

Assessment of Substance Abuse among Blood Donors

Edmund Dongyeru¹, Iyevhobu Kenneth Oshiokhayamhe^{*2,3}, Abdul-Muiz Ahmed⁴, George Oduro⁵, Clement Anokye⁶, and Obohwemu Oberhiri Kennedy⁷

¹Department of Medical Microbiology, Tacoma General Reference Laboratory, Tacoma, Washington State, USA

²Department of Medical Microbiology, Faculty of Medical Laboratory Science, Ambrose Alli University, Ekpoma, Edo State, Nigeria

³Department of Medical Laboratory Science, Edo State University, Iyamho, Edo State, Nigeria.

⁴Department of Hematology, Aisha Hospital, Tamale, Northern, Ghana

⁵Department of Clinical Laboratory Science, Valley Medical Center, Renton Washington State, USA

⁶Department of Medical Microbiology, Tacoma General Hospital, Tacoma, Washington State, USA

⁷Leeds Trinity University, SSS Partnership, Birmingham Campus, United Kingdom; and PENKUP Research Institute, Birmingham, United Kingdom

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Corresponding Author: **Iyevhobu Kenneth Oshiokhayamhe**
E-Mail: kennylamai@yahoo.com

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ABSTRACT

Background: Blood transfusion services prioritise the safety of both the donor and the recipient. Donors are taken through processes of interview, physical and medical examinations to ensure their qualification before donation. Their blood is screened for viral infections to ensure its safety but then, concerning medications and substance use, their answers are taken without any objective verification. This does not eliminate potential risks that may be related to these medications and substances. The study was aimed at establishing substance abuse among blood donors in Tamale.

Subjects and Methods: A cross-sectional study design was employed in conducting the study. A total 109 blood donors who were all males (100%) were conveniently sampled. Data for this study were collected through questionnaires and blood and urine specimens were collected for analysis. Data was entered into Microsoft Excel and exported to Graph prism for analysis. Statistical significance was defined as a $p < 0.05$. Three major conclusions were drawn from the study's findings.

Result: These results include substance use among blood donors, prevalence outcomes, substance distribution, and variations in complete blood count parameters. A prevalence of 21.1% (23) drug users was found in the studies. Nonetheless, there were two types of substance users: single substance users and multiple substance users.

Conclusion: Additionally, the study showed some alterations in complete blood count measures, including a decrease in white cell and platelet counts.

Keywords: Substance Abuse, Blood Donors, Blood transfusion, Transfusion transmissible infections, Full blood count.

Introduction

In order to ensure a safe and adequate supply of blood and blood products, blood transfusion services are an essential component of health services that prioritise the safety of both donors and recipients. Due to the presence of contaminative indicators for transfusion-transmissible illnesses such as syphilis, hepatitis B and C, and HIV-AIDS, an estimated 1.6 million units are refused [1]. Furthermore, due to anaemia, pre-existing medical issues, or the possibility of diseases that could be spread by transfusion, at least 13 million potential donors are denied the opportunity to donate blood [2]. A stringent procedure is used to evaluate potential donors' suitability in order to achieve these goals.

Donor registration, questionnaire completion, counselling and interviews, health and risk assessment, and informed permission are all part of this process. A basic health check that includes a physical examination, weighing, and/or taking vital signs is performed as part of the donor health and risk evaluation. Prospective donor blood samples are screened for transfusion-transmissible infections, and the results are utilised in the evaluation together with details about the donor's medical history.

Sub-Saharan Africa and other low-resource nations are experiencing a rise in the demand for blood and blood products. Compared to Western nations, the majority of blood donors are between the ages of 18 and 35 [2].

Substance misuse and other social vices are common within this age group. When someone abuses drugs or alcohol, it usually leads to serious issues in their lives [3]. Substance abuse has been recognised as a growing global public health and socioeconomic problem, with notable increases, especially in emerging nations [4]. The medication history of potential donors is considered in assessment, but the assessment of substance abuse by potential donors is mostly not considered or is overlooked when questioning donors. An estimated 271 million people, or 5.5% of the world's population between the ages of 15 and 64, reported using drugs in the year prior in 2017. In Germany, 8.8% of young potential donors reported using drugs or other substances [5]. With an estimated 188 million users, cannabis is the most popular drug in the world. 53.4 million persons used opioids, 28.9 million used amphetamines, and 18.1 million used cocaine globally in 2017 [6]. The majority of marijuana users are under thirty years old, making it the most commonly abused narcotic in the world [7]. Substance abuse is an issue in Ghana as well as other developing nations, with marijuana being the most often abused narcotic there [8]. Ghana has been classified as the top marijuana user in Africa and the third worldwide. Ghana is now acknowledged as a producer of marijuana for the international drug trade with significant population usage [6].

