

Substance Use

Objective:

- Describe the burden of substance use, and abuse globally and nationally
- Understand difference between: use and substance use disorder
- List the different health complications and sequelae for select substances
- List the presenting symptoms for individuals with substance use addiction, or intoxication
- List the treatment for substance use intoxication for select substances
- Assess the patients who may be at risk for alcohol use, and take proper history for alcohol intake
- List the national policies available for prevention and control of substance use in the Kingdom (e.g. National Committee for Narcotics Control)

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Definitions

What is substance use?

- It the use of “any **psychoactive compound** with the potential to cause health and social problems, including substance use disorder.”
- These substances may be illegal, legal or controlled through prescription

What are psychoactive substances?

- Substances that affect the mental processes, e.g. perception, consciousness, cognition or mood and emotions, when taken in or administered into one’s system
- They belong to a broader category of substances that include alcohol and nicotine.
- Production, distribution, sale or non-medical use of many psychoactive drugs is either controlled or prohibited outside legally sanctioned channels by law.
- They have different degrees of restriction of availability, depending on their risks to health and therapeutic usefulness, and classified according to a hierarchy of schedules at both national and international levels.

Substance use vs. misuse, vs. substance use disorder

The word **addiction** is not used anymore if you see it in mcqs it's the **wrong** answer

Substance Use

- Taking a substance for a purpose that could either be medical or to get high
- It can be using a legal or illegal or controlled drug
- **Using a substance** that does not classify as harmful and does not meet the criteria for substance use disorder

Substance Misuse

- The substance is used for **non-medicinal** reasons or for **reasons other than prescribed**; or using legal controlled substance without medical supervision
- Still does not meet the criteria for substance use disorder

Substance Abuse

- (Old definition, **not used anymore**)
- Using the substance in a very high doses or in a way that may produce harm to oneself or those around us, but still does not classify as substance use disorder;

Substance use disorder

- Results from **prolonged** harmful use
- It is diagnosed according to a set of criteria (DSM-V)
- Requires specialized clinician for diagnosis

Other Important Terminology

Withdrawal

The onset of a predictable constellation of signs and symptoms following the ^{keyword} **abrupt** discontinuation of, or rapid reduction in, the dose of a psychoactive substance

Tolerance

a state of adaptation in which exposure to a drug over time results in diminution of one or more of the drug's physiologic effects.

Intoxication

- This differs by substance
- The symptoms of intoxication may range from cognitive impairment to death

Different scenarios mean different things

For example, take three different scenarios for drinking alcohol:

The international definition for “moderate drinking” => two or less drinks a day in Men, one or less drinks a day in Women, with a specified definition for amount of 1 drink

Alcohol use

Another ex. Someone that smokes 2-3 cigarettes per day => **Substance use**

Heavy episodic drinking (binge drinking) => 5 or more drinks Men, 4 or more drinks in Women, in one setting

Alcohol misuse

A person who has **repeated** drinking **pattern** that causes biological, social harm and meets criteria for substance use disorder **diagnosed based on a criteria**

Alcohol use disorder

DSM 5 Criteria for Diagnosing Substance Use Disorders*

Diagnostic Criteria for Substance Use Disorders

- Using in larger amounts or for longer than intended
- Wanting to cut down/stop using, but not managing to
- Spending a lot of time to get/use/recover from use
- Craving
- Inability to manage commitments due to use
- Continuing to use, even when it causes problems in relationships
- Giving up important activities because of use
- Continuing to use, even when it puts the you in danger
- Continuing to use, even when physical or psychological problems may be made worse by use
- Increasing tolerance
- Withdrawal symptoms

*Fewer than 2 symptoms = no disorder; 2-3 = mild disorder; 4-5 = moderate disorder; 6 or more = severe disorder.

Dependence vs Use disorder

Dependence

“a syndrome of physiological, behavioural and cognitive phenomena, which lead to loss of control over use.”

Use disorder

The now used term among medical practices instead of (abuse, dependence, addiction)

The individual is classified on a spectrum: mild, moderate, severe, depending on no. of symptoms

No need to memorize just know that the disorder is based on this criteria

Different Substance Classes

Their effects on the CNS and other side effects:

Illicit substances	Legal (licit) substance
Controlled substances that cannot be obtained, banned in most parts of the world and are illegal for consumption, distribution or purchase	Controlled substances that can be obtained in most countries by prescription for medical purposes or age regulation
<p>Examples:</p> <ul style="list-style-type: none"> • Cannabis • ATS: Amphetamines, methamphetamine, MDMA • Opioids/opiates (ketamine, heroin) • Cocaine • Khat 	<p>Examples:</p> <ul style="list-style-type: none"> • Tobacco • Alcohol • Cough medication • Prescription opioids (e.g. Tramadol, codeine, morphine, oxycontin) • Pregabalin • Gabapentin • Sedatives (e.g. Benzodiazepines)

