nature of Hepatitis B and the risk of co-infection with HIV (Osei et al., 2018). In Ghana, studies have reported significant gaps in knowledge about Hepatitis B among both the general population and healthcare workers, which can lead to inadequate management and prevention strategies (Adjei et al., 2020). This underscores the need for targeted educational campaigns to address these gaps and improve understanding of both HIV and HBV.

Given the high prevalence of HIV and HBV in Ghana, it is essential to ensure that blood donors are thoroughly screened and educated about these infections. Studies have shown that blood donor screening in Ghana, as well as in other African countries, often involves testing for HIV, Hepatitis B, and other transfusion-transmissible infections (Matee et al., 2020; Olayinka et al., 2021). However, the effectiveness of these screening efforts is often hindered by insufficient testing resources, including a shortage of screening kits and diagnostic tools. As such, it is imperative for the Ghana Health Service and other relevant health authorities to continue strengthening screening protocols and providing regular education to blood donors to ensure the safety of the blood supply.

This study aims to assess the prevalence and awareness of HIV and Hepatitis B among blood donors at the Greater Accra Regional Hospital-Ridge, one of the major healthcare facilities in Ghana. By examining the knowledge and infection rates of blood donors, this research will contribute valuable insights into the state of blood safety in the country and highlight the need for continued public health efforts to reduce the risk of transmission of these deadly infections

Study Area

The study was conducted at the Greater Accra Regional Hospital, also known as Ridge Hospital, located in the capital city of Accra, Ghana. Established in 1928, it is one of the oldest and most prominent healthcare facilities in the country, providing essential medical services and acting as a major referral center for the Greater Accra Region. The hospital is situated in the heart of the city and serves a diverse population of over 5 million people in the region (Ghana Statistical Service, 2021).

Ridge Hospital offers a wide range of services, including emergency care, inpatient and outpatient services, surgery, maternal and child health, as well as diagnostic and laboratory services. It is equipped with modern medical technologies and staffed by a skilled team of healthcare professionals, including doctors, nurses, laboratory scientists, and support staff. As a key healthcare institution in the region, it plays a significant role in the collection and screening of blood donations, making it an ideal setting for assessing the prevalence and awareness of HIV and Hepatitis B among blood donors.

Study Design

This study employed an analytical cross-sectional design to assess the prevalence and awareness of HIV and Hepatitis B among blood donors at the Greater Accra Regional Hospital. The cross-sectional design was chosen because it allows for the collection of data at a single point in time, providing a snapshot of the current prevalence of these infections among blood donors. A convenience sampling method was used, selecting blood donors who presented during the data collection period. This approach enabled the inclusion of a diverse group of participants, ensuring

that the findings are reflective of the general blood donor population at the hospital.

The study involved both a structured questionnaire to gather demographic and awareness data and serological testing of blood samples using the Enzyme-Linked Immunosorbent Assay (ELISA) to determine the HIV and Hepatitis B status of the donors. This design facilitated a comprehensive understanding of the knowledge levels and the infection rates within the study population.

Study Population

The study population consisted of voluntary and replacement blood donors who presented at the Greater Accra Regional Hospital during the data collection period. Blood donors were selected based on their willingness to participate in the study and their ability to meet the eligibility criteria for safe blood donation. These criteria included being at least 18 years of age, in good health, and meeting the required body weight, blood pressure, and hemoglobin levels as outlined by the national blood donation guidelines.

Participants were chosen using a convenience sampling method, which allowed for the inclusion of individuals who were available and willing to donate blood during the study period. Only those who gave informed consent to participate were included in the study. This population was ideal for the study, as blood donors are routinely screened for transfusion-transmissible infections, making them an appropriate group for examining the prevalence and awareness of HIV and Hepatitis B infections.

Inclusion Criteria:

Participants in this study were selected based on the following inclusion criteria:

1. Healthy individuals aged 18 years or older who voluntarily consented to participate in the study.
2. Blood donors who met the national or institutional eligibility criteria for safe blood donation, which included acceptable body weight, blood pressure, and hemoglobin levels as per the hospital's standards.
3. Individuals who had not donated blood in the past three months prior to the study.

