EVALUATING THE KNOWLEDGE AND PRACTICE ON THE USE OF STIMULANTS BY UNIVERSITY STUDENTS

BY

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MAT NO: BMS1609369

DEPARTMENT OF MEDICAL BIOCHEMISTRY

SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN

BENIN CITY

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THIS PROJECT IS SUBMITTED TO THE DEPARTMENT OF MEDICAL BIOCHEMISTRY, SCHOOL OF BASIC MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A BACHELOR OF MEDICAL BIOCHEMISTRY DEGREE (B.sc.Hons) IN MEDICAL BIOCHEMISTRY

JULY, 2021.

CERTIFICATION

We the undersigned hereby certify that this research work was carried out by IGBINADOLOR PRECIOUS I of the department of medical Biochemistry, Basic medical sciences, University of Benin, Benin city and we approved that

the research work was adequate both in scope and quality for the award of Bachelor of science Degree (B.sc) in medical Biochemistry.

Signed:

_____ _____

Dr. E.F. Omorowa. **Date**

Project supervisor

_____ _____

Prof. A, A. Omonkhua. **Date**

Head of department

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Date

External Examiner

DEDICATION

This project work is dedicated to Almighty God for giving me wisdom, knowledge and courage that kept me throughout my studies in the University of Benin, to my late dad, Chief. Engr Sunday Nosakhare Igbinadolor and to my Mom Mrs. Doris Igbinadolor.

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To my project supervisor Dr, E.F Omorowa for his guidance and advice and above all, for the time he took in going through my work over and over again to make sure that it is in order, I really appreciate all your efforts sir, and to my HOD Prof. A. A. Omonkhua and the entire staff of the department, I say thank you. My sincere appreciation goes to my parents, my late dad cheif engr. Sunday Nosakhare Igbinadolor and my mom Mrs Doris Igbinadolor, I love and cherish every effort that

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ABSTRACT

Stimulants are a major constituent of psychoactive substances. They cause several untoward effects; including academic difficulty which can lead to untoward consequences for students. The understanding of the knowledge and pattern of use of stimulant will help in its prevention and control. Thus, this study intended to investigate the knowledge and practice and current prevalence rates of stimulant use, using the undergraduate students in the university of Benin as case study, age and gender of students as well monthly income and how they got to know about stimulants, specific type of stimulant used and reason for using stimulants. The instrument consisted of sociodemographic variables and the stimulant knowledge section, benefits, health effects and effects section of Questionnaire for Student Drug Use Survey. It was administered on 100 undergraduate students of University of Benin selected by random technique. The current prevalence rates of stimulant use were 61%, 54% and 50% respectively for the use caffeine, alcohol and cannabis. The majority (77%) of our respondents were in the age range of 21-25. Only 2% of our respondents were married. Therefore, efforts at curtailing the use of stimulants must start early; incorporating such strategy into primary school curriculum will be worthwhile. There

is need to focus more on common stimulants like coffee, Kola nut, caffeinated energy drinks. Students need to study without using stimulants.

CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

1.0 Introduction

Educators throughout Nigeria have remained relentless in their continuous strive to find ways and means of improving the Nigerian child in character as well as in learning; in body and in spirit so as to become more useful to himself and to the larger society. But drug abusecontinues to present a problem which learning institution must address. This is because there has been an overwhelming increase in the abuse of substances among students in higher

institutions. Students in this, context refers to male and female or boys and girls in institution of learning. Over 100, 000 students were abusing substances out which 85, 000 were girls in Nigeria (Akinyemi, 2008). A baseline survey on drug and substance abuse, National Drug Law Enforcement Agency (NDLEA) commissioned by the Federal Government of Nigeria to campaign against drug abuse revealed that more than fifty percent (50%) of university students are drug addict in Nigeria, National Drug Law Enforcement Agency (NDLEA, 2003). Haladu (2003) in South – South and North West geo – political zone, that more than 22.7% of the primary school children are taking alcohol, a figure that rises to 57.9% in secondary schools and to 68% among university students. A large number of students across all age groups have been exposed to alcohol, tobacco, miraa (Khat), glue, bhang (Marijuana), and even hard substances such as heroin and cocaine. The practice has resulted to a number of negative effects in their academic performance and other mal-adjustive behaviour such as truancy, theft of library materials, rudeness, dropouts, injuries, loss of lives, destruction of properties, draining away of morals, misallocation of resources, indiscipline, examination malpractice, cultism and compromised academic standards amongst others. The effect of this drug abuse among Nigerian students has also been associated with the loss memory, loss of our societal values and ideals (Adewuya, 2005). Drugs alter the normal biological and psychological functioning of the body, especially the central nervous system (Alan, 2003). Majority of the Nigerian youths ignorantly depend on one form of drug or the other which has bastardized their interest in effective use of library thereby affecting their academic performance. Academic library as we all know is an integral part of the university. And as stated in the national policy on education, one of the goals of university education is to acquire both physical and intellectual skills which will enable individuals to become self-reliant and useful members of the society, Federal Government of Nigeria (FGN, 2004).To this effects, experts have identified major causes of drug abuse as; peer pressure, weak

parental control, child abuse, imitation, emotional stress, the availability of the drugs and the ineffectiveness of the laws on drug trafficking. On imitation, it is a sad pity that Nollywood artistes have not set good example to Nigerian youths seen the way and manner some of our actors and musicians unnecessarily abuse drugs in their films and in reality. Alli (2006) and Ojikutu (2010), revealed that the common reasons for drug abuse amongst university students in Nigeria are mostly out of curiosity and acceptance by friends (peer pressure). A study by Abdulihi (2009) showed that peer pressure was responsible for youths' consumption of drugs for the purpose of stimulating appetite for food. Abduh-Raheem (2013) argued that the very high rate of alcohol use and abuse among students in tertiary institutions in Nigeria began from their childhood or early adolescence. At this times youth, including students, who hawk for their parents, are themselves exposed to substance abuse. Some youths will experiment and stop, or continue to use occasionally without significant problems. Others will develop addiction, moving on to more dangerous drugs and causing significant harm to themselves and the society at large. So, drug abuse has far reaching effects on the progress and aspiration of the students. It determines how far the Students can benefit from available opportunities provided by the school, the government and the community. The most unfortunate victims of these drugs are student whose age is usually between the ages of 15 years and 18 years old (WHO Report, 2009). Regrettably, research works have shown that most poor academic performance of university students are caused by drugs abuse not because the lecturers are bad or are not teaching but because many students are drugs addict and lack effective use of library. Abdu-Raheem (2013) in a study conducted titled Sociological Factors to drug abuse and the effects on students' academic performance in Ekiti and Ondo states, Nigeria. The study examined the influence of drug abuse on students in relation to their family background, family cohesion, peer group influence, and students' academic performance. Four hypotheses were formulated to guide the study. The population comprised all secondary school students

in Ekiti and Ondo states, while the sample consisted of 460 students. Descriptive survey design was used. The instruments used for data collection was a self – designed questionnaire called Drug Abuse Questionnaire (DAQ). The data collected were analyzed using Pearson Moment Correlation Analysis. The study found out that there was significant relationship between family background, peer influence, family cohesion, and drug abuse. It was also discovered that drug abuse negatively affects students' academic performance in Ekiti and Ondo states. In another study conducted by Olley (2008), titled Drug Abuse in Nigerian Schools in Bayelsa state, south-south, Nigeria. The study aims to explore the perception of public institutions' students around drugs and substance abuse and how these perceptions influence their behaviours. It was conducted in three institutions in Bayelsa State, descriptive survey research design was adopted. Three research questions and three null hypotheses guided the study. The population of the study was 27800 and samples of 1390 students were used. A validated questionnaire was used to collect relevant data. The data obtained was analyzed using Measures of central tendency and t-test statistics. The findings of this study revealed that the perceptions of the students with regards to drugs and substance abuse contributed negatively to their behavior in schools. Therefore, the war against drug abuse, to save the nations battered image must therefore be fought from homes to all corners of the federation not minding whose ox is gored or who might be exposed in the process. Social workers in particular, have been working relentlessly to provide solutions to the problems posed by drug abuse. To this end, several explanationson the causes, effects, as well as recommendations are made by different scholars to see that drug abuse could at least be reduced in the society. But since the aim has not been fully accomplished, the need for more research work on the problem becomes more imperative coupled with the facts that the Social, Economic, Political, and academic lives of drug users in both rural and urban areas are at risk. Based on this, drug abuse amongst young people should be a matter of concerns to all

Nigerians especially the government, school heads, the leaders of various religious groups and the NGOs. This study therefore aimed at investigating the knowledge and use of drugs among Medical Biochemistry students in university of Benin.

1.1 Background Of The Study

The issue of stimulant use has always been an international problem because it has never been possible to confine drugs to their place of origin. “The scale of global drug problems generated concern as long ago as 1909 when the first international Drug conference was convened in Shanghai. Since then, there has been an extensive international program of legislation, lately under the auspices of the United Nations. In Nigeria, the problem initially came to the attention of research and health care exerts as far back as the early 1960s. The menace of “area boys” across the towns and cities, problems of armed robbery, delinquency among students in institutions of learning, especially students of higher learning, indiscriminate violence in social amusement parks, disloyalty to age mates, elders, parent and even constituted authority by breaching its laws and orders, are some of the social vices which may be related to drug misuse/abuse. Ignorance among the populace and lack of awareness on the use of various drugs and their effects on the body give room for self medication may lead to drug abuse.

This is obvious as health education program is not mandatory in secondary and University curriculum and neither is it taught to community at large? This is the work of health personnel in the ministries of education to inculcate health awareness and wholesome health practice especially regarding drugs, drugs usage and their effects. There is also the proliferation of patient medicine stores where any type of drugs can be bought whether such drugs are supposed to be over -the - counter drugs or prescription types, and at times those dispensing the drugs lack necessary training and experience in line with pharmaceutical security - risks to the health of the populace through the possibility of drug misuse and abuse. The peer - group influence is also counted among possible reasons that play a vital role in drug problems of a nation. University students are seen moving about in-groups both at school and outside the school. Most of the time their ambition is centered how to defy school and home

norms and the most available medium by which they can do this is through the use of drugs (stimulants) which give them added coverage to achieve their aims. These reasons and many other factors lead to an indiscriminate use of drugs. Hence, the need for guidance and counseling in schools should be made compulsory. In addition, it is expected that drug education would be considered as part of the curriculum for secondary school and universities. As technology improves man discovers the pharmaceutical knowledge of investing drugs and testing its effects. Thus, the effect to state the various effect of drugs, and using such terms as side effect or adverse effect, overdose, underdose, abuse, dependence and host of other jargons.

Drugs have been used for pleasure, social, religious, and medical purpose. It is man's continuing desire to find cure for all the illness that afflicts him, that had lead to the invention and discovery of more drugs. The interaction of the agent (drug) 'host (individual) and the environment (society culture) determine the drug-taking behavior in secondary school and most of the higher institution of learning. The drug-taking problem must be viewed in its psychological and social cultural context.

1.2 Statement Of The Problem

In Nigeria today there is a prevalence of drug/substance abuse, which increase at alarming rate requiring an urgent approach to rectify the problem. Frequent crisis in higher institutions with activities rampaging in the higher institutions has all been linked to students who take to drugs.

These problems which cut across age groups 10 - 40 and that mostly the youth especially students are involved since the youth are the future leaders, they will replace the older one and whatever the characteristics they develop now will manifest in the future.

1.3 Objectives of the Study

This research work, is particularly aimed at investing knowledge and use of drug stimulant drugs among undergraduate students of Medical Biochemistry, University of Benin. Specifically the objectives of the research work are:

1. To determine students' knowledge of stimulants.

2. To identify the types of stimulant substances commonly used among students in this vicinity of learning.

3. To identify factors responsible for drug abuse among university students.

4. To assess students' knowledge of the health effects /implications of stimulant use .

1.4 Significance Of The Study

This study will serve as eye opener to some of the problems of students, and when the cause of a problem is known, finding a solution is easier. The study will also expose some of the major sources of drugs students use and this will help to find a way to block such. The research will be useful to guidance counseling who come in contact with these students. It will also be useful to the government in making laws and policies that will help in terminating this social menace. It will also help the student to know the dangers in drug abuse thereby helping them to desist from it bearing in mind the sorry state of the drug abusers and what they stand to lose and face in the near future. There is a serious need for everyone to join hands in finding lasting solution to this man - made menace. In order to have more policy relevance, research like this one is important because school mirrors the society, and what is taking place in the school usually get worsen in the society. So, there is the need to address this issue from the concept of undergraduates.

1.6. Literature Review

Stimulants (also often referred to as psychostimulants or colloquially as uppers) is an overarching term that covers many drugs including those that increase activity of the central nervous system and the body, drugs that are pleasurable and invigorating, or drugs that have sympathomimetic effects. Stimulants are widely used throughout the world as prescription medicines as well as without a prescription (either legally or illicitly) as performance-enhancing or recreational drugs. The most frequently prescribed stimulants as of 2013 were lisdexamfetamine, methylphenidate, and amphetamine (US Pharmaceutical Statistics, 2013). It was estimated in 2015 that the percentage of the world population that had used cocaine during a year was 0.4%. For the category "Amphetamines and prescription stimulants" (with "amphetamines" including amphetamine and methamphetamine) the value was 0.7%, and for Ecstasy 0.4% (World Drug Report, 2013).