Classification of substances:

Nicotine	cigarettes, vapor-cigarettes, cigars, chewing tobacco, and snuff
Alcohol	including all forms of beer, wine, and distilled liquors; alcohol is also a depressant
Cannabinoids	Marijuana, hashish, hash oil, and edible cannabinoids
Opioids	Heroin, methadone, buprenorphine, Oxycodone, Vicodin, and Lortab
Depressants	Benzodiazepines (e.g., Valium, Librium, and Xanax) and Barbiturates (e.g., Seconal)
Stimulants	Cocaine, amphetamine, methamphetamine, methylphenidate (e.g., Ritalin), and atomoxetine (e.g., Stratera)
Hallucinogens	LSD, mescaline, and MDMA (e.g., Ecstasy; also stimulant)

Alcohol intoxication and Alcohol withdrawal

Alcohol intoxication	Alcohol withdrawal
Alcohol intoxication depends on the level of alcohol in the blood	Cessation of alcohol or reduction in alcohol consumption that has been heavy and prolonged
Symptoms of alcohol intoxication: <ul style="list-style-type: none"> • Slurred speech • Nausea • Vomiting • lack of coordination • impaired judgment • mood and personality changes • Hypothermia • drowsiness • respiratory depression <p style="color: green; font-size: small;">The symptoms could come as a case</p>	Associated with 2 or more of the following: <p>Symptoms of alcohol withdrawal:</p> Insomnia <ul style="list-style-type: none"> • nausea/vomiting • autonomic hyperactivity • Tremors • agitation (psychomotor) • transient visual • tactile or auditory hallucination • anxiety or generalized tonic-clonic seizures
Management: <ul style="list-style-type: none"> • Investigating level of alcohol in blood • Securing airways • LFT • Electrolytes • Assessment of withdrawal 	Management: <ul style="list-style-type: none"> • No blood tests; depends on symptoms • Evidence of alcohol use in blood: \uparrowGGT, AST:ALT ratio >2, \uparrowethyle-glucouronide in urine • Nutritional support (thiamine and folic acid) • Rx: benzodiazepines; gabapentin

Illicit Substances:

Cannabis

The use of cannabis can have several health consequences in addition to social consequences.

Most importantly, cognitive impairment: Decreased intelligence, **Brain fog**, Learning difficulty, Amotivation

Most serious when use starts among adolescents

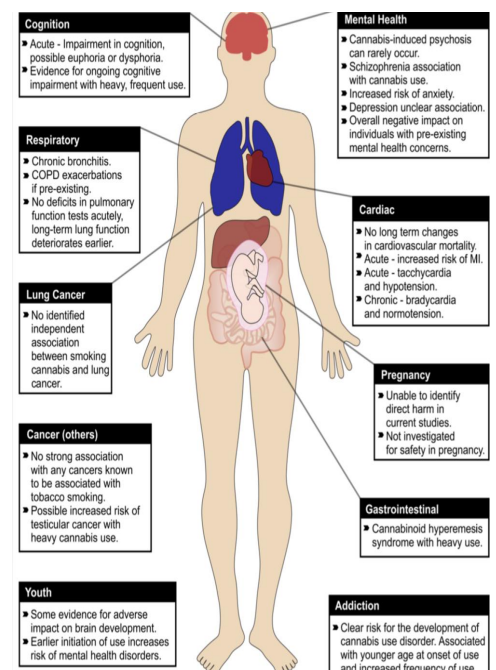
Other complications include: triggering of schizophrenia, MI

Social consequences of cannabis use: unemployment, lower educational attainment and life satisfaction, Family and social problems

Withdrawal symptoms: irritability, anxiety, restlessness, appetite changes, and disrupted sleep

Treatment of cannabis use disorder:

- delta-9-tetrahydrocannabinol(THC)>for withdrawal symptoms
- Antidepressants
- Sedatives and hypnotics (for sleep disturbance)
- Cognitive behavioural therapy (CBT) "support groups" gold standard



