

Asian Journal of Pharmaceutical and Health Sciences

<http://www.ajphs.com>

ISSN: 2231- 2331(Print) | ISSN: 2231–234X(Online)



Original Article

Evaluation of Anthropometric Indices and Liver Function Parameters Among Illicit Drug Consumers at The University of Port Harcourt, Nigeria

Mao E. Bunu^{1,2,*}, Samuel J. Bunu³, Adienbo O.M²

¹Department of Human Physiology, Faculty of Basic Medical Sciences, Bayelsa Medical University, Yenagoa, Bayelsa State, Nigeria.

²Department of Human Physiology, Faculty of Basic Medical Sciences, University of Port Harcourt, Nigeria.

³Department of Pharmaceutical and Medicinal Chemistry, Faculty of Pharmacy, Niger Delta University, Wilberforce Island, Nigeria.

Article History

Received : 03.12.2025
 Revised : 20.04.2026
 Accepted : 23.04.2026

DOI

10.5530/ajphs.2026.16.96

Keywords

Illicit drug use
 Anthropometric indices
 Liver function
 Hepatic enzymes
 University students

*Corresponding Author:

Mao E. Bunu
 dr.macloud80@gmail.com

ABSTRACT

Background: Drug and substance abuse are a global issue, causing mental disorders, death, addiction, and other hardships. The growing problem of illicit drug use among young adults has become a major source of concern, owing to the possible consequences for numerous aspects of health. **Objectives:** Hence, this study was conducted to evaluate anthropometric indices and liver function parameters among illicit drug users at the University of Port Harcourt. **Methods:** A descriptive cross-sectional and analytical study design was used, employing well-structured questionnaires to obtain socio-demographic and anthropometric indices and blood samples were collected from ninety (90) participants (45 test and 45 control) for laboratory analysis of liver function parameters using standard operating protocols. **Results:** Results revealed that individuals in the test group had a slightly higher BMI ($24.50 \pm 0.71 \text{ kg/m}^2$), hip circumference ($39.09 \pm 0.51 \text{ cm}$), and lower waist circumference ($31.98 \pm 0.56 \text{ cm}$) compared to controls. Notably, the waist-to-hip ratio (WH-R) was significantly lower in the test group (0.82 ± 0.01 vs. 0.86 ± 0.01 , $p < 0.05$), indicating a more favorable fat distribution. This reduction in WH-R was observed across weekly and daily users, all durations of use (1–3, 4–6, >6 years), and most drug combinations. Regarding liver function, the test group showed significantly elevated aspartate transaminase (AST) and alanine transaminase (ALT) levels compared to controls (e.g., AST: $29.92 \pm 1.62 \text{ IU/l}$ vs. $22.93 \pm 0.78 \text{ IU/l}$ in 1–3-year users, $p < 0.05$; ALT: $24.55 \pm 1.26 \text{ IU/l}$ vs. $18.94 \pm 0.72 \text{ IU/l}$, $p < 0.05$). AST and ALT elevations were seen across all drug types, frequencies (weekly and daily), and durations, but albumin levels remained unchanged. Illicit drug use among university students is associated with a consistently lower waist-to-hip ratio and significantly elevated liver enzymes (AST and ALT), suggesting altered fat distribution and persistent hepatic stress, respectively. **Conclusion:** These findings highlight the need for targeted health education, gender-specific interventions, and routine liver function monitoring in this population. Longitudinal studies are required to establish causality and long-term consequences.

Cite this article as: Mao E. Bunu, Samuel J. Bunu, Adienbo O.M. Evaluation of Anthropometric Indices and Liver Function Parameters Among Illicit Drug Consumers at The University of Port Harcourt, Nigeria. Asian J. Pharm. Health. Sci. 2026; 16(3):3296-3303. DOI:10.5530/ajphs.2026.16.96



1. INTRODUCTION

Drug and substance abuse are a global issue causing mental disorders, death, addiction, and other hardships (Idowu et al., 2018). Illicit drug consumption among young adults leads to academic difficulties, physical health issues, mental health problems, poor peer relationships, and involvement in the juvenile justice system (Cicchetti & Handley, 2019). Illicit drug users often abuse other types of psychoactive substances, which can aggravate their clinical and nutritional status (Roque-Bravo et al., 2022; Fischer et al., 2015). Illicit drugs have been established to cause weight changes, body composition changes, and liver function issues. Stimulants like cocaine or methamphetamine can suppress appetite, while certain opioids can increase appetite and contribute to weight gain (Sebastiani et al., 2018; Mahboub et al., 2021). Liver enzymes can be elevated due to these drugs, and some drugs can induce fatty liver disease (Di Pasqua et al., 2022). Some of these substances, especially herbal aphrodisiacs, are often adulterated with conventional phosphodiesterase inhibitors (sildenafil, tadalafil, etc.) and might lead to unexpected negative health complications (Kashimawo et al., 2025).

