

Research Article

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Investigating the Complications of Blood Donation in Health Institutions in Abia State, Nigeria

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Abstract

Background: Blood donation is a critical component of healthcare systems globally. However, complications associated with blood donation can affect donor safety and the quality of services provided by health institutions. This study aims to investigate the occurrence and nature of complications of blood donation in health institutions in Abia State, Nigeria.

Materials and Methods: A cross-sectional, six-month retrospective study was conducted across public and private health institutions in Abia State, Nigeria, involving 13 hospitals from the three senatorial zones: Abia North, Abia South, and Abia Central. Data was collected from November 2023 to February 2024 through a semi-structured, pretested interviewer-administered questionnaire and review of blood bank records covering January to June 2022. The questionnaire assessed 20 complications of blood donation, including agitation, sweating, cold skin, nausea, and more, using a 5-point Likert scale. Statistical analysis was performed using SPSS version 23, with significance set at $p \leq 0.05$.

Results: The highest occurring complication was pain, which often affected donors, but other complications like agitation, sweating, fatigue, venous hematoma, and thrombophlebitis were observed sometimes. Most complications, such as pallor, low blood pressure, syncope, and convulsions, were rare or never occurred. The study found that none of the complications occurred consistently in all donations, highlighting variability in donor reactions.

Conclusion: Complications from blood donation in Abia State health institutions are generally infrequent, with pain being the most common. The findings underscore the need for continuous monitoring of donor health and the implementation of preventive strategies to enhance donor safety.

Keywords: blood donation; complications; health institutions; donor safety

Introduction

Blood donation is a critical element in modern healthcare systems, offering life-saving support for various medical procedures including surgeries, trauma care, and treatments for conditions such as anaemia, cancer, and haemophilia. However, despite the significant benefits of blood donation, complications remain a concern, both for donors and recipients. In Nigeria, blood donation is particularly important due to the high demand for transfusions, often driven by conditions like sickle cell disease, malaria, and haemorrhage during childbirth [1]. Globally, the complications of blood donation can be classified into mild, moderate, and severe categories. Mild complications, such as dizziness, nausea, and

bruising at the puncture site, are the most commonly reported. These are typically transient and can be managed effectively through proper donor care protocols [2]. However, more serious complications, including hematomas, arterial punctures, and vasovagal syncope, though less common, require immediate medical intervention. In rare cases, fatal complications such as air embolism and transfusion-related acute lung injury (TRALI) have been reported, though these are typically related to transfusion rather than donation itself [3]. In sub-Saharan Africa, the context of blood donation complications is exacerbated by infrastructural challenges, inadequate medical staff, and limited donor education [4]. Donor management is often constrained by a lack of proper

facilities, leading to heightened risks of complications. The lack of public awareness and misconceptions surrounding blood donation in the region further complicate the situation. Studies have indicated that many potential donors in Africa refrain from donating due to fears of contracting infections, excessive blood loss, or adverse reactions [5]. These fears may not only reduce donor numbers but also contribute to the underreporting of complications when they occur.

Nigeria faces a dual challenge in blood donation: a high demand for blood and a relatively low supply of voluntary donors. The National Blood Transfusion Service (NBTS) is tasked with meeting the country's blood needs, yet reports indicate that over 60% of blood donations come from family replacement donors rather than voluntary non-remunerated donors [6]. This reliance on family donations often limits the quality and safety of the blood supply, as screening for transfusion-transmissible infections (TTIs) is not as rigorous in family-based donations [7]. Complications associated with blood donation in Nigeria can be attributed to several factors, including improper donor screening, inadequate staff training, and poor post-donation care. Reports of fainting, dizziness, and mild pain at the needle site are common, but more severe cases of syncope, nerve injuries, and excessive bleeding have also been documented [8]. In some instances, health institutions have lacked the necessary equipment to manage these complications effectively, further endangering donors.