1.6.1 Medical Uses of Stimulants

Stimulants have been used in medicine for many conditions including obesity,, sleep, mood disorders, impulse control disorders, asthma, nasal congestion and, in case of cocaine, as local anaesthetics (Harper et al, 2006). Drugs used to treat obesity are called anorectics and generally include drugs that follow the general definition of a stimulant, but other drugs such as cannabinoid receptor antagonists also belong to this group. Eugeroics are used in management of sleep disorders characterized by excessive daytime sleepiness, such as narcolepsy, and include stimulants such as modafinil. Stimulants are used in impulse control disorders such as ADHD (Attention- Deficit Hyperactive Disorder) and off-label in mood disorders such as major depressive disorder to increase energy, focus and elevate mood.

Stimulants such as epinephrine, theophylline and salbutamol orally have been used to treat asthma, but inhaled adrenergic drugs are now preferred due to less systemic side effects. Pseudoephedrine is used to relieve nasal or sinus congestion caused by the common

cold, sinusitis, hay fever and other respiratory allergies; it is also used to relieve ear congestion caused by ear inflammation or infection.

1.7 Patterns of Drug Use in Nigeria

1.7.1 Gender and drug use

Most research has revealed a greater rate of substance use among males compared to females, with males twice as likely as women to meet the criteria for any substance use disorder and three times more likely to abuse alcohol (Conwayetal. ,2006; Grantetal., 2004).Males are more likely than females to report marijuana and alcohol use, whereas females are more likely than males to report non-medical use of prescription drugs (Cotto et al.,2010). Previously, the non-medical use of prescription drugs was documented to be similar in both genders (Substance Abuse and Mental Health Services Administration (SAMHSA),2005). Among students, the trend seems to be the same with psychoactive substance use reported to be more common among male undergraduates in Nigeria (Adeyemo, 2016). Rates of cannabis and tobacco (smoked) use are much greater among male students. A study by Ekwueme and Chukwuneke (2010) had no record of female use of cannabis while Oye-Adeniran *et al.* (2014), reported a rate of 1%. Alcohol use has been revealed to be greater among male students but some studies have shown a greater use of alcohol among female students (Johnson *et al*., 2017). These differences are most likely due to the cultural differences between the regions studied.

Proportionally, more men than women have used drugs in Nigeria. In the past year, one in four drug users in Nigeria is a woman. While men are seven times more likely than women to use cannabis, the gender difference in the non-medical use of pharmaceutical opioids-such as tramadol, codeine, and morphine, tranquilizers and cough syrups containing codeine or

dextromethorphan is less pronounced. Men are also more likely than women to be high-risk drug users, including those who inject drugs (Johnsonetal.,2017).

1.7.2 Age and drug use

While the use of drugs is observed among all age groups in Nigeria, overall past-year use of most drug types is high among young people within the age brackets of 25 and 39 years. This is true for cannabis as well as for non-medical use of prescription opioids (tramadol, codeine, morphine) and cough syrups containing codeine or dextromethorphan. In Nigeria, the burden of drug abuse is on the rise and becoming a public health concern (Pela, 1982). Nigeria, which is the most populous country in Africa, has developed a reputation as a center for drug trafficking and usage mostly among the youth population (Abiodun, 1991). According to the 2018 UNODC report titled “Drug use in Nigeria”, the first large-scale, nationwide national drug use survey in Nigeria, one in seven persons (aged 15–64 years) had used a drug in the past year (UNODC, 2018). Also, one in five individuals who had used drugs in the past year is suffering from drug-related disorders and drug abuse has been a cause of many criminal offences such as theft, burglary, sex work, and shoplifting (UNODC, 2018).

1.8 Commonly Abused Substances

1.8.1 Cannabis

Cannabis is the most commonly used drug in Nigeria with 10.8 per cent (or 10.6 million people) of the adult population reporting use in the past year. Nigeria is among the main countries globally that reported high quantities of cannabis herb seized in 2016 (UNODC, 2018). The extent of cannabis use in Nigeria is comparable to the 2016 UNODC prevalence estimates of cannabis use in West and Central Africa (13.2 per cent). Cannabis use is reported 7 times higher among men than women with past year prevalence estimated at 18.8 percent

among men as compared to 2.6 percent among women. The current mean age of men using cannabis was 34 years while women cannabis users were slightly younger – with a mean age of 31 years. The average age of initiation of cannabis use was 19 years regardless of gender. Thus at present, on average a cannabis user had been using cannabis for nearly 15 years. A typical cannabis user was characterized by having completed senior secondary school and to be in full-time regular employment. Most of the cannabis users were either married (monogamous - 51 per cent) or single (never married - 38 per cent). Nearly one third of people in the general population and two thirds among the high-risk drug users who reported cannabis use in the past year were daily or nearly daily users of cannabis. The average daily expenditure on cannabis in the past 30 days among cannabis users within the general population was ₦363 (Nigerian Naira) - equivalent to USD 1.1522. Considering that the minimum wage of a full time worker in Nigeria is ₦18,000 per month (or USD 57 per month), the average daily expenditure on cannabis use amounts to almost 2 percent of the minimum monthly wage of a full time worker in Nigeria. However, high-risk drug users spent considerably more of their earnings on cannabis per day in the past month, i.e., ₦1,340 or USD 4.25 (UNODC,2018).

Tetrahydrocannabinol (THC) and cannabidiol (CBD) are two types of cannabinoids found naturally in the resin of the marijuana plant, both of which interact with the cannabinoid receptors that are found throughout the body. Although THC and CBD have been the most studied cannabinoids, there are many others identified to date including cannabinol (CBN), cannabigerol (CBG), Cannabidivarin (CBDV), and Tetrahydrocannabivarin (THCV) that can be found within the medical cannabis 10. While both CBD and THC are used for medicinal purposes, they have different receptor activity, function, and physiological effects. If not provided in their activated form (such as through synthetic forms of THC like Dronabinol or Nabilone), THC and CBD are obtained through conversion from their precursors,

tetrahydrocannabinolic acid-A (THCA-A) and cannabidiolic acid (CBDA), through decarboxylation reactions. This can be achieved through heating, smoking, vaporization, or baking of dried unfertilized female cannabis flowers, Ujvary and Hanus (2016).

The Cannabis plant

The cannabis plant has two main subspecies, *Cannabis indica* and *Cannabis sativa,* and they can be differentiated by their different physical characteristics. *Indica*-dominant strains are short plants with broad, dark green leaves and have higher cannabidiol content than the sativa plants in which THC content is higher. *Sativa*-dominant strains are usually taller and have thin leaves with a pale green colour. Due to its higher THC content, *C. sativa* is the preferred choice by users. It is a complex plant with about 426 chemical entities, of which more than 60 are cannabinoid compounds [Dewey, 1986]. The four major compounds are d-9-THC, CBD, d-8-THC and cannabinol, which have been most researched [Pertwee, 1997, 2008; Pamplona and Takahashi, 2012]. In the plant, cannabinoids are synthesized and accumulated as cannabinoid acids, but when the herbal product is dried, stored and heated, the acids decarboxylize gradually into their proper forms, such as CBD or d-9-THC [De Meijer et al. 2003]. Originally it was thought that CBD was the metabolic parent to d-9-THC, but it was later found that its biosynthesis occurs according to a genetically determined ratio [Russo and Guy, 2006]. Even though the chemical structures of all four compounds are similar, their pharmacological effects can be very different. The most researched compounds of the plant are d-9-THC and CBD and therefore we will mainly focus on these two compounds and their differences.

Mechanism of action

The exact mechanism of action of CBD and THC is not currently fully understood. However, it is known that CBD acts on cannabinoid (CB) receptors of the endocannabinoid system,

which are found in numerous areas of the body, including the peripheral and central nervous systems, including the brain. The endocannabinoid system regulates many physiological responses of the body including pain, memory, appetite, and mood. More specifically, CB1 receptors can be found within the pain pathways of the brain and spinal cord where they may affect CBD-induced analgesia and anxiolysis, and CB2 receptors have an effect on immune cells, where they may affect CBD-induced anti-inflammatory processes.

has been shown to act as a negative allosteric modulator of the cannabinoid CB1 receptor, the most abundant G-Protein Coupled Receptor (GPCR) in the body 5. Allosteric regulation of a receptor is achieved through the modulation of the activity of a receptor on a functionally distinct site from the agonist or antagonist binding site. The negative allosteric modulatory effects of CBD are therapeutically important as direct agonists are limited by their psychomimetic effects while direct antagonists are limited by their depressant effects 5.

Metabolism

THC and CBD are metabolized in the liver by a number of cytochrome P450 isoenzymes, including CYP2C9, CYP2C19, CYP2D6 and CYP3A4. They may be stored for as long as four weeks in the fatty tissues from which they are slowly released at sub-therapeutic levels back into the blood stream and metabolized via the renal and biliary systems. The main primary metabolite of CBD is 7-hydroxy-cannabidiol.

Effects of cannabis

1. Psychological effects

The psychoactive effects of cannabis, known as a "high", are subjective and vary among persons and the method of use. When THC enters the blood stream and reaches the brain, it binds to cannabinoid receptors. The endogenous ligand of these receptors is anandamide, the

effects of which THC emulates. This agonism of the cannabinoid receptors results in changes in the levels of various neurotransmitters, especially dopamine and norepinephrine; neurotransmitters which are closely associated with the acute effects of cannabis ingestion, such as euphoria and anxiety. Some effects may include a general alteration of conscious perception, euphoria, feelings of well-being, relaxation or stress reduction, increased appreciation of the arts, including humor and music (especially discerning its various components/instruments), joviality, metacognition and introspection, enhanced recollection (episodic memory), increased sensuality, increased awareness of sensation, increased libido,(Osborne and Fogel, 2009) and creativity. Abstract or philosophical thinking, disruption of linear memory and paranoia or anxiety are also typical. Anxiety is the most commonly reported negative side effect of smoking marijuana. Between 20 and 30 percent of recreational users experience intense anxiety and/or panic attacks after smoking cannabis; however, some report anxiety only after not smoking cannabis for a prolonged period of time. (Medical marijuana and the mind, 2010), Inexperience and use in an unfamiliar environment are major contributing factors to this anxiety. Cannabidiol (CBD), another cannabinoid found in cannabis in varying amounts, has been shown to ameliorate the adverse effects of THC, including anxiety, that some consumers experience(Niesink and Vanlaar, 2013).

2. Somatic effects

Some of the short-term physical effects of cannabis use include increased heart rate, dry mouth, reddening of the eyes (congestion of the conjunctival blood vessels), a reduction in intra-ocular pressure, muscle relaxation and a sensation of cold or hot hands and feet and / or flushed face (Moelker, 2008).

Electroencephalography or EEG shows somewhat more persistent alpha waves of slightly lower frequency than usual, (kalant *et Al*, 1998). Cannabinoids produce a "marked depression

of motor activity" via activation of neuronal cannabinoid receptors belonging to the CB1 subtype (Adersson *et al*, 2005)

3. Cardiovascular effects

Short-term (one to two hours) effects on the cardiovascular system can include increased heart rate, dilation of blood vessels, and fluctuations in blood pressure (Falvo, 2005). There are medical reports of occasional heart attacks or myocardial infarction, stroke and other cardiovascular side effects.[69] Marijuana's cardiovascular effects are not associated with serious health problems for most young, healthy users (Jones, 2002). Researchers reported in the International Journal of Cardiology, "Marijuana use by older people, particularly those with some degree of coronary artery or cerebrovascular disease, poses greater risks due to the resulting increase in catecholamines, cardiac workload, and carboxyhemoglobin levels, and concurrent episodes of profound postural hypotension. Indeed, marijuana may be a much more common cause of myocardial infarction than is generally recognized. In day-to-day practice, a history of marijuana use is often not sought by many practitioners, and even when sought, the patient's response is not always truthful" (Ariana and Williams, 2007).

A 2013 analysis of 3,886 myocardial infarction survivors over an 18-year period showed "no statistically significant association between marijuana use and mortality" (Frost *et al,* 2013).

Cannabis arteritis is a very rare peripheral vascular disease similar to Buerger's disease. There were about 50 confirmed cases from 1960 to 2008, all of which occurred in Europe (Peyrot, *et al*, 2007)

4. Appetite

The feeling of increased appetite following the use of cannabis has been documented for hundreds of years (Mechoulam, 1984). and is known colloquially as "the munchies" in the

English-speaking world. Clinical studies and survey data have found that cannabis increases food enjoyment and interest in food, (As Hoc group of experts, 2007). A 2015 study suggests that cannabis triggers uncharacteristic behaviour in POMC neurons, which are usually associated with decreasing hunger (Devlin, 2015). Endogenous cannabinoids ("endocannabinoids") were discovered in cow's milk and soft cheeses (Dimarzo, et al, 1998). Endo cannabinoids are also found in human breast milk (Fride, *et al*, 2015). Recent research has identified the endogenous cannabinoid system to be the first neural system to display complete control over milk ingestion and neonatal survival (Fride E., 2004).