In 2021, a global population of 296 million people between the ages of 15 and 64 used drugs, reflecting a 23% increase over the previous decade. (United Nations Office on Drugs and Crime, 2023). Young people under 35 years old are more prevalent, especially in Africa and Latin America (United Nations Office on Drugs and Crime, 2023; Yenagoa et al., 2024). Studies have suggested that illicit drug consumption can significantly affect liver function, leading to various adverse effects (Garcia-Cortes *et al.*, 2020; Roy and Goswami, 2016; Clinton et al., 2021).

Anthropometric indices, which involve measurements of human physical dimensions and body composition, play a crucial role in evaluating population health and well-being (Wang et al., 2000). These indices serve as essential tools for analyzing nutritional status, growth trends, and general health conditions (Tur & Bibiloni, 2019). The lack of empirical investigation into the specific relationship between illicit drug consumption and its effect on anthropometric indices and liver function parameters necessitates this study. This study provides novel evidence by simultaneously examining anthropometric and hepatic outcomes in a young adult Nigerian university population, stratifying by drug type, combination patterns, frequency, and duration of use, an integrated approach not previously reported in this context. This study sought to assess anthropometric

indices and liver function parameters in illicit drug users at the University of Port Harcourt. This was achieved by measuring body mass index (BMI), hip and waist circumference, waist-hip ratio, and waist-height ratio, as well as determining the levels of aspartate transaminase (AST), alanine transaminase (ALT), and albumin. Also, the study quantifies the relationship or association between the anthropometric parameters and the liver function parameters. We hypothesized that chronic illicit drug use would be associated with significant alterations in anthropometric indices (particularly reduced WH-R) and elevated hepatic transaminases compared to non-users, with variations based on drug type, frequency, and duration of use.

2. METHODS

2.1 Study Area and Design

This study was carried out at the University of Port Harcourt (Uniport), Port Harcourt metropolis, South-South geopolitical zone of Nigeria. The descriptive cross-sectional study design was adopted for this study. The target population for this study comprised the student population at the University of Port Harcourt during the time of this research.

2.2 Inclusion and exclusion criteria

Inclusion criteria include those consenting students aged 16- 30 years and students with no chronic diseases or history of chronic illness, healthy students, and consumers of illicit drugs, while exclusion criteria were non-consenting students engaging in illicit drug consumption in the University of Port Harcourt, Students ≤ 15 years ≥ 30 years with chronic diseases or history of chronic illness, and unhealthy students of the University of Port Harcourt.

2.3 Sample Size/Sampling Method and Data Analysis

The sample size of ninety (90) participants (45 test and 45 control) was derived using purposive and snowball sampling methods. Purposive sampling was used to initially identify known hotspots for drug use within the university community (e.g., specific hostels, off-campus gathering points) based on information from student health services and campus security reports. Snowball sampling was then employed because of the hidden and stigmatized nature of illicit drug use; initial participants referred other eligible drug users, ensuring access to a population that would otherwise be difficult to reach. The sample size of 45 per group was determined based on feasibility

constraints and comparable previous studies in similar Nigerian university settings (which used sample sizes ranging from 30–50 per group), and it provides sufficient power (80%) to detect a clinically meaningful difference in ALT levels of approximately 5 IU/l at $\alpha=0.05$. Data were collected through structured questionnaires and blood samples. The study involved determining anthropometric indicators such as height and weight, waist circumference, and waist-hip ratio. Participants' BMI was calculated using weight and height measurements (Hood, 2018). Waist circumference and hip circumference were measured using a measuring tape (Dereje et al., 2021). The waist-hip ratio was calculated using the World Health Organization's criteria, with a ratio of less than 0.95 for men and less than 0.85 for women. Normal weight, overweight, and obesity were determined using WHO criteria (WHO, 2008). Neck circumference and waist-to-height ratio (WHt-R) were included as additional anthropometric markers because they independently predict cardiometabolic risk and upper body adiposity; their inclusion allows assessment of whether drug effects on body composition are region-specific. Laboratory analysis of blood samples determined liver function parameters such as aspartate transaminase (AST), alanine transaminase (ALT), and albumin in triplicate, and the mean value as well as standard deviation (SD) were recorded.

