



RECREATIONAL USE AND ADDICTION TO METHAMPHETAMINE (MKPULUMMIRI) AMONGST STUDENTS OF RIVERS STATE UNIVERSITY

Joy Ziworitin

Abstract

Use of methamphetamine (“Ice”, Mkpulummiri: seed of water) as a recreational drug and consequent addiction by students of Rivers State University, Nkpolu-Oroworukwo was studied. The research involved informal interviews, discussions and the administration of questionnaires. Three formal research questions were raised, 100 questionnaires administered and 91 retrieved. 80 Christians and 11 participants from other religions participated in the research. The mean age of participants was 24 years with 65 males and 26 females. It was observed that the drug caused effects such as anxiety, mood swings, aggressiveness and financial mismanagement. Simple percentage was used in reporting results, conclusion and recommendations were made.

KEYWORDS:

Methamphetamine, drug, addiction, recreational

Introduction

Methamphetamine known by various street names such as Ice “Mkpulummiri (seed of water), crystal, glass, speed, meth and kryptonite is a potent central nervous system stimulant that is commonly used as a recreational drug. Sadly, it is less commonly used as a second line treatment for attention deficit hyperactivity disorder and obesity.

It was discovered in 1893 by Nagayoshi Nagai a Japanese pharmacologist who synthesized it from ephedrine.

However, in 1919 Nagayoshi's compatriot Akira Ogata went further and synthesized methamphetamine into a crystallized form (Sato, 2008).

It was used by soldiers to enhance their endurance and performance (Anglin et al, 2000, page 138)

Methamphetamine is currently and internationally a controlled, schedule II or illegal substance in some countries. Apart from its addictive nature, methamphetamine use is also associated with many negative outcomes. Methamphetamine exists as two enantiomers which are 'levo' and 'dextro-methamphetamine'.

WHAT IS A DRUG?

A drug is any substance food exclusive, that is used to prevent, treat, relieve or diagnose symptoms of a condition that is not normal.

RECREATIONAL DRUG USE

Recreational drug use is the use of a psychoactive drug (a psychoactive, psycho-pharmaceutical, psychoactive agent or psychotropic drug, is a chemical substance that brings a change in nervous system function thereby resulting in alterations in mood, perception, cognition, consciousness or behaviour).

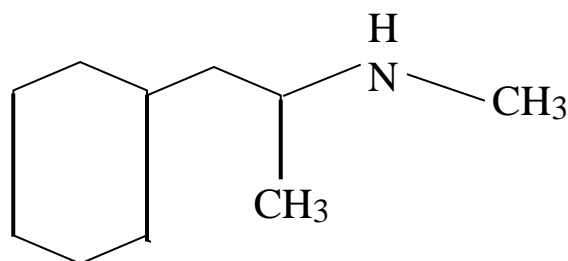
Recreational drugs is a loose term that refers to legal or illegal drugs which are often used without medical supervision.

Recreational drugs are taken for enjoyment and or leisure purposes rather than medical reasons.

DRUG ADDICTION

Drug addiction otherwise known as substance use disorder is a disease that affects a person's brain and behaviour thereby making an individual unable to control the use of a legal or illegal drug

Methamphetamine



Alternative names include: N-methylamphetamine, N α -dimethylphenethylamine, desoxyephedrine.

Routes of administration

Medical: Oral ingestion

Recreational Use: Oral, Intravenous, Intra muscular, Subcutaneous, Insufflation, Vaginal, Rectal, Vapour, Inhalation.

BIOAVAILABILITY

The bioavailability of oral intake is 70% while intravenous administration is 100%. Onset of action for methamphetamine is rapid with an elimination half life of 5-30 hours. It has duration of action of 10-20 hours and is primarily excreted by the kidneys.

Its formula is $C_{10}H_{15}N$

In low to moderate doses, methamphetamine can elevate mood, increase alertness, concentration and also increase energy in fatigued individuals. It reduces appetite and promotes weight loss. At doses that are very high it can induce psychosis, break down of skeletal muscles, seizures, and bleeding in the brain.