Illicit Substances

Opioids

Worldwide problem

- Used in medical setting for **chronic pain**
- Could be naturally occurring alkaloids (codeine, morphine); synthetic (fentanyl, methadone, tramadol), semisynthetic (oxycodone, hydromorphone, oxycodone)
- Prescription opioids are causing a crisis worldwide:
 - 21% to 29% of those with chronic pain go on to opioid SUD
 - Mechanism of action=> stimulation of opioid receptors causing euphoria, analgesia, cough suppression
- Adverse effects:
 - constipation, respiratory depression, tolerance and dependence, nausea, vomiting, sedation, myoclonus or pruritus.
- Signs: pupillary injection; wounds (injection site); poor motor skills; low weight and poor hygiene
- Most hospitalization due to: Traumatic injuries, intoxication, infection of injection site, endocarditis, MI or cardiac arrest
- Diagnosis of suspected use:
 - Biological sample: urine, saliva, blood, hair
- Treatment:
 - **Naloxone => for intoxication**
 - Methadone and buprenorphine => for withdrawal symptoms

Cocaine

Just know that it has an immediate effect + ADRS are mainly cardio and CNS

- Cocaine is a powerful stimulant -> **immediate effect**
- It is consumed through snorting, inhalation or injectable in water- soluble form
- Mechanism of action => Increased dopamine activity in the mesocortical limbic system -> increased epinephrine -> increased sympathetic activity
- Adverse effects:
 - Cardiovascular -> MI, cardiomyopathy
 - Endothelial dysfunction and platelet aggregation -> atherosclerosis, stroke
 - CNS -> seizures, headaches, transient loss of consciousness, focal neurologic complications like intracranial hemorrhage and infarcts
 - Psychiatric -> hallucinations, paranoia, suicidal ideation, aggression, agitation, stereotyped behavior, and anxiety
 - Respiratory -> airway injury, tracheal stenosis, pneumothorax
 - GI -> bleeding, colitis, intestinal obstruction and perforation
- Diagnosis:
 - Urine testing or gas chromatography -> benzoylecgonine (cocaine metabolite)
- Management:
 - Symptoms -> agitation give antipsychotic; for ACS give nitroglycerin; treat hyperthermia

Illicit Substances

Methamphetamine

- Psychoactive stimulant
 - Can be ingested, inhaled or injected
- Effects:
 - Increased energy, arousal, reduction in appetite, tachycardia, disinhibition
- Adverse effects:
 - Psychiatric -> Psychosis, depressed mood, anxiety, suicide, homicide
 - CVS -> ventricular fibrillation and acute heart failure, bacterial endocarditis (injections)
 - Pulmonary edema -> respiratory failure
 - CNS -> seizures and stroke
- Diagnosis:
 - Urine analysis -> up to **48 h** after use
- Treatment:
 - Supportive -> treat symptoms (intestinal; ACS; psychosis...etc)

Burden of Substance Use Worldwide

Substance use is a growing public health concern

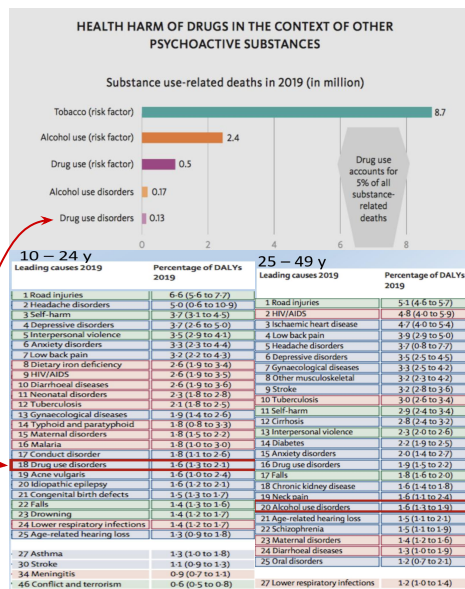
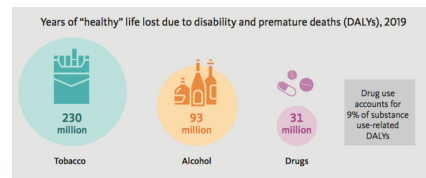
Substance use has been increasing globally (risen 11.5% from 2011 to 2017 alone)

As a result -> upsurge in human, social, health and economic costs in the form of substance-related violence, criminal acts, health care needs, legal orders, rehabilitative services, reduced labor productivity and judicial expenditure

Some of the important consequences of substance use:

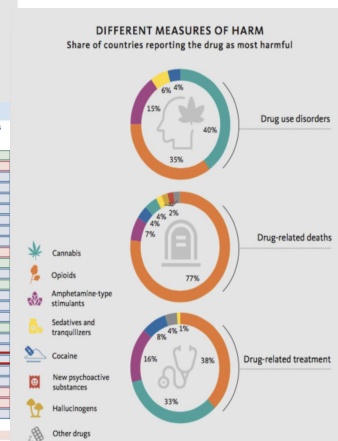
- arrest for driving under the influence (DUI)
- Motor vehicle accidents
- Intimate partner and sexual violence
- Child abuse and neglect
- Suicide attempts and fatalities
- Organ damage (e.g. liver, renal, brain, CNS...)
- Stroke
- Overdose death

Tobacco use is the leading cause of premature deaths compared to other substances.