2.4 Ethical Consideration

Ethical clearance was sought and obtained from the ethical committee of the University of Port Harcourt with approval number: No: UPH/CEREMAD/REC/MM104/050.

2.5 Statistical Analysis

The data were entered using Microsoft Excel 2019, while the data were analysed using IBM SPSS version 22 (IBM Corp., Armonk, NY, USA). Descriptive statistics presented the values as mean $\pm$ standard error of the mean (SEM). One-way analysis of variance (ANOVA) was used to compare means across more than two groups. Where ANOVA yielded a significant overall effect ($p < 0.05$), Tukey's Honest Significant Difference (HSD) post-hoc test was applied to identify specific pairwise differences between groups, with particular focus on comparisons between each drug-using group and the non-consumer control group. For comparisons involving only two groups (e.g., test vs. control, male vs. female), independent samples t-tests were used. The confidence interval was set at 95%, and a p-value less than 0.05 was considered statistically significant.

3. RESULTS

All pairwise comparisons between drug-using groups and the control group reported as significant were confirmed by Tukey's HSD post-hoc test following a significant one-way ANOVA ($p < 0.05$). Results obtained from the research are presented in frequency tables and charts. The test group showed a significantly lower waist-to-hip ratio (WH-R: 0.82 ± 0.01) compared to the control group (0.86 ± 0.01), primarily driven by a smaller waist circumference, indicating a more favorable fat distribution profile. Significant gender differences were also observed, with females exhibiting a lower neck circumference and lower WH-R than males, consistent with expected biological patterns; however, the waist-to-height ratio (WHt-R) was identical (0.19 ± 0.00) across both groups and genders (Table 1).

Groups combining marijuana (MJ) with other substances (particularly NIC, RNL, SWL, COD, and TRM) consistently showed significantly lower waist-to-hip ratios (WH-R: $0.79 - 0.82$) compared to non-consumers (0.86), suggesting altered fat distribution favoring reduced abdominal adiposity; this effect was strongest in the MJ+NIC group (0.79) and most complex combination (MJ+NIC+COD+SWL+RNL+TRM: 0.80), and was primarily driven by lower waist circumferences (e.g., 30.48 cm in the latter group vs. 33.05 cm in non-consumers), while BMI, hip circumference, neck circumference, and WHt-R remained statistically comparable across all groups (Table 2).

The anthropometric parameters showed that the weekly and daily drug users, as well as all groups with a history of illicit drug consumption (1-3 years, 4-6 years, >6 years), exhibited significantly lower waist-to-hip ratios (WH-R) compared to non-consumers, accompanied by progressively lower waist circumferences, suggesting a consistent pattern of reduced abdominal adiposity linked to both increased frequency and duration of use, while BMI, hip circumference, neck circumference, and waist-to-height ratio (WHt-R) remained largely unchanged (Table 3).

Based on the hepatic function markers, all groups with illicit drug consumption (1-3 years, 4-6 years, >6 years) exhibited significantly elevated levels of liver enzymes AST (peaking at 29.92 ± 1.62 IU/l in 1-3 years) and ALT (peaking at 24.55 ± 1.26 IU/l in 1-3 years) compared to non-consumers (AST: 22.93 ± 0.78 IU/l; ALT: 18.94 ± 0.72 IU/l), indicating persistent liver stress or injury across all durations of use, with the most pronounced enzyme elevation occurring in the earliest phase (1-3 years); however,

Table 1: Participants' demographic and anthropometric variables according to participants' distribution.