Substance misuse is linked to a higher risk of syphilis, hepatitis B and C, and HIV/AIDS. Additionally, unprotected sex is more common when under the influence of illegal narcotics [9]. Co-prescribing opioids with benzodiazepines has been linked to drug-related poisoning, according to studies [10]. Tramadol produced thrombocytopenia in rats, according to a study by Owoade et al [11]. Another study demonstrated thrombocytopenia caused by morphine treatment [12]. In Lucknow, a case of thrombocytopenia brought on by tramadol was documented [13]. Barbiturates are classified as category D medications because there is evidence that they increase the risk of birth abnormalities in pregnant women. Additionally, barbiturates have been shown to trigger acute attacks in porphyria patients [14].

Such a study has not been reported in Ghana, and given the current crisis of substance use among the youth in the country, this motivates us to conduct this study to establish evidence of substance abuse among potential blood donors in the Tamale metropolis.

Methods

Study Design

This cross-sectional study was carried out among eligible blood donors in Tamale, Ghana, between May and September of 2021. The Tamale Teaching Hospital served as the study's site. The Tamale Metropolitan Assembly oversees the Dabokpaa Community, where Tamale Teaching Hospital is situated on Salaga Road. The Community's borders are shared with Vittin to the north, Dohanaayili to the south, Kalariga to the west, and Kukuo to the east. According to the World Population Review [15], Tamale, formally known as Tamale Metropolis, is the capital of Ghana's Northern Region and is home to an estimated 360,579 inhabitants. Its borders are shared with the Mion District to the east, East Gonja to the south, Central Gonja to the south-west, and Sagnarigu District to the north and west. People from many ethnic backgrounds live in the area, with the Mole-Dagombas making up the majority. Other tribes include the Gonjas, Mamprusis, Akans, and Dagaabas [16].

Population and Sample

Every participant was a healthy, eligible Ghanaian who was at least eighteen years old. A donor was considered eligible if they passed all serological screening tests and had a good haemoglobin level. The questionnaires were given to 109 blood donors in Tamale city using a practical sampling technique. Each subject gave their informed consent, and participation was entirely voluntary. Both the institutional review board of the university for Development Studies and the ethics and research committee of Tamale Teaching Hospital authorized the study.

Instrument Study

The 10 parameters drug test kit panel was used to test for various drug metabolites in urine sampled voided by our respondents which was developed by Incas-Diagnostics (2005) were used to measure the degree of substance abuse. Multiple drugs indication represents multiple drug involvement. The 10-parameter drug test kit panel cassette was chosen for the study because it was written in simple English language and could be read by a senior high school child, was adaptable to different cultures, and because it is both reliable and valid. The 10-parameter drug test kit panel consists of 10 parameters for illicit drugs (e.g., cocaine, marijuana (Tetrahydrocannabinol), and heroin, amphetamines, barbiturates, opioids, Tramadol, benzodiazepam, nicotine, Morphine, tricyclic -antidepressant) substances. We used the cut-off levels of the various drugs, which are the recognised values for groups using drugs, to determine whether a sample is positive or negative for that. Cut-off level for opioid, benzodiazepam, Barbiturate, cocaine, is 300 ng/ml, Amphetamine is 1000 ng/ml, Cannabinoid (THC) 50 ng/ml, Tramadol 200ng/ml, Tricyclic antidepressant (TCA) 1000 ng/ml. Results over the cutoff are reported as positive (presumptive positive results), and results below the cutoff are reported as negative. Only a preliminary analytical test result is provided by this assay. A validated analytical result requires the application of a more precise alternative chemical approach. The recommended confirmatory technique is gas chromatography/mass spectrometry (GC/MS).

Principle of test: The drug of abuse test (urine) is an immunoassay based on the principle of competitive binding. Drugs that may be present in the urine specimen compete against their respective drug conjugate for binding sites on their specific antibody. During testing, a urine specimen migrates upward by capillary action. A drug, if present in the urine specimen below its cut-off concentration, will not saturate the binding sites of its specific antibody coated on the particles. The antibody-coated particles will then be captured by the immobilized drug conjugate and a visible colored line will show up in the test line region of the specific drug strip. The colored line will not form in the test line region if the drug level is above its cut-off concentration because it will saturate all the binding sites of the antibody-coated on the particles. A drug-positive urine specimen will not generate a colored line in the specific test line region of the strip because of drug competition, while a drug-negative urine specimen or a specimen containing a drug concentration less than the cut-off will generate a line in the test line region.

