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Haematological Parameters of Commercial Sex Workers in Ekpoma, South-South Nigeria

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Abstract

Commercial sex work remains a longstanding social practice worldwide and is associated with multiple health risks. This study evaluated the haematological parameters of commercial sex workers compared with non-commercial sex workers in Ekpoma, Edo State. A total of 100 participants were recruited, comprising 50 commercial sex workers and 50 controls. Blood samples were analyzed using a Sysmex KX-21N haematology autoanalyzer following standard operating procedures. The majority of participants were aged 16-20 years, with a mean age of 24.28 ± 6.35 years, and most had secondary education. Among commercial sex workers, frequent daily work and a higher number of sexual partners were common. Eosinophil count, mean corpuscular haemoglobin concentration (MCHC), and red cell distribution width (RDW-CV) were significantly higher ($p < 0.05$) in commercial sex workers compared with controls, while mean corpuscular volume (MCV) was significantly lower. Haemoglobin and packed cell volume (PCV) were significantly reduced among participants who worked daily. Additionally, red blood cell count, haemoglobin, and PCV were significantly lower in subjects reporting more than seven sexual partners per day, whereas MCH and MCHC were significantly higher in this group. In conclusion, commercial sex work is associated with significant alterations in selected haematological parameters, particularly among individuals with higher work frequency and multiple daily sexual partners. Larger studies are recommended to further elucidate these findings and assess additional haematological indices.

Keywords: haematological parameters; commercial sex; prostitution; sex; sex workers

Introduction

Haematological parameters refer to the factors associated with the blood and organs involved in blood production. Blood serves as an indicator of the health condition of animals exposed to toxins and various situations (Anorue, 2024). Analyzing blood provides a chance to study different metabolites and elements present in an animal's body, contributing significantly to understanding the physiological, nutritional, and pathological condition of an organism (Al-Samkari et al., 2022). According to Anorue, (2024) examining blood for their constituents can provide important information for the diagnosis and prognosis of diseases in animals. Blood constituents change in relation to the physiological conditions of health (Nakhaee et al., 2019). These changes are of value in assessing response of animals to various physiological situations (Eledo et al., 2017). According to Chandra et al., (2017), changes in haematological parameters are often used to determine various status of the body and to determine stresses due to environmental, nutritional and/or pathological factors.

Commercial sex work, formerly known as prostitution, is one of the phenomena in the social life of the human beings that has been practiced in different parts of the world for a long period of time. Commercial sex is essentially the exchange of sexual services for payment. It is a widespread practice that is not limited to any specific culture and involves individuals of various age groups, including young girls as young as eight years old in some instances. The term 'sex worker' is used to describe individuals involved in prostitution and is the favored expression in literature related to this topic. This term is preferred as it carries less negative and discriminatory implications compared to the term 'prostitute'. Even though its origin and exact time has not been pointed, some literatures (Rottenberg, 2017; Kempadoo & Doezema, 2018) indicated that it existed from the time of ancient Greece and Rome. Sex work is a term used to describe a wide range of activities relating to the exchange of money (or its equivalent) for the provision of a sexual service. A long list of the different types of sexual services practiced by sex workers around the world. From this list, they grouped types of sexual services into two categories; direct and indirect sex work. Direct sex work refers to

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services, such as indoor and outdoor prostitution as well as escort services. This type of sex work typically involves the exchange of sex for a fee in which genital contact is common. As studies and· surveys undertaken by different scholars (Farley, 2018) revealed, it has appeared at different times and forms for different purposes (politics, economic, culture, religion and the like).

Commercial sex work is regarded as one of the moral and legal issues that have been controversial among different scholars like sociologists (persons who study social organization and structure of the society), moralists (who have strong ideas about moral principles), traditionalists (persons who stick to traditional way of doing things and prefer tradition to modern ideas) and legal persons (Bullough et al., 2022). In addition to this, it has become one of the areas of study undeliaken by professionals like psychoanalysts, psychologists, social workers, health personnel, gender activists and other experts.

According to Agwu and colleagues (2020), the landscape of commercial sex work has evolved significantly, with the emergence of male sex workers in Nigeria engaging in commercial activities with other men, supported by an organization. The practice of commercial sex work has taken a troubling and reprehensible turn in Africa, especially through human trafficking and human rights violations, which are prominent issues in West Africa (Human Right Action, 1997). Lately, commercial sex work has turned into a profitable industry in Nigeria, particularly among young people. Studies indicate that 31% of sex workers, notably students, are active in Nigerian educational institutions (Olagunju et al., 2025). Olagunju and colleagues (2025) suggest that there are various types of sex workers, including those based in brothels, those soliciting on the streets, and those operating from their residences.

