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Topic: Association of impulsivity and methamphetamine use in the development of gambling disorders; a prospective, Single-center study.

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INTRODUCTION

According to the previous edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV-TR) (reference), pathological gambling (PG) is an impulse-control disorder characterized by repetitive gambling behavior that is a significant cause of impairment or distress. However, in the DSM-5 (*Diagnostic and Statistical Manual of Mental Disorders*, n.d.-b), pathological gambling has been renamed as a Gambling Disorder (GD) and has been moved into the category of substance-related and addictive disorders. There have also been some changes to the criteria, including the removal of the illegal act criterion and the addition of a craving criterion.

Pathological gambling and substance use disorders are highly co-morbid (Lorains et al., 2011a). Moreover, pathological gambling and substance use disorders share similar clinical features: preoccupation, tolerance, withdrawal, and continuation despite negative consequences (Kalechstein et al., 2007). The etiology of GD and Substance Use Disorders (SUDs) is also substantially similar. Impulsivity and impaired decision-making, as well as pathological activation of reward-related learning and alterations in striatal activation, are characteristic of both types of addiction (Balodis & Potenza, 2020). Impulsivity has been consistently associated with a vulnerability to the development of SUDs and behavioural addictions (Verdejo-Garcia & Albein-Urios, 2021).

In GD, a characteristic example of impulsivity is risk-taking behaviour, which has been shown to be predictive of the severity of gambling in pathological gamblers (Ciccarelli et al., 2020; Ciccarelli et al., 2016; Cosenza et al., 2017; Mishra et al., 2017; Wolfschlag & Håkansson, 2023). Impulsivity is defined as the tendency to react with little or no forethought, often without considering the negative consequences of the action for the impulsive individual or others (Mestre-Bach et al., 2020). It is defined in three main areas: response impulsivity, choice impulsivity, and impulsive tendencies (MacKillop et al., 2016; Mestre-Bach et al., 2020).

Impulsive choice is characterised by a preference for a smaller reinforcer available earlier than a larger reinforcer available later. Impulsive responding refers to the failure to inhibit an action or to withhold an action in the presence of certain stimuli. Impulsive personality, or trait impulsivity, assesses persistent and stable aspects of personality, primarily using self-reporting measures (Reynolds et al., 2006; Smith et al., 2023).

GD is a persistent and recurrent maladaptive gambling behaviour that has an impact on personal, family, and occupational functioning. To be diagnosed with GD based on the criteria

in the DSM-5 (*Diagnostic and Statistical Manual of Mental Disorders*, n.d.-b), an individual must experience at least four of nine symptoms over a twelve month period (Leino et al., 2023). GD offers the possibility to understand addiction without the potentially confounding effects of neurotoxicity in the context of acute or chronic use of psychoactive drugs (Verdejo-García et al., 2008 ;Wyckmans et al., 2019).

SUDs involve the excessive use of nicotine, alcohol and other illicit substances, leading to impairment in social, academic and occupational functioning. The most prevalent illicit substances include cannabis, sedatives, hypnotics, anxiolytics, inhalants, opioids, hallucinogens and stimulants (Jahan & Burgess, 2024). The initial stages of substance use disorders are characterised by positive reinforcement, in which the individual experiences a sense of well-being or euphoria from use, whereas later, as physiological and psychological dependence progresses, the individual experiences negative reinforcement, in which the substances alleviate dysphoria and unpleasant withdrawal symptoms (Jahan & Burgess, 2024).

Research Problem

It is well known that substance abuse is a common co-morbidity of pathological gambling (Maccallum & Blaszczynski, 2002). There is a higher proportion of people with GD who suffer from a SUD compared to the general population (Rash et al., 2016a). A meta-analysis of population-based surveys reported that 60% of people with GD were nicotine dependent and 58% had other SUDs (Lorains et al., 2011b). Some studies have suggested that the co-occurrence of gambling and substance abuse in individuals is likely to be associated with more complex psychological symptoms than substance abuse alone (Rueda Ruiz et al.,2023; Abdollahnejad et al., 2014; Langenbucher & Merrill, 2001). The prevalence of gambling is significantly higher in clinical samples of individuals seeking treatment for substance misuse (Hodgins & el-Guebaly, 2010; Rueda Ruiz et al., 2023). Therefore, more research is needed to understand the vulnerability factors involved in the development of gambling problems in people with substance use disorders in order to promote better interventions for both addictions (Rash et al., 2016b).

Hypotheses

This clinical study will test 3 hypotheses that were developed based on the research:

1. The incidence of pathological gambling is expected to be higher in patients with methamphetamine use disorder compared to the group including patients with opiate use disorder. (H1)

2. The incidence of pathological gambling is expected to be higher in patients with methamphetamine use disorder compared to a control group of non-drug users. (H2)
3. The prevalance of impulsivity among pathological gambling patients is expected to be significantly higher.

Statement of the problem

Highlight the prevalence of gambling disorder

In recent years, gambling disorder has been increasingly recognized as an addictive disorder similar to substance use disorders due to its similar personality-related, neurobiological and clinical features, leading to its reclassification into the same category as substance use disorders in the DSM-5 and ICD-11 (Kim & Hodgins, 2019). These similarities, combined with the high impact of substance use disorders on people experiencing homelessness, suggest increased rates of gambling problems in this population (Deutscher et al., 2023). GD is associated with high rates of psychiatric comorbidity, including psychotic states and schizophrenia (Dowling et al., 2015; Granero et al., 2021; Yakovenko & Hodgins, 2018; Yau & Potenza, 2015). On the basis of epidemiological data, it is likely that GD and psychotic disorders often co-occur, and it appears that one disorder may exacerbate the symptoms of the other (Yakovenko et al., 2016).

Addictive disorders are characterized by severe consequences, including suicidal events, but most studies examining the relationship between addiction and suicide risk have focused on substance use disorders and gambling disorders at the expense of other behavioral addictions (Valenciano-Mendoza et al., 2021). At the Bellvitge University Hospital (Barcelona, Spain) between January 2005 and May 2020, the results of the study showed that patients with a gambling disorder had a higher risk of having a suicidal event (either considering suicide or attempting suicide) (Valenciano-Mendoza et al., 2021). The highest prevalence of attempted suicide was found in gambling disorder (6.7%). In a nationwide diagnostic study assessing the risk of attempted (including fatal) suicide in gambling disorder in Sweden between 2005 and 2016 (Håkansson & Karlsson, 2020), nationwide registry material of patients with gambling disorder shows that the high prevalence of attempted suicide in patients with gambling disorder was particularly high among those with another psychiatric disorder during the period studied here, and that alcohol and drug use disorders significantly increase the risk of suicidal behaviour in patients with gambling disorder.