Mood swings can occur with chronic high dose, it has been reported that recreational uses of methamphetamine lead to increase in sexual desire. It has high level of addiction which means high dose use will lead to compulsive drug use and high likelihood that withdrawal symptoms will “set in” when methamphetamine use is stopped.

There is a great percentage of withdrawals from methamphetamine after very heavy use leading to post-acute withdrawal syndrome that may persist beyond the expected periods of withdrawal.

It is a neuro toxin at high doses to human mid brain dopaminergic neurons. It belongs to the substituted phenylalanine and substituted amphetamine chemical classes. Methamphetamine is also related to other dimethylphenethylamines as a positional isomer of compounds which share the common chemical formula $C_{10}H_{15}N$.

USES

Methamphetamine hydrochloride under the trade name Desoxyn has been approved for treating ADHD – attention deficit hyperactivity disorder in both children and adults.

Methamphetamine is sometimes prescribed for treating idiopathic insomnia and narcolepsy. Its levorotary form is available in some over-the-counter (OTC) nasal decongestant products. Since Methamphetamine is associated with a very high potential for misuse, it is regulated under the controlled substances act.

Recreationally, methamphetamine is used for its effects as a potent stimulant, euphoriant and aphrodisiac qualities.

CONTRAINDICATIONS

Methamphetamine is contra indicated in individuals with a known history of substance use disorder, severe anxiety, heart disease or in people that are presently experiencing glaucoma, hyperthyroidism, severe hypertension, and arteriosclerosis. It is also applicable to people that have experienced hypersensitivity disorders or reactions to other stimulants either in the past or currently taking monoamine oxidase inhibitors.

Individuals with bipolar disorder, depression, mania, psychosis, liver and kidney disease, elevated blood pressure, Tourette syndrome, thyroid problems etc to monitor their symptoms while using methamphetamine.

PHYSICAL EFFECTS

Physical effects of methamphetamine use include among others dilated pupils, excessive sweating (hyperhidrosis), flush skin, loss of appetite, increased movement, headache, dry mouth and grinding of teeth which leads to “meth mouth”, heartbeats that are irregular and present as accelerated or slowed heartbeat, rapid and incessant breathing, high blood pressure(hypertension), low blood pressure (hypotension), elevated body temperature, constipation, diarrhoea, dizziness, blurred vision, numbness, twitching, tremors, dry skin (xeroderma), acne and pallor.

With long term use of methamphetamine, there are usually sores in the skin which is exacerbated by poor diets. Users of methamphetamine and especially addicts may lose their teeth very fast and this is not dependent on the route of administration and this condition is informally referred to as meth mouth.

However, “meth mouth” is more severe in users who inject the drug rather than inhaling, smoking or swallowing of the drug. It is said that “meth mouth” is probably caused by combination of drug induced physiological or psychological changes that result in the dry mouth (xerostomia) other reasons could be long periods of poor oral hygiene or care, bruxism: teeth grinding and clenching, repeated intakes of high-calorie carbonated beverages.

PSYCHOLOGICAL EFFECTS OF METHAMPHETAMINE USE:

Psychological effects may include changes in libido, euphoria, dysphoria, apprehension, decreased sense of fatigue, self confidence, insomnia or wakefulness, irritability, restlessness, obsessive behaviour. Something peculiar to methamphetamine and related stimulants is “punding”: which is a compulsive performance of repetitive mechanical tasks such as assembling and disassembling, collecting or sorting household objects, which is also known as a persistent non goal directed repetitive activity.

Methamphetamine use also has a very high association suicide, violent behaviours, depression, anxiety and amphetamine psychosis.

NEUROTOXIC AND NEUROIMMUNOLOGICAL EFFECTS

In both laboratory animals and humans, methamphetamine is found to be directly neuro-toxic to dopaminergic neurons. Methamphetamine use is associated with a higher incidence of Parkinson's disease. Aside from being neuro-toxic on dopaminergic systems evidence in humans shows that high-dose methamphetamine use can also be neuro-toxic to serotonergic neurons.

With magnetic resonance imaging of human methamphetamine users, it is evident that there is neuro degeneration or adverse neuro-plastic changes in the structure and function of the brain.