Moreover, the profession of sex work is increasingly adopted by women, particularly in nations like the Netherlands, Brazil, Norway, and others. It has emerged as a significant source of income for the government, resulting in the payment of taxes to authorities (Olagunju et al., 2025). According to Olagunju et al., (2025), sex workers encounter widespread discrimination worldwide, making them vulnerable to various forms of mistreatment such as extortion by law enforcement, unjustified imprisonment, and other violations of their basic rights, some of which can be seen as a form of slavery. In Nigeria, sex work is considered illegal under the law, although the government has not taken substantial action against it (Olagunju et al., 2025).

Sex work and substance abuse are closely connected and both pose significant health risks. Prostitutes are a marginalized group in society with low health standards. Their use of routine healthcare is often limited and though outreach services are better used by this group, they often only attend when their health curtails their ability to sell sex. They are at increased risk of acquisition of sexually transmitted infections. This risk is reduced by condom use but condom use is inconsistent and clients encourage unprotected sex by offering more money. Entry into prostitution may occur at a young age, increasing total exposure to these risks (Olagunju et al., 2025).

Individuals engaged in the sex trade encounter adverse consequences despite benefiting from it. According to Whiteaker (2021), sex work is a significant source of HIV/AIDS and STD transmission, leading to global discrimination against those involved. The constant health risks associated with this profession have branded sex work as a societal threat and a form of violence against individuals (Whiteaker, 2021). Consequences such as premature death, despair, and unintended pregnancies are prevalent among this group. A major obstacle is the lack of education among some sex workers, preventing them from attending workshops or being informed of the dangers through media sources like television. This work has then, become their life style, therefore, making it difficult for the government to cope with. As a vulnerable group of health issues, the physique of prostitutes is much prone to exposure with both communicable and non-communicable diseases. As well, recurrent exposure to competitive and disturbed emotional backgrounds leads into psychological deprivations. Being ill physically and mentally, social well-being of the individual is getting affected because social well-being is related with terms of behaviours that reflect community and organizational participation, community or group membership, or social capital and social cohesion (Whiteaker, 2021). Hence, both physical and mental health is directly involved in maintaining social manners. Frequent social contacts with the general public, an affected prostitute plays a role of a transmitter or receiver of diseases especially in communicable diseases. Emotionally obliged prostitute-client relationship deals with conflicts in mentality. For the assumption of a healthy society, wellness of prostitutes is foremost essential.

Sex workers come from various socio-economic backgrounds. For instance, some students turn to sex work to support their education expenses, a trend believed to have risen due to the implementation of additional tuition fees (Nafisat et al., 2021). This contrasts with the common belief that sex workers typically come from disadvantaged economic backgrounds. Nevertheless, this particular group is

less likely to experience significant social marginalization and is expected to cease their involvement in sex work upon completing their studies (Nafisat et al., 2021).

In a country like Nigeria, prostitution is viewed as a form of misconduct and detrimental to the community. It is also a significant source of shame for both the government and families whose young individuals engage in such behavior, leading to a loss of respect from society regardless of their social status (Olagunju et al., 2025). The combination of poor health conditions, lack of proper medical attention, and the necessity to exchange sex for money to support drug habits can lead to severe health issues. Previous research on sex workers has focused on job-related concerns and sexual health rather than their overall well-being. Studies have often included women working on the streets and those in off-street settings like massage parlors, yet these two categories may exhibit distinct characteristics and health challenges. There has been no quantitative analysis of the blood parameters of commercial sex workers. Research has shown that sex can impact blood values in various animal species (Ugochukwu et al., 2018; Adamu & Jigam, 2019; Pstras et al., 2019; Babatope et al., 2025). Much work has not been done on the influence of sex on haematological parameters of commercial sex workers. This study is aimed at determining the haematological parameters of commercial sex workers in comparison with non-commercial sex workers in Ekpoma, Edo State.