Another study (Gavriel-Fried et al., 2023), which included cross-country comparisons of gambling prevalence, found that gambling behaviour and problems were more prevalent and

gambling was perceived as more accessible in liberalised markets (e.g. Australia, Canada and Croatia) compared to Israel, which is relatively more conservative and has more restrictive regulations. The perception of social accessibility was higher among gamblers and was associated with higher risk gambling, especially among women.

Introduce impulsivity as a potential covariate

Impulsivity is a complex characteristic that is frequently defined by a proclivity to act on immediate impulses or desires without thoroughly contemplating the potential repercussions. The concept contains multiple dimensions, such as cognitive, motor, and non-planning components, which contribute to its complexity and significance in human behavior. Impulsivity has been identified as a possible covariate in psychological research, affecting various findings in different areas.

Comprehending the significance of impulsivity's position as a covariate is essential for multiple reasons. Firstly, it can have a substantial influence on decision-making processes, causing individuals to partake in dangerous or impulsive actions that could result in negative consequences. This is especially pertinent in disciplines like clinical psychology, where impulsivity is linked to conditions such as ADHD, substance misuse, and impulse control disorders.

Furthermore, impulsivity has the ability to interact with other factors, either moderating or mediating their impacts on different results. For instance, it can worsen the connection between stress and emotional dysregulation, leading to increased psychological suffering.

Impulsivity is a widely studied personality trait and research construct which is considered to be a risk factor for substance use, including initiation and continued use(Loree et al., 2015). In general terms, impulsivity refers to actions that are premature, too risky and not well thought out. Dysfunctional impulsivity involves deficits in attention, lack of reflection and/or insensitivity to consequences, all of which are present in addiction(Crews & Boettiger, 2009). Longitudinal studies have identified impulsivity in children as a risk factor for later development of substance abuse and gambling problems (Dawes et al., 1997; Vitaro et al., 1997; Petry & Madden, 2010) and cross-sectional studies show that levels of impulsivity are associated with substance use and abuse and gambling among college students (Jaffe & Archer, 1987). At its core, impulsivity results from an inability to adequately suppress or inhibit inappropriate behaviour and from a general intolerance of delayed gratification, a tendency that is common among abstinent drug addicts (Bari et al., 2011). Overall, it is clear that impulsivity,

measured in several ways, is associated with some forms of drug abuse and appears to result from possibly multiple dysfunctions in corticostriatal pathways associated with different forms of impulsivity. These disorders may not always be caused by the same factors; some may be pre-existing and others drug-induced, both of which may coexist in the same individual and contribute in different ways to the addictive process (Dalley et al., 2011). Personality traits such as impulsivity and sensation-seeking are highly prevalent in chronic drug users and have been associated with an increased risk of drug abuse. However, it is unclear whether these personality traits are a cause or effect of addiction to stimulants(Ersche et al., 2010).

CAPTER I: Literature review

1.1. Brief overview of psychoactive substances

The use of psychoactive substances is a widely investigated human activity among psychologists and psychiatrists. Psychoactive substances have an effect on the central nervous system (CNS) by acting on the neurotransmitters in the brain and interfering with their function, thereby producing certain sensations and perceptions. By activating the brain reward system, consisting of the network of the brain structures, that is also stimulated by exercise, eating, sex and other activities, psychoactive substances alter levels of neurotransmitters such as dopamine and serotonin in the CNS (*2021 Book DrugsAndHumanBehavior*, n.d.). The neurophysiological effects result from the use of psychoactive substances, which are determined by the quantity of the substance, the form of administration, and their mechanism of action in the body. The use of these substances generally produce pleasurable effects, leading to an inevitable desire to use them again. Moreover, compulsive use leads to the phenomenon of tolerance, a reduced reaction to the drug following its repeated use, requiring ever-increasing doses. Withdrawal, in turn, characterized by cessation of use, results in a range of aversive symptoms due to psychological and neurological adaptations.

There are several classes of psychoactive drugs with diverse mechanisms of action that produce different physiological and behavioral responses, but all have the ability to alter the function of the CNS (reference is needed). The pharmacological mechanisms of each class of psychoactive drugs differ, but they all activate the reward system of the brain, linked to behavioral reinforcement, by modulating (i.e. releasing or inhibiting) the neurotransmitters involved in the experience of pleasure and the reduction of unpleasantness.

Psychoactive substances are broadly classified as depressants, stimulants, cannabinoids and hallucinogens on the basis of their diverse effects on the CNS:

1. Depressants are substances that decrease CNS activity and display sedative, hypnotic and anxiolytic effects. The most common depressants are alcohol, inhalants (glue, shoe polish, poppers), opioids (morphine, heroin, fentanyl, codeine), benzodiazepines (bromazepam, clonazepam, alprazolam), and GHB (gamma-hydroxybutyric acid).

(a) A wide range of pharmacologically diverse depressant substances that readily vaporize are included under the term "inhalants". The abuse of inhalants, sometimes called solvent or volatile substance abuse, can be better understood if the extensive list of inhalants is divided into 3 groups based on current pharmacological knowledge: group I contains volatile solvents, fuels and anesthetics; group II contains laughing gas; and group III contains volatile alkylnitrates (*Inhalant Abuse | Pediatrics | American Academy of Pediatrics*, n.d.). Group I aliphatic, aromatic or

halogenated hydrocarbons, found in thousands of common and readily available consumer products, are the most commonly abused inhalants. Almost any hydrocarbon can have a mind-altering effect when inhaled in large doses. Nitrous oxide, or 'laughing gas', which belongs to group II, is diverted from medical or dental anesthetics and sold in inhalation balloons. It is also simply inhaled from whipped cream aerosol cans. Alkyl nitrites, or 'poppers', are also widely abused. A typical example is the 'popping' and inhalation of amyl nitrite vials intended for the treatment of angina (Table 1).

Inhalants are abused through a variety of methods, and many “street” terms for this activity have been generated, such as (glue) sniffing, snorting, huffing, gliding, and dusting. Inhalants are readily absorbed by the lungs, have an immediate and brief effect, and are then metabolized by the liver in a relatively short time.