EPIGENETIC FACTORS

With people using methamphetamine, addiction is known to be persistent with more than sixty percent (60%) of people treated for meth addiction falling into relapse in just one year.

Approximately 50% (fifty percent) of individuals with methamphetamine addiction keep indulging over a ten year period with the other 50% trying to bring down use after one to four years from start of methamphetamine use.

Due to the persistence of addiction, it simply follows that long lasting changes in gene expression may take place in specific areas of the brain and this in turn contributes greatly to the addiction phenotype.

In 2015, a review summed up the number of studies that involved long term methamphetamine use in rodents. Long term methamphetamine use elicited gene specific histone acetylations, deacetylations and methylations. The different types of epigenetic alterations caused down or up regulations of specific genes important in the problem of addiction.

Citing the current Cochrane review on drug dependence and consequent withdrawal in individuals that are recreational users of methamphetamine, when long term heavy users suddenly stopped methamphetamine use, many of them complained of a time limited syndrome (withdrawal syndrome) that occurs within 24 hours of the last methamphetamine intake.

Withdrawal symptoms for methamphetamine can include increased appetite, fatigue, increased or decreased movement, drug craving, dysphoric mood: lack of motivation, lack of sleep or feelings of sleepiness and dreams that are either lucid or vivid.

METHAMPHETAMINE OVERDOSE

A methamphetamine overdose may culminate into a wide array of symptoms. In moderate overdose, there may be symptoms such as abnormal rhythms of the heart, confusion, difficult and or painful urination, over active reflexes, severe agitations, tremor, inability to pass urine.

In very large overdoses we may find symptoms such as methamphetamine psychosis, adrenergic storm, minimal passage of urine or no passage at all, cardiogenic shock, bleeding in the brain, circulatory collapse, hyperpyrexia: dangerously high body temperature, pulmonary hypertension, kidney failure and muscles break down.

Methamphetamine overdose is also likely to result in mild brain damage which is due to neuro-toxicity of dopaminergic and serotonergic pathways. Convulsions and coma succeed death from methamphetamine poisoning.

CHEMISTRY

Methamphetamine is a chiral compound that has two enantiomers: dextromethamphetamine and levomethamphetamine. The free base of methamphetamine is a clear, colourless liquid (at room temperature) with an odour akin to geranium leaves.

It is miscible with chloroform and soluble in ethanol and diethyl ether. On the other hand, the hydrochloride salt of methamphetamine is odorless and has a bitter taste. At room temperature it occurs as a white crystalline powder or as white crystals.

The hydrochloride salt is also soluble in water and ethanol.

DEGRADATION

A study in 2011 into application of bleach for the destruction of methamphetamine, it was shown that the effectiveness of bleach was directly related to its concentration and time of exposure.

Another study in 2011 showed that methamphetamine is a persistent pollutant in soils. Yet another study in 2013 involving bioreactors in waste water, methamphetamine was shown to be degraded with 30 days under light exposure.

SYNTHESIS

Racemic (mixture of equal amounts of two enantiomers or substances that have dissymmetric molecular structures that are mirror images of one another) methamphetamine is prepared by either the reductive amination method or the Leukart method.

In the Leukart reaction, an equivalent of phenylacetone is reacted with two (2) equivalent of N-methylformamide to produce the formyl amide of methamphetamine carbon dioxide and methylamine as side products.

An intermediate iminium cation which is reduced by the second equivalent of N-methylformamide is formed. Hydrolysis of the intermediate formyl amide under acidic aqueous conditions is carried out which yields methamphetamine as the final product.

Phenylacetone can be reacted with methylamine under conditions of reduction to produce methamphetamine.

Suggestions based on animal research have been made citing calcitriol the active metabolite of vitamin D to produce high levels of protection against the DA: activation of dopaminergic (DA) systems and 5HT(5hydroxytryptamine): serotonin depleting effects of neuro toxic doses of methamphetamine.

TREATMENT (ACCESS TO TREATMENT)

One study that examined access to treatment by female methamphetamine users in Southern Nigeria showed that 12 (twelve) participants had used methamphetamine (crystal or powder), two had used methamphetamine tablets in their lifetime (Akpabio, et al, 2019).