Materials and Methods

Area of Study

The research was conducted in Ekpoma, the main town of Esan West Local Government in Edo State. It is positioned at a latitude of 6.7491oN and a longitude of 6.0732oE. The population of Ekpoma is approximately 190,000 individuals. The residents are engaged in various occupations such as teaching, driving, motorcycle riding, craftsmanship, agriculture, and commerce. Rainfall and wells are the primary water sources in the area. The wells are supported by an irrigation system established by the Government for communal use. Ekpoma comprises several neighborhoods including Eguare, Iruekpen, Emaudo, Ujoelen, Ihumudumu, Illeh, Uke, Uhiele, Ujemen, Ukepnu, Idoa, Ukhun, Egoro, Emuhi, Igor, and Idumebo. This study focuses on Eguare, Ujoelen, Ihumudumu, Emaudo, and Iruekpen. Ambrose Alli University, Ekpoma is located within this vicinity. The climate in Ekpoma is characterized by cold nights and hot days, along with a hilly terrain. The samples were examined in the Research Diagnostic Laboratory, of the Faculty of Medical Laboratory Science, College of Medicine, Ambrose Alli University, Ekpoma.

Study Population

The subjects used in this study was commercial sex workers in Ekpoma metropolis. A total of one hundred samples were recruited for this study which comprise of fifty (50) test samples of commercial sex workers and fifty (50) samples from non- commercial sex workers.

Research Design

This study was undertaken to investigate the effect of the commercial sex work on haematological indices and make comparison with the control (non-commercial sex workers). A complete record of medical history was obtained for each subject, including name, ethic group, and age. This research was conducted between the month of November, 2022 through December, 2022. The test that was performed was the effects of commercial sex work on the haematological parameters.

Ethical Approval

Approval was granted by the Ambrose Alli University Health Research Ethics Committee. Every participant was asked for their consent before collecting samples.

Sample Size

The sample size was determined using the Cochrane formula for sample size calculation: The sample size (N) is derived from the formula provided below.

$$(N) = \frac{Z^2Pq}{d^2}$$

Were, N = the desired size; Z = 1.96 (standard score); P = Prevalence (7%) (0.07), q. = 1- P (0.92); d = sample error tolerated (0.05)

$$N = \frac{1.96^2 \times 0.07 \times 0.92}{0.05^2} = 98.9 \text{ approximately} = 100$$

Inclusion Criteria

Apparently healthy commercial sex workers with no history of any underlying illness were included for the study.

Exclusion Criteria

Non-commercial sex workers not included in the control group were excluded from the study.

Sample Collection

About 4mls of blood was collected from all the subjects via venipuncture and dispensed into ethylene diamine tetra acetic acid (EDTA) bottle. It was then be mixed immediately by reverse uniform inversion for used for red cell indices determination.

Analytical Methods

Determination of Haematological Parameters using Sysmex KX-21N Haematology Autoanalyzer

The haematological parameters were analyzed using a Sysmex KX-21N haematology autoanalyzer (Sysmex Kx-2N, 2008) using Standard Operative Procedures (SOPs) within four hours of the blood collection. Dedicated reagents and standard methodologies were used. Quality controls were run every day and the analyzer was maintained according to the manufacturer's instructions during the entire period of the study.

Principle

A haematological analyzer uses the Impedance Principle to tally blood cells. This method was pioneered by Wallace Coulter in 1956 (Ochei & Kolhatkar, 2003). The Coulter counter mechanism relies on the concept that red and white blood cells conduct electricity less effectively than substances like saline. As cells displace the saline, it leads to a detectable shift in resistance. The cells are allowed to pass through an aperture through which an electric current is flowing. Cell passing through the aperture displace the diluents; and being bad conductors of electricity, the increase in resistance is counted as a voltage pulse which are converted to digital recordings. The cell suspension is drawn through the aperture with the help of a vacuum pump into a system of tubing.

Data Analysis

The average and deviation of the obtained outcomes were computed. Student's t-test and ANOVA (LSD) were utilized for the examination with the SPSS software version 18. Results with $p<0.05$ were deemed statistically significant in this research.

Results

Information about the subjects' socio demographic backgrounds and personal histories was also provided.

Socio-Demographic Characteristics of The Subjects Studied

Table 1 displayed the socio-demographic traits of the participants in the study. The study population was predominantly young, with most participants aged 16-20 years (40%), followed by 21-25 years (26%), 26-30 years (22%), and above 30 years (12%), with a mean age of 24.28 ± 6.35 years. Most subjects had secondary education (92%), while few had tertiary education (6%) or no formal education (2%). Half of the participants (50%) had been in the business for 3-6 months, 36% for 7 months to 1 year, and 14% for 2-3 years. The majority (72%) reported working every day. Most subjects (64%) reported sleeping with 5-7 men daily, while 24% had 2-4 men, and 12% had more than 7 men per day. Slightly more than half (54%) did not use sexual enhancement substances, smoke, or drink alcohol, whereas 46% reported engaging in these behaviors.

Table 1: Socio-Demographic Characteristics of the Study Population.