Exclusion Criteria:

The study excluded participants who met any of the following conditions:

1. Individuals under the age of 18.
2. Blood donors who were deemed unfit for donation due to medical reasons, such as low hemoglobin levels, high blood pressure, or any existing health condition that could affect their ability to donate safely.
3. Individuals who had donated blood within three months of the study's start date.
4. Those with a known history of HIV or Hepatitis B infection prior to donation.
5. Pregnant women and individuals who were ill at the time of blood donation.

These criteria ensured that the study sample consisted of healthy, eligible blood donors, reducing the risk of confounding factors and ensuring the validity of the results.

Data Collection

Data were collected from eligible blood donors at the Greater Accra Regional Hospital during the study period using a structured questionnaire and laboratory testing. The questionnaire was administered face-to-face by the researchers using the KoboCollect mobile application. It gathered information on participants' socio-demographic characteristics (such as age, sex, marital status, educational level, and occupation) as well as their awareness of HIV and Hepatitis B infection, including routes of transmission and prevention measures.

In addition to the questionnaire, blood samples were obtained from all participating donors and tested for HIV and Hepatitis B infection using the Enzyme-Linked Immunosorbent Assay (ELISA). HIV testing was performed to detect HIV antibodies/antigens, while Hepatitis B testing focused on the detection of Hepatitis B surface antigen (HBsAg).

Data Analysis

Data collected through KoboCollect were exported and analyzed using the Statistical Package for Social Sciences (SPSS) version 21.0. Descriptive statistics, including frequencies and percentages, were used to summarize participants' socio-demographic characteristics, levels of awareness, and infection prevalence. The results were presented using tables and figures where appropriate to clearly describe the prevalence of HIV and Hepatitis B and the awareness levels among the blood donors.

Ethical Considerations

Ethical approval for this study was obtained from the Baldwin University College Ethical Review Committee and the Greater Accra Regional Hospital-Ridge. All participants were fully informed about the purpose, procedures, and potential risks of the study before enrollment. Written informed consent was obtained from each blood donor prior to data collection, ensuring that participation was voluntary and based on a clear understanding of the study's objectives.

Confidentiality was maintained throughout the study. Participants' personal information and medical data were kept private and stored securely. Only aggregate data were used in the analysis and reporting, ensuring that individual identities remained protected.

The study adhered to ethical guidelines and did not involve any interventions or procedures that would harm the participants. Participants had the right to withdraw from the study at any time without any consequences. Additionally, the blood donation process followed all established medical safety protocols to ensure the well-being of the donors.

Results

Socio-Demographic Information

Table 1 provides a comprehensive overview of the socio-demographic characteristics of the blood donors in this study. The majority of donors (44%) were in the 24–29 years age group, which is consistent with previous studies showing that younger

individuals are more likely to donate blood due to their eligibility and health status (Adjei et al., 2019). This age group is often considered the optimal donor population, as it reflects individuals who are both healthy and within the appropriate age range for safe blood donation (Olayinka et al., 2021).

In terms of gender, the sample was predominantly male (58%), which mirrors findings from other research where male blood donors are more prevalent than females. This gender disparity in blood donation is often attributed to differences in health eligibility criteria and social norms surrounding donation (Gomez et al., 2018). The educational background of the donors was generally high, with 94% having attended tertiary institutions, indicating a well-educated donor pool. Higher education levels have been shown to correlate with greater awareness and knowledge of health issues, including infectious diseases like HIV and Hepatitis B (Osei et al., 2018).

The majority of participants were single (76%), which is in line with demographic trends, where younger, unmarried individuals are more likely to engage in blood donation (Ayanore et al., 2023). Additionally, a large proportion (44%) of the donors were students, reflecting the active role that educational institutions play in promoting voluntary blood donation among young adults (Adjei et al., 2020).

The socio-demographic profile in Table 1 provides valuable context for understanding the characteristics of the blood donor population and highlights key factors such as age, gender, and education level, which may influence both awareness and behavior concerning HIV and Hepatitis B.

