Drugs and Society Drug Abuse and Misuse

GST 125

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Session objectives

- To improve understanding on drugs in general
- To enable informed decision on use of drugs
- To promote rational use of drugs
- To improve understanding of drug abuse and misuse and substance Abuse
- To improve understanding of the social and health consequences of drugs and substance abuse

Lecture Content

- Drugs and Society
- Sources of Drugs
- Classification of Drugs,
- Dosage, forms and Routes of Drug Administration
- Adverse Drug Reactions
- Rational and Irrational Drug Use
- Drug Abuse and Misuse/Substance Abuse
- Social and health consequences of drug/substance abuse

Introduction

- Drugs have been part of society for a long time.
- The term ‘drug’ was derived from the French word ‘drogue’ or dried herbs
- Drugs are used for diagnosis, cure, mitigation and prevention of diseases
- A crude drug contains the active ingredients and requires no further processing (ginger, turmeric, moringa etc.)
- A specific drug can be:

  (a) a remedy, used to treat a symptom or disease.

  (b) a poison, misused in some way to cause harmful effects.

  (c)a magical charm, when it is used in the belief that it can solve all of life's problems.
- The scientific definition of a drug is any substance, other than food, that by its chemical or physical nature alters the structure or function of a living organism, resulting in physiological or behavioral changes or both.

Introduction

- Multivitamin pill or herbal tea are not regarded
- as drugs, but the substances in the pill or tea can produce changes in the human body.
- Some drugs like antibiotics and tranquilizers. require a prescription from a health worker before a patient can get them from a pharmacist especially in developed countries.
- Other drugs can be purchased without a prescription, common painkillers, cough and cold remedies (over the counter or OTC)
- Drug use has occurred in every society throughout the world, from ancient times.

Sources of Drugs

Major sources

1. **Plants Sources:** This is the oldest source of drugs

- Most drugs in the ancient time were obtained from plants.
- All parts of plants may be useful, leaves, flower, bark, stem, root, seed etc.
- Leaves: Digoxin is made from the leaves of Digitalis Purpurea, used for treating congestive cardiac failure.
- Tobacco leaves are the source of Nicotine
- Leaves of Eucalyptus give oil of Eucalyptus, an important component of cough syrups.
  Flowers: Poppy Papaver Somniferum gives morphine (Opioid)
- Vinca rosea gives Vincristine and Vinblastine -anti-cancer
- Rose gives rose water used as tonic

Sources of Drugs

Fruits: Senna pod gives Anthracine, which is a purgative (used in constipation)

Seeds: Seeds of Nux Vomica give strychnine, which is a CNS stimulant.

•Castor oil seeds give castor oil.

•Calabar beans give Physostigmine, an anti- cholinomimetic drug.

Roots: Ipecacuanha root gives Emetine, used to induce vomiting as in accidental poisoning, and has amoebicidal properties.

•Rauwolfia Serpentina gives reserpine, a hypotensive agent used for hypertension treatment.

Sources of Drugs

Bark: Cinchona bark gives quinine and quinidine, which are antimalarial drugs.

- Atropa belladonna gives atropine, which is anticholinergic.
- Hyoscyamus Niger gives Hyosine, which is also anticholinergic

Stem: Chondrodendron Tomentosum gives Tuboqurarine, which is skeletal muscle relaxant used in general anesthesia.

2. Animal Sources: Pancreas is a source of Insulin, used in treatment of Diabetes.

- Urine of pregnant women gives human chorionic gonadotropin which was used in the past for the treatment of infertility.
- Sheep thyroid is a source of thyroxin, used in hypertension.

Sources of Drugs

- Cod liver is used as a source of vitamin A and D.
- Anterior pituitary is a source of pituitary gonadotropins, used in treatment of infertility.
- Blood of animals is used in preparation of vaccines.
- Stomach tissue contains pepsin and trypsin, which are digestive juices used in treatment of peptic diseases in the past but has now been replaced by better drugs

3. Mineral Sources:

(a)Metallic and Non-metallic sources

- Iron is used in treatment of iron deficiency anemia.
- Mercurial salts are used in Syphilis.