Variables		Frequency	Percentage (%)
Age (Years)	16-20	20	40.0
	21-25	13	26.0
	26-30	11	22.0
	>30	6	12.0
	Age (Mean ±SD)	24.28±6.35	
Educational Status	Secondary Level	46	92.0
	Tertiary Level	3	6.0
	No Formal Education	1	2.0
	Total	50	100
How Long have you been in the Business	3-6months	25	50.0
	7months-1year	18	36.0
	2-3years	7	14.0
	Total	50	100
Do You Work Everyday	Yes	36	72.0
	No	14	28.0
	Total	50	100
How Many Men Do You Meet a Day?	2-4	12	24.0
	5-7	32	64.0
	>7	6	12.0
	Total	50	100
DO You Take Sexual Enhancement, Smoke or Drink?	Yes	23	46.0
	No	27	54.0
	Total	50	100

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Table 2 compares haematological parameters between the subjects and the control group. Most parameters showed no statistically significant difference ($p > 0.05$) between both groups, including WBC, lymphocytes, monocytes, neutrophils, basophils, RBC, haemoglobin, PCV, MCH, platelets, MPV, and PDW. However, eosinophils were significantly higher ($p < 0.05$) in the subjects compared to the control group. Additionally, MCV was significantly lower, while MCHC and RDW-CV were significantly higher in the subjects compared to the control. Overall, the results indicate that although most haematological indices were similar between the two groups, significant differences were observed in eosinophils, MCV, MCHC, and RDW-CV.

Table 2: Haematological Parameters levels between the Subjects and the Control.

Parameters	Yes(n=36)	No(n=14)	t value	P value
WBC (x109/L)	6.25±2.30	5.59±1.77	0.964	0.340
LYM (%)	46.72±13.44	43.10±17.18	0.790	0.434
Monocytes (%)	9.63±2.73	8.76±3.67	0.940	0.350
Nuetrophils (%)	39.76±14.52	41.42±12.44	0.390	0.698
Eosinophils (%)	3.63±2.60	3.84±2.23	0.257	0.799
Basophils (%)	0.16±0.16	0.19±1.00	0.400	0.691
RBC (x109/L)	4.24±0.69	4.61±0.57	1.793	0.079
Haemoglobin (g/dl)	10.88±1.68	12.21±1.29	2.664	0.010
PCV (%)	31.93±5.10	36.09±3.70	2.772	0.008
MCV (fl)	25.69±7.68	78.51±6.63	1.205	0.234
MCH (Pg)	25.94±2.94	26.59±2.49	0.731	0.469
MCHC (g/dl)	34.22±1.26	33.88±0.97	0.917	0.363
RDW-CV (%)	11.70±2.39	11.24±1.29	0.670	0.506
Platelets (x109/L)	268.53±125.27	237.93±140.69	0.748	0.458
MPV	14.02±19.65	9.24±1.17	0.904	0.371
PDW (%)	19.73±6.29	16.71±3.41	1.697	0.096

KEYS: n = Sample size; p > 0.05= Not significant; p < 0.05= Significant. WBC = White Blood Cell; LYM = Lymphocyte; RBC = Red Blood Cell; PCV = Packed Cell Volume; MCH = Mean Cell Volume; MCHC = Mean Cell Haemoglobin Concentration; RDW-CV = Red Cell Distribution Width; MPV = Mean Platelet Volume; PDW = Platelet Distribution Width.

Table 3 compares haematological parameters based on whether the subjects worked daily. The findings showed that PCV and MCV levels were significantly higher ($p < 0.05$) in subjects who did not work every day compared to those who worked daily. Although WBC, lymphocytes, monocytes, MCHC, RDW-CV, platelets, MPV, and PDW were higher in subjects who worked daily, these differences were not statistically significant ($p > 0.05$). Similarly, neutrophils, eosinophils, RBC, and MCV were higher in subjects who did not work daily, but these differences were also not statistically significant ($p > 0.05$). Overall, only PCV and MCV showed significant differences based on daily work status.

Table 3: Haematological Parameters of the subjects according to Daily Working.