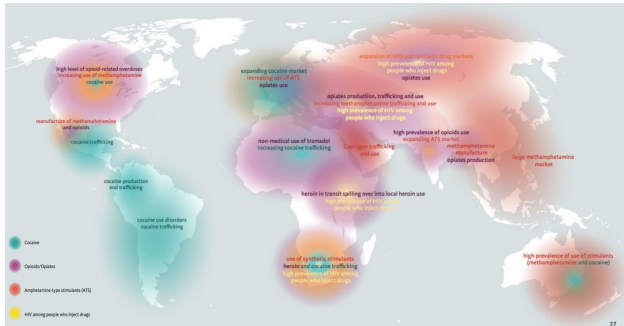
Opioids are the leading cause of death and consume the greatest costs for treatment.

Most of the drug use disorders are related to **cannabis**.



Drug Use and Consumption

Distribution of drugs used and confiscated by region:



Cannabis => the number one drug used worldwide

- 4% of the worldwide population use cannabis
- Highest prevalence is in North America

Opioids => the most lethal of all drugs

- Highest production of opium in Afghanistan
- Prescription opioids use disorders are now the concern
- In North America -> the fentanyl epidemic
- In North Africa -> Tramadol epidemic
- Women are more susceptible to misusing prescription opioids, compared to other drugs

Cocaine:

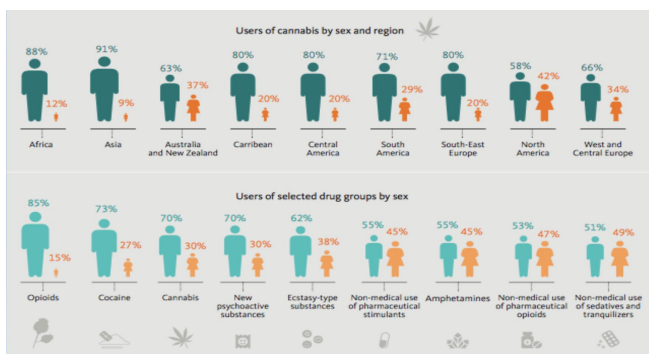
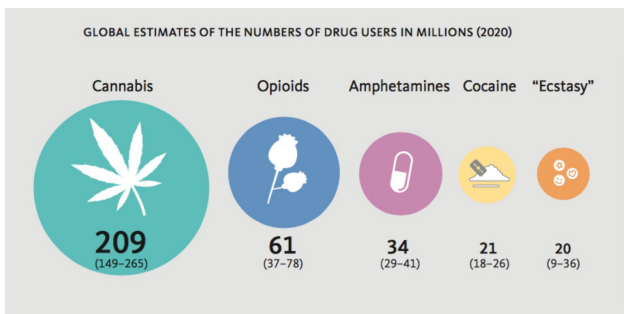
- Highest production in South America
- Market for consumption is in North America and Europe

Amphetamine Type Stimulants (ATS):

- Prevalence of use is highest in North America, East and South-East Asia
- Methamphetamine -> highest trafficked ATS worldwide
- Captagon (fenethylamine) -> highest trafficked ATS in Middle East
- 3,4-methylenedioxymethamphetamine (MDMA) or ecstasy-> trafficking is lower compared to methamphetamine; it is also a hallucinogen

Khat => mild stimulant similar to amphetamine

- Largely cultivated in East Africa and Arabian Peninsula



Risk factors for substance use:

Family history & genetic factors (some people may be genetically predisposed to substance use)

Peer pressure & Young adult (high risk age between 19 and 25 years)

History of mental illness & Having friends who use substances (peer pressure)

Being victim of abuse or neglect & Conflict and violence

Low education level & Unemployment

Low socioeconomic level & Low social support

Trends of substance use in KSA

There are no studies that assessed substance use in the general population:

Only one study assessed through online survey in 2017*;

- Majority were young adults (19-25 y)
- Prevalence of substance use was as follows:
 - Psychoactive Drug Use(unspecified)maybemedicalornon-medical=>19.5%
 - Gabapentin=>4.6% (total of 10;2.7%used recreationally)
 - Pregabalin=>4.5%
 - Alprazolam=>2.7%
 - Tramadol=>0.54%
 - MDMA=>0.27%
- The rest of the studies all assessed frequency of substances among patients admitted for substance use disorder (SUD):
 - **Amphetamine** (Captagon mainly) is the most common reason for SUD
 - Followed by alcohol
 - Cannabis
 - Opioids