Sources of Drugs

•Zinc is used as zinc supplement. Zinc oxide paste is used in wounds and in eczema.

•Iodine is antiseptic. Iodine supplements are also used for treating deficiency.

• Gold salts are used in the treatment of rheumatoid arthritis.

(b) **Miscellaneous Sources**

• Fluorine has antiseptic properties.

• Borax has antiseptic properties.

• Selenium as selenium sulphide is used in anti dandruff shampoos.

• Petroleum is used in preparation of liquid paraffin.

Sources of Drugs

Synthetic/ Semi synthetic Sources:

- When both the nucleus and the chemical structure of the drug from natural source is altered, we call it synthetic, while changing only the chemical structure will produce a semi-synthetic drug.
- Emetine Bismuth Iodide is an example of synthetic drug.
- Examples of semi-synthetic ones include: Apomorphine, Diacetyl morphine, Ethinyl Estradiol, Homatropine, Ampicillin and Methyl testosterone.
- Most of the drugs used nowadays (such as anti-anxiety drugs, anti-convulsant) are semi-synthetic forms.

Sources of Drugs

Microbiological Sources: Penicillium Notatum is a fungus which gives penicillin.

• Actinobacteria give Streptomycin.

• Aminoglycosides such as gentamicin and tobramycin are obtained from streptomycis and micromonosporas.

Recombinant DNA technology: Recombinant DNA technology involves cleavage of DNA by enzyme restriction endonucleases.

•The desired gene is coupled to rapidly replicating DNA (viral, bacterial or plasmid).

• The new genetic combination is inserted into the bacterial cultures which allow production of vast amount of genetic material.

Sources of Drugs

Examples are Interferon, Alfa 2a Alfa-2b, Hepatitis B vaccine, Covid-19 vaccine

Advantages:

- Huge amounts of drugs can be produced.
- Drug can be obtained in pure form.
- It is less antigenic.

Disadvantages: Costs as well-equipped lab is required; Highly trained staff is required

Drug names/Nomenclature

Every drug has 3 names:

1. **Chemical name:** based on the chemical composition of the drug.
2. **Generic name** or non-proprietary name, usually derived from the chemical name and is short.

- Generic names are given by official body within a country, which means they can vary from country to country.
- For example, the generic name for the common pain medication- Paracetamol in most countries while it is Acetaminophen or Tylenol in the USA.

Drug names/Nomenclature

3. Brand/Trade or Proprietary name- is the official name given by the manufacturer.

- A brand name can only be used by a single manufacturer, which means the same drug may have several brand names depending on the number of manufacturers.
- The anti-malarial Artemisinin has 94 brands, Lumefantrine, Aigth L Plus, Artefen Artequick.
- The brand names are usually easier to say and easier to remember.
- They may be better known than the generic name.
- Acetaminophen is often called by one of its commonly used brands in the USA: Tylenol.

Classifications drugs

Drugs can be categorized in a number of ways.

1. **Anatomical classification** -based on organ on which it acts.

(Gastrointestinal, Cardiovascular system, Respiratory System, Central Nervous Systems, Musclo-skeletal system etc.)

2.Therapeutic classification –based on the condition it treats- Anti-hypertensive, Diabetic, Antimalarials etc.

3.Chemical classification (Glycosides, Alkaloid oils etc.)

4.Combined classification, where two or more of the above classes are combined e.g. (ATC/DDD) (Anatomical, Therapeutic, Chemical Classification with Defined Daily Doses)

Classifications drugs

• The purpose of the ATC/DDD system is to serve as a tool for drug utilization research in order to improve quality of drug use and for international comparison.