Table 1. Categories, examples, and chemicals present in commonly abused inhalants (Baydala et al., 2010)

Category	Examples	Chemicals	Other terms
Aliphatic, aromatic and halogenated hydrocarbons	Hair spray, air fresheners, deodorants	Butane, propane, fluorocarbons	Medusa, moon gas, poor man’s pot, air blast, discorama, hippie crack, chroming, gladding, whiteout
	Fuels including cigarette lighters	Gasoline, propane, benzene, butane	
	Paint/polish removers, paint thinners, felt-tip markers, correction fluids, glues and rubber cements	Trichloroethane, trichloroethylene, toluene, hexane, acetone, methylene chloride, ethyl acetate	
	Varnishes, lacquers,resins, lacquer thinners	Benzene, xylene	
	Dry cleaning fluids, spot removers, degreasers	Trichloroethane, tetrachloroethylene, xylene	

	Computer/electronics cleaning sprays	Dimethyl ether, hydrofluorocarbons, hydrocarbons	
	Vegetable oil cooking sprays	Hydrocarbons	
	Medical anesthetics	Diethyl ether, halothane, enflurane, ethyl chloride	
Nitrous oxide	Whipping cream aerosols, balloon tanks, anesthetics	Nitrous oxide	Lauging gas, shoot the breeze, whippets, buzz bomb
Volatile alkyl nitrities	Angina medications, 'room odourizers', videocassette recorder head cleaners, synthesized products	Amyl nitrities, butyl nitrites, cyclohexyl nitrite, isopropyl nitrite, other nitrites	Medusa, moon gas, pearls, boppers, snappers, poppers, amys, bolt, quicksilver, rush, climax, aroma of men, hardware, locker room, thrust

(b) Alcohol is a depressant that slows down the parts of your brain that control your thinking, behaviour, breathing and heart rate. There are four types of alcohol: methyl alcohol, ethyl alcohol, propyl alcohol and butyl alcohol. The type used to make alcoholic beverages is an ethyl alcohol, or ethanol (C2H5OH). The other three, methylated alcohol, propylated alcohol and butylated alcohol, may cause blindness and death, even at relatively low levels of consumption.

Ethanol (EtOH) is a primary and persistent CNS depressant (Rawat, 1976) acting on a variety of cellular molecular targets, including alterations in synaptic function (Ollat et al., 1988). Acute exposure to EtOH activates or inhibits the function of proteins involved in synaptic transmission, whereas chronic exposure often results in opposing and/or compensatory/homeostatic effects on the expression, localization and function of these proteins (Lovinger & Roberto, n.d.). Neuronal dysfunction is the neurobiological basis of alcohol-related behaviour. Alcohol directly stimulates the release of serotonin, a neurotransmitter involved in emotional expression, and endorphins, endogenous opioid-like neuropeptides that can contribute to the 'high' of intoxication and craving (Oscar-Berman & Marinkovic, 2003). Alcohol also regulates the release of dopamine (DA), a neurotransmitter that plays a role in motivation and the rewarding effects of alcohol (Weiss & Porrino, 2002).
(c) Opioids primarily act in the CNS for analgesia, antitussive and sedation (KuKanich & Wiese, 2015). The term opioid analgesics refers to a broad class of drugs including: (1) alkaloids extracted from the poppy seed (morphine, codeine, thebaine) and their semi-synthetic derivatives (heroin, oxycodone, hydromorphone, oxymorphone); (2) synthetic phenylpiperidines (meperidine, fentanyl) and synthetic pseudopiperidines such as methadone (Jamison & Mao, 2015). The effects of opium, morphine, and codeine are similar, but the typology is diverse. Thebaine, used as a precursor for the synthesis of other opioids, is a weak pharmacological compound in several Papaver species. Synthetic opioids are chemically diverse compounds. They are entirely produced in the laboratory.
Most psychoactive drugs work by acting on a receptor. It is possible to think about this as "lock and key", with the key being the drug that opens the lock. There are three main classes of receptors on which opioid analgesics act: μ, δ and κ receptors. Opiate receptors can be further divided into types: the m (mu) receptor prefers morphine, heroin and methadone, the e (epsilon) receptor prefers b-endorphins (beta endorphins), the d (delta) receptor prefers enkephalins, and the k (kappa) receptor prefers dynorphins. A substance that binds to a receptor is called a ligand; endorphins are the natural opiate receptor ligands. The term "endogenous opiate receptor ligand system" refers to the entire endogenous opioid system (Payte et al., n.d.). Receptors have a variety of properties. Any substance, including the endogenous ligand or any exogenous compound, that binds to a receptor does so through a process of chemical bonding. Regarding opiate receptors and opioid analgesics, the higher the affinity, the stronger the analgesic properties of the substance (Payte et al., n.d.). Heroin, methadone and morphine are opioid agonists. These are substances that bind to the receptor and produce a similar effect to that of the natural ligand. In contrast, antagonists, such as

naltrexone and naloxone, bind to the receptor but block it by not allowing the natural ligand or any other compound to bind to the receptor. Antagonists do not do the opposite. They simply fit into the receptor and block other substances from binding. By stimulating opioid receptors in the brain, opioids and many of their metabolites can cause sedation, analgesia, euphoria and respiratory depression (reference needed). Opioids rapidly develop tolerance and dependence (Wang, 2019).

(d) Benzodiazepines (BZDs) have been in clinical use since the 1960s. BZDs are a class of psychoactive drugs known as CNS depressants. They act through allosteric modulation of the GABAA receptor to enhance the activity of GABA, an inhibitory neurotransmitter. GABA is the most abundant neurotransmitter in the CNS, and BZDs act mainly at the GABA-A receptor subunit (Charles E. Griffin III et al., 2013). This results in a slowing of neurotransmission and sedative and anxiolytic effects (Nielsen, 2017).

Benzodiazepines are now widely used to treat psychiatric and neurological disorders, including anxiety and panic attacks, insomnia, muscle spasms, epilepsy and alcohol withdrawal. They are also commonly used for self-medication and abused with other psychoactive substances such as opioids, psychostimulants and alcohol (Zawilska & Wojcieszak, 2019). Serious adverse effects may occur when BZDs are administered with opioids: the depressant effects on spontaneous ventilation are dramatically increased when opioids are used in combination with BZDs, and these effects are dose-related (Charles E. Griffin III et al., 2013). Particularly in certain vulnerable subgroups, such as those with a history of substance use disorders, there is evidence that BZDs have a potential for abuse (Votaw et al., 2019). Regular use of BZDs has been shown to lead to serious, harmful psychological and physical dependence (A. N. Edinoff et al., 2021). Psychological symptoms include agitation, nightmares, anxiety, insomnia, panic attacks, depression, hallucinations, irritability, paranoid thoughts, social phobia, memory problems, concentration, delirium and psychosis (reference). Physical symptoms include headaches, seizures, head and neck pain or stiffness, altered limb sensation, weakness and fatigue, tingling and numbness, muscle twitching, tremors, gastrointestinal symptoms, appetite and weight changes, unusual odours, etc. (Allison & Pratt, 2003).

(e) GHB is a potent CNS depressant that has had a history of limited therapeutic use and a potential for abuse (Couper & Marinetti, 2002). GHB is a naturally occurring analog of gamma-aminobutyric acid (GABA) (Mason & Kerns II, 2002). GHB is an endogenous substance that acts as an inhibitory neurotransmitter in the central nervous system of mammals.(Waszkielewicz & Bojarski, 2004). Exogenously administered GHB induces a

variety of neuropharmacological effects including sedation, memory impairment, increased stages 3 and 4 sleep, seizures, dependence/abuse and coma. Clinically, GHB is successfully used to treat cataplexy/narcolepsy and has limited use as an anesthetic and in alcohol dependence/abstinence (Crunelli et al., 2006). In addition, due to its euphoric, behavioural disinhibiting and amnestic properties, coupled with its ease of administration (i.e. high solubility, colourless and tasteless drink), it is abused as a recreational substance and as a so-called 'date-rape drug' (Crunelli et al., 2006).