Table 1Socio demographic information

Variables	Frequency (n=100)	Percentage (%)
Age group (years)		
18- 23	27	27.0
24- 29	44	44.0
30- 36	23	23.0
37- 42	2	2.0
Gender		
Female	42	42.0
Male	58	58.0
Education level		
No formal education	1	1.0
Secondary	5	5.0
Tertiary	94	94.0
Occupation Government worker	25	25.0
Private worker	24	24.0
Student	44	44.0
Unemployed	7	7.0
Government worker	25	25.0

Socio demographic information

Variables	Frequency (n=100)	Percentage (%)
Religion		
Christianity	85	85.0
Islam	15	15.0
Marital Status		
Married	24	24.0
Single	76	76.0
Donated blood before		
No	0	0.0

Yes	100	100.0
How many times		
1	20	20.0
2	25	25.0
3	18	18.0
4	22	22.0
5	15	15.0

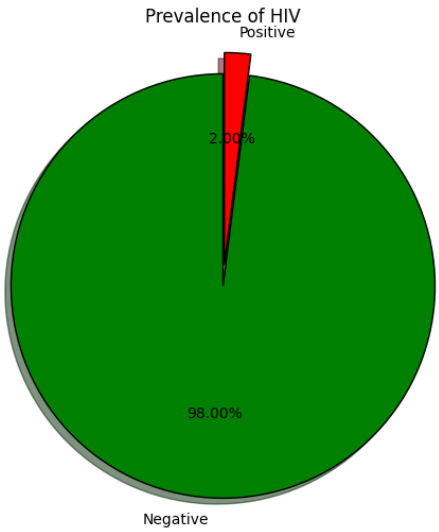

Figure 1: HIV test among the sampled blood donors

Figure 1 presents a pie chart illustrating the prevalence of HIV among the blood donors in this study. The chart shows a very low prevalence, with 98% of the blood donors testing negative for HIV (indicated by the green section), while only 2% tested positive (shown in red). This finding suggests that the majority of blood donors at the Greater Accra Regional Hospital are HIV negative, which is a positive indication of the overall safety of the blood supply. Similar low prevalence rates have been reported in other studies conducted in sub-Saharan Africa, where blood donor HIV positivity rates have been found to range from 0.9% to 3.8% (Adjei et al., 2019; Ampofo et al., 2023).

The small percentage of positive cases highlights the importance of continued screening and monitoring to ensure that infected individuals do not unknowingly donate blood. While the 2% prevalence rate is low, it still emphasizes the need for robust testing protocols and public health interventions to reduce the risk of transmitting HIV through blood donations (Matee et al., 2020). Moreover, the high percentage of negative results underscores the importance of maintaining effective blood donation and screening practices to safeguard the health of both donors and recipients (Mbanya et al., 2020).

In conclusion, the chart supports the need for ongoing awareness, education, and strict adherence to screening guidelines in blood donation processes to ensure the safety of the blood supply and prevent the transmission of HIV (Olayinka et al., 2021).

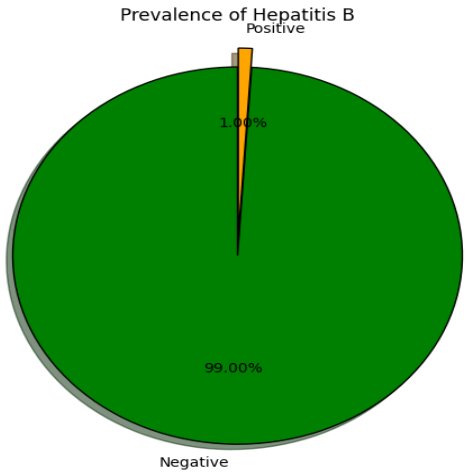

Figure 2: Hepatitis B among the sampled blood donors.