Parameters	Control(n=50)	Subjects(n=50)	t value	P value
WBC (x109/L)	5.56±1.98	6.07±2.17	1.212	0.228
LYM (%)	48.24±10.29	45.71±14.49	1.005	0.317
Monocytes (%)	8.79±2.52	9.39±2.91	1.086	0.280
Nuetrophils (%)	40.17±10.14	40.18±13.87	0.005	0.998
Eosinophils (%)	2.59±2.34	3.69±2.48	2.286	0.024
Basophils (%)	0.21±0.23	0.17±0.17	0.967	0.336
RBC (x109/L)	4.34±0.45	4.34±0.68	0.005	0.996
Haemoglobin (g/dl)	11.54±0.98	11.25±1.68	1.061	0.291
PCV (%)	34.45±2.83	33.09±5.07	1.648	0.103
MCV (fl)	79.69±6.26	76.48±7.45	2.329	0.022
MCH (Pg)	26.92±2.66	26.12±2.81	1.470	0.145
MCHC (g/dl)	33.53±1.42	34.13±1.19	2.260	0.026
RDW-CV (%)	10.66±0.76	11.57±2.14	2.844	0.005
Platelets (x109/L)	242.50±86.25	259.96±129.25	0.795	0.429
MPV	10.11±3.83	12.68±16.76	1.057	0.293
PDW (%)	18.59±9.31	18.88±5.76	0.192	0.848

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The results in table 4 showed the comparison of Haematological Parameters levels of the subjects according to if they take sexual enhancement, smoke or drink. Monocytes, Eosinophils, RBC, PCV, Haemoglobin, MCV, RDW-CV and MPV levels were higher in subjects that take sexual enhancement, smoke or drink, when compared with subjects that do not take sexual enhancement, smoke or drink, but were not statistically significant ($p > 0.05$). Furthermore, WBC, LYM, Nuetrophils, MCH, MCHC, Platelets and PDW levels were higher in subjects that do not take sexual enhancement, smoke or drink, when compared with subjects that take sexual enhancement, smoke or drink and also were not statistically significant ($p > 0.05$).

Table 4: Haematological Parameters of the subjects according to do you take Sexual Enhancement, Smoke or Drink.

Parameters	Yes(n=23)	No(n=27)	t value	P value
WBC (x109/L)	5.84±2.10	6.26±2.25	0.671	0.505
LYM (%)	45.31±17.25	46.05±11.98	0.179	0.858
Monocytes (%)	9.57±3.41	9.23±2.47	0.398	0.692
Nuetrophils (%)	39.27±15.44	40.97±12.63	0.429	0.670
Eosinophils (%)	4.06±3.14	3.37±1.73	0.975	0.334
Basophils (%)	0.17±0.17	0.17±0.17	0.180	0.858
RBC (x109/L)	4.38±0.76	4.31±0.61	0.369	0.713
Haemoglobin (g/dl)	11.30±1.90	11.20±1.51	0.216	0.830
PCV (%)	33.48±5.70	32.77±4.56	0.490	0.626
MCV (fl)	76.59±7.34	76.39±7.68	0.095	0.925
MCH (Pg)	26.10±3.00	26.13±3.00	0.031	0.975
MCHC (g/dl)	34.03±1.32	34.21±1.08	0.545	0.588
RDW-CV (%)	11.58±2.83	11.56±1.36	0.038	0.970
Platelets (x109/L)	238.48±107.20	278.26±144.93	1.087	0.283
MPV	13.44±19.13	12.04±14.79	0.293	0.771
PDW (%)	18.67±6.81	19.07±4.83	0.245	0.807

Table 5 compares haematological parameters based on the number of men the subjects sleep with daily (2-4, 5-7, and >7 men). Most parameters, including WBC, lymphocytes, monocytes, neutrophils, eosinophils, basophils, haemoglobin, MCV, RDW-CV, platelets, MPV, and PDW, showed no statistically significant differences ($p > 0.05$) across the groups. However, some parameters showed significant differences. RBC levels were significantly higher ($p < 0.05$) in subjects who slept with 2-4 men daily compared to those with 5-7 and >7 men. PCV levels were significantly higher ($p < 0.05$) in subjects who slept with 5-7 men daily compared to the other groups. Additionally, MCH and MCHC levels were significantly higher ($p < 0.05$) in subjects who slept with more than 7 men daily. Overall, while most haematological indices did not differ significantly based on the number of partners per day, significant variations were observed in RBC, PCV, MCH, and MCHC.

Table 5: Haematological Indices of the subjects according to Daily Sexual Act.