GHB is rapidly absorbed, with effects occurring within minutes of ingestion. Chronic use leads to poorer mental, physical and sexual health, social and occupational dysfunction (Tay et al., 2022). Tolerance to GHB's effects develops with chronic use, leading to physical and psychological addiction (Couper & Marinetti, 2002). GHB is available illegally in the form of white powder, white pills and capsules, or as a clear liquid.

1. Stimulants are a class of drugs that increase certain types of activity in the central nervous system, and may include prescription medications as well as illicit substances.

Commonly prescribed stimulants include amphetamines (Adderall,Dexedrine), and methylphenidate (Concerta, Ritalin), while the most common illicit stimulants are methamphetamine and cocaine. Many illicit and prescription stimulants are prone to abuse and highly addictive, partly because of the euphoria and high they often produce (*Drug_of_abuse.Pdf,* n.d.).

2. Stimulants, especially those for recreational use, act on the central and peripheral nervous systems to produce a range of possible psychostimulant effects, such as increased alertness, hyperactivity and mood changes, and can also affect the cardiovascular and ocular systems and disrupt temperature control (reference). They can be a cause of acute psychosis, particularly at higher doses and in chronic use. In particular, many stimulants act on monoaminergic pathways involving the neurotransmitters noradrenaline (NE), DA, and serotonin (5-HT) to produce their effects (Docherty & Alsufyani, 2021).

Depending on the substance and its effects, stimulants are abused for different reasons. Stimulants may cause euphoria, weight loss, increased alertness, improved concentration and thinking, increased self-confidence, increased sex drive, and improved performance at school, work or sports. Stimulants can be taken in a number of different ways, each with its own effects. Prescription stimulants are most commonly available in the form of tablets or capsules that are intended for oral use. In some cases, people may attempt to crush the tablets and snort

them or dissolve their contents in water for injection. Illegal stimulants, in their various forms, are most commonly snorted, smoked or injected. (You did not mention types of stimulants) Especially because your main topic is methamphetamines here.

3. Cannabinoids have a long history of use for both recreational and pharmaceutical purposes in humans. Psychoactive cannabinoids cause euphoria, increased sensation, tachycardia, anti-nociceptive effects, difficulty concentrating and memory problems (Ameri, 1999). Cannabinoids are ligands with affinity for and activity at cannabinoid receptors that are either plant-derived, synthetic or semi-synthetic (Harry, 2022a). Like endogenous cannabinoids, Phyto cannabinoids and synthetic cannabinoids act by interacting with the endocannabinoid system (ECS).

The terms "cannabis" or "marijuana" refer to mixtures of dried herbs from the mature female Cannabis sativa plant. The main active constituent of the hemp plant Cannabis sativa is Δ9-tetrahydrocannabinol (Δ9-THC). Δ9-THC acts as a partial agonist for both cannabinoid receptors, CB1R and CB2R, and is primarily responsible for psychoactive and physical effects (Harry, 2022b). The cannabinoid CB1 receptor is mainly associated with the nervous system, but also has expression in other organs. The CB2 receptor is primarily associated with the immune system and is not expressed in nerve cells (Sañudo-Peña et al., 2000). There are more than 400 different chemical compounds in this plant, including more than 120 different Phyto cannabinoids. Phyto cannabinoids, like endogenous cannabinoids, act biologically by interacting with the endocannabinoid system. This system has been implicated in many psychiatric, neurological, neurodegenerative and neuroinflammatory disorders and is essential for a wide range of brain functions, including mood regulation, energy balance, learning and memory. Positive effects on mood have been associated with the use of cannabis, but there is also the potential for slowed reaction time, motor incoordination, short-term memory loss and attention problems (reference).

The development of a certain degree of physical and psychological dependence on cannabis is suggested by the occurrence of a withdrawal syndrome on cessation of use after chronic use. The cannabis withdrawal syndrome in humans is similar to that of alcohol and opioid withdrawal and includes restlessness, anxiety, dysphoria, irritability, insomnia, anorexia, muscle tremors, increased reflexes and various autonomic effects (Ashton, 1999).

4. Hallucinogens are psychoactive substances that strongly alter perception, mood and a range of cognitive processes. Generally, a hallucinogen causes the user to have a heightened

awareness of sensory input (audio, visual, etc.) and a reduction in control over the experience (Cody, 2008). Add the types of the hallucinogens here.

Typical clinical effects of hallucinogens are as follows (Nichols, 2004):

1. Somatic symptoms: dizziness, weakness, tremor, nausea, drowsiness, paraesthesia, and blurred vision.
2. Perceptual symptoms: changes in shapes and colours, difficulty in focusing on objects, a heightened sense of hearing and, rarely, synesthesia.
3. Psychological symptoms: mood swings (happy, sad or irritable at different times), tension, distorted sense of time, difficulty expressing thoughts, depersonalization, dreamlike feelings and visual hallucinations.

Hallucinogens are a heterogeneous class of substances with individual effects and diverse mechanisms of action. In moderate doses, these substances are physiologically well tolerated. Their major complications are associated with unsupervised use and can lead to serious psychological problems. Compared with most other psychoactive drugs, their potential for dependence is not as high (Passie & Halpern, n.d.). Hallucinogens are serotonin 2A (5-HT2A) receptor agonists, so they are often categorised as either classical hallucinogens or serotonergic hallucinogens (Halberstadt, 2015). Serotonergic hallucinogens, such as lysergic acid diethylamide (LSD), psilocybin and N,N-dimethyltryptamine (DMT), are well known for their ability to temporally and profoundly alter an individual's visual experience. These visual alterations exhibit a consistent set of characteristics despite large inter- and intra-individual variability. Many reports document a common experience of perceiving colours as more saturated, with increased brightness and contrast in the environment ("Visual Intensifications"). Environmental objects may be altered in size ("visual illusions") or take on a modified and special meaning for the subject ("modified self-reference") (Kometer & Vollenweider, 2018).

Acute complications of the use of hallucinogens can include injuries as well as complications of the cardiovascular systems and CNS, metabolic disorders and hyperthermia. A possible complication of the use of serotonergic hallucinogens, including dextromethorphan, is serotonergic toxicity, including serotonin syndrome. Although it is rare for exposure to a single serotonergic agent to be involved, the risk of severe serotonin toxicity is higher when a number of serotonergic substances are taken (Gillman, 2011). Serotonin syndrome can be life-threatening, manifesting as altered mental status, autonomic hyperactivity and neuromuscular abnormalities including hyperreflexia (reference). There are a significant

number of documented case reports of serotonin syndrome associated with LSD, MDMA and 5-MeO-DIPT, some of which have been fatal (Nadkarni et al., 2014).