5. Legal classification (legal or illegal)

-Controlled Substances

- Teratogenic Risks

Classifications of controlled drugs

- Drugs that have a significant potential for abuse are placed into five categories called schedules and are classified according to their potential for abuse:
- Schedule I drugs have the highest potential for abuse – Schedule V drugs have the lowest potential for abuse
- Schedule I e.g. Heroin, Estacy drugs
- Schedule II Hydromorphone methadone, Eperidine, Fentanyl
- Schedule III Ketamine, anabolic steroids
- Schedule IV Alprazolam, diazepam
- Schedule V Cough preparations containing not more than 200 mg of codeine

Drugs that acts on the Central Nervous System (CNS)

STIMULANTS: Commonly abused drugs that affects the central nervous system, raising the body's levels of physiological activity. -known as "uppers", "speed" and "heart" -it gives high feelings to the user. -example: nicotine, cocaine, methamphetamine

DEPRESSANTS: Also referred to as sedative or downer- Induce sleep and relieve stress and anxiety--drugs that slows down the normal function of the central nervous system. -make the heartbeat and respiratory rate slower than normal. -used for the treatment of anxiety and insomnia.

- Common types of depressants includes, Alcohol and Barbiturates used to treat conditions like seizures, insomnia, anxiety , depression and severe emotional stress. Valium, Promethazine, alcohol

Drugs that acts on the CNS

HALLUCINOGENS -also known as psychedelic drugs, alter a person's view and concept of what is real. -affects all the body's senses. -some of the common hallucinogens are, lysergic acid diethylamide (LSD), phencyclidine (PCP) , ketamine, and psilocybin found in "magic mushrooms.

NARCOTICS -used principally for pain management and medication. -produce numbing effects and induce sleep. -administration is done through inhalation, intravenous injection or oral intake.

Heroin, codeine and opium.

CHEMICAL INHALANTS -volatile substances inhaled by users. The highly intoxicating effects of inhalants are referred to as "huffing". -Examples of inhalants: common household cleaners, glues, spot removers, perfumes, industrial chemicals like solvent and sealants and spray paints.

Rational and Irrational Drug use

Rational use of drugs: “Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community." (WHO, 1985)

Irrational drug use - Any use that does not meet the definition of rational use

- Worldwide more than 50% of all medicines are prescribed, dispensed, or sold inappropriately.
- while 50% of patients fail to take them correctly.
- However, about one-third of the world's population lacks access to essential medicines.

Common types of irrational medicines use

- The use of too many medicines per patient (poly-pharmacy).
- Inappropriate use of antimicrobials/antibiotics-leading to resistance.
- Over-use of injections.
- Failure to prescribe in accordance with clinical guidelines.
- Inappropriate self-medication.
- Lack of access to medicines and inappropriate doses.
- Irrational over-use of medicines: lead to inappropriate patient demand.
- Medicine stock-outs lead to loss of patient confidence in the health system.
- Inappropriate use and over-use of medicines waste resources.
- Increase in out-of-pocket payments.

Reasons for Irrational use of Drugs

1. Ignorance
2. Role models – Teachers or seniors
3. Lack of diagnostic facilities/Uncertainty of diagnosis
4. Demand from the patients
5. Patient load
6. Promotional activities of pharmaceutical industries
7. Drug promotion and exaggerated claim by companies
8. Defective drug supply system & ineffective drug regulation
9. Wrong use of antimicrobials
10. Incorrect route
11. Incorrect dosing – under or overdose
12. Incorrect duration – prolong or short-term use
13. Unnecessary use of expensive medicines
14. Unsafe use of corticosteroids

Measures to ensure Rational drug use

1. Identify the patient's problem based on symptoms and signs.
2. Diagnosis of the disease – define the diagnosis.
3. List possible intervention or treatment.
4. Start the treatment by writing an accurate & complete prescription e.g. name of drugs with dosage forms, dosage schedule & total.
5. Give proper information, instruction & warning regarding the treatment given e.g. side effects, dosage schedule & dangers/risk of stopping the therapy suddenly.
6. Monitor the treatment to check, if the treatment has solved the patient's problem.
7. Passive monitoring – done by the patient, explain him what to do if the treatment is not effective or if too many side effect occur.
8. Active monitoring - done by physician through follow-up to check the response of the treatment.