1.8.2 Opioids: Heroin and Pharmaceutical opioids

Opioids is a generic term applied to opiates and their synthetic analogues with actions similar to those of morphine. Therefore, opioids are commonly used as painkillers, for the treatment of acute and chronic pain, and as an anaesthetic during surgery. Synthetic opioids are structurally diverse, can be extremely potent, and include a variety of substances including a number of fentanyl derivatives, methadone, buprenorphine andAH-7921 (UNODC, 2016). Nationwide, 4.7 percent of the adult population are estimated to be past year users of opioids – this places Nigeria among the countries with high estimates of non-medical opioid use globally. The estimate of past year opioid use is driven predominantly by past year non-medical use of pharmaceutical opioids such as tramadol, codeine or morphine. The majority (85 percent) of people who had misused pharmaceutical opioids in the past year used these orally while over 12 percent had injected pharmaceutical opioids – proportionately more women (20 percent) than men (11.5 percent) had injected pharmaceutical opioids. The mean age of initiation of non-medical use of pharmaceutical opioids was 21 years. On average, the past-year opioid users had regularly used opioids for 12 years. Nearly 80 percent of all opioid users were daily or nearly daily users. The past year prevalence of non-medical use of pharmaceutical opioids (tramadol, codeine, morphine) among those aged 60-64 was also high.

Also, the gender gap in the non-medical use of pharmaceutical opioids was less pronounced as compared to that of cannabis use. These patterns of non-medical use of pharmaceutical opioids among the elderly and among women correspond with findings in other countries. (Cynthia *et al.,* 2010). The non-medical users of pharmaceutical opioids were most likely to be married (monogamous) or single (never married) and to report living rent-free either with friends or family. Past-year users were also more likely to have received vocational education/training, and to be working in part-time employment or doing irregular jobs. On average, among the general population, urban users spent ₦310 NGN (nearly 1 USD) per day in the past 30 days on pharmaceutical opioids compared to ₦190 NGN (USD 0.60) spent per day in the rural settings. There was no significant difference between genders in the average amount of money spent per day for non-medical use of pharmaceutical opioids. High-risk drug users however spent on average ₦1,145 (USD 3.6) per day in the past 30 days for non-medical use of pharmaceutical opioids. Heroin use in Nigeria is less common - an estimated 87,000 people or nearly 0.1 per cent of the Nigerian population had used heroin in the past 12 months. The mean age of heroin initiation was 22 years, as was the age of first injecting the drug. Almost half (49 per cent) of regular heroin users reported smoking as their usual method of use. While men were four times more likely than women to report past year heroin use, proportionately more women (37 per cent) than men (20 per cent) who had used heroin reported injecting it in the past year. Heroin users were more likely to be working on a casual basis, and more likely to be sleeping on the streets. Women heroin users reportedly spent slightly more money than men per day in the past 30 days on their heroin use (₦3,500 NGN or USD 11 per day for women, vs. ₦3,070 or nearly USD 10 per day for men). The scientific literature describes that women have less control than men over how and from whom they acquire their drugs (mostly illicit drugs) and are more likely to have those supplied by a male

partner (UNODC, 2018). This can partly explain the disparity among men and women in the monthly expenditure on heroin use in Nigeria.

1.8.3 Stimulants: amphetamines, cocaine and ecstasy

Stimulants are psychoactive drugs also referred to as psychostimulants, that have a stimulatory effect on the central nervous system. Stimulants are characterized by their ability to increase alertness, heighten arousal and cause behavioural excitement.27 Pharmaceutical stimulants include, among others Adderall, Dexedrine or Ritalin, that are often prescribed to treat attention deficit disorder (ADD), attention deficit hyperactivity disorder (ADHD) and narcolepsy. However, these are also commonly misused along with illicitly sourced amphetamine. Overall, 670,000 people (an estimated 0.6 per cent of the population aged 15-64) had used different stimulants such as amphetamines (including non-medical use of prescription amphetamine, illicit amphetamines), cocaine and ecstasy in the past 12 months. Ecstasy (0.3 percent or 340,000 pastyear users) and amphetamines (0.2 percent or 238,000 past year users) users account for the majority of stimulant use in Nigeria. Among the estimated 155,000 past year amphetamine users nearly 15 per cent were those who had used illicit amphetamine, whereas the remaining had used pharmaceutical amphetamine for non-medical purposes. The mean age of initiation of ecstasy use was 19 years among women and nearly 23 years among men whereas the duration of use did not vary among men and women - mean duration of ecstasy use was 13 years. On average men spent ₦ 775 or USD 2.5 per day compared to women who spent ₦ 926 or USD 2.9 per day on their ecstasy use in the past 30 days. Nearly one third of the past year ecstasy users were daily or nearly daily users of ecstasy. Compared with other age groups, the use of ecstasy was more common among those who were within 25-39 years age groups. The mean age of initiation of pharmaceutical amphetamine was 23 years with no difference in the age of initiation among men and women. Compared to men, women reported a longer duration of regular use of pharmaceutical

amphetamine - over 9 years among women and 6 years among men. Compared to other age groups, the non-medical use of prescription amphetamines was higher among those who were aged between 30 and 39 years. The non-medical use of prescription amphetamine was also commonly reported among students. Women spent nearly 20 per cent more per day than men on the use of amphetamine - on average women had spent N 2,100 (USD 6.6) per day compared to men who spent N 1,700 (USD 5.4) per day on amphetamine use in the past 30 days.The use of cocaine and methamphetamine (both crystal and tablet form) is less common in Nigeria with an estimated 92,000 past year users of cocaine and 89,000 past year methamphetamine users in the country. While cocaine use was more common among those who were between 25 and 39 years old, more methamphetamine users were between the ages of 30 and 39. On average, cocaine users reported spending N 6,300 NGN (or 20 USD) per day on cocaine (N 7,000 by women or 22 USD spent per day). This amount is nearly half of the national minimum wage per month. Similarly methamphetamine users spent an average of N 4,000 (or USD 13) per day in the past 30 days – though it was slightly higher among women. Only one quarter of men and women cocaine users were daily or nearly daily users, whereas the majority of both men and women users reported using methamphetamine 2-3 times per week.

1.8.4 Non-medical Use of Other Pharmaceutical or Over-The-Counter

The non-medical use of other pharmaceutical drugs, such as sedatives and tranquilizers, is a major concern in many countries. Globally some 60 countries rank the non-medical use of tranquilizers such as benzodiazepines as among one of the main drugs of abuse (UNODC, 2018). In Nigeria, less than one per cent of the population aged 15-64 years reported past year non-medical use of tranquilizers or sedatives (0.5 per cent or 481,000 persons). The non-medical use of tranquilizers is reported at comparable levels among men and women (0.5 per cent among men vs. 0.4 percent among women). Within the general population, people had

initiated non-medical use of tranquilizers at age of 26 and therefore higher levels of non-medical use of tranquilizers is observed with increasing age. The typical user of tranquilizers for non-medical purposes, was around 38 years old, mainly married, and had a senior secondary school level of education. There was no difference in the non-medical use of tranquilizers among those who had regular full time work or those who were currently not working.Over-the-counter (OTC) medicines are those that are available for purchase without a prescription and could be purchased from a pharmacist or from any other sale point that stocks such medicines. In Nigeria the non-medical use of cough syrups containing codeine or dextromethorphan (such as Coldex or Benylin) is the third most common form of substance misuse.As with the non-medical use of other pharmaceutical preparations, the past year non-medical use of cough syrups was comparable among men and women (2.3 percent among men vs. 2.5 percent among women) or roughly 2.4 million people had used cough syrups in the past year for non-medical purposes. The non-medical use of codeine containing cough syrups is also quite wide-spread among the different age groups with higher levels of their misuse seen among those aged 35-39 years and those aged 60-64 years. The mean age of initiation of non-medical use of cough syrups was 20 years while the mean duration of its regular use was 8 years. Nearly half of the people who used cough syrups for non-medical purposes used those daily or near daily. The average expenditure for the non-medical use of cough syrups was N 3050 or nearly USD 10 per day in the past 30 days. A typical person misusing cough syrup is either married (monogamous) or single (never married), and has completed senior secondary school. There is no significant difference in the occupational status (either regular full time work or not working at all) of those misusing cough syrups. One third among those who had misused cough syrups in the past year, and were not currently working, were university students.

1.8.5 Solvents or Inhalants

Nationwide, the past year prevalence of solvents or inhalants use was relatively low at 0.3 per cent or 300,000 people aged 15-64. The use of inhalants was higher among men than women (0.5 percent men vs. 0.1 percent women). Past year users of inhalants reported initiating use at 18 years of age, and most users had been using inhalants on average for 16 years. Past year use was higherin rural areas than urban areas (23 percent of users resided in urban areas vs. 76 percent in rural areas). No differences were found for educational attainment, employment status or job type regarding those solvent users.

1.8.6 Tobacco and Alcohol Use

Among the general population, nearly 15 per cent of the adult population had smoked or used a tobacco product, whereas nearly 7 per cent of men and 1 per cent of women were currently (past 30 days) smoking or using tobacco products. These estimates of current tobacco use among the general population are comparable with the results of 2012 Global Adult Tobacco Survey conducted in Nigeria. (WHO,2012). With a mean number of 78 cigarettes smoked per month, manufactured cigarettes were the most common tobacco product used in Nigeria. Overall, nearly one quarter of the adult population in Nigeria reported using an alcoholic drink in their lifetime. In the past year, 25 percent of men and 13 percent of women reported having an alcoholic drink. Among those who reported alcohol use in the past year, over 40 per cent reported using alcohol occasionally. However, among those one third of men and 15 per cent of women reported daily or near daily use of alcohol over the past 12 months. On average, men reported binge drinking (binge drinking is defined as having more than five standard drinks for men and 4 standard drinks for women in a row) on three occasions in the past 30 days, while women reported binge drinking on 2 occasions. Both the use of alcohol and tobacco was much higher among drug users than amongst the general population.

Alcohol

Alcohol is a psychoactive drug/beverage. It is the second most used psychoactive drug. (Caffeine is rated as the first most used.) It is considered a depressant because at medium to high concentrations, it depresses neural firing. (Though at low levels, it can have the opposite effect.) It contains no vitamin or minerals. However, it does contain calories. An important thing to note is that this type of alcohol should not be generalized to mean the same as the organic chemistry term alcohol. Rather this type of alcohol, in terms of organic chemistry, is actually ethanol (or ethyl alcohol). Its chemical formula is: CH_3CH_2OH. Due to its small and amphiphilic nature, ethanol is soluble in water and fat, so it is able to cross cell membranes, giving it great access to do harm to cells and affecting the entire body, Carl H.(2008)

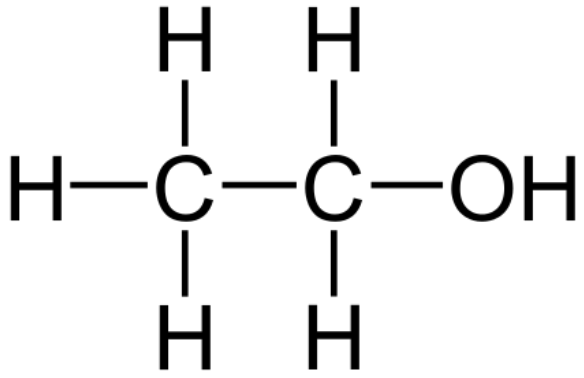

Fig 1., structure of alcohol

Alcohol metabolism

The main site of metabolism of ethanol is the liver, although some other tissues, for example kidney, muscle, lung, intestine and possibly even the brain, may metabolize smaller quantities. It is generally believed that the rate-limiting step in the metabolism of alcohol is its conversion to acetaldehyde, a reaction catalysed by the zinc-containing enzyme, alcohol dehydrogenase (ADH). This process occurs chiefly in the soluble cytoplasm of liver cells,

with nicotinamide adenine dinucleotide (NAD) acting as the hydrogen acceptor. However, particularly in alcoholics, some ethanol may be oxidized by the peroxidase-xanthine oxidase-catalase system, and possibly other oxidases both in liver and plasma (TrC molikres & Carr C, 1960, 1961). Small amounts of alcohol may also be converted to ethyl glucuronide (Kamil, Smith & Williams, 1952), ethyl sulphate and other esters, and excreted in the urine. Orme-Johnson & Ziegler (1965) have described a 'mixed-function enzyme', and Lieber and his colleagues (Lieber & DeCarli, 1968 a, b, 1969; Rubin, Hutterer & Lieber, 1968; Baraona & Lieber, 1970; Rubin, Bacchin, Gang & Lieber, 1970) have found liver microsomes, which comprise the smooth endoplasmic reticulum (SER), capable of oxidizing ethanol, using NADPH (instead of NAD+) at a pH optimum of 7.0. They have also shown that chronic ethanol administration produced proliferation of the SER and induction of the microsomal ethanol oxidizing system (MEOS) leading to in-creased blood ethanol clearance. However, the significance in man of the MEOS has been questioned by several authors (Klaasen, 1969; Tephly, Tinelli & Watkins, 1969; Isselbacher & Carter, 1970; Khanna & Marsham, 1970; Khanna & Kalant, 1970; and, Lin & Bustos, 1971). It has also been suggested that androgenic steroids can induce kidney ADH and explain the in-creased alcohol metabolism seen in adult males compared with females (Ohno, *et al,* 1970). The acetaldehyde formed in the first oxidative step in the metabolism of ethanol is converted to acetate, a reaction catalysed by aldehyde dehydrogenase, utilizing NAD as cofactor, and eventually to acetyl-CoA, the Krebs cycle, and other reactions. Acetaldehyde can also be converted to other substances, such as acetoin (Stotz, Westerfeld & Berg, 1944) and hydroxyketohexanoic acid (Westerfeld & Bloom, 1969). The availability of unreduced NAD in the cell sap seems to be important in alcohol metabolism, since NADH competes with NAD for binding sites on ADH and, insufficient concentration, may inhibit the rate of ethanol dehydration (Mahler, Baker & Shiner, 1962). The NADH formed in the oxidative steps must be continually reoxidized to

NAD for alcohol oxidation to proceed. In the cytoplasm of liver cells the reoxidation of NADH may be coupled with the reduction of pyruvate to lactate (Westerfeld, Stotz & Berg, 1943 ; Lundquist, Fugmann, Klaning & Rasmussen, 1959), and to the reductive synthesis (Lieber & Schmid, 1961), elongation and saturation of fatty acids; but perhaps the most important route for reoxidation of the NADH involves the mitochondrial flavoprotein-cytochrome electron transfer system coupled with oxidative phosphorylation (Lehninger, 1953-54; Green & Crane, 1958; Lardy, Lee & Takemori, 1960). The 'carrier' of the hydrogen equiva-lents from NADH across the relatively impermeable mitochondria1 membranes for oxidation in the intra-mitochondria1 compartment may be substances like malate and glutamate (Chappell, I 968), a-glycerophosphate (Lardy *et al*. 1960), P-hydroxy-butyrate (Devlin & Bedell, 1959, 1960).