Using methamphetamine for weight reduction purposes, a female who took crystal methamphetamine discovered that it helped her control her eating habits and weight loss which made her continue the drug for weight control. She claims taking crystal meth facilitated her weight loss.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Nigeria has been “crowned” over the past years as a significant producer of methamphetamine with many street name such as Mkpulummiri, speed, ice, crystal, glass, meth or kryptonite.

Discoveries have been made by the NDLEA (National drug law enforcement agency) of illegal laboratories spread across some south-eastern states of Nigeria. It is clear that local laboratories have contributed largely to growing epidemic of methamphetamine use.

Weight control is said to be a motivation for methamphetamine use with one other factors blamed on methamphetamine use being unemployment. A 2018 United Nations office on Drugs and Crime (UNODC) report estimated that about 89,000 Nigerians were using methamphetamine with use of the drug blamed on the depressed economy reality faced by the youth in Nigeria.

Earlier on in 2016, the illicit market for methamphetamine took a higher turn in Nigeria with drug syndicates bringing Latin American experts to help in setting up large scale methamphetamine laboratories with similarities to those found in Mexico. A particular industrial super laboratory was said to have the capacity to produce 4000kg of methamphetamine in one week.

The NDLEA raided the site in March, 2016 and arrested 4 Mexican and 5 Nigerians. From reports gathered, the Mexicans come from Sinaloa state, with their arrests, it was confirmed that there was an alliance between Latin American and Nigerian drug cartels.

The rapid growth of the illicit methamphetamine market in Nigeria has been on the rise due to accessibility of starting materials or precursor chemicals such as ephedrine which in theory is supposed to be a controlled substance but is widely available in Nigeria.

In March 2019, the NDLEA seized 309kg of ephedrine from supposed members of a criminal network in Trans Ekulu Estate in Enugu and Festac town in Lagos. According to 2017 report by the United Nations Commission on narcotic drugs in Vienna, Nigeria criminal networks bring in ephedrine from other West African Countries that import more than they need.

A portion of the methamphetamine produced in Nigeria is consumed locally with a greater portion being exported to South Africa. In late 2018, after the destruction of a laboratory in Obinugwu village, south-east Nigeria, the NDLEA special enforcement team commander by name Sunday Zirangey said that methamphetamine is a serious threat with Nigeria risked into becoming a narcotic state.

Just like what obtains in Mexico where syndicates of drug cartel control the drug market through the use of force and violence, altercation and confrontations between drug gangs in Nigeria are rapidly increasing.

In August 2017, gunmen attacked a church in Ozubulu in Anambara state in the process of looking for rival drug gang leader and ended up killing 13 people.

On November 27, 2021 a news outlet reported that the NDLEA in Enugu state had uncovered illegal laboratories producing methamphetamine arresting 3(three) suspects (Ulasi, 2021). Also, on the 10th of December 2021, the Daily times newspaper reported that the NDLEA had destroyed a laboratory in Asaba arresting 8 (eight) suspects.

Since drug availability to a large extent encourages consumption and associated harms (Dumbili 2020). It follows therefore that citing of the local laboratories and the activities of these drug cartels is causing the increasing trend of methamphetamine use.

Neuro imaging studies have revealed that METH can cause neuro degenerative changes in the brains of human addicts (Aron and Paulus 2007, Chang et al, 2007). It is known also that these abnormalities include persistent reductions in the levels of dopamine transporters (DAT) in the dorso lateral, prefrontal cortex, the caudate putamen and the orbito frontal cortex (Mc Cann et al 1998, 2008, Se Kine et al 2013, Volkow et al, 2001)

Serotonin transporter (5HTT-5hydroxytryptamine transporter also reduces in the caudate putamen, mid brain, hypothalamus, thalamus, temporal, cingulated, orbitofrontal cortices of METH dependent individuals (Sekine et al, 2006).

It has been discovered through neuropsychological studies that there are deficits, working memory, attention and decision making in long term methamphetamine addicts. Strong evidence also shows the negative neurological and psychiatric of METH abuse are due partly to drug-induced neuro-pathological changes in the brains of these individuals that are exposed to methamphetamine.