Method of Test: Allow the test panel, urine specimen, and/or controls to equilibrate to room temperature (15-30°C) prior to testing. Bring the pouch to room temperature before opening it. Remove the test panel from the sealed pouch and use it as soon as possible. Take off the cap outside of the test end.

With arrows pointing toward the urine specimen, immerse the test panel vertically into the urine specimen for at least 10-15 seconds. Immerse the test panel to at least the level of the wavy lines on the strip(s), do not pass the arrows on the test panel when immersing the panel. Place the test panel on a non-absorbent flat surface, start the timer and wait for the red line(s) to appear. The results should be read at 5 minutes. Do not interpret results after 10 minutes.

Blood sample for serology: Freshly collected blood samples in red top (No Additive) bottles were processed for Hep B using a one-step dipstick test (ACCURATE, USA) while Hep C was processed using (OSCAR, Benzer Multi-Technology Ltd, India) and Syphilis screening was done using (RAPIDIP INSTA TEST, USA). HIV was tested using (FIRST RESPONSE, CARD TEST KIT, India).

Blood sample for FBC: Freshly collected blood samples in EDTA bottles were analysed for haematological assay using an automatic haematological assay analyser (URIT-5250, URIT Medical Electronic Co Ltd, China). Different tested haematological parameters were as follows: White Blood Cell (WBC), Red Blood Cells (RBC), Haemoglobin (HGB), Haematocrit (HCT), Red cells (RDW%), Red cells Distribution Width (RDW), Mean Corpuscular Haemoglobin (MCH), Mean Corpuscular Haemoglobin Concentration (MCHC), Platelet (PLT), Mean Platelet Volume (MPV), Mean Corpuscular Volume (MCV), Platelet crit (PCT), Platelet distribution width (PDW).

Other measures

Body Mass Index, visceral fat, muscle mass, height and weight.

Data Analysis

The information was displayed as percentages or mean $\pm$ standard deviation. Unpaired t-tests were used to analyse continuous data, and Fisher's exact tests were used to analyse categorical variables. A value of $p < 0.05$ was deemed significant in all statistical tests. Tables and literature show the corresponding analyses that were carried out.

Research Ethic

The Institutional Review Board of the University for Development Studies, Ghana, and the Ethics and Research Committee of Tamale Teaching Hospital both gave their ethical permission for this study. Before the sample was collected, each subject gave their informed consent.

Results

Table 1 shows that of the 109 blood donors who completed the 109 surveys, 97 (87.0%) were Muslims. Participants in the study ranged in age from 18 to 35, with a mean age of 25.55 ± 4.024 . Of the study participants, 65 (59.6%) were single, 97 (87.0%) were Muslims, and 12 (11.0%) were Christians. When the respondents were categorised according to their educational attainment, 14 (12.5%) had no formal education, 87 (79.8%) had secondary education, and 7.4% had university education, as Table 1 illustrates. In terms of family size choice, 47 people (43.1%) had a family size bigger than 8, while 58 people (53.2%) had a family size between 5 and 8. Mole-dagomba had the biggest number of research participants (93, or 85.3%), whereas Kasena, Dagaabas, and Gonjas combined only made up 14.7%. According to Table 1, the majority of donors were gainfully employed (77, or 70.6%).

Table 1: Socio-demographic characteristics of study participants

Variables	Frequency (n=109)	Percent (%)
Sex		
Male	109	100
Religion		
Christians	12	11
Muslims	97	89
Educational status		
No formal education	14	12.8
Secondary	87	79.8
Tertiary	8	7.4
Marital status		
Single	65	59.6
Married	44	40.4
Family size		
1 – 4	4	3.7
5 – 8	58	53.2
>8	47	43.1
Ethnicity		
Mole-Dagomba	93	85.3
Others	16	14.7
Employment status		
Unemployed	32	29.4
Gainful employed	77	70.6

Data presented as frequency and percent. Others in ethnicity include; Dagaabas, Gonjas, Kasenas, Ewe, and Asante's.