Effects of alcohol

1. Short-term effect

The short-term effects of alcohol consumption range from a decrease in anxiety and motor skills at lower doses to unconsciousness, anterograde amnesia, and central nervous system depression at higher doses. Cell membranes are highly permeable to alcohol, so once alcohol is in the bloodstream it can diffuse into nearly every cell in the body. The concentration of alcohol in blood is measured via blood alcohol content (BAC). The amount and circumstances of consumption play a large part in determining the extent of intoxication; for example, eating a heavy meal before alcohol consumption causes alcohol to absorb more slowly (Horowitz, 1989). Hydration also plays a role, especially in determining the extent of hangovers. After binge drinking, unconsciousness can occur and extreme levels of consumption can lead to alcohol poisoning and death (a concentration in the blood stream of

0.40% will kill half of those affected (Carleton college, 2009). Alcohol may also cause death indirectly, by asphyxiation from vomit.

Alcohol distrupt normal sleep patterns thereby reducing sleep quality and can greatly exacerbate sleep problems. During abstinence, residual disruptions in sleep regularity and sleep patterns are the greatest predictors of relapse (Feige*, et al,* 2007)

2. Long-term effects

According to the World Health Organization's 2018 Global Status Report on Alcohol and Health, there are more than 3 million people who die from the harmful effects of alcohol each year, which amounts to more than 5% of the burden of disease worldwide (WHO, 2018).

Even light and moderate alcohol consumption increases a person's cancer risk, especially the risk of developing squamous cell carcinoma of the esophagus, cancers of the mouth and tongue, liver cancer, and breast cancer (Platzman, 2017).

3.Health risks of alcohol consumption

A systematic analysis of data from the Global Burden of Disease Study, which was an observational study, found that long-term consumption of any amount of alcohol is associated with an increased risk of death in all people, and that even moderate consumption appears to be risky (GBD Alcohol Collaborators, 2018). Similar to prior analyses, it found an apparent benefit for older women in reducing the risks of death from ischemic heart disease and from diabetes mellitus, but unlike prior studies it found those risks cancelled by an apparent increased risk of death from breast cancer and other causes.(GBD Alcohol Collaborators, 2018). A 2016 systematic review and meta-analysis found that moderate ethanol consumption brought no mortality benefit compared with lifetime abstention from ethanol consumption

(Stockwell, 2016).Risk is greater in younger people due to heavy episodic drinking which may result in violence or accidents (O'Keefe, 2014).

Long-term heavy use of alcohol damages nearly every organ and system in the body (Caan, 2002). Risks include alcohol use disorder, malnutrition, chronic pancreatitis, alcoholic liver disease (e.g., permanent liver scarring) and several types of cancer. In addition, damage to the central nervous system and peripheral nervous system (e.g., painful peripheral neuropathy) can occur from chronic alcohol misuse (muller, *et al* 1985).

The developing adolescent brain is particularly vulnerable to the toxic effects of alcohol (Guem, 2010).

1.8.7 Caffeine and its Structural Biochemistry

Caffeine is the most popular drug that is being used to maintain a certain mental stability such as staying awake, changing the way the brain functions, and moods. It is found in many of the drinks we consume daily. This includes, but not limited to sodas, coffee, and tea. Many consume this drug without even being conscious of their daily intake, and it is not something that most people think of as being dangerous or questionable. Although Caffeine is taken very lightly, large amounts of this product are in many of our drinks. For example, according to an article, "Neuropsychiatric Effects of Caffeine", by Anthony Winston, it shows that 100 mg is in a normal cup of coffee, 75 mg in instant coffee, and 50 mg in tea that we drink every day.

Commonly, caffeine starts to affect the brain and body within an hour and begins to wear off after 3 to 4 hours.Caffeine is mainly use for the purpose to raise and boost mental functions, but when it is overly used, it can also advance into a harmful state called caffeinism.

According to Winston,“caffeine is characterized by restlessness, agitation, excitement, rambling thought, speech, and insomnia". Following these symptoms, many other disorders such as anxiety, sleep, eating disorders, and many more may occur.

Caffeine (1, 3, 7-trimethylxanthine) is a natural product found in plants. While the actual caffeine content of plant seeds and leaves varies quite a bit from species to species, caffeine is viewed as the most abundant naturally-occurring purine alkaloid, meaning it is derived from one or more purine nucleotides. Alkaloids are a large group of compounds that can be found mainly in plants and contain basic nitrogen atoms. These compounds usually exist as salts because of their basic nature. Major caffeine sources include the seeds of the coffee plant (*Coffea Arabica*), tea leaves (*Camellia Sinensis*), and cola nuts. It is widely accepted that caffeine is a stimulant when consumed by humans, with its main focus falling upon the central nervous system (Ashihara, 2004) Plants utilize caffeine as a line of defense. It works as an insecticide for the plant, deterring many potential threats as it can obstruct metabolic pathways (Mohanpuria, 2009).

Fig 2, structure of caffeine (pohanka, 2015).

Effects of Caffeine

By in-taking caffeine, the body feels a sense of alertness and wakefulness. The reason caffeine affects the body in the way that it does is because of its structural resemblance to both adenosine and cyclic adenosine monophosphate (cAMP). As a result of similar structures, caffeine can potentially bind to receptors that usually bind to adenosine and its derivatives. Within the body, adenosine plays a role in regulating the brain and its activity. When there are large build-ups of adenosine in the brain, they begin to bind to the brain receptors and that causes reactions leading to sleepiness and feeling drowsy. However, when caffeine enters the body it binds to these same receptors because of its similar structure and this prevents adenosine from binding to these receptors and this delay the body from feeling

sleepy. cAMP is a secondary messenger that is responsible for processes involving blood pressure and oxygen in the body. It increases the amount of oxygen delivered to the brain as well as blood pressure, both of which keep the body alert. However, there is an enzyme found inside the body, cyclic nucleotide phosphodiesterase (cAMP-PDE), that breaks down cAMP and removes its anti-drowsy effects from the body. As a result of its similarity to the structure of cAMP, caffeine prevents cAMP-PDE from breaking down cAMP and allows the anti-drowsy effects to prolong for much longer.

Disorders of Caffeine use

1**. Sleep Disorders**:

Insomnia is sometimes the outcome of an excessive amount of caffeine. When taken near bed time, it may extend the hours awake and give the inability to easily fall asleep. In addition, according to Winston, "it reduces slow-wave sleep in the early part of the sleep cycle and can reduce REM sleep later in the cycle". In conclusion, wakefulness is a symptom of the sleeping disorder caused by caffeine if taken inconsiderably.

2**. Eating Disorders**:

Caffeine is also a cause of Anorexia and Bulimia nervosa. Studies have shown that people with these eating disorders frequently have an extensive intake of caffeine. This drug gives way to a smaller appetite and a fast metabolism. In addition, it may also be dangerous for the heart as well as an increase in chance of receiving osteoporosis.

3. Caffeine and weight loss

Caffeine is a stimulant that stimulates the central nervous system, helps when dealing with fatigue, aids in preventing sleepiness and tiredness, and improves with alertness, mood, metabolism. It is important that caffeine is monitored and taken at a balanced diet. A common source of caffeine is coffee. About two to four cups of coffee a day is considered healthy. Energy drinks and caffeine-carbonated drinks contain a dangerous amount of caffeine. Drinking more than two a day is enough to do its intended job. Any more can cause serious problems. Caffeine is also linked to weight lost. Caffeine may help shed a few pounds, or block further weight gain. Caffeine is one of the ingredients in the dangerous weight loss pills that people depend on to lose weight. Caffeine is thought to have contribute to weight loss due to the fact that it can: suppress appetite, increase metabolism and chances of burning calories, and induce water weight loss. Caffeine may suppress appetite for a short period of time, however it seems to not have any correlation with suppressing appetite for a long period of time. Caffeine may implement and induce thermogenesis, which is the body's way of creating heat while digesting food. Caffeine may also present the body with alertness and behavioral changes, which may help during exercise and induce faster calorie burning. Caffeine burns fat, which preserves the alternative (glycogen, glucose, amino acids) from being burned. This keeps the sugar in the bloodstream, and enables the body to run a little longer without getting hungry. Caffeine has also been a popular choice of intake before a workout. If someone intakes caffeine before a workout, it is shown that caffeine isolates extra fat flowing, and targets and accesses the fat for energy, rather than carbs or existing muscle. Caffeine targets and breaks the fat, and is rapidly burned at that instant. However, it is important to drink a lot of water during the workout to prevent dehydration. Caffeine, coffee in particular, may lead to eating disorders, such as anorexia and bulimia, because of the notion that coffee has 0 calories and 0 carbs. Coffee indeed has 0.5-0.9g of carbs. Coffee may also help a person reduce the cravings and need for food, with its bitter taste, and convince

someone that he or she is not hungry. Caffeine is also known to prevent fat from building and collecting in cells. There is research on the caffeine inhibiting enzymes, and its role in fat synthesis. Caffeine is the main ingredient in numerous diet pills. People with eating disorders turn to caffeine and coffee for energy and satisfaction of hunger. However, in this case, it is more harmful than effective. Caffeine can also increase urination since it is a diuretic. An increased urination may help shed water weight and bloatedness. However, losing weight through the removal of fluids will be effective for only a short period of time. Caffeine is not intended to serve as a meal replacement, or as a sole source of weight loss. Relying on caffeine to lose weight is not a healthy or efficient method. Since the thermogenetic characteristic of caffeine is one adopted by weight loss drugs, caffeine can be chosen as an alternative to acquire thermogenesis, rather than from weight loss drugs itself. Relying on caffeine can cause extreme health effects, both physically and mentally. It can increase chances of insomnia, nervousness, makes a person jittery, instability, rapider heart rate, and potassium deficiency. Pregnant women should prevent intaking caffeine at a large rate, since caffeine runs through the bloodstream and directly to the fetus. It is important to take into consideration that in order to have an efficient weight loss, diet and exercise are the two most crucial aspects and factors. Relying and overdosing on caffeine will have damaging effects and may cause the body to gain weight, instead of intended loss.

1.8.8 Energy Drinks

Energy drink is a type of beverage containing stimulants drugs, chiefly caffeine, which may or may not be carbonated and many also contain sugar or other sweeteners, herbal extracts and amino acids (Boyle, 2006). Approximately 66% of its drinkers are between the ages of 13 and 35 years old, with males being approximately 65% of the market (Machado, 2001). By 2001, the US energy drink market had grown to nearly 8 million per year in retail sales.

Over the next 5 years, it grew an average of over 50% per year, totalling over $3 billion in 2005 (Machado, 2001). The market is currently estimated at over $12.5 Billion, having grown by 60% between 2008-2012 (Worral, 2005). In Nigeria, there are many brands of energy drinks such as Red Bull, Power Horse and Power Fist. It has been reported that energy drinks have energizing effects, with effects being strongest 30 to 60 minutes after consumption and sustained at least 90 minutes.

1.9 Health Consequences/Risks of Stimulant Use

Stimulants are a class of drugs that "stimulate" the body's central nervous system, which includes the brain and spinal cord. They increase the levels of catecholamines—a family of brain chemicals that includes dopamine. These chemicals are used in the brain processes to signal reward and motivation. By increasing catecholamine levels, stimulants can temporarily increase a person's energy level and alertness. Stimulants may also cause other changes in the body. The effects vary according to the specific drug, the amount of the drug, and how the drug is taken. For instance, stimulants that are snorted or injected have more immediate effects than drugs that are swallowed.Stimulants include the caffeine found in coffee, medications such as methylphenidate (Ritalin®, Concerta®), and abused drugs, such as methamphetamine and cocaine. Stimulants can have useful properties—under the right circumstances.The prevalence of psychostimulant use has increased and some psychostimulants are perceived as relatively safe drugs by some users. Consequently, there is a growing body of literature examining the risks associated with varying levels of psychostimulant use. Risk domains reviewed in this chapter include neurological, neuropsychological, physiological, psychiatric, injecting, sexual and social risks. Research suggests that there are some significant risks associated with psychostimulant use, especially from heavy use. However, available evidence is sparse and often inconclusive.