Abia State is one of the southeastern states in Nigeria, and like many regions, it grapples with challenges in its blood donation practices. Hospitals and health institutions in the state are often under-resourced, which poses risks for both donors and recipients [9]. There is a significant gap in the regulation and standardization of blood donation practices across the state, leading to inconsistent management of complications. A study by Udo et al. found that over 30% of donors in selected hospitals in Abia State reported experiencing mild to moderate complications, with the majority of these donors being first-time donors [10]. The absence of comprehensive donor education programs further exacerbates the issue. Many donors are unaware of the risks involved in blood donation and often do not receive adequate pre-donation counselling. In some cases, this lack of information has led to anxiety-related complications, such as vasovagal reactions, which could have been prevented with proper

guidance [11]. Moreover, health institutions in the state often fail to document and analyze these complications systematically, making it difficult to develop targeted interventions to reduce risks.

To improve blood donation safety in Abia State, several measures must be taken. First, there is a need for enhanced training for healthcare personnel involved in the blood donation process. Ensuring that staff are equipped to handle both routine and emergency complications is crucial. Moreover, public health campaigns should aim to increase awareness of blood donation safety and encourage voluntary donation, thereby reducing the reliance on family replacement donors [6]. Additionally, health institutions should implement standardized protocols for monitoring and reporting complications. The introduction of digital systems for tracking donor outcomes would not only improve the efficiency of reporting but also help in analyzing patterns and developing evidence-based strategies for complication management. Collaboration between government agencies, health institutions, and non-governmental organizations can play a vital role in improving the safety and efficacy of blood donation practices in Abia State [6].

Materials and Methods

Study Design

A cross-sectional six-month retrospective study was conducted in both Abia state public and private health institutions. Health facilities that met the inclusion and exclusion criteria were recruited in the study. The three Senatorial zones in Abia state were involved: Abia North, Abia South and Abia Central. Four to five health institutions that met the inclusion criteria were recruited from each of the three senatorial zones respectively.

Study Area

Abia State is a state in the Southeast geopolitical zone of Nigeria, it is bordered to the north and northeast by Enugu and Ebonyi states respectively, Imo State to the west, Cross River State to the east, Akwa Ibom State to the southeast, and Rivers State to the south. Abia State occupies about 6,320 square kilometres of land with an estimated population of over 3,720,000 as of 2016. It has three Senatorial zones: Abia North, Abia South and Abia Central. Each senatorial zone. which consist of 6, 6, and 5 LGAs respectively. On the whole Abia

state has a total of 17 Local govt. areas (LGA). Abia state has about 200 registered hospitals and clinics.

Data Collection

A well-structured pretested interviewer-administered questionnaire (adapted from the National Blood Transfusion, Ministry of Health) was used for the study. Blood bank records were used where necessary. Information was obtained from data covering January to June 2022. Data was collected between November 2023 and February 2024 in Health facilities in Abia State and a total of 13 health facilities were used. Information on blood donation complications was obtained from an experienced leader of every health facility's blood bank. The data collected include:

Demographic data

The following information was collected under demographic data: Senatorial zone made up of Abia North, Abia South and Abia Central. Type of the Institutions (Secondary and tertiary), Specialty (multispecialty).

Results

Table 1: Socio-demographic Characteristics of The Hospital Facilities

Variables	Frequency (n = 13)	Percentage (%)
Senatorial zone		
Abia North	4	30.8
Abia South	4	30.8
Abia Central	5	38.5
Type of Institution		
Secondary	11	77
Tertiary	3	23
Specialty		
Monospecialty	0	0
Multispecialty	13	100
Number of dedicated staff in the blood transfusion unit		
One staff, all?	7	53.8
Two staff	3	12.5
≥3	3	12.5

Complications of the blood donation observed: The following twenty Variables. were used: agitation, sweating, cold skin, Weakness/fatigue, nausea, lightheadedness, pallor, low blood pressure, bradycardia, Tingling sensation, vomiting, loss of consciousness, convulsion, syncope, Urinary incontinence, faecal incontinence, venous haematoma, bleeding from venipuncture, pain, and thrombophlebitis. Five points Likert scale including always, often, sometimes, rarely, and never were used in assessing possible complications of blood donation and the highest occurring responses were obtained.

Statistical Analysis

Data was analyzed using the SPSS version 23 statistical package. Continuous variables were analyzed using descriptive data (mean, standard deviation, median) while categorical variables were analyzed in frequency and proportions. A p-value of 0.05 or less was considered statistically significant.