Anthropometric Variables	Participants' distribution	
	Control Group	Test Group
BMI (Kg/m ²)	24.08 ± 0.54	24.50 ± 0.71
HIP-C (cm)	38.63 ± 0.52	39.09 ± 0.51
WAIST-C (cm)	33.05 ± 0.53	31.98 ± 0.56
NECK-C (cm)	15.08 ± 0.15	14.99 ± 0.15
WH-R	0.86 ± 0.01	0.82 ± 0.01*
WHt-R	0.19 ± 0.00	0.19 ± 0.00
Anthropometric Variables	Gender distribution	
	Female	Male
BMI (Kg/m ²)	24.79 ± 0.41	24.05 ± 0.63
HIP-C (cm)	39.78 ± 0.35	38.42 ± 0.50
WAIST-C (cm)	32.12 ± 0.43	32.70 ± 0.53
NECK-C (cm)	14.53 ± 0.15*	15.27 ± 0.13*
WH-R	0.81 ± 0.01*	0.85 ± 0.01*
WHt-R	0.19 ± 0.00	0.19 ± 0.00

* Significantly different from control (p<0.05). Mean ± SEM. BMI – Body Mass Index, HIP-C Hip circumference, WAIST-C = Waist circumference, NECK-C = Neck circumference, WH-R = Waist-Hip Ratio, WHt-R = Waist–Height Ratio.

Table 2: Anthropometric parameters of subjects based on the type of illicit drugs consumed (Mean ± SEM).

Anthropometric parameters	BMI (Kg/m ²)	HIP-C (cm)	WAIST-C (cm)	NECK-C (cm)	WH-R	WHt-R
Non-Consumers	24.08 ± 0.54	38.63 ± 0.52	33.05 ± 0.53	15.08 ± 0.15	0.86 ± 0.01	0.19 ± 0.00
MJ only	27.00 ± 3.55	38.75 ± 2.06	33.25 ± 2.18	15.13 ± 0.44	0.85 ± 0.01	0.20 ± 0.02
MJ + COD	23.89 ± 0.00	37.50 ± 0.00	32.00 ± 0.00	16.00 ± 0.00	0.85 ± 0.00	0.17 ± 0.00
MJ + NIC	26.44 ± 2.18	39.33 ± 0.83	31.17 ± 0.17	14.67 ± 0.33	0.79 ± 0.01*	0.18 ± 0.01
MJ + RNL + SWL	24.23 ± 0.85	39.54 ± 0.64	32.54 ± 1.24	14.92 ± 0.26	0.82 ± 0.02*	0.19 ± 0.01
MJ + NIC + COD + SWL	23.37 ± 0.79	39.40 ± 0.75	32.28 ± 0.82	16.00 ± 0.55	0.82 ± 0.01*	0.18 ± 0.01
MJ + NIC + COD + SWL+ RNL	23.59 ± 1.45	40.50 ± 2.02	32.50 ± 0.87	14.50 ± 0.29	0.81 ± 0.02*	0.19 ± 0.01
MJ + NIC + COD + SWL+ RNL+ TRM	23.44 ± 0.67	38.33 ± 1.03	30.48 ± 0.75	14.71 ± 0.26	0.80 ± 0.01*	0.18 ± 0.00

Table 3: Anthropometric parameters

Anthropometric parameters	Frequency of drug consumption			
	Non-Consumers	Occasionally	Weekly	Daily
BMI (Kg/m ²)	24.08 ± 0.54	24.85 ± 1.84	25.47 ± 1.26	23.78 ± 0.42
HIP-C (cm)	38.63 ± 0.52	38.50 ± 1.05	39.56 ± 0.84	39.35 ± 0.72
WAIST-C (cm)	33.05 ± 0.53	32.28 ± 1.22	32.06 ± 1.55	31.71 ± 0.44
NECK-C (cm)	15.08 ± 0.15	15.25 ± 0.23	14.67 ± 0.29	14.93 ± 0.25
WH-R	0.86 ± 0.01	0.84 ± 0.01	0.81 ± 0.03*	0.81 ± 0.01*
WHt-R	0.19 ± 0.00	0.19 ± 0.01	0.19 ± 0.01	0.19 ± 0.00
Anthropometric parameters	Duration of illicit Drug consumption			
	Non-Consumers	1-3 years	4-6 years	> 6years
BMI (Kg/m ²)	24.08 ± 0.54	26.02 ± 1.79	24.23 ± 0.71	23.12 ± 0.62
HIP-C (cm)	38.63 ± 0.52	39.88 ± 1.02	39.32 ± 0.70	38.03 ± 0.84
WAIST-C (cm)	33.05 ± 0.53	33.41 ± 1.38	31.35 ± 0.54	31.05 ± 0.49
NECK-C (cm)	15.08 ± 0.15	15.25 ± 0.25	15.00 ± 0.30	14.70 ± 0.23
WH-R	0.86 ± 0.01	0.83 ± 0.02*	0.80 ± 0.01*	0.82 ± 0.01*
WHt-R	0.19 ± 0.00	0.20 ± 0.01	0.18 ± 0.00	0.18 ± 0.00

* Significantly different from control (p<0.05). Mean + SEM

Table 4: Hepatic Function Markers of subjects according to Duration of Illicit Drug Consumption.