1.9.1 Neurotoxicity

Risk of brain toxicity and receptor changes have been the subject of much research in the psychostimulant area, particularly for ecstasy (MDMA). Evidence of neurotoxicity has come mainly from animal studies and evidence in humans is inconclusive. Neurotoxic risks associated with psychostimulant use may include short- and long-term disruption to brain neurotransmitters that can result in significant health risks, such as hyperactivity, mental confusion, agitation, fever, tachycardia and tremor (known as the 'serotonin syndrome'), the effects of which can be fatal. Monoamine depletion can also lead to low mood, anhedonia and lethargy post-use ('come down'). Similar deficits have been identified after methamphetamine use. Neurotoxic effects appear to persist for extended periods post-administration in animals (Parrott, 2002)

1.9.2 Neuropsychological Risks

Some identified long-term effects of ecstasy use include memory and neurocognitive deficits. Parrott (2002) has summarised the literature identifying significant memory deficits on neuropsychology tests in heavy long-term users and in young ecstasy users, particularly in immediate and delayed memory recall.There has been a substantial amount of research into the neurocognitive deficits experienced by ecstasy users and evidence suggests that even in early and light users there is some evidence of attentional and working deficits. These may reflect serotonergic changesand may be permanent (Kalant, 2001)

Other cognitive functioning does not appear to be consistently affected, although there is some evidence that executive functioning (including decision-making, reasoning and problem-solving) may be reduced and that impulsivity may be increased (Kalant, 2001). However, some researchers have indicated that caution must be exercised in interpreting the data concerning long-term cognitive effects, as ecstasy use is most often seen in the context

of polydrug use and the role of concomitant cannabis use in cognitive impairment has yet to be adequately described (Croft et al, 2001). Functional consequences of long-term use of ecstasy will remain uncertain until large epidemiological studies have been conducted (Gowing et al, 2002).

Kosten *et al*. (1996) have described two broad categories of neuropsychological deficits from cocaine use. Mood changes, including depression, are likely to be a result of abnormalities in catecholamine receptors and are probably reversible, although in some cases have been found to be long lasting and may trigger an underlying propensity for mood disorder. Cognitive deficits may be due to neural lossand include an increase in brain activity and cerebral atrophy as a result of lowered cerebral blood flow leading to cognitive deficits even after use has ceased (Daras, 1996). The most common deficits are spatial learning, concentration and recent memory, but abnormalities have been found in motor tasks, including parkinsonian-like symptoms, such as motor deficits (Kosten et al., 1996).

1.9.3 Physiological Risks

There are significant toxic effects from psychostimulant use. Primary physiological toxicity effects of ecstasy use include liver toxicity (including jaundice); cardiovascular toxicity (including hypertension and tachycardia resulting in heart failure); brain haemorrhage; and cerebral toxicity leading to seizures and disruption of respiration and circulation (Kalant, 2001). Hyperthermia and disturbance of metabolite balance are also commonly reported effects (Gowing *et al*, 2002). Volkow *et al*.(1996)have noted that the most frequent complication of cocaine use is cardiac toxicity, including myocardial infarction and fatal arrhythmias as a result of release of adrenaline and noradrenaline and the inhibition of noradrenaline reuptake. Daras (1996) noted that the risk of these cardiovascular events is substantially increased by the concurrent use of alcohol, which is a common pattern of

polydrug use. Hypertension is an acute effect that appears to subside (Daras, 1996). Neurovascular complications of cocaine use that have been documented include ischaemic and haemorrhagic stroke, probably as a result of dose-related rises in arterial pressure and heart rate, as a result of inhibited reuptake of noradrenaline. Headaches, seizures and abnormal movements such as tics and choreoathetoid (uncoordinated movements) have also been documented (Daras, 1996).

Physiological effects of amphetamines include hyperthermia and seizures (Hanson et al.,1996). Cardiovascular toxicity (including ventricular arrhythmias, acute myocardial infarction and cardiomyopathies) have been noted (Hung et al., 2003). Cerebrovascular problems may also occur such as stroke, aneurysm and cerebral haemorrhage (Yen et al., 1994).

Risk reduction strategies should include a psycho-educational component to increase awareness and understanding of physiological risks of psychostimulant use. These effects are usually dose related, but low doses have also been known to produce acute physiological symptoms.

The effects of hyperthermia and metabolite imbalances can be exacerbated by the context of use, such as the rave or dance party environment. Users should be made aware of strategies to reduce these risks, including drinking appropriate amounts of water, reducing other concomitant drug use (including alcohol) and ensuring breaks from dancing.

1.9.4 Risk of Injecting

In addition to the usual risks of injecting (such as blood borne virus transmission and vein care), there are some specific risks to injectors of psychostimulants. Injecting of ecstasy is rare and potential strategies to reduce initiation to injecting may be useful for ecstasy users, especially if they are likely to or currently inject other drugs. However, injection of cocaine

and methamphetamine is much more common. Following a survey among users of cocaine, van Beek et al. (2001) noted that the prevalence of injecting use of cocaine had recently increased. This is a particular problem given the short half-life of cocaine, making injecting typically more frequent than other drugs. Injectors tend to be former heavy snorters or injectors of other drugs who have added cocaine to their repertoire, van Beek *et al.* (2001) noted that because of the short half-life of cocaine, the initial rush was often quickly followed by a rapid reduction in brain concentration, experienced as a 'crash', easily remedied by further use. They concluded that this pattern of use may result in binges lasting several days. Respondents in this study averaged 15 injections per day on their highest use days, with some injecting up to 60 times a day. The authors noted that the frequency of cocaine injecting resulted in problems with vein access and other skin problems, with thrombosed veins, unexplained cuts and bruises and abscesses frequently reported by injecting users. Compulsive skin picking and scratching in response to tactile hallucinations were also reported by chronic users. The authors also noted that cocaine users were at high risk of re-using needles when availability was limited, particularly because the nature of cocaine often induced a feeling of invincibility. Social support appears to reduce injecting risk and interventions that increase non-using social supports may be useful (Stein et al 2002). Toppet *et al.* (2002) have noted that base amphetamine, due to its consistency, has been associated with increased vascular damage among amphetamine users. In addition, Kaye and Darke (2000) noted that because amphetamine use tends to be a social activity, there may be more opportunities for needle sharing than for other drug users. In this study, social dysfunction was related to degree of dependence among injecting users. Since injecting has a higher dependence potential than other forms of use injecting users are also at higher risk of both dependence and declining social functioning.It is generally considered rare for injecting users

to return to non-injecting practices. However, non-injectors may benefit from strategies aimed towards preventing initiation into injecting.

1.9.5 Blood Borne Viruses and Risky Sexual Behaviours

Several studies have shown that psychostimulant users have higher levels of sexual risk-taking behaviour than non-users. Lenton et al.(1997) noted that young inexperienced users were largely unaware of the higher risk of unsafe sex whilst using psychostimulants. Klitzman et al.(2002)found that gay ecstasy users tended to havemore partners and more unprotected anal sex than non-users. These researchers and others have also noted that psychostimulant users are more likely to use 'sex-on-premises' venues than those who did not. This is an important finding as most new human immunodeficiency virus (HIV) infections in Australia are a result of unsafe sexual activity (National Centre for HIV Epidemiology and Clinical Research, 2002), particularly by men who have sex with men (MSM). In addition, Malbergier and Guerra de Andrade (2001)noted that cocaine dependence was more prevalent among users with HIV infection than those without HIV infection. Together, these results suggest that use of psychostimulants may be associated with an increase in sexual risk-taking behaviour and hence risk for blood borne virus (BBV) infection, as both are high in psychostimulant users. van Beek et al. (2001) have identified sexual risk-taking behaviour as a special concern among cocaine users in Sydney. They noted that feelings of invincibility may lead to increased willingness to engage in unsafe sex and to take other sexual risks. Of particular concern was the high proportion (27%) of sex workers in their study. Most said they engaged in sex work to pay for cocaine and most used while they were sex working. The authors suggest that this pattern increases the likelihood of a cycle of using to work and working to use that may be difficult to break. According to some key informants, this may also increase willingness to engage in unsafe sex in order to get the work needed to pay for their use.

1.9.6 Mental Health Risks

Psychostimulants have been implicated in a range of mental health problems and there has been an increasing interest in these sequelae. Mental health effects appear to be more often documented for amphetamine users than cocaine and ecstasy users. In a review of the psychiatric case study literature, Soar et al. (2001) found that there were a substantial number of cases where ecstasy users had developed psychiatric symptoms, including psychotic symptoms (29%), anxiety and panic attacks (26%), delusions, hallucinations, illusions (26%) and depression (16%). These symptoms occurred with as little as one occasion of use and usually without a family or personal history of mental illness. Some of these case studies presented evidence that symptoms were potentially long term, continuing long after ecstasy use ceased. They also presented evidence from studies that showed that a significant proportion of users experienced subclinical symptoms.These data do, however, support the commonly held view that there is a significant relationship between ecstasy use and psychiatric symptoms, although polydrug use and polydrug dependence may also influence the interpretation of these results. In a longitudinal study, Lieb *et al*. (2002) conducted detailed assessments with 2,462 adolescents and young adults over a 4-year period and found that ecstasy users were significantly more likely to attract a psychiatric diagnosis , including other substance use disorders, than both non-drug users and other drug users. They reported higher rates of prescription medication use than non-users, but not higher rates of health service utilisation. Interestingly, analyses showed that, in the majority of cases, these psychiatric symptoms occurred prior to ecstasy use, suggesting that adolescents and young people with symptoms of mental disorders are at an increased risk of using ecstasy. van Beek *et al*. (2001) noted that after a binge the crash, often increasingly more intense each time, is characterised by depression, fatigue and sleeping difficulties. Similar patterns of use and effects have been identified for amphetamine users, although the half-life of amphetamines

issubstantially longer that cocaine. In this group, depression and suicidal behaviour have been identified as significant risks during the 'crash' period. Most respondents in the van Beek et al. study reported paranoia, hallucinations, depression, anxiety and obsessiveness. Other psychological problems identified by these users included low self-esteem, an altered sense of reality and feelings of hopelessness. The study did not identify any users who reported psychosis, but key informants reported that psychosis was common and problematic among users in treatment. In addition, because of the significant paranoia and irritability common in cocaine users, referral to mental health services is often a difficult process. Informants noted that symptoms typically subsided when treated or when cocaine use ceased but often reoccurred when use resumed.

Back *et al*. (2001)note that post-traumatic stress disorder (PTSD) is highly prevalent among cocaine users, with studies reporting up to 45% for lifetime diagnosis. Nearly a quarter would meet criteria for a current diagnosis of PTSD, significantly higher than the general population at around 8%. They also note a number of studies that have shown that cocaine use is associated with more severe psychiatric symptomatology, higher rates of DSM-IV Axis II (personality disorder) psychopathology and higher risk of re-victimisation. In a study of exposure therapy for cocaine users with PTSD, Brady *et al.* (2001) found that dropout rates were high but those who completed treatment reduced both cocaine use and PTSD symptoms. Several studies have identified a higher than usual risk of suicidal behaviour among cocaine users. Roy (2001) compared a group of cocaine users who had attempted suicide with cocaine users who had never attempted suicide and found that suicide attempters were more likely to be female, have a family history of suicide, had more childhood trauma, comorbid substance use and depression and had particular personality characteristics, including introversion, neuroticism and hostility. Field *et al*. (2001) noted that adolescents at risk for depression were, among other factors, more likely to use cocaine and cannabis. However, in this study their

relationship with parents and other indicators of wellbeing accounted for a majority of the variance. In a review of adverse effects of psychostimulants, Kamieniecki *et al*. (1998) noted a particularly high prevalence of mental health symptoms among amphetamine users. For example, these authors noted that between 50% and 90% reported symptoms of depression, between 60% and 80% reported anxiety symptoms and between 30% and 80% had experienced symptoms of psychosis. Israel and Lee (2001) and Kratofil, Baberg and Dimsdale (1996)both presented several case studies of self-mutilation after amphetamine use. In each case this was attributed to psychosis. Self-mutilation behaviours have also been seen in animal studies (Kratofil et al., 1996). Kratofil *et al*. (1996) noted that the behaviour was commonly motivated by religious, sexual and 'neurotic' themes, such as self-punishment and control. Self-mutilation included enucleation (amputation) of limbs and eyes, genital mutilation, stabbing and cutting injuries. The behaviours appear to be relatively rare and virtually unknown among women who use psychostimulants, but are probably under-reported (Israel & Lee, 2001). Other mental health and psychological symptoms that have been noted as a result of psychostimulant use include agitation and anxiety, paranoia, hostility and aggression, confusion, delirium and hallucinations (especially auditory and tactile).