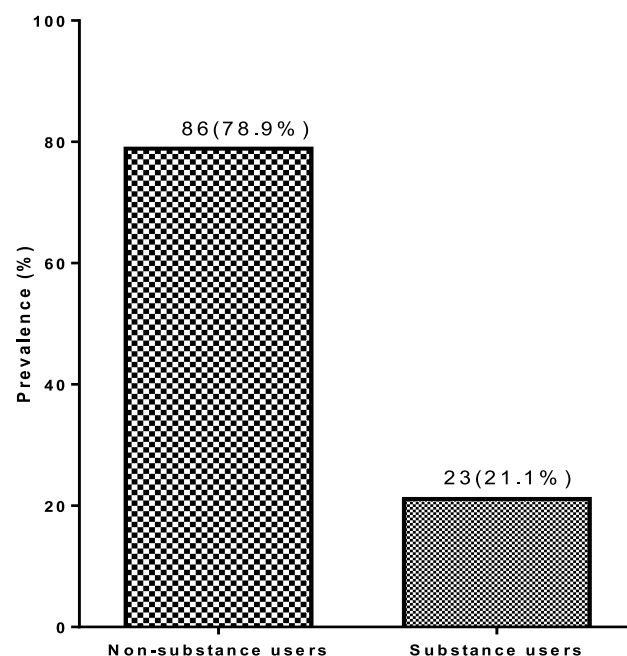


Figure 1: Prevalence of substance users among blood donor

According to Figure 1, the percentage of study participants who used drugs was 21.1% (23 out of 109).

Single substance users and multiple substance users, which comprised two combinations, three combinations, four combinations, and six combinations, were separated into two groups.

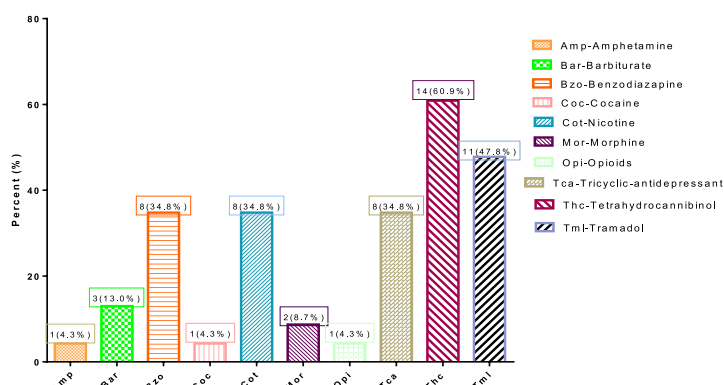


Figure 2: Distribution of single substance users

A projection into the use of a single chemical is presented in the study. Tetrahydrocannabinol was found in the majority of substance users (60.9%), followed by tramadol (47.8%). Eight (8) people, or 34.8% of the total, tested positive for benzodiazepines, nicotine, and tricyclic antidepressants. Amphetamines, cocaine, and opioids all tested positive in one individual (4.3%). (Fig. 2). This was further streamline to depict the various multiple combination used by donors. This shows multiple substance users who were on two combinations, three combinations, four combinations and six combinations, the multiple combinations were further categorized into the various substances used. Two combinations constituted Bar+Tca 1(4.3%), Bzo+Cot 2(8.7%), Bzo+Tml 1(4.3%), Cot+Tca 1(4.3%), Cot+Thc 1(4.3%), Cot+Tml 2(8.7%), Tca+Tml 1(4.3%), Thc+Tml 5(21.7%). Three combinations constituted Bar+Tca+Tml 1(4.3%), and Bar+Thc+Tml 1(4.3%), with Bzo+Tca+Thc to be 1(4.3%), while Cot+Mor+Tca 1(4.3%), and finally Cot+Thc+Tml had 1(4.3%). Five combinations of substance used included Bzo+Cot+Thc+Tml 1(4.3%), and Cot+Tca+Thc+Tml 1(4.3%) and six combinations was Amp+Bzo+Mor+Opi+Thc+Tml 1(4.3%) (Table 2).

Table 2:Distribution of multiple substance users

Substance	Frequency	Percent (%)
Two combinations		
Bar+Tca	1	4.3
Bzo+Cot	2	8.7
Bzo+Tml	1	4.3
Cot+Tca	1	4.3
Cot+Thc	1	4.3
Cot+Tml	2	8.7
Tca+Tml	1	4.3
Thc+Tml	5	21.7
Three combinations		
Bar+Tca+Tml	1	4.3
Bar+Thc+Tml	1	4.3
Bzo+Tca+Thc	1	4.3
Cot+Mor+Tca	1	4.3
Cot+Thc+Tml	1	4.3
Four combinations		
Bzo+Cot+Thc+Tml	1	4.3
Cot+Tca+Thc+Tml	1	4.3
Six combinations		
Amp+Bzo+Mor+Opi+Thc+Tml	1	4.3