Parameters	2-4 Men (n=12)	5-7 Men(n=32)	>7 Men(n=6)	F value	P value
WBC (x109/L)	6.38±1.21 a	6.18±2.36 a	4.85±2.52 a	1.117	0.336
LYM (%)	39.79±7.49 a	47.88±14.98 a	45.98±20.70 a	1.381	0.261
Monocytes (%)	9.65±2.49 a	9.23±3.08 a	9.68±3.20 a	0.121	0.261
Nuetrophils (%)	45.45±8.93 a	38.15±12.80 a	40.52±20.88 a	1.223	0.303
Eosinophils (%)	4.48±3.87 a	3.41±1.85 a	3.60±2.02 a	0.816	0.448
Basophils (%)	0.18±0.15 a	0.17±0.19 a	0.18±0.13 a	0.032	0.968
RBC (x109/L)	4.53±0.54 a	4.43±0.55 a	3.49±0.95 b	6.942	0.002
Haemoglobin (g/dl)	11.08±1.53 a	11.58±1.39 a	9.83±2.75 ab	3.029	0.058
PCV (%)	33.05±4.47 a	34.12±4.06 a	27.70±8.02 b	4.651	0.014
MCV (fl)	72.97±5.99	77.33±8.12	78.978±3.72	1.954	0.153
MCH (Pg)	24.64±2.24 a	26.27±2.93 a	28.22±1.53 ab	3.765	0.030
MCHC (g/dl)	33.77±1.07 a	33.96±0.90 a	35.75±1.64 b	8.467	0.001
RDW-CV (%)	12.75±3.80 a	11.27±1.09 b	10.82±1.09 ab	0.687	0.079
Platelets (x109/L)	310.17±112.24 a	250.25±132.99 a	211.33±129.89 a	1.446	0.246
MPV	9.03±0.89 a	14.63±20.78 a	9.62±2.30 a	0.591	0.558
PDW (%)	20.93±8.41 a	18.64±4.77 a	16.10±3.03 a	1.520	0.229

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Table 6 compares haematological parameters across different age groups (16-20, 21-25, 26-30, and >30 years). The findings showed that none of the haematological parameters differed significantly ($p > 0.05$) across the age groups. Although slight variations were observed-such as higher WBC and neutrophils in the 16-20 years group, higher lymphocytes and RBC in those >30 years, higher PCV, MCV, MCH, and platelet levels in the 26-30 years group, and higher MCHC in the 21-25 years group-these differences were not statistically significant. Overall, age did not have a significant effect on the haematological parameters of the subjects in this study.

Table 6: Haematological Parameters of the subjects according to Age.

Parameters	16-20 years (n=20)	21-25 years (n=13)	26-30 years (n=11)	>30 years (n=6)	F value	P value
WBC (x109/L)	6.80±2.23 a	6.03±1.79 a	5.58±2.48 a	4.60±1.47 ab	1.966	0.132
LYM (%)	42.61±12.81 a	43.67±10.73 a	50.22±19.17 a	52.20±16.65 a	1.159	0.336
Monocytes (%)	9.75±2.37 a	8.79±2.25 a	9.75±4.39 a	8.82±3.00 a	0.398	0.755
Nuetrophils (%)	42.30±9.10 a	42.12±11.62 a	36.70±20.96 a	.35.37±16.89 a	0.699	0.557
Eosinophils (%)	3.32±2.09 a	4.88±3.67 a	3.07±1.55 a	3.38±1.20 a	1.428	0.247
Basophils (%)	0.13±0.10 a	0.12±0.11 a	0.27±0.22 ab	0.23±0.29 a	2.597	0.064
RBC (x109/L)	4.32±0.55 a	4.28±0.99 a	4.34±0.42 a	4.56±0.74 a	0.234	0.872
Haemoglobin(g/dl)	11.17±1.34 a	10.98±2.33 a	11.49±1.11 a	11.65±2.21 a	0.304	0.823
PCV (%)	32.53±4.15 a	32.28±6.99 a	35.15±3.63 a	34.80±5.85 a	0.561	0.644
MCV (fl)	75.45±6.27 a	76.00±8.25 a	78.77±7.36 a	76.78±10.30 a	0.482	0.696
MCH (Pg)	25.96±2.35 a	26.19±3.51 a	26.59±2.69 a	25.62±3.39 a	0.182	0.908
MCHC (g/dl)	34.39±1.05 a	34.39±1.59 a	33.74±0.74 a	33.40±1.03 a	1.755	0.169
RDW-CV (%)	11.23±1.01 a	12.07±3.67 a	11.27±1.42 a	12.17±1.70 a	0.616	0.608
Platelets (x109/L)	258.95±135.77 a	225.08±88.49 a	394.82±112.89 a	275.00±208.04a	0.595	0.622
MPV	9.50±2.92 a	9.38±1.53 a	17.27±27.78 a	22.05±3082 a	1.336	0.274
PDW (%)	19.16±5.26 a	19.31±8.43 a	17.37±2.01 a	19.82±5.92 a	0.329	0.804

Discussion

The aim of this research is to analyze the blood-related characteristics of sex workers who work for money, in contrast to those who do not charge for their services in Ekpoma, Edo State. To achieve this goal, a total of fifty female sex workers took part in the investigation, a relatively small number compared to other research studies due to their reluctance to join. The research indicated that adolescent girls are more likely to engage in this profession compared to young women under 20 years old, as shown in a study conducted in the Jimma Zone by Dufera et al., (2021).