1.9.7 Social Risks

Strote, Lee and Wechsler (2002) conducted a survey of ecstasy use among college students. They noted that, although they spent less time studying, ecstasy users were not academic under-achievers and were as satisfied with education as non-using students. Riley *et al*. (2001) identified four main risks for young people using ecstasy: driving on drugs, unprotected sex, over indulgence and injecting. They found that 85% of ecstasy users reported concurrent polydrug use, 30% had unprotected sex while using, 35% reported driving while intoxicated and nearly 1% reported injecting. In a survey of users, van Beek et al. (2001)identified a number of significant social risks. 60% of respondents admitted to

committing crimes they wouldn't normally engage in whilst using, 77% agreed that it made people socially unreliable and 64% believed that cocaine use interferes with relationships. Cocaine use has also been associated with violent injury as has amphetamine use (Wright & lee, 2001).

Similarly, Winstock et al. (2001)found that dance music enthusiasts in London used substantial doses of multiple substances, including alcohol at hazardous levels. Over 5% of the sample injected, primarily amphetamines and heroin. They noted that purchasing patterns (an average of eight pills bought at a time) and the prevalent selling-on put users at risk of legal consequences. They also noted use patterns that put users at high risk of dependence.

1.9.8 Drug Dependence and Severity of Dependence among Drug Users

Based on a set of questions using the different domains of dependence, as given in the WHO ICD 10 criteria, 20 per cent of people who self-reported past year use of any drug (other than tobacco and alcohol) were considered drug dependent. More than one third of cannabis users, one quarter of heroin users, and 20 per cent of those who had misused pharmaceutical opioids (such as tramadol, codeine, morphine) in the past twelve months met the criteria of dependence or of those suffering from drug use disorders. It is important to note that the extent of drug use disorders among those who had used drugs in the past year is only indicative and does not reflect a clinical diagnosis of dependence or drug use disorders among the adult population using drugs in Nigeria. The Severity of Dependence Scale (SDS)(Michael *et al*, 1992) is a measurement tool used to ascertain the extent of dependence among regular users of different drug types. The SDS contains five questions ranked on a Likert-scale that are concerned with psychological components of drug dependence. The scores are correlated to quantity, frequency and length of drug use. High scores of SDS have been associated with high-risk injecting and sexual behaviours, psychological morbidity,

andhigher risk of overdose(Michael et al, 1995).From a public health perspective high scores indicate the extent to which high-risk drug users may require structured interventions to address their drug use disorder. Cut-off values for SDS scores vary according to drug type, for example, a cut-off value of five among heroin users, or a value of 4 among cocaine or amphetamine users, is indicative of the need for structured interventions to address their drug use disorder. In Nigeria, more than 80 per cent of the high-risk drug users had severity of dependence that would require some intervention to address their problematic drug use. Except for amphetamines, male high-risk drug users had higher mean values than women of severity of dependence. The high-risk drug users ranked pharmaceutical opioids (tramadol, codeine, morphine), cannabis and heroin among the drugs that had caused most harm to them. Proportionally more men perceived pharmaceutical opioids and cannabis to be the most harmful drugs, while more women high-risk drug users considered heroin, codeine-based cough syrup, and cocaine as the most harmful drugs.

CHAPTER TWO

METHODOLOGY

2.1 Study Design

This study is a descriptive cross-sectional study on Assessing the Knowledge and Practice on Use of Stimulants by University students.

2.2. Study Area

This study was conducted in the University of Benin, Ugbowo metropolis, Benin City.

2.3 Study Population

The study population included all registered full time students of the University of Benin.

2.4 Sample Size and Sampling Technique

The simple random sampling technique was employed in selecting a sample size of 100students from all levels for this study. The sample size was gotten using the sample size calculator.

2.5 Research Instrument

The research was made by the use of questionnaire as a primary source instrument for collecting vital information. The questionnaire were prepared, validated by the Supervisor and administered to the respondents for the study. Data were also gathered through the secondary source, such as textbooks, online journals, internet and browsed materials.

2.6 Data Collection

Data was carefully collected by proper distribution of the questionnaire in a randomized manner among students from several departments on the same day. The respondents were duly guided to fill the questionnaire after obtaining informed consent. Only data obtained from the participants were used in the study.

2.7 Data Analysis

Data was collected and organised. They were fed into Microsoft Excel Sheet and analysed using Statistical Package for Social Sciences (SPSS) version 23.Descriptive statistics was carried out on the variables and the results were presented as frequencies and percentages.

2.8 Ethical Consideration

Informed consent was obtained from the respondents by means of verbal explanation and an introductory remark on the research instrument. They were made to understand that participation was voluntary and there was no consequence for non-participation. They were instructed not to write their name or class number in order to maintain anonymity.

CHAPTER THREE

RESULTS

3.1 Demographics of Respondents.

One hundred respondents were recruited into the study and one hundred respondents successfully participated. This gave a total response rate of 100%.

Table 3.1 represents the demographics of the study population which comprises 69 males and 31 females. The majority (77%) of our respondents were in the age range of 21-25. Only 2% of our respondents were married. Majority of the respondentsclaimed they had knowledge of substances of abuse from peer groups and school.

Table 3.1 Demographic Characteristics of Respondents

Variables	Frequency	Percent
Age		
15-20	5	5.0
21-20	1	1.0
21-25	77	77.0
26-30	16	16.0
Above 30	1	1.0
Gender		
Female	31	31.0
Male	69	69.0
Religion		
Christianity	81	81.0
Islam	12	12.0
Pagan	7	7.0
Religiousparticipation		
Frequently	18	18.0
Occasionally	58	58.0
Rarely	24	24.0
Maritalstatus		
Married	2	2.0
Single	98	98.0
Level		
100	9	9.0
200	9	9.0
300	39	n39.0
400	38	38.0
500	5	5.0
Economicstatus		
Above N 30,000	44	44.0
Below N10,1000	8	8.0
N10,100-20,000	22	22.0
N21,000-30,000	26	26.0
Howdoyouknowaboutstimulant		
Media	2	2.0
Parents/guardians	5	5.0
Peer group	42	42.0
School	43	43.0
Siblings	8	8.0

3.2 Distribution of Questionnaire

Table 3.2 shows how the questionnaire was distributed among different departments in the University. The questionnaire was administered across 26 departments.

Table 3.2: Showing Various Departments

Departments			
		Frequency	Percent
Valid	AEB	3	3.0
	Anatomy	7	7.0
	Architecture	1	1.0
	Biochemistry	5	5.0
	Chemical Engineering	2	2.0
	Civil Engineering	2	2.0
	Crop Science	1	1.0
	DEF	6	6.0
	French	3	3.0
	Geology	2	2.0
	History and International studies	3	3.0
	Home Economics	1	1.0
	Industry Chemistry	2	2.0
	Law	2	2.0
	Mathematics	3	3.0
	Medical biochemistry	17	17.0
	Medicine and Surgery	1	1.0
	Microbiology	4	4.0
	MLS	8	8.0
	Philosophy	3	3.0
	Physiology	3	3.0
	Physiotherapy	5	5.0
	Plant Biology/Biotechnology	9	9.0
	Quantity Surveying	3	3.0
	SLT	3	3.0
	Social Works	1	1.0
	Total	100	100.0

3.3 Substance/Stimulant UseAmong Respondents

Table 3.3 shows the percentage of stimulant use by the respondents, including substances that are currently used, used but discontinued and never used. Among all, caffeine recorded the

highest number of use among the respondents (61%), followed by alcohol (54%) and cannabis(50%).

Table 3.3: Percentage Of Substance Used

Variables	Currently used	Used but discontinued	Never used
Alcohol (Beer, hot drink, palm wine, energy drinks, alcoholic wine)	54%	20%	26%
Nicotine (Cigarettes, snuff, shisha)	34%	30%	36%
Caffeine (Coffee, coca-cola, kolanut, caffeinated drinks and teas)	61%	22%	17%
Crack	8%	23%	69%
Cannabis (Common/street names; igbo, weed, marijuana, hemp, ghanja, green leaf)	50	17%	33%
Miscellaneous substances such as cow drug, human excreta, lizard droppings, soak away pit)	2%	8%	90%
Skoochies	12%	43%	45%

Table 3.4: Gender-related difference in stimulant use

Gender	Alcohol	Nicotine	Caffeine	Crack	Cannabis	Miscellaneous	Skoochies
Male	41	31	36	8	49	2	11
Female	13	3	25	0	1	0	1
Total	54	34	61	8	50	2	12

3.5 Knowledge of Health Effects of Stimulant Use

Table 3.4 shows a list of health effects of stimulant use by our respondents. A total of 37 knowledge questions were used to assess respondents' knowledge of physical, psychological and social health effects of stimulant use. The knowledge was assessed by the number of questions correctly answered by the majority of the respondents.

Table 3.5: Health Effects of Stimulant Use

	No		Yes	
Variables	**Frequency**	**Percent**	**Frequency**	**Percent**
Beneficial effect of stimulants on academic performance				
Enhanced assimilation	24	24.0	76	76.0
Keeps you awake for longer period of reading	21	21.0	79	79.0
Energize you to do more work than normal	28	28.0	72	72.0
Helps to keep you focused in completion of a particular task	22	22.0	78	78.0
Improved sexual performance	25	25.0	75	75
Helps during social interactions	33	33.0	66	66
Builds confidence for a certain period of time	16	16.0	84	84.0
Kills boredom and brings periods about excitement	15	15.0	85	85.0
Physical health effects				
Heachache	28	28.0	72	72.0
Hand tremor	44	44.0	56	56.0
Improved heart function	87	87.0	13	13.0
Liver damage	70	70.0	30	30.0
Sexual dysfunctions	59	59.0	41	41.0
Lungs cancer and respiratory diseases	57	57.0	43	43.0
Weight gain	58	58.0	42	42.0
Accidents	37	37.0	63	63.0
Improved vision	63	63.0	37	37.0
Premature death	61	61.0	39	39.0
Psychological health effects				
Low self esteem	70	70.0	30	30.0
Timidity	74	74.0	26	26.0
Self-isolation	54	54.0	46	46.0
Exam-phobia	70	70.0	30	30.0
Phobia for bulky academic workload	74	74.0	26	26.0
Emotional problems	46	46.0	54	54.0

Inability to sleep (Insomnia)	33	33.0	67	67.0
Reduced aggressiveness	84	84.0	16	16.0
Anxiety, paranoia, psychosis and depression	56	56.0	44	44.0
Improve mental health	88	88.0	12	12.0
Poor concentration	53	53.0	47	47.0
Tolerance/dependence	52	52.0	48	48.0
Social health effects				
Altered family relationship	10	10.0	90	90.0
Better academic performance	64	64.0	36	36.0
Risky sexual behavior	37	37.0	63	63.0
Undue violence	29	29.0	71	71.0
Social vices such as robbery and cultism	35	35.0	65	65.0
Bankruptcy	24	24.0	76	76.0
Increased social acceptance	46	46.0	54	54.0

CHAPTER FOUR

DISCUSSION AND CONCLUSION

4.1 DISCUSSION

This study was initiated to evaluate the use of stimulants among undergraduate students of University of Benin, and to assess their knowledge of the implications associated with stimulant use.

Demographic information show that majority of our respondents were males and were between 21-25 years of age. Majority of the respondents were single and this is attributed to the fact that they were relatively young and still pursing their academics; this is evidenced by the information showing that majority of the respondents were in their third and fourth academic year.

Our respondents were gathered across 32 departments in the University of Benin, with majority (17%) of our respondents from the department of Medical Biochemistry; the department in which the research work is being carried out. This was done in order to gain enough coverage and to obtain a wider response that will help to properly evaluate our findings and validate the findings of this research.

Majority of the respondents (42%) and (43%) claimed that they learnt about stimulant use from peer groups and school respectively. The latter is an institution of higher learning that is saddled with the responsibility of enlightening her students in many issues, including that of stimulant use, which is the topic of our research. Research has also shown that peer group is vital source of information for stimulant use among University undergraduates: hence, the aforementioned sources are justified. However, the poor knowledge of stimulant use from the media and parents/siblings underscore the need for media involvement in joining the crusade

of properly enlightening the youths and the general public about the stimulant drug use and abuse.

Parents on the other hands must brace up and educate their children/ward on stimulant use. Imparting a positive orientation will help to develop proper attitude, values and beliefs that will guide the child towards adolescence and adulthood.

Caffeine is the most widely used drug all over the world. Literature suggests that use of caffeinated beverage is quite common among University undergraduate (O'brien*et al,* 2008). In this study, majority (66%) of our respondents reported to have used caffeine in different forms; coffee, tea, energy drinks, chocolates and kolanuts; while 22% said they discontinued, 17% alleged they never used caffeine. Our report is in agreement with the findings of O'brien*et al,*(2008).

The wide use of caffeine as a stimulant can be attributed to the availability and inexpensiveness of caffeine containing products such as tea, coca-cola, chocolate and kolanuts.