Dosage Forms, and Route of Administration

- Dosage forms are the means by which drug molecules are delivered to sites of action within the body.
- Accurate dose.
- Protection e.g. coated tablets.
- Sealed ampules.
- Protection from gastric juice.
- Masking taste and odour.
- Placement of drugs within body tissues.
- Sustained release medication.
- Controlled release medication
- Optimal drug action.
- Insertion of drugs into body cavities (rectal, vaginal)
- Use of desired vehicle for insoluble drugs.

Adverse Drug Reactions

Any response to a drug which is noxious & unintended & which occurs at doses in man for prophylaxis, diagnosis or treatment is referred to as Adverse drug reaction.

Classification based on onset of reaction:

- Acute (<60 minutes),
- Sub-acute (1- 24 hrs.)
- and Latent (>2 days)

Thalidomide :PHOCOMELIA (hypoplastic and aplastic limb deformities) in the newborn babies

JAUNDICE associated with the use of SALVARSAN, an organic arsenical used in the treatment of Syphilis, in the last century.

DRUG & SUBSTANCE ABUSE

Content

- What is Substance abuse
- Why is substance abuse an issue of global and national concern.
- Emerging Issues in Substance Abuse
- Commonly abused substances
- Substance abuse in Nigeria
- Prevention of Substance abuse
- Management of addiction

Substance Abuse

- Drug abuse refers to the non-medical use of substances to induce psychoactive effects despite the knowledge of their negative health and social consequences
- Drug misuse refers to the incorrect/inappropriate use of drugs that have medical use without prescription or the required diagnosis
- Psychoactive substance use, can lead to dependence.
- Dependence is a cluster of behavioural, cognitive, and physiological phenomena that develop after repeated substance use,
- Dependence include a strong desire to take the drug, inability to restraint its use, persisting in its use despite harmful consequences.
- People who are dependent on a substance give a higher priority to drug use than to other activities and obligations.

Substance Abuse

- Substance abuse is a pattern of harmful use of any substance for mood altering purpose
- Substances would include alcohol, and other drugs (legal or not) and other substances that are not drugs at all (solvents etc.)
- Abuse can be because substance is being used in ways that is not intended or recommended or use when it is not prescribed
- Harmful use: substance use becomes abuse if repeated use causes significant impairment like health issues, disabilities, failure to fulfil responsibilities, impaired control and social risk
- For example, if one drinks enough to cause hangover, use enough substance to miss work or school or smoke enough marijuana to loose friends, drink or use more than intended then substance use becomes abuse
- Substance abuse also refers any use of illegal drugs that are not prescribed for a health condition

Substance Abuse

- Drug abuse is defined as the self-administration of a drug for non-medical reasons in quantities and frequencies which may impair and individual's ability to function effectively, and which may result in social, physical and emotional harm.
- Drug dependence occurs when someone who abuses drug has compulsion to take the drug on a continuous basis in order to experience the psychic effect and to avoid the discomfort of its absence.
- Non-medical use of alcohol and other psychoactive drugs is a serious public health concerns in many countries, including Nigeria.
- Experience has shown that the problem occurs most among young people 10-24 and more in males
- Abuse of psychoactive substances by young people is a global public health problem

Substance Abuse

- Illegal or illicit drugs usually do more than alter moods, they:
  - -Cloud judgement
  - -Distort perception
  - -Alter reaction time which can put one in danger of accidents or injury
- The drugs are termed illegal because they are potentially addictive and can cause negative health effects
- Recreational use: some argue that casual use of say marijuana is not an abuse and say that it has some health benefits unlike harder drugs
- However, research has shown that marijuana users become psychologically dependent there for it is addictive

Drugs that acts on the CNS

STIMULANTS: Commonly abused drugs that affects the central nervous system, raising the body's levels of physiological activity. -known as "uppers", "speed" and "heart"-it gives high feelings to the user.

Common stimulants: caffeine, nicotine, cocaine, methamphetamine.