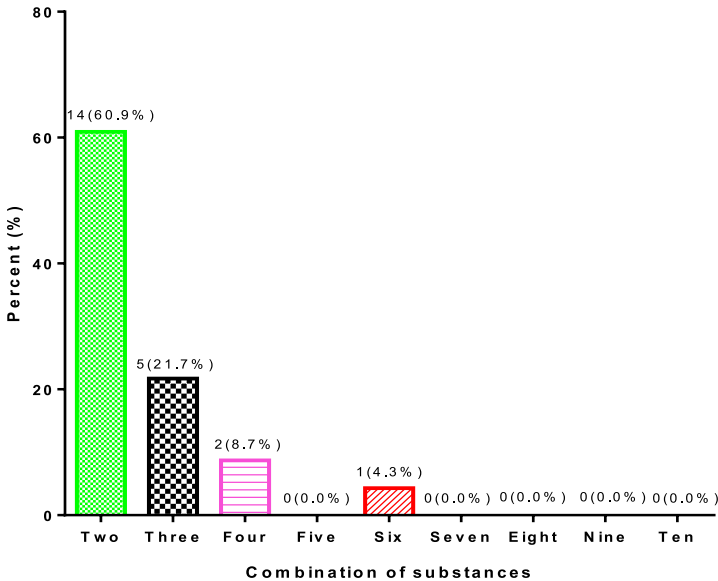


Figure 3:Distribution of multiple substance combination

Table 4: Socio-demographic characteristics stratified by substance users and non-substance users

Variables	Total (n=109)	Non-Substance users (n=86)	Substance Users (n=23)	p-value
Age (years)	25.55 ± 4.024	25.97 ± 4.200	24.98 ± 3.739	0.2061
Religion				
Christians	12 (11.0)	9 (9.5)	3(13.0)	0.7141
Muslims	97 (89.0)	77 (90.5)	20(87.0)	
Educational status				
No formal education	14 (12.8)	12 (14.0)	2(8.7)	0.7298
Secondary	86 (78.9)	66 (76.7)	20(87.0)	0.3932
Tertiary	9 (8.3)	8 (9.3)	1(4.3)	0.6811
Marital status				
Single	65 (59.6)	49 (57.0)	16 (69.6)	0.2744
Married	44 (40.4)	37 (43.0)	7 (30.4)	
Family size				
1—4	4 (3.7)	3 (3.5)	1 (4.3)	0.9997
5—8	57 (52.3)	47 (54.7)	10 (43.5)	0.3406
>8	48 (44.0)	36 (41.9)	12 (52.2)	0.3762
Parents married				
Yes	89 (81.7)	86 (100.0)	23(100.0)	Not significant
Ethnicity				
Mole-Dagomba	93 (85.3)	73 (84.9)	20 (87.0)	0.9997
Others	16 (14.7)	13 (15.1)	3 (13.0)	
Employment status				
Unemployed	32 (29.4)	26 (30.2)	6 (26.1)	0.6982
Gainful employed	77 (70.6)	60 (69.8)	17 (73.9)	

The projection shown on Table 4 depicts the medical history stratified by substance users and non-substance users. A total of 10.1% of the respondents were cigarette smokers of which 9.3% were non-substance users and 13.0% being substance users. Alcoholic beverages consumption revealed was 7(6.4%) out of which 5.8% were non-substance users and 8.7% substance users. The study also recorded that, a total of 53(48.6%) drank caffeinated beverages of which 42(48.8%) were non-substance users and 11(47.8%) were substance users.

The study recorded 69.7% first-time donors of which substance users were 16(21.1%) and 60(78.9%) non-substance users. There was no significant difference between both non-substance users and substance users.

All subjects' average systolic blood pressure values were 130.7 ± 12.82 mmHg. Substance users' average systolic readings were 131.2 ± 12.12 mmHg, whereas non-users' average SBP readings were 130.3 ± 13.39 mmHg.

Substance users had a mean diastolic blood pressure of 78.41 ± 6.316 mmHg, while non-users had a mean of 80.57 ± 11.47 mmHg. There was no statistically significant difference.

Urinalysis results show that majority of the urine samples had straw colour, of which 87.2% were from non-substance users while 88.4% were from substance users. Leucocytes detection on dipstick indicated most (62.4%) of the study population had urinary tract infection with non-substance users recording 60.5% and substance users recording 69.6%. The majority had normal pH reading in the study population were 107(98.2%).

Microscopy readings of urine of all participating blood donors who have donated successfully showed a normal range of epithelial cells in most of the study population totaling 99(90.8%), Non-substance users were 80(93.0%) with substance users being 19(82.6%).