With structural magnetic resonance imaging, it is obvious that methamphetamine addicts suffer substantial morphological changes in their brains. The changes are loss of gray matter in the cingulated, para limbic and limbic cortices, observable shrinkage of the hippocampus and white mater hypertrophy (Thompson et al, 2004).

Also, white mater of brain of methamphetamine abusers show hyper intensities (Bae et al 2006). Ernst et al 2000, show decreases in neuronal marker: N-acetylaspartate (Ernst et al 2000, Sung et al 2007)

There is also observed reduction in marker of metabolic integrity, creatine (Sekine et al, 2002) and a rise in a marker of glial activation myoinositol (Chang et al, 2002; Ernst et al; Sung et al , 2007; Yen et al, 1994).

In the frontal gray matter of methamphetamine abusers, there is elevated choline levels that are indicative of increase in cellular membrane synthesis and turn over (Ernst et al, 2000) Salo et al, 2007; Taylor et al, 2007.

CHAPTER THREE

MATERIALS AND METHOD

STUDY AREA

Rivers State University formerly known as Rivers State University of Science and Technology is a university located in the Diobu area of Port Harcourt, Rivers State Nigeria.

The Vice Chancellor of the university is Professor Nlerum Sunday Okogbule. It is the first technological university in Nigeria and was established in 1980 from the Rivers State College of Science and Technology.

Its acronym is RSU with its motto being: Excellence and Creativity.

STUDY DESIGN

The study combined a community based non formal interview type and cross sectional survey design to evaluate the use of methamphetamine (Mkpulummiri) as a major recreational drug by science students in Rivers State University.

STUDY POPULATION

The study population comprises students from the Faculty of Sciences.

SAMPLING AND SAMPLING TECHNIQUES

A sample of 100 (one hundred) students was selected from the faculty of sciences, departments of medical laboratory sciences, engineering and microbiology. The participants were all undergraduates. The random sampling technique was adopted in selecting the study size, thus all the students were given equal chance of being selected.

INSTRUMENTATION

The research instruments used were verbal (informal) interviews, discussions and questionnaires. The questionnaires were divided into (2) sections.

SECTION A:

This section contains information relating to the demographics of the participants (respondents) such as age, sex, year of study, religion.

SECTION B

This section was made to elicit information on methamphetamine:- “Ice”, “speed”, Mkpulummiri as a recreational drug in Rives State University.

VALIDITY OF THE INSTRUMENT

The validity of the instruments is the fact value of the questionnaire which is evaluated by the participant (respondents) who are first time users, multiple users and those struggling to stop the use of methamphetamine.

ADMINISTRATION OF INSTRUMENT

Hundred (100) questionnaires were administered to the respondents and 91 questionnaires were retrieved.

DATA ANALYSIS METHOD

The simple percentage approach was used in analyzing the data. Items in the questionnaire were grouped together and their percentage found.

CHAPTER FOUR

RESULT AND ANALYSIS

QUESTIONNAIRE SAMPLE

SECTION A

AGE
SEX
RELIGION
YEAR OF STUDY

QUESTIONNAIRE

Question 1

When where you first introduced to drug use?

Question 2

Are you currently on Methamphetamine or any other recreational drug?

Question 3

Does the use of methamphetamine result in weight loss?

AGE: the median age of study participants was 24years

SEX: 65male participants and 26 female participants.

RELIGION: 80 participants are Christians while 11 participants belong to other religions.

YEAR OF STUDY	YEAR I	YEAR II	YEAR III
No. of Users	12	34	45

QUESTIONS ON METHAMPHETAMINE USE

Question 1:

Participants were asked when they were first introduced to drug use.

This question was asked so as to ascertain if wanting to fit into the school system served as boost for recreational drug use: 80% of the responses were clear on the point of respondents taking their first doses of drugs when they got admitted into school.

Question 2:

Participants were asked if they were currently on methamphetamine or any other recreational drug.

70% of respondents agreed to be using the drug currently and on a weekly basis and this question helped to make estimates on the number of current and radical users of methamphetamine.