Table 2: Complications of Blood Donation Observed by staff working in the blood Bank Unit in Abia State Health Institutions

Variables	Always	Often	Sometimes	Rarely	Never	Highest occurring
Complications of Blood Donation						
Agitation	0(0)	1(7.7)	7(53)	3(23)	2(15.4)	Sometimes
Sweating	1(7.7)	3(23.1)	7(53.8)	1(7.7)	1(7.7)	Sometimes
Cold Skin	0(0)	2(15.4)	2(15.4)	2(15.4)	7(53.8)	Never
Weakness/ Fatigue	0(0)	5(30.8)	5(38.)	3(30.8)	0(0)	Sometimes
Nausea	1(7.7)	1(7.7)	5(38.5)	5(30.8)	2(30.4)	Sometimes
Light headiness/dizziness	1(7.7)	1(23.1)	3(23.1)	2(15.4)	1(7.7)	Often/sometimes
Pallor	1(7.7)	0(0)	0(0)	5(38.5)	7(53.8)	Never
Low blood pressure	0(0)	0(0)	1(7.7)	5(38.5)	7(53.8)	Never
Bradycardia	0(0)	0(0)	1(7.7)	3(23.1)	9(69.2)	Never
Tingling sensation	0(0)	0 (0)	0(0)	3(23.1)	10(79.9)	Never
Vomiting	0(0)	3(23.1)	1(7.7)	4(30.8)	5(38.5)	Never
Loss of consciousness	0(0)	3(23.1)	1(7.7)	4(30.8)	5(38.5)	Never
Convulsion	0(0)	0(0)	0(0)	4(30.8)	9(69.2)	Never
Syncope	0(0)	0(0)	1(7.7)	2(15.4)	10(76.9)	Never
Urinary incontinence	0(0)	0(0)	2(15.4)	4(30.8)	7(53.8)	Never
Feecal incontinence	0(0)	0(0)	1(7.7)	1(7.7)	11(84.6)	Never
Venous haematoma	0(0)	0(0)	6(46.2)	4(30.8)	3(23.1)	Sometimes
Bleeding from venipuncture site	0(0)	1(7.7)	8(61.5)	2(15.4)	2(15.4)	Sometimes
Pain	1(7.7)	5(38.5)	3(23.1)	2(15.4)	2(15.4)	Often
Thrombophlebitis	0(0)	1(7.7)	1(7.7)	5(38.5)	6(46.2)	Never

Five-point Likert scale is used in assessing possible complications of blood donation.

Assessment of the highest occurring response showed that none of the possible complications occurred always. Pain is the only complication that occurs often. Agitations, Sweating, weakness/ fatigue, nausea, Venous haematoma, bleeding from venipuncture and thrombophlebitis occurred sometimes. Others rarely or never occurred.

Discussion

The findings of this study provide valuable insights into the complications of blood donation observed by staff in blood bank units across health institutions in Abia State, Nigeria. Blood donation is generally considered safe; however, certain complications can arise during or after the donation process, affecting donor health and comfort. The complications observed in this study were categorized based on frequency, ranging from "always" to "never." None of the complications were reported to occur "always," and only pain was found to occur "often." This observation aligns with the notion that while complications may occur, they are generally infrequent and manageable.

The most frequently reported complications in this study include pain (often), followed by agitation,

sweating, weakness/fatigue, nausea, venous haematoma, and bleeding from the venipuncture site, all of which occurred "sometimes." This pattern is consistent with findings from other studies. For instance, Eder et al. reported that pain and discomfort, particularly at the venipuncture site, are common among blood donors, with pain being the most frequently reported issue [12]. Pain, particularly localized at the site of venipuncture, may result from improper needle insertion, which can lead to venous trauma or bruising, contributing to donor discomfort [13].

Additionally, weakness/fatigue and nausea were also observed as occasional complications. This mirrors findings from Masser et al., who noted that first-time donors or those with lower body mass index are more susceptible to vasovagal reactions such as nausea, dizziness, and weakness [14]. These symptoms typically arise due to the transient drop in blood pressure or anxiety associated with the donation process [15]. The fact that these symptoms occurred "sometimes" in the current study further emphasizes the transient and manageable nature of these complications.