Biomarkers	Non-Consumers	1-3 years	4-6 years	> 6years
AST (IU/l)	22.93 ± 0.78	29.92 ± 1.62*	28.23 ± 1.76*	26.77 ± 1.49*
ALT (IU/l)	18.94 ± 0.72	24.55 ± 1.26*	23.48 ± 1.48*	23.91 ± 1.44*
ALB (IU/l)	9.09 ± 0.84	10.65 ± 2.28	9.96 ± 2.59	9.40 ± 2.32

Table 5: Hepatic Function Markers of subjects according to the type of illicit drugs consumed.

Variables	Biomarkers (IU/l)		
	Aspartate transaminase	Alanine transaminase	Albumin
Non-Consumers (Control)	22.93 ± 0.78	18.94 ± 0.72	9.09 ± 0.84
MJ only	32.02 ± 2.25*	25.55 ± 1.09*	6.29 ± 2.25
MJ + COD	30.93 ± 0.00*	23.01 ± 0.00*	4.07 ± 0.00
MJ + NIC	30.30 ± 5.24*	25.49 ± 2.97*	12.41 ± 8.76
MJ + RNL + SWL	26.69 ± 1.75*	21.75 ± 1.66*	10.36 ± 2.61
MJ + NIC + COD + SWL	31.51 ± 3.06*	24.09 ± 2.44*	10.42 ± 4.15
MJ + NIC + COD + SWL+ RNL	23.18 ± 2.95*	21.76 ± 3.60*	11.16 ± 4.90
MJ + NIC + COD + SWL+ RNL+ TRM	27.24 ± 1.40*	25.65 ± 1.58*	11.52 ± 2.94

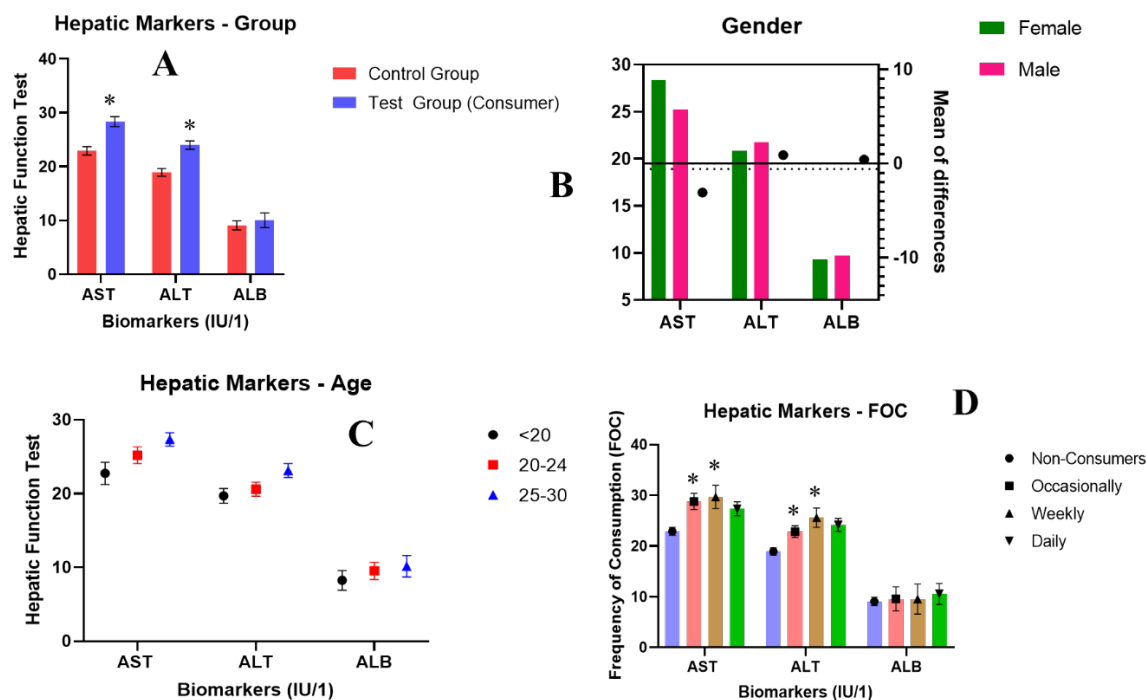


Figure 1: Hepatic Function Markers in Control and Test Groups (A), Gender (B), age distribution in years (C), and according to frequency of drug Consumption (D). Significantly different from control ($p < 0.001$). Mean + SEM, AST = Aspartate transaminase, ALT = Alanine transaminase, ALB = Albumin

albumin (ALB) levels remained statistically unchanged across all groups (Table 4).