Aside caffeine, alcohol (54%) and cannabis (50%) were highly reported to be used among our respondents. Alcohol include beer, hot drinks, palm wine, energy drink and alcoholic wine. Alcohol use has been reported commonly among University students. Access to alcohol occurs through various events such as parties, celebrations, clubbing. Students who were 20 years and older had a higher prevalence of alcohol. This is not surprising, given the legal age of alcohol use in most countries, including Nigeria is 18 years. Age 20 signifies the transition period between adolescence and adulthood and is the time when many young adults are experimenting and trying new things, including alcohol use and use of cannabis, especially among peers. Prevalent use of alcohol and cannabis could be attributed to the cheap price, age of majority of respondents (21-25), gender (majority of our respondents were males),

socio-economic status (most of our respondents say they earn above N30,000) and religion as most of our respondents are Christian. Wilsnack*et al*, (2005) found that women are seen as social guardians and the rate of alcohol consumption in public by females is lower than that of males. Religion is said to have a protective effect on the alcohol consumption and riskier pattern of use. Some religion such as Islam forbid the use of alcohol due to its psychotropic effects, whereas Christianity and Judaism do not forbid alcohol consumption and may even use it in rituals (Luczaketal, 2013).

Our research was conducted in the Southern part of Nigeria which is dominated by the Christians, and this is a possible cause of increased prevalence of alcohol use from our research. Use of alcohol and cannabis is worse of amongUniversityundergraduates probably due to perceived sense of freedom from parental control and as a result, feel free to engage in substance use. Many students see the school years as a time to experiment the various habits seen in these environments and many peers and they may involve or engage in stimulant use for social acceptance, to improve sexual performance or to cope with academic stress.

Other substances of abuse such as nicotine, crack, skoochies and miscellaneous substance such as lizard droppings and sewage water were reported to be used by smaller percentage of our respondents.

The findings of this study demonstrate that majority (76%) of the participating students self-perceive that caffeinated beverages and other stimulants improve assimilation and thus enhance academic performance. However, no association has been found between stimulants use and academic performance. Majority of our respondents also believe that caffeine and other stimulants increase wakefulness and energize them for more work, keep them focused, improve sexual performance, build confidence and kill boredom. It is a common perception that caffeine and other stimulants are being considered to enhance information processing

speed, attention and reaction times in humans,and our report is nodifferent. Research studies from other parts of the world reported similar studies. A survey conducted in America showed that almost all students all students that participated in the survey were consuming caffeine is one or other forms. The same survey reported that caffeine is the most popular substance on campus with an average of 1106.23-1698.02mg per week, increasing with year in schooling (Norton *et al,* 2011). A study conducted on first year and second year students of University Puerto Rico Medical Science Campus showed that more than two-third of students consume caffeinated beverage and reported that it helps them keep awake during exams, reduce stress and improve attention (Rio *et al*, 2013).

The findings of this study were consistent with the findings of our study. Majority of students believe that it reduces stress, improve attention and increase assimilation, thus improves academic performance but in reality, it has not been proven by research and studies recommended that students should remain careful while consuming caffeinated beverages and other stimulants due to harmful effects of stimulant use.

The increasing trend in caffeine use could be due to peer pressure, social media, especially WhatsApp and Facebook and social marketing of caffeinated energy drinks.It is sometimes surprising to see undergraduate and other members of the population say alcohol stimulates them. Alcohol however, is a central nervous system depressant and not a stimulant. The observed notion of alcohol as a stimulant may be due to the transients‘high‘ it provides on consumption.

This research also found some gender differences in psychoactive substance use among our respondents. There was a higher rate of stimulants use among male undergraduates which is consistent with previous reports on gender differences among undergraduate stimulant use in Nigeria (Adeyemo*et al,* 2016, Ekwume and Chukwuneke, 2010). Our findings show a

relatively high use of caffeine by females. This may be due to the presence of caffeine in frequently consumed products such as coco-cola, tea and energy drinks, and its easy accessibility. On the other hand, higher use of stimulants by males can be due to several reason such as peer pressure, curiosity, use by family members or need to improve sexual performance.

Our respondent's knowledge on physical, psychological and social effects of stimulants use were assessed and only 4/10 were correct. Majority of the respondents believed that stimulants can cause physical health affects such as tremor, headache, accidents and reduced heart function. However, knowledge was lacking on whether stimulant use can cause liver damage, sexual dysfunction, and premature death etc. This knowledge gap may be due to the fact that many of these respondents are from non-medical departments and are probably deficient of the knowledge of physical implications associated with substance use.

A better knowledge of the psychological health effects of stimulants use was observed as the majority of our respondents got 9/12 of the questions. The better response may be due to less-technicality of the psychological question and their common occurrence in the society.

The majority of our respondents had a better knowledgeofthe social effects of stimulant use (score= 6/7). This improved knowledge can be attributed to social and environmental occurrences observed as consequences of stimulants use such as violence and risky sexual behaviors.

4.2 CONCLUSION

Substance use is a phenomenon leading to various physical,, mental, social, and economic harms. Sometimes to the extent that the individual experiences serious decline in his/her individual or social function. It is considered a contagious phenomenon, which endangers the peers and friends of the substance-user individual.

Results of this study are consistent with previous research of undergraduate students regarding prescription stimulant use for nonprescribed purposes, specifically for academic performance enhancement. Data from the study support that alcohol abuse and dependence among students is a pertinent concern, suggesting that substance abuse in general must be addressed. Substance abuse and awareness programs combined with stress management programs in an overall substance-abuse reduction strategy, including the use of prescription stimulant use beyond the originally intended purpose, may be beneficial. Because of the lack of research focusing on graduate health care students, further investigations should use similar populations. Increasing risk perception via training, social alternatives to risky activities and parental training for continuing care and advice in the university/college period are recommended.

REFERENCES

Abdulahi, Z. (2009). “Drug abuse among youths: Strategies for school counseling”, The Nigerian Society of Educational Psychologists, Jos: Nigeria. 4(1): 131-136.

Abdu-Raheem, B. O. (2013) Sociological Factors to Drug Abuse and the Effects On Secondary School Students’ Academic Performance in Ekiti and Ondo States, Nigeria. Unpublished Ph.D. thesis, Ekiti State University, Nigeria.

Andersson M, Usiello A, Borgkvist A, Pozzi L, Dominguez C, Fienberg AA, Svenningsson P, Fredholm BB, Borrelli E, Greengard P, Fisone G (September 2005). "Cannabinoid action depends on phosphorylation of dopamine- and cAMP-regulated phosphoprotein of 32 kDa at the protein kinase A site in striatal projection neurons". The Journal of Neuroscience. 25 (37): 8432–8.

Adewuya, A. (2005) . Validation of the alcohol use disorders identification test (AUDIT) as a screening tool for alcohol-related problems among Nigerian university students. Alcohol & Alcoholism, 40(6): 575-577.

Akinyemi, K (2008). Pushing the drug war in the South West. Daily Trust, 30 November, 2008. On-line edition.

Alan, I.L.(2003). Drug abuse and prevention. Washington D.C: National Institute on Drug Abuse.

Ali, A..(2006). Fundamentals of Research in Education.Awka, Anambra State, Meks Publishers (Nig).

Aryana A, Williams MA (May 2007). "Marijuana as a trigger of cardiovascular events: speculation or scientific certainty?". International Journal of Cardiology. 118 (2): 141–4.

Ashihara, H, &Ashihara, H. (2004).Distribution and biosynthesis of caffeine in plants. Frontiers in bioscience, 9(1-3)

Back, S. E., Dansky, B. S., Carroll, K. M., Foa, E. B. & Brady, K.T. (2001). Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: Description of procedures. *Journal of Substance Abuse Treatment, 21*(1), 35–45.

Boyle M, Castillo VD. : Monster on the loose. Fortune 2006; 154: 116-122.

Brady, K.T., Dansky, B. S., Back, S. E., Foa, E. B. & Carroll, K. M. (2001). Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: Preliminary findings. *Journal of Substance Abuse Treatment, 21*(1), 47–54.

Caan, Woody; Belleroche, Jackie de, eds. (11 April 2002). Drink, Drugs and Dependence: From Science to Clinical Practice (1st ed.). Routledge. pp. 19–20. ISBN 978-0-415-27891-1.

Carleton College: Wellness Center: Blood Alcohol Concentration (BAC)". Archived from the original on 14 September 2009. Retrieved 29 August 2015.

Cheryl Platzman Weinstock (8 November 2017). "Alcohol Consumption Increases Risk of Breast and Other Cancers, Doctors Say". Scientific American. Retrieved 13 November 2018.

Croft, R. J., Mackay, A. J., Mills, A.T. &Gruzelier, J. G. (2001).The relative contributions of ecstasy and cannabis to cognitive impairment. *Psychopharmacology Bulletin, 153*(3).

Cynthia I. Campbell and others, "Age and Gender Trends in LongTermOpioid Analgesic Use for Noncancer Pain", American Journal of Public Health, vol. 100, No. 12 (December 2010), pp. 2541-2547.

Daras, M. (1996).Neurological complications of cocaine. In M. D. Majewkski (Ed.), *Neurotoxicity and neuropathology associated with cocaine abuse*. Rockville, MD: US Department of Health and Human Services.

Devlin H (2015-02-18). "Cannabis 'munchies' explained by new research". The Guardian. Retrieved 2018-10-18.

Dewey W. (1986) Cannabinoid pharmacology. Pharmacol Rev 38: 151–178

Di Marzo V, Sepe N, De Petrocellis L, Berger A, Crozier G, Fride E, Mechoulam R (December 1998). "Trick or treat from food endocannabinoids?". Nature. 396 (6712): 636–7.

Falvo, D R (2005). Medical and psychosocial aspects of chronic illness and disability (Third ed.). Jones & Bartlett Learning. p. 217. ISBN 978-0-7637-3166-3.

Federal Republic of Nigeria, (2004).National policy on Education (4th edition) Lagos: National Educational Research Development Council press.

Feige B, Scaal S, Hornyak M, Gann H, Riemann D (2007). "Sleep electroencephalographic spectral power after withdrawal from alcohol in alcohol-dependent patients". Alcohol. Clin. Exp. Res. 31 (1): 19–27.

Field, T., Diego, M. & Sanders, C. (2001).Adolescent depression and risk factors. *Adolescence, 36*(143), 491–498.

Fride E, Bregman T, Kirkham TC (April 2005). "Endocannabinoids and food intake: newborn suckling and appetite regulation in adulthood" (PDF). Experimental Biology and Medicine. 230 (4): 225–34.

Frost L, Mostofsky E, Rosenbloom JI, Mukamal KJ, Mittleman MA (February 2013). "Marijuana use and long-term mortality among survivors of acute myocardial infarction". American Heart Journal. 165 (2): 170–5.

GBD 2016 Alcohol Collaborators (August 2018). "Alcohol use and burden for 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016". Lancet. 392 (10152): 1015–1035.

Gowing, L., Cooke, R., Biven, A. & Watts, D. (2002). *Towards better practice in therapeutic communities*.Bangalow, New South Wales: Australasian Therapeutic Communities.

Guerri, C.; Pascual, M.A. (2010). "Mechanisms involved in the neurotoxic, cognitive, and neurobehavioral effects of alcohol consumption during adolescence". Alcohol. 44 (1): 15–26.

Haladu, H. (2003). Emerging serious psychopathology associated with abuse of cannabis (Indian hemp, marijuana). Tropical Journal of Pharmaceutical Research, 4(1): 329-330.

Hanson, G. R., Jensen, M., Johnson, M. & White, H. S. (1999). Distinct features of seizures induced by cocaine and amphetamine analogs. *European Journal of Pharmacology, 377*(2–3), 167–173.

Harper, S. J.; Jones, N. S. (1 October 2006). "Cocaine: what role does it have in c0

Horowitz M, Maddox A, Bochner M, et al. (1989). "Relationships between gastric emptying of solid and caloric liquid meals and alcohol absorption". Am. J. Physiol. 257 (2 Pt 1): G291–6298.

Hung, M. J., Kuo, L.T. &Cherng, W. J. (2003).Amphetamine-related acute myocardial infarction due to coronary artery spasm. *International Journal of Clinical Practice, 57*(1), 62–64.

Ikuo Yamamoto, Kazuhito Watanabe, Shizuo Narimatsu, Hidetoshi Yoshimura (1995), Recent advances in the metabolism of cannabinoid, *The international journal of biochemistry & cell biology* 27 (8), 741-746,

Israel, J. A. & Lee, K. (2001).Amphetamine usage and genital self-mutilation. *Addiction, 97*, 1215–1218.

Jones RT (November 2002). "Cardiovascular system effects of marijuana". Journal of Clinical Pharmacology. 42 (S1): 58S–63S. doi:10.1002/j.1552-4604.2002.

Kalant, H. (2001). The pharmacology and toxicology of 'ecstasy' (MDMA) and related drugs. *Canadian Medical Association Journal, 165*(7), 917–928.

Kalant, H., Khanna, J. M. & Marsham, J. (1970). J. Pharmac. exp. Ther. 175, 318.

Kalant, H.K.; Roschlau, W.H.E. (1998). Principles of Medical Pharmacology (6th ed.). pp. 373–375.

Kamil, I. A., Smith, J. N. & Williams, R. 7’. (1952). Biochemistry of alcohol, vol 3. 51, xxxii.

Kamieniecki, G., Vincent, N., Allsop, S. &Lintzeris, N. (1998). *Models of intervention and care for psychostimulant users* (Monograph Series No. 32). Canberra, ACT: National Centre for Education and Training on Addiction.