Question 3:

Since some user claim that methamphetamine use helps them control their weight, question number 3 was asked.

45% of respondents agreed that it helped in weight loss

Other questions were generated in a non-formal manner by way of discussion

1. Is methamphetamine strong enough to promote sustainable “highs”?
2. Is the inhalation route preferred to the injection?
3. Is methamphetamine an aphrodisiac?

4. Is government doing enough to curb production and sale of all forms of the drug?

5. Is methamphetamine a relaxant that help to ease stress?

Varying levels of agreements and disagreements were reached. It was however observed that about 40% of participants who resided off campus complained about wanting to quit but not being able to.

From these discussions and the passion exhibited by respondents it is clear that users of the drug have a “false” feeling of fulfillment and having solutions to their problems. There is a general consensus though that the drug gives a euphoric effect and makes people feel like they are untouchable.

Still from informal interviews and discussions it was clear that most of the students on methamphetamine were not eating properly and this may be the reason for the weight loss reported.

- i) Methamphetamine is agreed to promote sustainable “highs”.
- ii) Most respondents preferred inhaling the drug
- iii) On the issue of the government, they feel more stringent measures should be put in place.
- iv) They strongly believe it eases stress.

Methamphetamine can cause a spike in body temperature which could end in death. The drug affects the brain and negatively increases the amount of dopamine which is a natural chemical in the brain.

Dopamine among other functions is involved in body movement, motivation and reinforcement of rewarding behaviours.

Methamphetamines ability to release high levels of dopamine in reward areas of the brain strongly influences drug taking actions which make a user want to take the drug again and again.

CHAPTER FIVE

DISCUSSION OF RESULT

The findings of the study showed that despite the acute and chronic health risks that are associated with the consumption of methamphetamine such as high blood pressure, extremes of behaviour and cardiovascular related illness, an increasing number of young people in Nigeria are currently on the drug with new “initiates”. Students in Rivers State University had a myriad of reasons why they use the drug, but most of all, there is this belief that the drug makes them relax and helps them coordinate properly.

On the outside, it seems like government is trying hard to curb production and intake of the drug. This seems like a very huge task considering the frequency with which these students get supplies of the drug.

There are “middle men” or agents that make sure the supply chain remains unbroken and an even tight code of silence with strict penalties for defaulters who divulge information to school authorities. First users were initiated by multiple users of methamphetamine and other drugs.

From interviews with students that stay off campus, it was observed that 57% of participants who stayed off campus had little bond with their parents. In cases of using methamphetamine as an aphrodisiac, 85% of the respondents agreed to methamphetamine’s libido boosting properties. Besides from this effect, this drug also causes sores and abrasions in the mouth via bruxism increasing the risk of infections that are sexually transmitted.

CONCLUSION

There is a high prevalence of substance use and substance use disorder in our schools and citadels of higher learning and this is a clarion call for all agencies of government and individuals to come on board and tackle this ugly trend of recreational use of drugs in our schools.

With this negative trend, national development is hindered since the youths that are supposed to be the “bedrock” of a nation are infusing themselves with substances that will alter their reasoning, cognitive skills and also result in loss of productive man-hours.

RECOMMENDATIONS

The family is considered an important unit that will positively sensitize the youth’s on the harmful effects of drug use and misuse.

There is dire need to address the ills of recreational drug use on our campuses and this can be achieved by religious bodies and leaders because Nigeria as a country has blind faith in our religious institutions.

Since prevention is key when experimenting with drugs, prevention is the best way to keep students from becoming addicted to drugs. Therefore, youths should be educated on the ills of drug-taking behaviours.

Another recommendation which though controversial in some quarters is aversion therapy otherwise called aversive therapy or conditioning which is use to help give up substance taking habit by having drug users associate it with unpleasant events. This therapy is controversial though since experts believe that aversion therapy is equivalent to using punishment as a form of therapy and this is unethical.

Government should clamp down on importers of precursor materials and chemicals used in the manufacture of methamphetamine and also investigate laboratories which are usually masked and are used in the production of illicit drugs. Most of the laboratories found in rural or semi urban communities are ignored when raids on drug laboratories are carried out.

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