Several complications, such as cold skin, pallor, low blood pressure, bradycardia, tingling sensation, vomiting, loss of consciousness, syncope, and urinary and faecal incontinence, were rarely or never

reported. This is encouraging, as it suggests that severe complications, particularly those associated with vasovagal syncope or cardiovascular reactions, are infrequent in the studied health institutions. According to an extensive review by Kamel et al., vasovagal reactions are among the most common serious complications of blood donation, but they are relatively rare, occurring in less than 1% of donors [16]. The low frequency of such complications in this study may reflect improved donor management and monitoring practices in the health institutions in Abia State.

Interestingly, convulsion and syncope were also reported as never occurring, which is consistent with other studies indicating that these more severe reactions are infrequent [17]. Convulsions, in particular, are exceedingly rare and typically occur only in donors with a pre-existing neurological condition or in the context of a severe vasovagal reaction [18].

Venous haematoma and bleeding from the venipuncture site were reported to occur "sometimes." Venous haematoma is a common complication, particularly in inexperienced donors or when there is difficulty accessing the vein. Studies by France et al. and Bijani et al. have highlighted that haematomas are often associated with prolonged or unsuccessful attempts to locate a vein, especially in individuals with difficult venous access [19, 20]. In the current study, the occurrence of venous haematomas "sometimes" suggests that while venous access may present a challenge, it does not significantly affect a large proportion of donors.

Additionally, thrombophlebitis was rarely observed, which is in line with previous studies. Thrombophlebitis, an inflammation of the vein due to blood clot formation, is a rare complication associated with blood donation, with an estimated incidence of less than 0.05% [21]. This rare occurrence further underscores the generally safe nature of the blood donation process in these institutions.

The pattern of complications observed in this study is largely consistent with global data on blood donation. A study conducted by Di Lorenzo et al. in Italy, for example, reported similar findings, with pain, dizziness, and haematomas being the most common complications [22]. However, the incidence of more severe complications, such as loss of consciousness or syncope, was similarly rare. This aligns with findings from the current study, where more severe complications were either rarely or never observed.

Similarly, Masser et al. found that donor anxiety and first-time donation status were significant predictors of adverse reactions, including vasovagal episodes and nausea [14]. The "sometimes" occurrence of nausea in the present study is indicative of similar triggers among Nigerian blood donors. Furthermore, Sweatt et al. in the United States noted that younger and first-time donors were more likely to report vasovagal reactions, including dizziness and light-headedness, reinforcing the idea that specific donor characteristics influence complication rates [23].

The findings of this study have important implications for blood donation practices in Abia State. The relatively low incidence of severe complications suggests that the current protocols in place for donor screening and monitoring are effective. However, the occasional occurrence of pain, haematomas, and other minor reactions highlights areas where donor care could be improved. Enhanced training for staff in venipuncture techniques and donor management, particularly for managing anxiety and preventing vasovagal reactions, could further reduce the incidence of these complications.

Conclusion

The complications of blood donation in health institutions in Abia State, Nigeria, were generally minor and infrequent. Pain, venous haematoma, and vasovagal reactions such as nausea and weakness were the most commonly observed complications, although none occurred "always." More severe reactions such as convulsions, syncope, and cardiovascular issues were rare or never reported. These findings are consistent with global studies and underscore the relative safety of blood donation when appropriate monitoring and care practices are in place.

Recommendations

Improved Training for Blood Bank Staff: There is a need for continuous professional training to ensure staff are equipped to manage mild and moderate complications and prevent them from escalating into severe conditions.

Adoption of Quality Policies: Health facilities should implement quality assurance policies to standardize procedures and mitigate complications associated with blood donations.

Voluntary Blood Recruitment Units: Institutions should be encouraged to establish dedicated voluntary

blood recruitment units to improve donor care and minimize complications.

Comprehensive Record Management: The adoption of digital record systems for better tracking of donor history and complications is recommended to enhance monitoring and follow-up on donors.

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