Few blood donors showed an abnormal range for epithelial cells on the study population constituting 10(9.2%), with non-substance users being 6(7.0%) and substance users were 4(17.4%). According to the white blood cell count, 101 (92.7%) of the study group had a urinary tract infection, whereas 82 (95.3%) were non-drug users and 19 (82.6%) were substance users.

Table 5: Medical history stratified by substance users and non-substance users

Variables	Total (n=109)	Non-Substance users (n=86)	Substance Users (n=23)	p-value
Any known medical condition				
No	109 (100.0)	86 (100.0)	23(100.0)	Not significant
Are you on medication				
No	109 (100.0)	86 (100.0)	23(100.0)	Not significant
Do you inject substance				
No	109 (100.0)	86 (100.0)	23(100.0)	Not significant
Viral Screening				
Hep B				
Negative	109 (100.0)	86 (100.0)	23(100.0)	Not significant
Hep C				
Negative	109 (100.0)	86 (100.0)	23(100.0)	Not significant
HIV				
Negative	109 (100.0)	86 (100.0)	23(100.0)	Not significant
VDRL				
Negative	109 (100.0)	86 (100.0)	23(100.0)	Not significant
Received blood/blood product				
No	109 (100.0)	86 (100.0)	23(100.0)	Not significant
First time donor				
Yes	76 (69.7)	60 (78.9)	16 (21.1)	0.9850
Number of times donated				
2 - 5 times	29 (26.6)	23 (26.7)	6 (26.1)	0.9495
>5 times	4 (3.7)	3 (3.5)	1 (4.3)	
Reason for blood donation				
Replacement	109 (100.0)	86 (100.0)	23(100.0)	Not significant
Smoke cigarette				
Yes	11 (10.1)	8 (9.3)	3 (13.0)	0.6968
Drink alcoholic beverage				
Yes	7 (6.4)	5 (5.8)	2 (8.7)	0.6371
Drink caffeinated beverage				
Yes	53 (48.6)	42 (48.8)	11 (47.8)	0.9313
Blood pressure measurement				
SBP (mmHg)	130.7 ± 12.82	130.3 ± 13.39	131.2 ± 12.12	0.7227
DBP (mmHg)	79.66 ± 9.656	80.57 ± 11.47	78.41 ± 6.316	0.2509
Pulse (beat/mins)	75.03 ± 10.37	74.22 ± 10.13	76.13 ± 10.69	0.3449
Urinalysis				
Colour				
Hazy	14 (12.8)	10 (11.6)	4 (17.4)	0.4885
Straw	95 (87.2)	76 (88.4)	19 (82.6)	
Appearance				
Clear	93 (85.3)	76 (88.4)	17 (73.9)	0.0818
Cloudy	16 (14.7)	10 (11.6)	6 (26.1)	
Leucocytes				
Positive	68 (62.4)	52 (60.5)	16 (69.6)	0.4236
Negative	41 (37.6)	34 (39.5)	7 (30.4)	

Bilirubin				
Positive	14 (12.8)	11 (12.8)	3 (13.0)	1
Negative	95 (87.2)	75 (87.2)	20 (87.0)	
Blood				
Positive	2 (1.8)	1 (1.2)	1 (4.3)	0.379
Negative	107 (98.2)	85 (98.8)	22 (95.7)	
PH				
Normal if <7.0	107 (98.2)	85 (98.8)	22 (95.7)	0.379
Abnormal if >7.5	2 (1.8)	1 (1.2)	1 (4.3)	
SG				
Normal if < 1.01	24 (22.0)	16 (18.6)	8 (34.8)	0.0963
Abnormal if >1.01	85 (78.0)	70 (81.4)	15 (65.2)	
Protein				
Positive	47 (43.1)	33 (38.4)	14 (60.9)	0.053
Negative	62 (56.9)	53 (61.6)	9 (39.1)	
MICROSCOPY				
EP				
0-5	99 (90.8)	80 (93.0)	19 (82.6)	0.2138
>5	10 (9.2)	6 (7.0)	4 (17.4)	
RBC				
0-5	107 (98.2)	85 (98.8)	22 (95.7)	0.379
>5	2 (1.8)	1 (1.2)	1 (4.3)	
WBC				
0-10	101 (92.7)	82 (95.3)	19 (82.6)	0.0596
>10	8 (7.3)	4 (4.7)	4 (17.4)	
Crystals				
Seen	14 (12.8)	11 (12.8)	3 (13.0)	1
Cast				
Seen	25 (22.9)	20 (23.3)	5 (21.7)	0.8779

Anthropometric measurements categorised by drug users and non-users are displayed in Table 5. All individuals had an average standing height of 172.1 ± 6.890 cm. Compared to drug users (171.4 ± 6.771 cm), non-users were taller (172.6 ± 6.985 cm). All individuals weighed an average of 68.47 ± 9.738 kg. Substance users weigh 67.50 ± 10.19 kg, whereas non-users weigh 69.17 ± 9.411 kg. Anthropometric measurements did not significantly differ between drug users and non-users ($p < 0.05$).