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SEDATIVES: Induce sleep and relieve stress and anxiety-Valium, Promethazine, alcohol

CHEMICAL INHALANTS: Volatile substances inhaled, the highly intoxicating effects of inhalants are referred to as “huffing”

- Examples of inhalants: common household cleaners, glues, spot removers, perfumes industrial chemicals like solvent and sealants and spray paints.

Why is Substance abuse an important public health issue

- Substance use has a major impacts on individuals, families and communities
- It is estimated that of the 246 million people worldwide, who used drugs in 2013, 27 million of them have drug use disorders. (UNODC).
- Over 14 million Nigerian are involved in drug abuse
- Illicit drug use causes more than 400,000 deaths annually around the world and is a risk factor for multiple health condition (including HIV/AIDS, Hepatitis) Road traffic accidents and suicides
- People with drug use disorders experience difficulties at work and in relationship with family and friends

Why is Substance abuse an important public health issue

- Studies have implicated drugs use disorders in crime, sexual and domestic violence, child abuse, homicides, teenage pregnancy
- People who inject drug are at risk of blood borne diseases like HIV/AIDS and Hepatitis B and C
- It is estimated that 13% of such person are infected with HIV and over half of them have Hepatitis B and C
- Impedes development of society-educational performance, reduce academic achievements, employment challenges
- Premature deaths and disability-accidents, other social vices

Why is Substance abuse an important public health issue

- Substance abuse is an expensive venture and has financial implications.
- Domestic violence, gender-based violence and child abuse.
- Substance abuse is of such importance to the global community that it is included as part of the 17 Sustainable development goals (SDGs) to be achieved by all countries by 2030.
- Goal 3 on Health has a target of substance abuse.
- Target 3.5: Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.

Emerging Issues in Substance Abuse

- In recent years, the impact of substance and alcohol abuse has been notable across several areas, including the following:
- Adolescent abuse of prescription drugs has continued to increase
- The availability of prescription drugs is increasing from many sources, including the family medicine cabinet, the Internet, and health providers
- Many adolescents believe that prescription drugs are safer to take than street drugs
- In addition, designer and synthetic drugs such as fake Cocaine and synthetic Marijuana which may be more dangerous

Substance abuse by Young People

- Experimentation with drug is common among young people due mainly to:
- Curiosity
- Peer Pressure
- To relieve stress

Most young people start with experimentation with tobacco and alcohol

Use of Tobacco and Alcohol increases the chances of trying other more addictive substances

Commonly abused substances

- Globally, Cannabis is the most widely used, followed by Opioids, Amphetamine-type stimulants and Cocaine.
- In the last 10 years there has been an unprecedented increase in the number and non-medical use of synthetic psychoactive substance such as synthetic cannabinoids and cathinone's.

Cannabis

- Cannabis is the general name for several psychoactive preparation of Marijuana (hemp) plant-other names are grass, pot, dope, weed, ganja and hashish
- Cannabis intoxication causes euphoria, lightness of the limbs
- Cannabis is globally the most used psychoactive substance under international control
- In 2013, an estimated 181.8 million people aged 15-64 years used cannabis for nonmedical purposes globally (uncertainty estimates 128.5–232.1 million) (UNODC, 2015)

Commonly Abused Substances

- Alcohol
- Opioids
- Cannabinoids
- Sedatives and hypnotics
- Cocaine
- Other stimulants including caffeine
- Hallucinogens
- Tobacco, electronic cigarettes (e-cigarettes)-Contains over 4000 compounds and chemicals of which 40 have been proven to cause cancer. Note secondary smoking
- E-cigarettes and Vaping and the challenges that it is creating especially among young people.
- Caffeine
- Volatile solvents
- Other psychoactive substance and drugs from different classes used in combinations