1.2.Addiction

Addiction is a primary, chronic disease of the reward, motivation, memory and related neural circuitry of the brain, and dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. Like other chronic illnesses, addiction can involve cycles of relapse and remission. Addiction is characterized by impaired behavioral control, craving, an inability to abstain consistently and a diminished awareness of significant problems with one's own behavior and interpersonal relationships. If not treated or engaged in recovery activities, addiction is progressive and may lead to disability or premature death (West & Brown, 2013).

Addiction is a persistent, compulsive dependency on behaviour or substance. There are two types of addiction: substance addiction (e.g. alcoholism, drug abuse and smoking) and behaviour addiction (e.g. compulsive gambling, food addiction, internet addiction and mobile phone addiction). It is increasingly recognised that many addicts, such as polydrug abusers, have multiple substance or behavioural addictions. Addiction is characterised by tolerance, craving and a withdrawal syndrome that occurs when the intake of the substance is reduced or stopped.

Recurrent use of psychoactive substance(s) to the extent that the user is periodically or chronically intoxicated, shows compulsion to use the preferred substance, has great difficulty in voluntarily stopping or modifying substance use, and shows determination to obtain psychoactive substances by almost any means. As individuals move from an impulsive to a compulsive disorder, the drive for the drug-taking behavior shifts from positive to negative reinforcement (Koob, 2009). Positive reinforcement (pleasure or gratification) is more likely to be associated with impulse control disorders. Negative reinforcement (relief of anxiety or relief of stress) is more likely to be associated with compulsive disorders.

In impulse control disorders, there is increasing tension and arousal before the impulsive act. There is pleasure, satisfaction, or relief during the act. After action, there may or may not be regret or guilt. Compulsive disorders involve recurrent and persistent thoughts (obsessions) that cause marked anxiety and distress. These are followed by repetitive behaviours (compulsions) aimed at preventing or reducing distress(Koob, 2011).

In addiction, drug-taking behaviour moves from impulsive to compulsive in a three-step cycle: binge/intoxication, withdrawal/negative affect and preoccupation/anticipation.

1.3. Neurobiological mechanisms of the binge/intoxication

A key element of drug addiction is the activation of brain reward systems by drugs of abuse, and understanding the neurobiological basis of acute drug reward has been a key to understanding how these systems are altered in the development of addiction (Koob & Moal, 1997). All drugs of abuse activate the mesolimbic dopamine system, but much evidence suggests that dopamine-independent reinforcement occurs at the level of the nucleus accumbens, suggesting multiple inputs to activate critical reinforcing circuits in these brain regions (Nestler, 2005). Thus, several neurotransmitters are involved in the acute reinforcing effects of drugs of abuse. Four of these systems - dopamine, opioid peptides, GABA and endocannabinoids - have been identified as being involved in the acute reinforcing effects of drugs (Koob, 2011). The initial action of drug reward is thought to depend on dopamine release in the nucleus accumbens for cocaine, amphetamine and nicotine, on opioid peptide receptor activation in the ventral tegmental area (via dopamine activation) and nucleus accumbens (independent of dopamine activation) for opiates, and on GABAA systems in the nucleus accumbens and amygdala for alcohol(Koob, 2011). The nucleus accumbens is strategically located to receive important limbic information from the amygdala, frontal cortex and hippocampus, which could be translated into motivational action via its connections with the extrapyramidal motor system. Thus, an early critical role of the nucleus accumbens was established for the acute reinforcing effects of drugs, with a supporting role for the central nucleus of the amygdala and the ventral pallidum (Koob, 2011).

Specifically, substances like cocaine, amphetamine, and nicotine are believed to enhance the release of dopamine in the nucleus accumbens. On the other hand, opioid peptide receptors for opiates are said to be stimulated in the ventral tegmental area through dopamine, and in the nucleus accumbens through a mechanism unrelated to dopamine. Alcohol has a positive impact on the nucleus accumbens and amygdala via influencing the GABAA systems, resulting in a reinforcing effect.

The nucleus accumbens plays a crucial role in this process since it receives input from key brain regions including the amygdala, frontal cortex, and hippocampus, and is capable of converting this information into motivating behaviors. Therefore, it is known that besides the nucleus accumbens, the central amygdala nucleus and ventral pallidum also have significant involvement in the progression of drug addiction(Koob & Volkow, 2016).

1.4. Neurobiological mechanism of the withdrawal/negative affect stage

You need to have an introductory sentence. This extended amygdala may represent a common anatomical substrate integrating brain arousal and stress systems with hedonic processing systems to produce negative emotional states that drive negative reinforcement mechanisms associated with addiction development. It has long been hypothesised that the extended amygdala plays a key role not only in the conditioning of fear ,but also in the emotional component of the processing of pain (Neugebauer et al., 2004).

Neurochemical changes reflecting alterations in the neurotransmitter system involved in acute drug reward are hypothesized to reflect intersystem neuroadaptation and contribute significantly to the negative motivational state associated with acute drug abstinence. A neuroadaptation within the system can be defined as "the primary cellular response element to the drug would itself adapt to neutralize the effects of the drug; the persistence of the opposite effects after the disappearance of the drug would produce the withdrawal response" (Koob & Bloom, 1988). Such intra-systemic changes include a reduction in dopaminergic transmission in the nucleus accumbent, and the reduced function of the reward system may remain in the form of long-term biochemical changes that contribute to the clinical syndrome of prolonged abstinence and vulnerability to relapse(Weiss et al., 1992).

1.5. Neurobiological mechanisms of the preoccupation/anticipation stage

The preoccupation/anticipation stage of the addiction cycle has long been thought to be a key element of relapse in humans, defining addiction as a chronic relapsing disorder. This stage has often been associated with the construct of craving. However, craving itself is difficult to measure in human clinical trials and does not always correlate with relapse. Nevertheless, there remains a focus on identifying the neurobiological basis for the stage at which the individual resumes drug-seeking behavior after abstinence (Koob & Volkow, 2016).

The process of addiction most often begins in adolescence, a period of time during which the brain is undergoing important developmental changes (Koob & Volkow, 2016). Adolescence is a period of significant, rapid brain development, during which the adolescent brain is at increased risk of addiction. The last region of the brain to develop is the frontal cortex. The frontal cortex is responsible for executive functions, including impulse control, risk assessment, evaluation of consequences and decision-making (Giedd, 2015). During adolescence and into the early 20s, significant changes occur in both grey and white matter in the frontal cortex, including continued myelination, thinning of grey matter and pruning of excess connections (Bava et al., 2010). The prefrontal cortex also serves to modulate the

activity of non-cortical systems, such as regulating the activity of emotional circuits in the limbic system. There is a linear increase in inhibitory control as the prefrontal cortex matures during adolescence. However, there is also an increase in activity in the nucleus accumbens, which is an increase in reward sensitivity (Galvan et al., 2006). These differences are likely to contribute to the increased risk-taking, novelty-seeking and impulsivity which may be observed in adolescents (Uhl et al., 2019a). Adolescents are also more likely to progress from drug experimentation to the development of substance use disorders (Uhl et al., 2019b).