Table 6: Anthropometric measurement stratified by substance users and non-substance users

Variables	Total (n=109)	Non-Substance users (n=86)	Substance Users (n=23)	p-value
Age (years)	25.55 ± 4.024	25.97 ± 4.200	24.98 ± 3.739	0.2061
Anthropometric measurement				
Height	172.1 ± 6.890	172.6 ± 6.985	171.4 ± 6.771	0.3629
Weight (kg)	68.47 ± 9.738	69.17 ± 9.411	67.50 ± 10.19	0.3812
BMI (kg/m ²)	23.55 ± 3.484	23.67 ± 3.697	23.40 ± 3.203	0.6950
Body fat (%)	18.11 ± 6.801	18.71 ± 6.712	17.30 ± 6.912	0.2899
Visceral fat	5.817 ± 3.206	6.032 ± 3.248	5.522 ± 3.160	0.4147
Muscle mass (%)	44.81 ± 39.69	40.57 ± 4.096	50.62 ± 60.80	0.1930

Table 6 is a comparison of the mean $\pm$ standard deviation of haematological parameters between those who tested positive for substance use and those who tested negative. There was no significant difference between the mean Total WBC, LYM%, MON%, NEU%, EOS%, BASO%, LYM#, MON#, NEU#, EOS#, BASO#, RBC, HGB, HCT, MCV, MCH, MCHC, RDW-SD, RDW CV, PLT, MPV, PLT, PDW, PCT, P_LCR and P_LCC of those that tested positive for substance use and non-substance users. ($P > 0.05$).

Table 7: Comparison of the Mean $\pm$ Standard Deviation of Haematological Parameters

FBC	Total	Non-Substance(n=10)	Substance Users(n=10)	p-value
WBC ($10^9/L$)	4.770 ± 1.066	5.011 ± 1.178	4.529 ± 0.9396	0.3252
LYM (%)	86.37 ± 11.51	82.44 ± 15.40	90.29 ± 2.876	0.1303
MON (%)	1.847 ± 1.056	1.604 ± 0.9187	2.089 ± 1.175	0.3174
NEU (%)	7.653 ± 3.031	8.560 ± 3.620	6.745 ± 2.113	0.1877
EOS (%)	4.007 ± 11.74	7.325 ± 16.32	0.6890 ± 0.2103	0.2147
BASO (%)	0.0710 ± 0.01334	0.0720 ± 0.01398	0.0700 ± 0.01333	0.7472
LYM# ($10^9/L$)	4.079 ± 0.9395	4.107 ± 1.108	4.052 ± 0.7967	0.9007
MON# ($10^9/L$)	0.1354 ± 0.2240	0.0821 ± 0.05542	0.1887 ± 0.3107	0.2996
NEU# ($10^9/L$)	0.3835 ± 0.2251	0.4523 ± 0.2726	0.3146 ± 0.1487	0.1778
EOS# ($10^9/L$)	0.1982 ± 0.5488	0.3660 ± 0.2394	0.0304 ± 0.00262	0.1780
BASO# ($10^9/L$)	0.0051 ± 0.00519	0.0053 ± 0.00527	0.0048 ± 0.00537	0.8359
RBC ($10^{12}/L$)	6.242 ± 1.605	6.093 ± 1.696	6.390 ± 1.584	0.6905
HGB (g/dL)	16.47 ± 4.375	16.46 ± 4.980	16.47 ± 3.951	0.9961
HCT (%)	53.60 ± 15.82	53.43 ± 17.37	53.76 ± 15.05	0.9643
MCV (fL)	85.06 ± 5.465	85.65 ± 5.249	84.46 ± 5.891	0.6392
MCH (pg)	26.33 ± 1.581	26.82 ± 1.225	25.84 ± 1.800	0.1717