Cocaine

- From Coca leaves or synthesized ecgonine are CNS stimulants.
- Cocaine derivatives are used as local anaesthetic in dentistry, ophthalmology and Ear, Nose and Throat surgeries, due to its strong vasoconstrictive action to reduce local bleeding.
- Cocaine is a central nervous system stimulant and used non-medically to produce euphoria or wakefulness.
- Repeated use, produces dependence.
- Cocaine or coke as its often called is sold as white, translucent crystalline flake or powder and can be sniffed, chewed or injected intra venously.
- Causes feeling of elation and exaggerated confidence and self esteem.
- Causes impaired judgement and irresponsible and dangerous activities

Opioids

- Opioids-from Opium Poppy(Papave Somniferum) or their synthetic analogues which interact with specific receptors in the brain.
- They have the capacity to relieve pain and produce a sense of well being (euphoria). They can also cause stupor, coma, respiratory depression result in high doses.
- Examples are Morphine, Diamorphine, Heroin, Codeine, Oxycodone-these are strong pain killers reserves for treating very serious pain from cancers, etc. in the medical field.
- Codeine is the most commonly abuse opioid in Nigeria
- Example of synthetic opioids include: Methadone, pethidine, pentazocine

Drug abuse in Nigeria

- Before 1990s, Nigeria was mainly a transit country for drugs from South America to Europe.
- 1989 the NDLEA was establish to address the menace of drug trafficking
- Drug abuse has been on the increase in the last 3 decades or so
- All types of drugs are available in Nigeria
- High prevalence of drug abuse among youth especially among students

2018 National survey on drug use in Nigeria by UNODC

- 14.3 million Nigerians aged 15-64 used drugs in 2017
- 14.4% prevalence of drug use in Nigeria more than 5.6% global average in 2016
- Cocaine, Heroin and Amphetamine abused by elite
- Cannabis is the most abused 10.6 million
- Tramadol, codeine, cough syrup and antibiotics common among youth
- BBC documentary on abuse of cough syrup show that it is very pervasive in Nigeria

Drug abuse in Nigeria

- 1 in 4 users are females
- Highest prevalence in 25-39 years
- 1in 7 persons age 15-64 used drugs in 2017
- One in 5 high risk users inject drugs (80,000)

Dependence

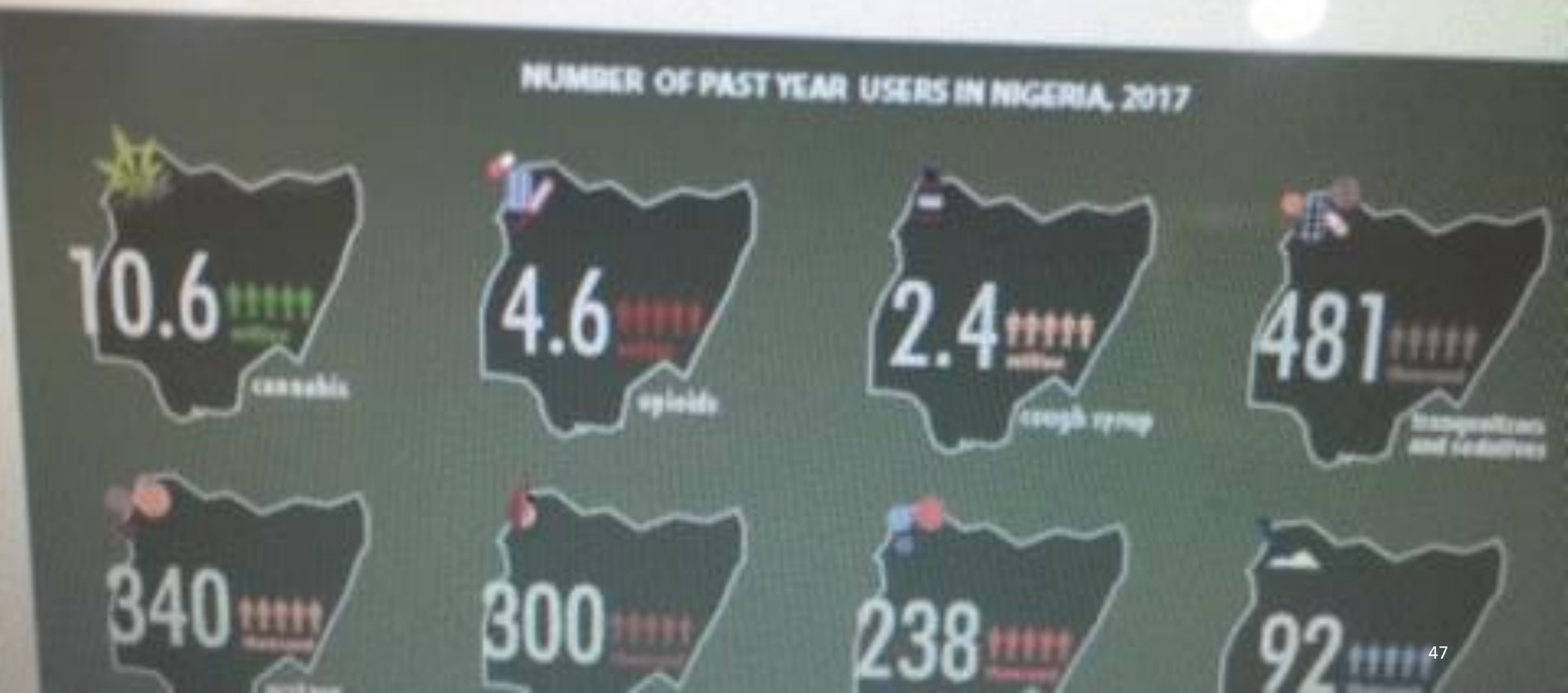
Overall, 1 in 5 drug users are dependent