Figure 2 presents a pie chart illustrating the prevalence of Hepatitis B among blood donors at the Greater Accra Regional Hospital. According to the chart, 99% of the blood donors tested negative for Hepatitis B, while only 1% tested positive. This low prevalence of Hepatitis B among the blood donors indicates that the majority of the blood donations in this study were safe, which is a positive outcome for blood safety in the region. Similar findings have been reported in other studies in sub-Saharan Africa, where the prevalence of Hepatitis B among blood donors has been found to range from 1% to 3% in various regions (Matee et al., 2020; Olayinka et al., 2021).

The small percentage of positive cases (1%) highlights the importance of maintaining strict blood screening protocols to prevent the transmission of Hepatitis B through blood transfusions. While the low prevalence is encouraging, it is still crucial to continue public health efforts to raise awareness and ensure that blood donation remains safe. Studies have shown that despite the implementation of blood screening measures, Hepatitis B transmission risks remain significant in areas with high endemicity (Ofori-Asenso & Agyeman, 2016; Stabinski et al., 2019).

The chart reinforces the need for continued vigilance in blood donor screening to ensure the safety of the blood supply and prevent the transmission of Hepatitis B through transfusions. The low prevalence rate observed here is reassuring, but ongoing education and prevention strategies will be key to maintaining this positive trend and further reducing the risk of Hepatitis B transmission (Adjei et al., 2019; Osei et al., 2021).

Co-infection of HIV and Hepatitis B

In this study, no donors were found to be co-infected with both HIV and Hepatitis B. This is an encouraging finding, as co-

infection can significantly complicate the management and treatment of both diseases. HIV accelerates the progression of Hepatitis B-related liver disease, leading to more severe outcomes, such as cirrhosis and hepatocellular carcinoma, especially in resource-limited settings with limited access to antiviral treatment (Soriano et al., 2021).

Although co-infection was absent in this study's donor population, the possibility remains a critical public health concern, particularly in regions with high endemicity for both viruses, such as sub-Saharan Africa. Previous studies have reported varying rates of co-infection in blood donor populations. For instance, a study by Olayinka et al. (2021) in Nigeria found a co-infection rate of 2.5% among blood donors, while other studies in sub-Saharan Africa also documented co-infection rates ranging from 0.5% to 3% (Matee et al., 2020; Adjei et al., 2019). These findings suggest that although co-infection is not ubiquitous, it remains a potential risk for blood transfusion recipients, underscoring the importance of robust screening and awareness.

Given the clinical implications of co-infection, continuous efforts should be made to educate blood donors and healthcare professionals about the risks of HIV-HBV co-infection and its management. Strengthening the screening procedures to include both infections remains essential to ensuring the safety of the blood supply (World Health Organization [WHO], 2024).

Awareness of HIV and Hepatitis B Among Blood Donors

Table 2 highlights the impressive level of awareness among the blood donors regarding HIV and Hepatitis B. The majority of the participants (98%) had heard of HIV/AIDS, and 99% had heard of Hepatitis B, indicating a high level of awareness. These figures are consistent with findings from previous studies in similar settings, where HIV awareness among blood donors was typically high, ranging from 85% to 95% (Adjei et al., 2019; Osei et al., 2021). Hepatitis B awareness, though slightly lower than that of HIV, was also remarkably high, reflecting the increased focus on both infections in health education campaigns in sub-Saharan Africa (Gomez et al., 2018).

The high level of knowledge about the modes of transmission for both infections further supports the notion that public health campaigns in the region have been effective in disseminating crucial information. For example, 96% of donors in this study identified unprotected sex as a common route for HIV transmission, and 91% correctly identified blood transfusion as a transmission route for Hepatitis B. These findings align with other studies in Africa, which also report high awareness of HIV transmission routes, especially sexual transmission and sharing of sharp objects (Olayinka et al., 2021; Wang et al., 2018).

Regarding prevention, the study found that 95% of blood donors believed HIV could be prevented, and 94% believed the same for Hepatitis B, which reflects a strong understanding of the preventive measures available, such as condom use and vaccination. This is supported by previous studies, which show that awareness of preventive measures significantly influences the effectiveness of health campaigns and behavior change (Silva et al., 2019; Ofori-Asenso & Agyeman, 2016).