The test group (drug consumers) exhibited significantly elevated AST and ALT levels compared to non-consumers, indicating drug-associated liver stress, while albumin (ALB) levels remained unchanged (Figure 1A). Both male and female drug consumers showed significantly higher AST and ALT levels than non-consuming controls, confirming consistent hepatic stress across genders without significant gender-based differences in enzyme elevation, and albumin levels remained stable (Figure 1B). All age groups of drug consumers (<20, 20-24, 25-30 years) demonstrated significantly elevated AST and ALT versus non-consumers, with no clear age-dependent pattern in enzyme levels, and albumin remained consistent across age cohorts (Figure 1C). Weekly and daily drug consumers displayed significantly higher AST and ALT than non-consumers, indicating frequency-dependent liver stress, while occasional users showed no significant differences, and albumin levels were unaffected across all consumption frequencies (Figure 1D).

All groups consuming illicit drugs, whether marijuana (MJ) alone or in combination with other substances like codeine (COD), nicotine (NIC), tramadol (TRM), Rohypnol (RNL), or shisha/hookah (SWL), exhibited significantly elevated levels of liver enzymes AST (22.93 ± 0.78 vs. 23.18 – 32.02 IU/l) and

ALT (18.94 ± 0.72 vs. 21.76 – 25.65 IU/l) compared to non-consumers, indicating consistent drug-induced hepatic stress regardless of substance complexity, with the MJ-only group already showing substantial enzyme elevation (AST: 32.02 ± 2.25 ; ALT: 25.55 ± 1.09); however, albumin levels exhibited no statistically significant changes despite high variability across groups (e.g., 4.07 ± 0.00 in MJ+COD vs. 12.41 ± 8.76 in MJ+NIC).

4. DISCUSSION

This study also revealed that consumption of illicit drugs does not appear to alter serum albumin levels. From the results, it was observed that based on the distribution of participants, there was a significant decrease in the Waist-Hip Ratio (WH-R) of consumers of illicit drugs compared to the control ($p < 0.05$). Irrespective of type or combination, there was a significant decrease in the Waist-Hip Ratio (WH-R) of consumers of illicit drugs compared to the control ($p < 0.05$). In both sexes, consumption of illicit drugs caused significant decreases in the Neck circumference (NECK-C) and Waist-Hip Ratio (WH-R) ($p < 0.05$). Irrespective of consumption frequency, illicit drugs caused a significant decrease in the Waist-Hip Ratio (WH-R) for daily and weekly consumers of illicit drugs compared to the control ($p < 0.05$). Irrespective of consumption duration, there was a significant decrease in the Waist-Hip Ratio (WH-R) in comparison with

the control group ($p < 0.05$). Based on the distribution of participants, consumers of illicit drugs indicated a significant increase in aspartate transaminase and alanine transaminase levels compared to the control ($p < 0.05$). Irrespective of consumption frequency, illicit drugs caused a significant increase in the levels of aspartate transaminase and alanine transaminase compared to the control ($p < 0.05$). Irrespective of consumption duration, there was a significant increase in the levels of alanine transaminase; however, there was a significant increase in aspartate transaminase for the 1- 3 years and 4- 6 years consumers in comparison with the control group ($p < 0.05$). Irrespective of type or combination, there was a significant increase in the aspartate transaminase and alanine transaminase levels, but there was no significant effect on the level of albumin in consumers of illicit drugs compared to the control ($p < 0.05$).

The study found a significant decrease in the Waist-Hip Ratio (WH-R) among consumers of illicit drugs compared to the control group, regardless of the type, combination, frequency, or duration of drug use. This reduction in WH-R was observed in both sexes and across different patterns of drug use. Illicit drug use can lead to weight loss and reductions in fat mass due to decreased appetite, increased metabolism, or muscle wasting (Reece et al., 2015). This may be responsible for the observed decrease in the Anthropometric parameters. Significant increases in aspartate transaminase (AST) and alanine transaminase (ALT) levels were observed, regardless of the type, combination, frequency, or duration of drug use. Illicit drugs possibly cause liver damage, inflammation, steatosis, and fibrosis, as evidenced by elevated AST and ALT enzymes (Vento & Cainelli, 2020; Friedman et al., 2018). Variability in albumin levels among drug users may be due to factors like preserved albumin synthesis until liver disease, suggesting illicit drug users may not have reached critical damage thresholds (Schuppan & Afdhal, 2008).