Prevention and control of substance use

VERY
IMPORTANT

How to fight and control substance use

Important approaches for prevention and control:

- 1. Monitor substance use in the community through substance use surveillance:**
 - Helps measure and assess burden of substance use in the community
 - Identifying the substances most used in the community and their sources
 - Identifying the population groups with highest risk for using them
 - Understanding the distribution and trends of substance use in the community
 - Expanding substance use research
 - Assessing the prevalence and incidence of substance use disorder
- 2. Developing programs for public health awareness about the harms of substance use and prevention of use (primary prevention) based on your findings from surveillance:**
 - Promoting healthy living environment and recreation for youth
 - Incorporating substance use control in school health programs
 - Based on understanding of the social, behavioral, genetic, environmental and other factors that contribute to use
- 3. Improve substance use healthcare services to ensure treatment and rehabilitation, and avoid relapse (secondary prevention)**

When to suspect substance use disorder?

At the clinical setting, these signs can hint to the possible existence of substance use disorder:

- Aggressiveness
- Isolation and social withdrawal
- Poor academic performance
- Poor performance at work and difficulty in retaining a job
- Laziness, class and work absence.
- Unjustified increased demand for money.
- Unstable and aggressive relationship with parents, brothers and sisters
- Lying about symptoms (e.g. pain or sleep difficulty or anxiety) to receive prescription for controlled psychoactive substances

International and national policies for substance use

International substance use monitoring Substance use surveillance

- United Nations => United Nations Office on Drug and Crime Reports (UNODC)
- World Health Organization => Global Survey on Alcohol and Health
- Europe => The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
- United States => National Survey on Drug Use and Health

National Substance Use control and Prevention in KSA

- Control and prevention of substance use (other than nicotine) is monitored and controlled by the National Committee of Narcotics Control (NCNC) اللجنة الوطنية لمكافحة المخدرات
- This committee is operated under the Ministry of Interior;
- Surveillance of substance use through seizure information, criminal data; and ministry of health admissions for treatment
- They have a project called (NEBRAS) under which educational campaigns and public health awareness material is developed and distributed to the Saudi Community.
- However, we still do not have periodical national surveys for substance use in the general population.

Summary

- Substance use is a growing problem worldwide
- Like the rest of the world, our community can be at risk for using these harmful substances
- Local data on seizure reports and patients at treatment centers suggest that the most used substances are: amphetamines, cannabis and alcohol
- There is limited information about substance use in the general Saudi population
- As a physician, it is important to look for the signs to suspect substance use in your patient; and screening through history should be done
- We need more research and a surveillance program for monitoring use among the general community

Practice Questions

Q1: Using a substance for reasons other than prescribed is known as:

A. substance use

B. substance use disorder

C. substance misuse

D. substance abuse

Q2: A state of adaptation in which exposure to a drug over time results in diminution of one or more of the drug's physiologic effects is the definition of:

A. addiction

B. withdrawal

C. tolerance

D. intoxication

Q3: Which one of the following is an example of a licit substance?

A. cocaine

B. codeine

C. cannabis

D. ketamine

Q4: Number one leading cause of premature deaths:

A. opioids

B. cannabis

C. tobacco

D. alcohol

Q5: A 30 year old female has been experiencing severe back pain for which she has been prescribed a drug to relieve the pain. The patient came back a few months later complaining of chronic constipation, nausea and vomiting. Which of the following drugs is most likely the one prescribed?

A. NSAIDS

B. pregabalin

C. opioids

D. paracetamol

Answer 1- C 2- C 3- B 4- C 5- C



Team Leaders:

Shahad Alaskar
Reema Alquraini
Lina Alyahya

Qusay Alsultan
Hassan Alabdullatif



The amazing Members:

Farah alhalafi
Sara almajed
Norah Alrashoud
Hoor aloraini
Mohammed Alzeer
Shahad Albukhari
Walaa AlMutawa
Meznah alshammari
deema alqahtani
Fatima halawi
raghad alkhodair
Amani Alotaibi
Nouf Aldhalaan
Reema AlJabarin
Reema Alhussien

Sarah Alzahrani
Raid almadi
Rayan alahmari
Mayssar Alshobaki
Kadi aldossari
nora bin hammad
Mayssam Aljaloud
Rahaf Almotairi
Lana Alhumaidhi
Jana Alhazmi
Yazeed Alsanad
Safia Aldkhyyl
Haifa Almuddahi
Omar Kadhi
Saad Alsahli