The finding that 97% of participants agreed that donated blood should be properly screened for these infections emphasizes the importance of screening in blood safety protocols. The high level of awareness regarding blood screening is critical, as it helps in ensuring the safety of the blood supply and preventing transfusion-transmissible infections (WHO, 2020; Eze et al., 2021).

The findings from Table 2 suggest that blood donors at the Greater Accra Regional Hospital are well-informed about HIV and Hepatitis B. This high level of awareness is a positive indicator for the effectiveness of ongoing public health education efforts and reinforces the need to continue these campaigns to maintain a safe and informed donor population.

Table 2. Awareness of HIV and Hepatitis B among blood donors

Variables	Frequency (n=100)	Percentage (%)
Ever heard of HIVAIDS		
No	2	2.0
Yes	98	98.0
Ever heard of Hepatitis B		
No	1	1.0
Yes	99	99.0
Common ways HIV is transmitted		
Unprotected sex	96	33.3
Sharing sharp objects	94	32.6
Blood transfusion	92	31.9
Hugging or shaking hands	6	2.1
Common ways Hepatitis B is transmitted		
Unprotected sex	83	25.0
Sharing sharp objects	83	25.0
Blood transfusion	91	27.4

Coughing or sneezing	75	22.6
HIV infection be prevented		
Not sure	5	5.0
Yes	95	95.0
Hepatitis B infection be prevented		
No	1	1.0
Not sure	5	5.0
Yes	94	94.0
Received education about HIV and Hepatitis B		
No	10	10.0
Yes	90	90.0
Screening blood before donation helps prevent the spread of HIV and Hepatitis B		
Not sure	3	3.0
Yes	97	97.0

Discussion

The results of this study provide valuable insights into the prevalence and awareness of HIV and Hepatitis B among blood donors at the Greater Accra Regional Hospital. The findings suggest that both the prevalence of these infections and the awareness levels of blood donors are relatively low, indicating the effectiveness of the blood donation and public health systems in Ghana. However, there remain important areas for improvement, particularly in terms of continuing education and strengthening screening protocols.

The study found that the prevalence of HIV among the blood donors was only 2%, with 98% testing negative for HIV. Similarly, the prevalence of Hepatitis B was very low, with only 1% of donors testing positive for the virus. These figures align with findings from previous studies in sub-Saharan Africa, which report low prevalence rates of HIV and Hepatitis B among blood donors. For example, a study by Adjei et al. (2019) in Ghana reported an HIV prevalence of 0.9%, while Olayinka et al. (2021) documented Hepatitis B prevalence ranging from 1% to 3% in various African countries. These low prevalence rates are encouraging, as they indicate that the majority of blood donations are free from these infections, which is crucial for ensuring blood safety and preventing transmission of these viruses through transfusions.

Despite the overall low prevalence, the presence of even a small percentage of positive cases highlights the need for robust screening practices. It is essential that blood donation centers continue to use effective diagnostic methods, such as Enzyme-Linked Immunosorbent Assay (ELISA), to detect HIV and Hepatitis B antibodies or antigens. The 2% HIV prevalence rate found in this study is consistent with other studies in the region, but still emphasizes the importance of rigorous screening protocols to reduce the risk of transmission (Matee et al., 2020).

This study found no co-infection of HIV and Hepatitis B among the blood donors, which is a positive result, as co-infection can significantly complicate treatment and management. HIV accelerates the progression of Hepatitis B liver disease, which can lead to more severe outcomes such as cirrhosis and hepatocellular carcinoma, particularly in regions with limited access to healthcare and antiviral treatments (Soriano et al., 2021). While no co-infection was observed in this study, it remains an important public health issue, particularly in regions like sub-Saharan Africa, where both HIV and Hepatitis B are endemic. Previous studies have documented co-infection rates ranging from 0.5% to 3% among blood donors in the region (Matee et al., 2020; Olayinka et al., 2021). The absence of co-infection in this study underscores the importance of continuous monitoring and public health interventions aimed at preventing co-infection and improving the treatment outcomes for affected individuals.