Behavioural addictions are similar to substance addictions in many ways, including their natural history, phenomenology, tolerance, co-morbidity, overlapping genetic contribution, neurobiological mechanisms, and response to treatment (Grant et al., 2010). Phenomenologically, behavioral addictions are characterized by a state of craving or urge prior to the initiation of the behaviour, as is also the case for individuals with substance use disorders prior to substance use(Grant & Chamberlain, 2014). Behavioural addictions, like substance use disorders, are characterised by a chronic relapsing disorder.

Behavioral addictions cover a wide range of conditions that represent important chemical entities, including gambling and internet-related behaviours. DSM-5 has grouped gambling and internet use together as Internet Gaming Disorder and only includes Gambling Disorder under Substance-Related and Addictive Disorders (Potenza, 2014 ; Ascher & Levounis, 2015).

1.6. Methamphetamine Use Disorder

Methamphetamine, also known as meth, is a potent central nervous system stimulant and highly addictive drug. Classified by the United States Drug Enforcement Administration (DEA) as a Schedule II substance, methamphetamine carries with it a significant potential for abuse and for severe physical and psychological dependence(*Drug Scheduling,* n.d.). Methamphetamine (meth) is chemically related to amphetamine, but the effects of meth on the CNS are more severe than those of amphetamine. The abuse of meth is an extremely serious and growing problem all over the world, including Azerbaijan. Meth has a high potential for abuse and can be easily produced in clandestine laboratories using relatively cheap over-the-counter ingredients.

Methamphetamine is a controlled substance that is universally illegal for both consumption and distribution. Its usage has been observed over a broad range of geographical locations worldwide, although it is acknowledged that its usage is more prevalent in certain countries.

These are some of the countries where methamphetamine usage is prevalent. Nevertheless, the use and commerce of this chemical are universally problematic and might be illicitly encountered in numerous nations.

It is important to describe the relevance of the study of cognition in methamphetamine use disorder. Cognition refers to a range of intellectual abilities, including memory, attention, speed of processing and executive functioning - the ability to juggle ideas, think before acting, resist impulse and concentrate(Potvin et al., 2018). Cognitive abilities are essential for functioning in society. Severe deficits in attention, memory, executive functioning or social cognition can lead to difficulties in performing activities of daily living, social isolation and unemployment(Dean et al., 2013). Methamphetamine acts on the brain's monoamine neurotransmitter systems, which explains the feeling of cognitive alertness and the increase in energy. In fact, an increase in cognitive abilities, particularly in terms of attention (vigilance), is one of the reasons why people use methamphetamines (Nordahl et al., 2003).

Methamphetamine use disorder, clinically known as stimulant use disorder, is characterised by the compulsive use of methamphetamine despite the negative impact it has on a person's life. To diagnose stimulant use disorder, healthcare professionals use the criteria listed in the 5th edition of the DSM-5. These criteria include, but are not limited to, the following(*Diagnostic and Statistical Manual of Mental Disorders*, n.d.-a).

A. A. A pattern of use of amphetamine-type substances, cocaine, or other stimulants that results in clinically significant impairment or distress, as evidenced by at least two of the following, occurring within a 12-month period:
1. The stimulant is often taken in larger amounts or for a longer period than usual.
2. There is a persistent desire or unsuccessful efforts to reduce or control the use of stimulants.
3. A great deal of time is spent on activities that are necessary to obtain the stimulant, to use the stimulant, or to recover from the effects of the stimulant.
4. Craving, or having a strong desire or urge to use the stimulant.
5. Recurrent stimulant use resulting in failure to meet important responsibilities at work, school or home.
6. Continued stimulant use despite persistent or recurrent social or interpersonal problems caused or made worse by stimulant effects.
7. Important social, professional or recreational activities are given up or reduced as a result of the use of stimulants.

8. Repeated use of stimulants in situations where it is physically dangerous.
9. Continuing stimulant use despite knowledge of a persistent or recurrent physical or psychological problem that the stimulant is likely to have caused or worsened.
10. Tolerance, defined as either
a. Requiring markedly increased amounts of the stimulant to become intoxicated or to produce the desired effect.
b. Continued use of the same amount of stimulant results in a markedly diminished effect.
11. Withdrawal symptoms occur when meth use is stopped or dramatically reduced.

Short-term and long-term effects of methamphetamine in human.

Meth can increase alertness and physical activity and decrease appetite, even at low doses. Short-term effects of meth include:increased alertness and decreased fatigue,increased activity,decreased appetite,euphoria and rush,increased respiration,and hyperthermia (Table1)(Toolaney, 2007)

Table 2. Short-term and long-term effects of meth in human

Short-term effects	**Long-term effects**
• Increased alertness and decreased fatigue	• Dependence and addiction psychosis -paranoia -hallucinations -mood disturbances -repetitive motor activiy -delusions
• Increased activity	• Stroke
• Decreased appetite	• Weight loss
• Euphoria and rush	• Insomnia
• Increased respiration	• Reduced coordination
• Hyperthermia	• Chronic anxiety

• Rapid and irregular heartbeat	• Severe heart problems (e.g.,chronic systemic and pulmonory hypertension,cardio myopathy, myocardial infarction)
	• Skin abscesses and damage blood vessels
	• Severe dental problems, such as gum disease and tooth decay

Long-term use of meth leads to addiction, a chronic relapsing disorder characterised by compulsive drug seeking and use, accompanied by functional and molecular changes in the brain. Chronic meth users show a range of symptoms, including violent behaviour, anxiety, confusion, and insomnia. Longer-term effects of meth include addiction and psychotic symptoms (paranoia, hallucinations, delusions, mood swings, repetitive movements), stroke and weight loss (Table 1). Psychotic symptoms may persist for months or years after cessation (Toolaney, 2007).

Methamphetamine is available in various forms, including pure crystalline hydrochloride salt (known as ice) and formulated tablets. It can be injected intravenously, smoked, inserted into the anus or vagina (suppository), sniffed through the nose (snorted) or taken orally (swallowed) (Roohbakhsh et al., 2016). When meth is ingested, inhaled or injected, it enters the bloodstream and, because of its lipophilic nature, it rapidly crosses the blood-brain barrier and enters the brain. Meth is well absorbed and distributed systemically through different routes. The major excretion of meth is in the urine, with a minor excretion in the sweat and saliva. The rate of excretion in the urine is strongly influenced by the pH of the urine. Its half-life depends on absorption, but usually ranges from five to thirty hours (A. Edinoff et al., 2022).