Beyond statistical significance, the observed elevations in AST and ALT (AST rising from ~ 23 IU/l in controls to ~ 30 IU/l in 1–3-year users) are clinically relevant. Although these values remain below the typical threshold for severe liver injury (often > 200 IU/l), persistent elevations of 1.3–1.5 times the upper normal limit in otherwise healthy young adults may indicate early subclinical hepatic stress or mild drug-induced liver injury (DILI). Such changes warrant routine liver function monitoring in students with known drug use, as they could progress to more significant injury with continued use or when combined with other hepatotoxic agents such as

alcohol, certain medications, etc. The finding that albumin levels remained normal suggests that synthetic function is preserved, implying that liver injury is currently mild or compensated. The consistently lower waist-to-hip ratio in drug users, while statistically significant, has uncertain clinical meaning; a lower WH-R is generally cardioprotective, but if driven by weight loss from appetite suppression or neglect of nutrition, it may signal an underlying health risk rather than a benefit. Clinicians should therefore interpret a low WH-R in drug users cautiously and assess nutritional status concurrently. Finally, the lack of significant differences between occasional users and controls suggests that harm reduction strategies focusing on reducing frequency of use may have measurable clinical benefits.

5. CONCLUSION

Drug users showed minor differences in anthropometric measurements when compared to the control group. Anthropometric variations were found to be influenced by various types of drugs, with marijuana users having higher body mass index (BMI), hip circumference, and waist circumference. Body mass index (BMI) and drug frequency were found to be significantly correlated, particularly among individuals who use drugs every week. The higher levels of aspartate transaminase and alanine transaminase among consumers suggest a possible liver strain caused by illicit drug use. Implementation of health education campaigns would help people realize the negative effects that substance use may have on body processes, especially the liver. Also, tailored therapy methods should be established based on the specific illicit drug combinations being consumed. Gender-specific therapies should be designed to meet the distinct needs and vulnerabilities of both male and female drug users. Longitudinal research is vital for gaining a more thorough understanding of the complicated relationship between drug intake and health effects. Finally, irrespective of the type or combination of illicit drugs consumed, there was a significant decrease in the Waist-Hip Ratio (WH-R) with a significant increase in the aspartate transaminase and alanine transaminase.

Acknowledgement

There is no acknowledgment

Funding

Nil.

Conflict of Interest

None declared.

Ethical Statement

In accordance with international or university standards, written ethical approval has been obtained and retained by the author(s).

Declaration of Generative AI

No artificial intelligence (AI) tools were used in the preparation of this manuscript

REFERENCES

- Aaseth, J., Ellefsen, S., Alehagen, U., Sundfor, T. M., & Alexander, J. (2021). Diets and drugs for weight loss and health in obesity - An update. *Biomedicine & Pharmacotherapy*, 140, 111789. <https://doi.org/10.1016/j.biopha.2021.111789>
- Cicchetti, D., & Handley, E. D. (2019). Child maltreatment and the development of substance use and disorder. *Neurobiology of Stress*, 10, 100144. <https://doi.org/10.1016/j.ynstr.2018.100144>
- Clinton, J. W., Kiparizoska, S., Aggarwal, S., Woo, S., Davis, W., & Lewis, J. H. (2021). Drug-induced liver injury: Highlights and controversies in the recent literature. *Drug Safety*, 44, 1125–1149. <https://doi.org/10.1007/s40264-021-01109-4>
- Di Pasqua, L. G., Cagna, M., Berardo, C., Vairetti, M., & Ferrigno, A. (2022). Detailed molecular mechanisms involved in drug-induced non-alcoholic fatty liver disease and non-alcoholic steatohepatitis: An update. *Biomedicines*, 10(1), 194. <https://doi.org/10.3390/biomedicines10010194>
- Fischer, B., Blanken, P., Da Silveira, D., Gallassi, A., Goldner, E. M., Rehm, J., et al. (2015). Effectiveness of secondary prevention and treatment interventions for crack-cocaine abuse: A comprehensive narrative overview of English-language studies. *International Journal of Drug Policy*, 26(4), 352–363. <https://doi.org/10.1016/j.drugpo.2015.01.002>
- Friedman, H., Newton, C., Klein, T. W., & Friedman, H. (2018). Microbial infections, immunomodulation, and drugs of abuse. *Clinical Microbiology Reviews*, 29(4), 897–929. <https://doi.org/10.1128/cmr.16.2.209-219.2003>
- Garcia-Cortes, M., Robles-Diaz, M., Stephens, C., Ortega-Alonso, A., Lucena, M. I., & Andrade, R. J. (2020). Drug-induced liver injury: An update. *Archives of Toxicology*, 94, 3381–3407. <https://doi.org/10.1007/s00204-020-02885-1>
- Idowu, A., Aremu, A. O., Olumide, A., & Ogunlaja, A. O. (2018). Substance abuse among students in selected secondary schools of an urban community of Oyo State,