The result for age showed that majority of the subjects were within the age range of 16-20 years; 20(40.0%), this was followed by 21-25 years, 13(26.0%), 26-30 years; 11(22.0%) and >30 years; 6(12.0%). Regrading to the educational status of the subjects, the results also showed that 46(92.0%) of the subjects had secondary level education, 3(6.0%) had tertiary level education and (2.0%) of the subjects had no formal education. As per the World Health Organization's report from 2016, a significant negative impact of engaging in sex work is the heightened likelihood of contracting sexually transmitted infections, notably HIV/AIDS, as an occupational risk, which also contributes to the proliferation of these infections (Aldridge et al., 2018). Research by Schlesinger & Daley in 2016 revealed similar findings, indicating that street prostitution zones are particularly susceptible to various difficulties and obstacles.

Eosinophils, MCHC and RDW-CV levels were significantly higher ($p < 0.05$) in the subjects when compared with the control. While MCV levels were significantly lower ($p < 0 .05$) in the subjects when compared with the control. The majority of sex workers are not enthusiastic about their work. They do not enjoy it and are not willingly participating, indicating external factors at play. Typically, teenage girls are more likely to be involved in sex work compared to those under the age of 15. The location where females/prostitutes reside significantly influences the types of sex work practiced. Rural women have a higher likelihood of engaging in sex work than urban women. Single women are more likely to be sex workers than married women. Many women enter sex work while their families are still alive. The percentage of sex workers who smoke is higher than those who do not smoke.

The findings indicated that levels of haemoglobin and PCV were notably lower ($p < 0.05$) in individuals who engage in daily work compared to those who do not. This suggests that frequent sexual activity leads to decreased haemoglobin and PCV levels. Engaging in sex work is deemed unethical. As per Sibani & Uche (2025), sex work is described as an embodiment of desire, spreading illnesses that jeopardize the overall health of a community, due to its impact on society.

Consequently, because of the high prevalence of HIV infections and a large number of sexual partners, sex workers are identified as a key group in transmitting HIV/AIDS and other sexually transmitted infections. Red blood cell count (RBC), hemoglobin levels, and packed cell volume (PCV) show a significant decrease ($p < 0.05$) in individuals who engage in sexual activities with more than 7 partners daily, in comparison to those who have 2-4 and 5-7 partners daily. This suggests that frequent sexual activity leads to a decrease in RBC, hemoglobin, and PCV levels among these individuals. Conversely, mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC) exhibit a significant increase ($p < 0.05$) in individuals with more than 7 sexual partners daily, as opposed to those with 2-4 and 5-7 partners daily.

Conclusion

In summary, Eosinophils, MCHC, and RDW-CV levels showed a significant increase ($p < 0.05$) in the individuals compared to the control group. Conversely, MCV levels demonstrated a significant decrease ($p < 0.05$) in the individuals compared to the control group. Other parameters did not exhibit significant differences ($p > 0.05$). RBC, hemoglobin, and PCV levels were notably lower ($p < 0.05$) in individuals who engage in sexual activity with more than seven men daily compared to those who have 2-4 and 5-7 partners daily. Meanwhile, MCH and MCHC levels were significantly higher ($p < 0.05$) in individuals who have more than seven partners daily compared to those with 2-4 and 5-7 partners daily. It is recommended that sex workers seek and access healthcare services from medical professionals without facing obstacles from healthcare providers. Failure to engage with healthcare providers may leave them at risk of contracting sexually transmitted diseases and incurring additional expenses following an illness.