An overdose of methamphetamine is a very serious and potentially life-threatening event. It can also lead to potential chronic medical events including heart failure, hypertension, cerebral haemorrhage, seizures, strokes, long-term cognitive effects (including psychosis) and possible coma. The most commonly reported physical symptoms of meth overdose are difficulty breathing, rapid heart rate, high blood pressure and chest pain. These symptoms are often life-threatening in the case of meth overdose (Harding et al., 2022).

1.7. Opioid Use Disorder

Opioids are recognized as a necessary and legitimate treatment for pain, but they are associated with significant risks for patients and society, including misuse, abuse, diversion,

addiction and death from overdose. With regular opioid use, people develop tolerance and physical dependence; both are predictable, physiological responses to repeated exposure to opioids. However, a significant number of people who misuse opioids develop opioid use disorder (OUD), which is a complex, primary, chronic, neurobiological disease with roots in genetic, environmental and psychosocial factors (Pergolizzi Jr et al., 2020).

Opioid use disorder is a form of substance use disorder that arises from the excessive and improper use of potent medicines known as opioids (such as morphine, oxycodone, codeine). This condition is characterized by the excessive ingestion of opioid drugs, frequently acquired through illicit means. Prolonged usage of opioids can lead to the body building up a tolerance to the drug and experiencing symptoms known as withdrawal syndrome. Withdrawal syndrome refers to a collection of bodily symptoms and discomfort that arise when an individual abstains from using a certain substance.This condition can lead to significant ramifications, encompassing both physical and psychological aspects.

Opioid consumption is linked to several health concerns. These can encompass respiratory difficulties, infections, cardiovascular issues, hepatic impairment, and psychological disorders such as sadness and anxiety.

Individuals afflicted with opioid use disorder frequently experience a decline in their ability to perform effectively. Challenges such as unemployment, financial hardships, and issues in familial and social interactions may emerge.

Effective intervention is crucial for persons suffering from opioid use disorder. Typically, these therapies involve a blend of:

1. Drug treatment involves the use of other medications, such as methadone and buprenorphine, instead of opioids. These drugs have the ability to decrease withdrawal symptoms and effectively manage addiction.
2. Psychotherapy encompasses several modalities, including individual therapy, group therapy, and family therapy, which are effective in comprehending the issues related to substance use and fostering the acquisition of adaptive coping mechanisms.
3. Support groups are beneficial for individuals facing addiction as they help in sustaining motivation and providing support throughout the journey of overcoming substance abuse.
4. Adopting a healthy lifestyle, enhancing social support networks, and utilizing additional health services, if needed, are crucial for making lifestyle changes and receiving assistance.

Opioid use disorder is a manageable condition, and with prompt intervention and suitable treatment, individuals can achieve a state of good health. The therapy approach is tailored to suit the specific requirements and circumstances of each individual.

Risk factors for the development of opioid use disorder

There is no single profile of the person with opioid use disorder, although there are trends. Opioid use disorder crosses all socioeconomic, racial and age barriers.

Risk factors include the following(Atkins, 2018):

a) Gender-Men are twice as likely as women to develop a substance use disorder, although in the case of opioids, women are catching up.
b) People with mental health problems are at a higher risk of developing all types of substance use disorders.
c) People with a high number of adverse experiences in their childhood.
d) People prescribed opioids because of an injury.
e) Data show that the younger an individual starts using any substance, including tobacco and vaping, the greater their risk of later developing a substance use disorder, including opioid use disorder.
f) People prescribed opioids before the age of 18 have an increased risk of developing an opioid use disorder.
g) People who use opioids on a long-term basis for chronic (non-cancer or palliative) pain are at an increased risk.
h) The opioid system is widely distributed throughout the brain and plays an important role in a wide range of functions, including pain, mood, reward and impulsivity. Opioids bind to specific receptors throughout the body like a lock-and-key. There are three main types of receptors:
i) Delta-Produces analgesia, elevates mood (anxiety and depression).
j) Mu- produces analgesia, elevates mood, activates the central dopamine reward system, euphoric effects. Mu receptors are the receptors that are most closely associated with the rewarding effects of opioids.
k) Kappa - stress-induced analgesia, associated with emotional changes including sadness/dysphoria, of interest to researchers as it is less associated with some of the mu receptor actions including respiratory depression and mood enhancement.
l) Like-1(ORL1/nociceptin) - the most recently identified receptor type.

Opioid receptors are found in all the brain regions that play an important role in addiction, e.g. the mesolimbic pathway, the prefrontal cortex(Herlinger & Lingford-Hughes, 2022).

We produce endogenous opiates. This has become known as the 'runner's high' to describe the release of endorphins, dynorphins and enkephalins during intense exercise and other pleasurable activities such as sex. Endogenous opiates, along with dopamine, play a key role in the brain's reward system, which has evolved to make both food and sex pleasurable. When opioids are taken externally over a long period of time, the body reduces the production of all products related to endogenous opiates (receptors and the molecules themselves). Studies in both humans and animals show that when opioids are stopped, the production of endogenous opioids does not quickly resume and may never return to its previous state. This has implications for the experience of prolonged post-acute withdrawal and the high likelihood of relapse, even after long periods of abstinence(Atkins, 2018).

Opioid use disorder (OUD) is a chronic and relapsing brain disorder caused by repeated exposure to exogenous opioids. To identify when opioid use has progressed to OUD, the DSM-5 focuses on 9 aberrant behaviours (see Table 1)(Pergolizzi Jr et al., 2020). Tolerance and physical dependence are inevitable consequences of opioid treatment. According to the DSM-5, OUD is defined as repeated opioid use within 12 months that leads to problems or distress, with 2 or more of the following symptoms:

Table 3. Symptoms of opioid use disorder

1. A craving for opioids or a strong desire to use them
2. Inability to control or reduce use, despite continued desire or efforts to do so
3. Continued use despite persistent or recurrent impairment, social functioning or interpersonal problems
4. Failure to fulfil important responsibilities at home, work and/or school
5. Withdrawal from social, work or leisure activities as a result of opioid use
6. Use of opioids for longer periods of time or in higher doses than intended
7. Spending a great deal of time obtaining, using and recovering from the effects of opioids
8. Repeatedly using opioids in physically dangerous situations
9. Continuing use despite awareness of negative physical/psychological consequences associated with or worsened by opioid use
10. Developing tolerance
11. Withdrawal symptoms after an opioid is stopped or reduced

Signs and symptoms of opioid withdrawal and opioid use disorders.

In many ways, the signs and symptoms of opioid use and withdrawal are the opposite of each other. And opioid overdose is a medical emergency that can lead to coma, respiratory and vascular collapse, and death if left untreated. The signs and symptoms of an overdose, especially with the more potent fentanyl, oxycodone, heroin and mixed drug overdoses, can occur within a few minutes.