1 in 3 Cannabis

1 in 5 Opioid

1 in 7 Amphetamine

1. EXTENT OF DRUG USE IN NIGERIA



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ce of drug use in Nigeria by geopolitical zones and states, 2017

Prevention of Substance Abuse

- Efforts have focused of the enforcement of the prohibition of non-medical use of internationally controlled substances
- Need for a comprehensive, balanced and inclusive drug policy:
- Prevention of drug use and reduction of vulnerability and risks;
- Treatment and care of people with drug use disorders;
- Prevention and management of the harms related to drug use;
- Access to controlled medicines
- Focus should be on preventing the initiation and continuation of drug use by children, adolescents and young people

Prevention of Substance Abuse

- Preventing the onset of substance use can be achieved through a comprehensive multisectoral approach
- Such strategies must target the risks and protective factors at different ages with a multiple interventions:
  - -Supply reduction measures
  - -Health promotion and/or drug use prevention programmes
  - - activities that reduce people's motivation to obtain and use illicit drugs
- Particular attention should be paid to the social and economic determinants of drug use, namely:
  - -Reducing vulnerability of individuals and communities
  - -Eliminate circumstances that promote or perpetuate risk behaviours

Treatment of Substance Abuse disorder

- The best treatment outcomes are achieved when a comprehensive multidisciplinary approach is implemented.
- Screening and counselling through early diagnosis and treatment, rehabilitation and social reintegration programmes.
- Medication assisted (opioid substitution) therapy of opioid dependence
- Sustained participation in peer led health civil society and non-governmental organizations is associated with continued abstinence
- Reducing the individual and public health harm of drug use.

Ensuring availability of controlled Substances

- Many internationally controlled substances are essential medicines that are:

  -critical for the relief of pain and for palliative care, for the treatment of psychiatric and neurological illnesses,

  -for use in anaesthesia, surgery and obstetrics, and for the treatment of substance use disorders, including opioid dependence

- Ensuring the adequate availability of controlled substances for medical and scientific purposes is one of the objectives of the international drug control conventions
- Governments should put in place a system that ensures

  -Adequate availability of controlled substances for medical and scientific purposes,

  -Preventing abuse, diversion and trafficking

Challenges of Treatment in Nigeria

- 40% of high-risk drug users wanted treatment but were unable to do so due to:
- Costs
- Fear of Stigma
- Treatment not available
- No information about available treatment

THE END

THANK YOU