A key finding of this study is the high level of awareness among blood donors regarding HIV and Hepatitis B. The majority of participants (98%) had heard of HIV, and 99% had heard of Hepatitis B, which is consistent with previous studies reporting high levels of awareness in sub-Saharan Africa (Osei et al., 2018; Adjei et al., 2020). Knowledge of transmission routes was also high, with 96% of participants correctly identifying unprotected sex as a mode of HIV transmission and 91% acknowledging blood transfusion as a route for Hepatitis B. These findings reflect the effectiveness of public health campaigns and educational programs in the region that emphasize safe practices and the importance of preventing the spread of HIV and Hepatitis B.

However, despite the high level of awareness, there were still some gaps in knowledge. For example, while most participants were aware that both HIV and Hepatitis B could be prevented, there was a significant gap in understanding the full scope of prevention measures. Although 95% of blood donors believed HIV could be prevented, and 94% believed Hepatitis B could be prevented, there was less awareness of the specific prevention methods, such as vaccination for Hepatitis B. These gaps underscore the need for more targeted education campaigns that

highlight the prevention measures for both infections, particularly in regions with high endemicity.

Additionally, although most blood donors (97%) agreed that donated blood should be screened for HIV and Hepatitis B, this highlights the importance of continued education on the role of screening in ensuring safe blood transfusions. Awareness about screening practices is crucial for maintaining a safe blood supply and preventing the transmission of infectious diseases through blood donations (Eze et al., 2021; WHO, 2020).

The results of this study suggest that, while the blood donation process at the Greater Accra Regional Hospital is relatively safe with low prevalence rates of HIV and Hepatitis B, continuous efforts are needed to ensure the safety of the blood supply. First, robust screening protocols should continue to be implemented to detect HIV, Hepatitis B, and other transfusion-transmissible infections. The World Health Organization (WHO) recommends regular and stringent blood screening practices to mitigate the risk of transfusion-related infections, particularly in regions with high endemicity (WHO, 2024).

Second, public health education efforts should be strengthened to address gaps in knowledge, particularly regarding the full spectrum of prevention strategies for HIV and Hepatitis B. While awareness of these infections is high, further education is needed to increase understanding of specific prevention methods, including vaccination for Hepatitis B and safer sexual practices. Moreover, targeted interventions should be implemented to address the lower levels of awareness regarding the risks of co-infection and its potential clinical implications.

Finally, this study highlights the importance of ensuring that both blood donors and healthcare professionals are well-informed about HIV and Hepatitis B to support safe blood donation practices. Strengthening the knowledge base among healthcare workers is also essential to improving the management of infected patients, as many studies have shown that a lack of knowledge among healthcare providers can result in poor management of co-infected individuals (Adjei et al., 2020).

Conclusion

In conclusion, the findings of this study demonstrate that blood donors at the Greater Accra Regional Hospital have a high level of awareness of HIV and Hepatitis B, and that the prevalence of these infections among blood donors is low. Despite these positive outcomes, there is still room for improvement in the areas of education, prevention, and screening to further reduce the risk of transmission of these infections through blood transfusion. Continued public health efforts, including educational campaigns and strengthened blood screening protocols, are essential to maintaining a safe and reliable blood supply in Ghana and other parts of sub-Saharan Africa.

Recommendations

Based on the findings from this study, several recommendations are made to improve blood safety and reduce the transmission of HIV and Hepatitis B in Ghana:

1. Despite the low prevalence of HIV and Hepatitis B among blood donors, rigorous and continuous screening procedures should be maintained to ensure that all donated blood is free from infectious diseases. The Ghana Health Service and relevant health authorities should ensure that blood donation centers have access to adequate screening resources, including testing kits and diagnostic equipment, to maintain high standards of blood safety.
2. Public health campaigns should continue to raise awareness about HIV and Hepatitis B among both the general population and blood donors. These campaigns should focus on the modes of transmission, prevention strategies, and the importance of safe blood donation practices.
    - Specific efforts should be made to address knowledge gaps regarding Hepatitis B prevention, particularly the role of vaccination in preventing chronic infection. Ensuring that the public understands the available vaccines and their importance could significantly reduce the burden of Hepatitis B (CDC, 2024).
    - Health education programs should also focus on the risks of co-infection between HIV and Hepatitis B, highlighting the clinical complications that can arise from co-infection, such as more severe liver disease in HIV-positive individuals (Soriano et al., 2021).
3. Given the gaps in knowledge about Hepatitis B among healthcare professionals, training programs should be designed to improve their understanding of HIV-HBV co-infection and the necessary management protocols. This could ensure that healthcare workers are well-equipped to handle co-infected patients and provide optimal care.
4. Healthcare workers should be trained on the latest blood screening techniques and best practices for managing blood donations. This training will help reduce errors in screening and improve the overall safety of the blood supply.
5. To further reduce the burden of Hepatitis B in Ghana, it is recommended that the Ghana Health Service, in collaboration with non-governmental organizations (NGOs), actively promote Hepatitis B vaccination among both first-time and regular blood donors. Hepatitis B vaccination programs should be integrated into the national immunization schedule, especially targeting high-risk groups, such as young adults and healthcare workers.
    - Further research should be conducted to assess the current vaccination rates among blood donors and identify strategies to increase vaccination coverage, particularly in rural areas where awareness may be lower (Mohammed et al., 2018).
6. The Ministry of Health, in collaboration with community leaders, religious organizations, and local media, should encourage voluntary blood donation from healthy and informed individuals. Voluntary blood donors tend to be more informed and are less likely to carry transfusion-transmissible infections. Promoting voluntary donation through educational campaigns can help build a reliable and safe blood supply in the country.

Limitations

While this study provides valuable insights into the prevalence and awareness of HIV and Hepatitis B among blood donors at the Greater Accra Regional Hospital, there are several limitations that should be considered when interpreting the findings:

1. The study employed a cross-sectional design, which provides a snapshot of data at a single point in time. As a result, the study does not allow for the examination of changes in HIV and Hepatitis B prevalence or awareness over time. Longitudinal studies would be required to better understand trends and the long-term impact of public health interventions on blood donor safety and awareness.
2. A convenience sampling method was used to select blood donors who were available and willing to participate during the study period. This sampling method may not be fully representative of the general blood donor population, as it could have introduced selection bias. Blood donors who were not present during the study or those who declined to participate may have different levels of awareness or infection rates, which could affect the generalizability of the findings.
3. The data on awareness of HIV and Hepatitis B were collected using self-reported questionnaires. While the use of the KoboCollect mobile application ensured efficient data collection, there is always the possibility of response bias. Participants may have provided socially desirable answers, leading to an overestimation of their knowledge or awareness of these infections and their prevention.
4. The study was conducted at a single hospital in the Greater Accra Region, which may not fully represent the broader population of blood donors in Ghana or other regions in sub-Saharan Africa. Regional variations in awareness, testing practices, and prevalence rates of HIV and Hepatitis B could influence the generalizability of the findings.
5. This study focused solely on HIV and Hepatitis B, neglecting other transfusion-transmissible infections such as Hepatitis C, syphilis, and malaria, which are also significant concerns in many African countries (Matee et al., 2020). A more comprehensive assessment of blood donor safety would include testing for a wider range of infections.
6. Although the study found no co-infection of HIV and Hepatitis B among the blood donors, the small sample size (100 participants) may limit the ability to detect co-infection rates. Larger sample sizes would be required to draw more definitive conclusions about the rate of co-infection among blood donors, which is an important public health concern in regions with high endemicity for both viruses.
7. While socio-demographic data such as age, gender, and education level were collected, the study did not explore other potentially relevant factors such as socio-economic status, healthcare access, or urban-rural differences. These factors may influence both the awareness of HIV and Hepatitis B and the likelihood of being infected, which could impact the generalizability of the findings to broader populations.
8. Although the study used the Enzyme-Linked Immunosorbent Assay (ELISA) for HIV and Hepatitis B testing, no diagnostic method is entirely error-free. There is a possibility of false-positive or false-negative results, particularly in resource-limited settings with limited access to confirmatory testing methods. The accuracy of the ELISA tests in the context of the study should be considered when interpreting the results.

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