MCHC (g/dL)	29.46 ± 6.407	31.25 ± 1.995	30.66 ± 1.334	0.4471
RDW_SD (fL)	51.27 ± 5.890	50.51 ± 4.349	52.02 ± 7.285	0.5805
RDW_CV (%)	9.781 ± 0.8743	9.891 ± 0.8040	9.670 ± 0.9696	0.5858
PLT (10 ⁹ /L)	148.1 ± 81.10	180.8 ± 79.70	115.3 ± 71.76	0.0693
MPV (fL)	6.740 ± 0.6411	6.720 ± 0.3938	6.760 ± 0.8435	0.8934
PDW (fL)	8.380 ± 0.9600	8.250 ± 0.7200	8.510 ± 1.179	0.5591
PCT (%)	0.0960 ± 0.05215	0.1110 ± 0.04886	0.0810 ± 0.05343	0.2066
P_LCR (%)	24.27 ± 8.917	21.03 ± 8.033	27.51 ± 8.945	0.1056
P_LCC (10 ⁹ /L)	30.10 ± 11.78	30.80 ± 10.08	29.40 ± 13.80	0.7985

Discussion

In the Ghanaian city of Tamale, this study offers the first empirical proof of drug usage among blood donors. This study's 21.1% substance use prevalence is consistent with earlier studies carried out in different contexts, such as Mahl et al. [5], who found comparable results among young potential blood donors. This emphasises the necessity for Ghanaian transfusion services to have more thorough screening procedures that go beyond self-reported medical histories.

According to statistics from the United Nations Office on Drugs and Crime [6], cannabis (tetrahydrocannabinol) is the most commonly detected substance globally. Ghana is known to be one of Africa's top producers and consumers of marijuana, and its cannabis consumption is also extensively documented. The continued opioid problem in West Africa, especially in Ghana, Togo, and Nigeria, is highlighted by the detection of tramadol usage in 47.8% of positive cases [17].

Transfusion safety is further complicated by its frequent usage among young people for alleged performance improvement and sexual stamina [18].

Other drugs were also noted, including tricyclic antidepressants, barbiturates, and benzodiazepines. Despite being less common, their existence is indicative of larger worldwide trends in the abuse of psychoactive substances [6]. The least common substances found were amphetamines, cocaine, and opioids, which could be explained by their scarcity in northern Ghana.

According to sociodemographic data, the majority of substance users were young, unmarried men who had completed secondary school and were employed. This is consistent with earlier research conducted in Ghana [19], which found that family history, peer pressure, and socioeconomic factors all contributed to youth substance use.

Higher substance use was also linked to larger family sizes, which may be due to socioeconomic pressures and less parental monitoring.

Trends like decreased platelet counts and somewhat lower white blood cell counts among drug users are noteworthy, even if haematological and anthropometric measurements did not reveal statistically significant differences between substance users and non-users. These patterns align with experimental research that has connected cannabis, morphine, and tramadol to haematological abnormalities such as neutropenia and thrombocytopenia [11-13]. These results point to potential hazards for donor health and blood recipient safety, even if they are not statistically significant.

Crucially, the disparity between actual drug test findings and donor self-reports highlights the shortcomings of Ghana's present donor screening procedures. Blood quality and transfusion safety may be jeopardised if verbal medical history is the only source of information used. Therefore, using objective drug screening methods could improve donor eligibility evaluations and protect donors and recipients.

There are several restrictions on this study. First, its applicability to female donors and other parts of Ghana was limited because it was limited to a comparatively small sample of 109 male donors from a single institution. Second, fast test panels were used for drug detection instead of more accurate confirmatory techniques like gas chromatography-mass spectrometry (GC-MS). Lastly, conclusions about the causes of the observed haematological variations cannot be drawn due to the cross-sectional design. To produce more reliable prevalence estimates and correlations, future research should use confirmatory testing, increase the sample size, and include female donors.

Conclusion

With a prevalence of 21.1%, this study offers new proof of drug usage among blood donors in Ghana's Tamale capital. The most commonly found drugs were tramadol and cannabis, then benzodiazepines, barbiturates, and tricyclic antidepressants. There were trends towards lower platelet and white cell counts among drug users, but these differences were not statistically significant. These results show that relying only on self-reported donor histories is insufficient and that objective substance testing must be incorporated into donor screening procedures to guarantee transfusion safety.

To increase blood safety, objective drug testing should be included in donor screening in addition to infectious disease testing. The health concerns of substance use and how it affects blood donation should be highlighted in awareness campaigns aimed at young potential donors. To verify prevalence rates and investigate the influence of drug metabolites on transfusion outcomes, larger, multi-centre studies using confirmatory techniques (e.g., GC-MS) are required. To promote truthful self-reporting and lower hidden risk factors, counselling and pre-donation education should be improved.

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Conflict of Interest

No conflicts of interest are disclosed by the writers. The content and authorship of this manuscript are solely the responsibility of the authors.

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Availability of Data and Materials

The authors attest that all information supporting the study's conclusions is included in the publication and may be obtained from the corresponding author upon reasonable request.

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