References

1. Aa, J. (2019). Effects of Malaria Infection on Some Haematological and Biochemical Parameters in The General Population and Pregnant Malaria Patients Attending Two District Hospitals in Niger State, Nigeria. *Global Journal of Infectious Diseases and Clinical Research*. 5(1):1-5.
2. Agwu, P., Okoye, U., Ekoh, P., Chukwu, N., Onalu, C., et al. (2020). A Systematic Review of Drivers and Interventions Against Sex Work Migration in Edo State, Nigeria. *Intern Journal of Sociology and Social Policy*, 40(7-8):733-764.
3. Al-Samkari, H., Loren, A. W., Lee, A. I. (2022). The Case for Classical Haematology: The Impact of a Name and The Future of a Field. *The Lancet Haematology*, 9(6):e455-e459.
4. Anorue D.N. (2024). Haemato-Biochemical Indices and Immune Response of Grower Pigs Fed Enzyme Supplemented Dried Cassava Peel and Maize Cob Composite Meal. *Brazilian Journal of Science*, 3(6):72-81.
5. Babatope I.O, Oboh V.O, Omoruyi M.O, Usman L.I. (2025). Haematological Parameters of Petrol Attendants in Ekpoma, Edo State, Nigeria. *Intern Blood Research & Reviews*, 16(3):8-17.
6. Bullough A, Guelich U, Manolova T.S, Schjoedt L. (2022). Women's Entrepreneurship and Culture: Gender Role Expectations and Identities, Societal Culture, and the Entrepreneurial Environment: A. Bullough et al. *Small Business Economics*, 58(2):985-996.
7. Chandra S, Gupta N, Patel S.K. (2017). Study of Iron Status Indicators in Different Phases of Menstrual Cycle in First Year Medical College Females. *International Journal of Research in Medical Sciences*, 5(1):46-49.
8. Dufera, F., Kebira, J. Y., Gobena, T., Assefa, N. (2021). Lifetime Prevalence of Sexual Violence and Its Associated Factors Among High School Female Students in Jarso District, Oromia Region, Eastern Ethiopia. *International Journal of Reproductive Medicine*, 2021(1):1821579.
9. Eledo B.O, Allagoa D.O, Ihedioha A.U, Dunga K.C, Izah S.C. (2017). Evaluation of Some Hematological Parameters Among Post-Menopausal Women in Bayelsa State, Nigeria: A Case Study of Patients Attending Federal Medical Centre, Yenagoa. *Laboratory Medicine*, 2(6):132-136.
10. Farley, M. (2018). Risks of Prostitution: When the Person is The Product. *Journal of The Association for Consumer Research*, 3(1):97-108.
11. Kempadoo K, Doezema J. (Eds.). (2018). Global Sex Workers: Rights, Resistance, and Redefinition. *Routledge. Browns Publishers*. 42-49.
12. Nafisat A, Boyi B, Mbap S.T, Elizabeth T, Ibrahim Y, et al. (2021). Effect of Breed, Sex, Age and Season on The Haematological Parameters of Sheep in Bauchi State, Nigeria. *Nigerian Journal of Animal Science*, 23(2):28-37.
13. Nakhaee S, Amirabadizadeh A, Brent J, Mehrpour O. (2019). Impact of Chronic Lead Exposure on Liver and Kidney Function and Haematologic Parameters. *Basic & clinical Pharmacology & Toxicology*, 124(5):621-628.
14. Olagunju B.O, John O.K.U.N.O.L.A, Olatunde A.O, Gbeminiyi O.O, Adeola B.T. (2025). Utilization of Social Work Education in Curtailing the Menace of Sex Workers in Higher

Institutions in Ogun State. *Journal of Theoretical and Empirical Studies in Education*, 10(2):569-581.
15. Pstras L, Debowska M, Wojcik-Zaluska A, Zaluska W, Waniewski J. (2019). Hemodialysis-Induced Changes in Hematocrit, Hemoglobin and Total Protein: Implications for Relative Blood Volume Monitoring. *PLoS One*, 14(8):e0220764.
16. Rottenberg, C. (2017). Neoliberal Feminism and The Future of Human Capital. *Signs: Journal of Women in Culture and Society*, 42(2):329-348.
17. Sibani C.M, Uche R.P. (2025). Prostitution and Value of Women in Nigeria: A Search for Socio-Religious Solutions. *Crowther Journal of Arts and Humanities*, 2(2).
18. Ugochukwu I.C.I, Ugochukwu E.I, Chukwu C.C. (2018). Haematological Parameters and Serum Biochemical Assay of West African Dwarf Goats Infected with Peste des Petits Ruminants Virus in Nsukka, Enugu State. *Comparative Clinical Pathology*, 27(1):13-19.
19. Whiteaker L. (2021). Seduction, Prostitution, and Moral Reform in New York, 1830-1860. *Routledge*.
20. World Health Organization. (2016). Progress Report 2016: Prevent HIV, Test and Treat All: WHO Support for Country Impact (No. WHO/HIV/2016.24). *World Health Organization*.

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