Kaye, S. &Darke, S. (2000). A comparison of the harms associated with the injection of heroin and amphetamines. *Drug and Alcohol Dependence, 58*(1–2), 189–195.

Klitzman, R. L., Greenberg, J. D., Pollack, L. M. &Dolezal, C. (2002). MDMA ('ecstasy') use, and its association with high risk behaviors, mental health and other factors

among gay/bisexual men in New York City. *Drug and Alcohol Dependence, 66*(2), 115–125.

Kosten, T. R., Malison, R. & Wallace, E. (1996). Neuropsychological abnormalities in cocaine abusers: Possible correlates in SPECT neuroimaging. In M. D. Majewkski (Ed.), *Neurotoxicity and neuropathology associated with cocaine abuse* (Vol. NIDA Monograph 163). Rockville, MD: US Department of Health and Human Services.

Kratofil, P. H., Baberg, H.T. &Dimsdale, J. E. (1996).Self mutilation and severe self-injurious behaviour associated with amphetamine psychosis. *General Hospital Psychiatry, 18*(2), 117–120.

Lenton, S., Boys, A. & Norcross, K. (1997).Raves, drugs and experience: drug use by a sample of people who attend raves in Western Australia. *Addiction, 92*(10), 1327–1337.

Lieb, R., Schuetz, C. G., Pfister, H., von Sydow, K. & Witten, H. (2002). Mental disorders in ecstasy users: A prospective-longitudinal investigation. *Drug and Alcohol Dependence, 68*(2), 195–207.

Machado Vieira R, Viale CI, Kapczinski F. Mania associated with energy drinks: The possible role of caffeine, taurine and inositol. Can J Psychiatry 2001; 46(5):454-5.

Malbergier, A. & Guerra de Andrade, A. (2001).Depressive disorders and suicide attempts in injecting drug users with and without HIV infection. *AIDS Care, 13*(1), 141–150.

MichaeilGossop, Paul Griffiths, Beverley Powis, and John Strang, “Severity of dependence and route of administration of heroin, cocaine, and amphetamines”. British Journal of Addiction (1992) 87:1527-1536

Mechoulam R (1984). Cannabinoids as therapeutic agents. Boca Raton, FL: CRC Press. ISBN 978-0-8493-5772-5.

Michael Gossop, and others, “The severity of dependence scale (SDS): psychometric properties of the SDS in English and Australian samples of heroin, cocaine, and amphetamine users”, Addiction (1995) 90:607-614.

Medical Marijuana and the Mind". Harvard Mental Health Letter. April 2010. Retrieved April 25, 2011

MirosalvPohanka(2015).Theperspectiveofcaffeineandcaffeinederivedcompoundsintherapy,BratislavskeLekarskeListy(BRATISLMEDJ)*InternationalJournalforBiomedicalSciencesandClinicalMedicine,*116(9):520-530

Moelker W (19 Sep 2008). "How does Marijuana Affect Your Body? What are the Marijuana Physical Effects?

Mohanpuria, P, &Mohanpuria, P. (2009).Caffeine biosynthesis and degradation in tea [Camellia sinensis (L.) O. Kuntze] is under developmental and seasonal regulation. Molecular biotechnology, 43(2)

Müller D, Koch RD, von Specht H, Völker W, Münch EM (March 1985). "Neurophysiologic findings in chronic alcohol abuse". Psychiatr Neurol Med Psychol (Leipz) (in German). 37 (3): 129–32.

National Centre for HIV Epidemiology and Clinical Research.(2002). *HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia*. Sydney: National Centre for HIV Epidemiology and Clinical Research, University of NSW.

NDLEA.(2003). "National Drug Law Enforcement Agency Report.

Niesink RJ, van Laar MW (October 2013). "Does Cannabidiol Protect Against Adverse Psychological Effects of THC?". Frontiers in Psychiatry (Review). 4: 130.

Ojikutu, R.K. (2010). The desire to remain awake at night among students of tertiary institutions in Lagos State, Nigeria: The health implications. International Journal of Academic Research 2 (2): 29-33.

O'Keefe, JH; Bhatti, SK; Bajwa, A; DiNicolantonio, JJ; Lavie, CJ (2014). "Alcohol and cardiovascular health: the dose makes the poison...or the remedy". Mayo Clinic Proceedings. 89 (3): 382–393.

Olley, B.O.(2008). Child sexual abuse, harmful alcohol use and age as determinants of sexual risk behaviours among freshmen in a Nigerian university. African Journal of Reproductive Health, 12 (2): 75-88.

Osborne GB, Fogel C (2009). "Understanding the motivations for recreational marijuana use among adult Canadians" (PDF). Substance Use & Misuse. 43 (3–4): 539–72, discussion 573–9, 585–7.

Peetwee R. (2010) Receptors and channels targeted by synthetic cannabinoid receptor agonists and antagonists. Curr Med Chem 17: 1360–1381

Pertwee R., Howlett A., Abood M., Alexander S., Di Marzo V., Elphick M. (2010) International Union of Basic and Clinical Pharmacology. LXXIX. Cannabinoid receptors and their ligands: beyond CB1 and CB2. Pharmacol Rev 62: 588–631

Peyrot I, Garsaud AM, Saint-Cyr I, Quitman O, Sanchez B, Quist D (March 2007). "Cannabis arteritis: a new case report and a review of literature". Journal of the European Academy of Dermatology and Venereology. 21 (3): 388–91.

Riley, S. C. E., James, C., Gregory, D., Dingle, H. & Cadger, M. (2001). Patterns of recreational drug use at dance events in Edinburgh, Scotland. *Addiction, 96*(7), 1035–1047.

Roy, A. (2001). Characteristics of cocaine-dependent patients who attempt suicide. *American Journal of Psychiatry, 158*(8), 1215–1219.

Soar, K., Turner, J. J. D. & Parrott, A. C. (2001). Psychiatric disorders in Ecstasy (MDMA) users: A literature review focusing on personal predisposition and drug history. *Human Psychopharmacology, 16*(8), 641–645.

Stein, M. D., Charuvastra, A. & Anderson, B. J. (2002). Social support and zero sharing risk among hazardously drinking injection drug users. J*ournal of Substance Abuse Treatment, 23*(3), 225–230.

Stockwell T, Zhao J, Panwar S, Roemer A, Naimi T, Chikritzhs T (2016). "Do "Moderate" Drinkers Have Reduced Mortality Risk? A Systematic Review and Meta-Analysis of Alcohol Consumption and All-Cause Mortality". J Stud Alcohol Drugs. 77 (2): 185–198.

Strote, J., Lee, J. E. & Wechsler, H. (2002). Increasing MDMA use among college students: Result of a national survey. *Journal of Adolescent Health, 30*(1), 64–72.

Topp, L., Degenhardt, L., Kaye, S. &Darke, S. (2002). The emergence of potent forms of methamphetamine in Sydney, Australia: a case study of the IDRS as a strategic early warning system. *Drug and Alcohol Review, 21*, 341–348.

Ujvary I, Hanus L (2016), Human Metabolites of Cannabidiol, A Review on Their Formation, Biological Activity, and Relevance in Therapy. Cannabis Cannabinoid Res. 2016 Mar 1;1(1):90-101. doi: 10.1089/can.2015.0012

UNODC, Terminology and information on drugs, Third edition, 2016.

UNODC, World Drug Report 2018

UNODC, World Drug Report 2018.

vanBeek, I., Dwyer, R. & Malcolm, A. (2001). Cocaine injecting: the sharp end of drug related harm. *Drug and Alcohol Review, 20*(3), 333–342.

Volkow, N. D., Fowler, J. S. & Ding, Y. S. (1996).Cardiotoxic properties of cocaine: Studies with positron emission tomography. In M. D. Majewkski (Ed.), *Neurotoxicity and neuropathology associated with cocaine abuse (NIDA Research Monograph 163)*. Rockville, MD: US Department of Health and Human Services.

WHO, Global adult tobacco survey Nigeria 2012, Fact Sheet.

WHO | Global status report on alcohol and health 2018"

Winstock, A. R., Griffiths, P. & Stewart, D. (2001). Drugs and the dance music scene: A survey of current drug use patterns among a sample of dance music enthusiasts in the UK. *Drug and Alcohol Dependence, 64*(1), 9–17

Winston, Anthony P. "Neuropsychiatric Effects of Caffeine." Advances in Psychiatric Treatment 11 (2005): 432–39.

World Health Organisation Report (2009). Management of substance abuse: Alcohol Geneva 2009 [http://www.who.org]. Retrieved, December 15, 2011

Worral BB, Philips CD, Henderson KK. Herbal energy drinks, phenylpropanoid compounds, and cerebral vasculopathy. Neorology 2005; 65(7):1137-8.

Wright, S. & Klee, H. (2001). Violent crime, aggression and amphetamine: What are the implications for drug treatment services? *Drugs: Education, Prevention and Policy, 8*(1), 73–90.

Yen, D. J., Wang, S. J., Ju, T. H., Chen, C. C., Liao, K. K., Fuh, J. L. &Hu, H. H. (1994). Stroke associated with methamphetamine inhalation. *European Neurology, 34*(1), 16–22.

APPENDIX

Definition of key terms.

It is appropriate to try to define in simple terms crucial words descriptively used by experts in association with this concept.

Drug: A substance, often an illicit one that causes addiction, habituation or a marked change in consciousness.

Drug abuse: Continuous use of centrally active substances in such a way that it becomes associated with some harm.

Drug Addiction: Compulsive physiological need for and use of a habit-forming substance characterised by tolerance and by well-defined physiological symptoms upon withdrawal.

Drug Dependence: is a state arising from continued desire to use a substance in spite of the presence of harm.

Drug Tolerance: is an adoption state characterized by diminished response to some quantity of drug or drug requiring larger quantities to produce the same pharmacological effect.

QUESTIONNAIRE

The survey instrument is designed to evaluate the use of stimulants by students in the University of Benin.

Dear Respondents, in order to ensure anonymity, you are required NOT to write your name or matriculation number on the questionnaire .Your genuine response will be highly appreciated.

SECTIONA: **Socio-Demographic Data**: Please tick the appropriate answer in the boxes provided.

Age:(inyears)15-20[]21-25[]26-30[]above30[]
Gender:male[]female[]
Religion:Christianity[]Islam[]Pagan[]
ReligiousParticipation:Frequently[]Occasionally[]Rarely[]
MaritalStatus: Single[ ]Married[]
Department:_____
Academiclevel:100(),200(),300(),400(),500(),600().
EconomicStatus:whatisYourmonthlyincome/allowance?
Below₦10,000[]₦10,000-20,000[]₦21000-30,000[]Above₦30,000[]
Howdidyouknowaboutstimulant:peergroup[]siblings[]parents/guardians[]media[]school[]

SECTIONB:**UseofStimulants**:Kindlytickthemostgenuineanswer

	SUBSTANCEUSED	CURRENTLYUSED	USEDBUTDISCONTINUED	NEVERUSED
1	Alcohol(Beer,Hotdrink,Palmwine,Energydrinks,Alcoholicwine			
2	Nicotine(Cigarettes,Snuff,Shisha)			
3	Caffeine(Coffee,Coca-Cola,Kolanut,Caffeinateddrinksandteas			
4	Crack			
5	Cannabis(Common/streetnames;igbo,weed,marijuana,hemp,ghanja,Greenleaf			
6	MiscellaneousSubstancessuchascowdrug,Humanexcreta,Lizarddroppings,Soakawaypit.			
7	Skoochies			

SECTIONC:KnowledgeofHealthEffects/ImplicationsofStimulantUse

Thefollowingarelongtermeffectsofstimulantuse:

	HEALTHEFFECTOFSTIMULANTS	YES	NO
A	**BENEFICIALEFFECTOFSTIMULANTSONACADEMICPERFORMANCE**		
1	Enhanced assimilation		
2	Keeps you awake for longer period of reading		
3	Energize you to do more work than normal		
4	Helps to keep you focused in completion of a particular task		
5	Improved sexual performance		
6	Helps during social interactions		
7	Builds confidence for a certain period of time		
8	Kills boredom and brings about excitment		
B	**PHYSICAL HEALTH EFFECTS**		
1	Headache		
2	Hand tremor		
3	Improved heart function		
4	Liver damage		
5	Sexual dysfunction		
6	Lungs Cancer and respiratory diseases		
7	Weight gain		
8	Accidents		
9	Improved Vision		
10	Premature death		

C	**PSYCHOLOGICALHEALTHEFFECTS**		
1	Low self esteem		
2	Timidity		
3	Self isolation		
4	Examphobia		
5	Phobia for bulky academic workload		
6	Emotional Problems		
7	Inability to sleep (Insomnia)		
8	Reduced Aggressiveness		
9	Anxiety, Paranoia, Psychosis and Depression		
10	Improve Mental Health		
11	Poor concentration		
12	Tolerance/dependence		
D	**SOCIAL HEALTH EFFECTS**		
1	Altered family relationship		
2	Better academic performance.		
3	Risky sexual behavior.		
4	Undue violence.		
5	Social vices such as robbery and cultism.		
6	Bankruptcy.		
7	Increased social acceptance.		