South West Nigeria: Implications for policy action. *African Health Sciences*, 18(3), 776–785. DOI: 10.4314/ahs.v18i3.36

- Kashimawo, A. J., Emmanuel, M. E., & Bunu, S. J. (2025). Qualitative determination of sildenafil and tadalafil adulterants in selected herbal aphrodisiac products. *International Journal of Traditional and Complementary Medicine*, 8(5), 64–71. <https://doi.org/10.36348/sitcm.2025.v08i05.002>
- Mahboub, N., Rizk, R., Karavetian, M., & de Vries, N. (2021). Nutritional status and eating habits of people who use drugs and/or are undergoing treatment for recovery: A narrative review. *Nutrition Reviews*, 79(6), 627–635. <https://doi.org/10.1093/nutrit/nuaa095>
- Reece, A. S., & Hulse, G. K. (2014). Impact of lifetime opioid exposure on arterial stiffness and vascular age: Cross-sectional and longitudinal studies in men and women. *BMJ Open*, 4(6), e004521. <https://doi.org/10.1136/bmjopen-2013-004521>
- Roque, B. R., Faria, A. C., Brito-da-Costa, A. M., Carmo, H., Mladěnka, P., Dias da Silva, D., et al. (2022). Cocaine: An updated overview on chemistry, detection, biokinetics, and pharmacotoxicological aspects, including abuse pattern. *Toxins*, 14(4), 278. doi: 10.3390/toxins14040278.
- Roy, D. N., & Goswami, R. (2016). Drugs of abuse and addiction: A slippery slope toward liver injury. *Chemico-Biological Interactions*, 255, 92–105. <https://doi.org/10.1016/j.cbi.2015.09.018>
- Schuppan, D., & Afdhal, N. H. (2008). Liver cirrhosis. *The Lancet*, 371(9615), 838–851. DOI: 10.1016/S0140-6736(08)60383-9
- Sebastiani, G., Borrás-Novell, C., Alsina, C. M., Pascual, T. M., Ferrero, M. S., Gómez, R. M. D., et al. (2018). The effects of alcohol and drugs of abuse on the maternal nutritional profile during pregnancy. *Nutrients*, 10(8), 1008. doi: 10.3390/nu10081008
- Tur, J. A., & Bibiloni, M. D. M. (2019). Anthropometry, body composition and resting energy expenditure in humans. *Nutrients*, 11(8), 1891. doi: 10.3390/nu11081891.
- United Nations Office on Drugs and Crime. (2023). *World drug report 2023*. https://www.unodc.org/res/WDR-2023/WDR23_Exsum_fin_DP.pdf
- Vento, S., & Cainelli, F. (2020). Acute liver failure in low-income and middle-income countries. *The Lancet Gastroenterology and Hepatology*, 8(11), 1035–1045. DOI: 10.1016/S2468-1253(23)00142-5
- Wang, J., Thornton, J. C., Kolesnik, S., & Pierson, R. N., Jr. (2000). Anthropometry in body composition: An overview. *Annals of the New York Academy of Sciences*, 904, 317–326. <https://doi.org/10.1111/j.1749-6632.2000.tb06474.x>
- Yenagoa, K. K., Bunu, S. J., & Bunu, M. E. (2024). Correlates and modalities of tackling substance abuse among tertiary and secondary school students in Bayelsa State. *Mathews Journal of Pharmaceutical Science*, 8(2), 1–9.