Table 4. Signs and Symptoms of withdrawal from and intoxication with opioids(Atkins, 2018)

Signs and Symptoms	**Withdrawal**	**Intoxication**
Gastrointestinal	Nausea, vomiting, cramping, diarrhea	Constipation (can be severe and progress to bowel obstruction)
Pupil size	Wide pupils (can obliterate the colored part(iris) of the eye(mydriasis)	Pinpoint pupils (miosis)
Respirations	Rapid rate	Decreased rate (in overdoses it can become loud, snoring, gasping and eventually stop altogether)
Skin	Sweating, gooseflesh	Dry (there may be scrathcing and evidence of needle marks (tracks) scars from old abscesses, or redness from active cellulitis)
Tremor	Yes	No
Bone or joint aches	Yes	No
Runny nose	Yes	No
Tearing	Yes	No
Yawning	Yes	Possible (may be sleepy, nodding off)
Mood	Anxious, depressed, irritable, angry	Calm, happy, euphoric
Behavior	Restless, agitated	Calm to sleepy, depending on dose and tolerance

Level of alertness	Alert	From normal, to nodding off, to unconscious, unarousable, and comatose
Hot and/or cold flushes	Yes	No
Muscle twithces	Yes	No
Cravings/Urges to use	Yes	Variable

As a table, these signs and symptoms indicate the physiological response of an individual's body to the consumption of alcohol or substances. This data elucidates the observable symptoms that may manifest when an individual consumes alcohol or narcotics.

These symptoms can offer valuable insights in recognizing substance use disorders and establishing the course of treatment. Nevertheless, due to the unique nature of each circumstance, it is advisable to seek guidance from a healthcare expert.

Opioid analgesics are among the most commonly prescribed drugs in the world, despite the serious side effects, including the potential for abuse and respiratory depression. Respiratory depression caused by opioids is characterised by slow, shallow and irregular breathing and, in severe cases, apnoea (ie, prolonged apnoea). Opioids also affect chemoreflexes and upper airway patency, causing muscle stiffness, sedation and sleep-disordered breathing(Bateman et al., 2023).

The main cause of death associated with therapeutic and recreational opioid use is opioid-induced respiratory depression (OIRD)(Ramirez et al., 2021). A number of clinical factors can increase the risk of OIRD or opioid overdose, including a history of drug use, switching to another opioid, the use of concomitant medications, and comorbid conditions; some people may have a combination of these risk factors(Fala & Welz, 2015). In addition to the clinical risk factors for OIRD and opioid overdose, there are also certain demographic factors that increase the risk of these conditions, such as gender, age and income level.

Opioid-related morbidity and mortality are a huge clinical, societal and economic burden, and interventions to prevent and treat opioid misuse and abuse are valuable and essential.

1.8. Introduction to Gambling Disorder

Pathological gambling (PG) was added to the DSM in 1980, largely through the efforts of Dr Robert Custer, who had been treating and writing about pathological gamblers for several years. The original diagnostic criteria included in DSM-III had not been previously tested; the diagnosis was based on Custer's clinical experience and that of other treatment professionals.The DSM-III criteria began with a statement about the individual experiencing a progressive loss of control, and then listed seven items with an emphasis on damage and disruption to the individual's family, personal or occupational pursuits, and money-related problems. In this edition, PG was classified as an impulse control disorder(Reilly & Smith, n.d.).

In the next edition (DSM-IV), the criteria for PG were revised to reflect its similarities to substance dependence and it was placed in the section "Impulse Control Disorders Not Elsewhere Classified". The DSM-5 Working Group proposed that PG be moved to the substance-related and addictive disorders category. According to Dr Charles O'Brien, Chair of the DSM-5 Substance-Related Disorders Work Group, brain imaging studies and neurochemical tests have provided "strong evidence that [gambling] activates the reward system in much the same way that a drug does"(Holden, 2010). The move of gambling disorder to the category of addictive disorders is a recognition that gambling disorder and substance use disorders are frequently co-morbid(el-Guebaly et al., 2012).

Pathological gamblers report cravings and highs in response to their stimulus of choice; it also runs in families, often with other addictions(Potenza et al., 2005). Neuroscience and genetics research have played a key role in these findings.

The following are more specific signs of gambling addiction (*Diagnostic and Statistical Manual of Mental Disorders*, n.d.-b):

-Frequent thoughts about gambling.
-Need to play with greater amounts of money/value to get the same level of pleasure/tolerance.
-Repeated unsuccessful attempts to control or quit gambling.
-Feeling anxious or irritable when you try to stop gambling (withdrawal symptoms).
-Gambling when in distress (as an "escape" from negative feelings).
-Gambling to compensate for recent gambling-related losses (called "chasing losses").

-Downplaying or lying to loved ones about your gambling behaviour.
-Relying on other people to help finance your gambling or to replace money you have lost to gambling.
-Continuation of gambling even when it has a negative impact on your finances, work, education or personal relationships.

A prominent indication of gambling addiction is the regular fixation or compulsion with thoughts pertaining to gaming. This fixation can engulf an individual's thoughts, resulting in incessant strategizing of gambling endeavors or indulging in daydreams about possible victories. The continuous fixation on gambling can disrupt daily functioning and result in neglecting one's responsibilities.

Another characteristic of gambling addiction is the emergence of tolerance. Over time, individuals may discover that they require larger sums of money or participate in more daring bets in order to attain the same degree of excitement or pleasure. This increase in gambling activity might contribute to financial difficulties and worsen the addiction cycle.

Individuals afflicted with a gambling addiction frequently face challenges in managing or discontinuing their gambling habits, even in the face of adverse outcomes such as financial setbacks or strained interpersonal connections. Individuals may engage in a series of failed endeavors to reduce or cease their gambling activities, only to find themselves repeatedly reverting back to gaming.

Withdrawal symptoms frequently occur in individuals with gambling addiction. When individuals attempt to decrease or cease their gambling activities, they may encounter sensations of worry, impatience, restlessness, or even despair. The presence of these withdrawal symptoms can strongly incentivize individuals to continue gambling in order to alleviate these distressing emotions.

Gambling addiction sometimes serves as a coping method to manage stress, worry, or other adverse feelings. Engaging in escapism through gambling may offer momentary respite, but it ultimately sustains the pattern of addiction by causing individuals to depend on gambling as a means to suppress their emotions or divert their attention from underlying problems.

Pursuing losses is another distinctive behavior associated with gambling addiction. Following financial losses incurred from gambling, individuals may feel an irresistible want to persist in gambling as a means to recoup their losses. Such conduct can result in more significant financial damage and exacerbate feelings of despair.

Gambling addiction is frequently accompanied with deception and secrecy. People may conceal their gambling habits from their loved ones, minimize the severity of their gambling behavior, or deceive others about financial problems in order to conceal the negative effects of their addiction. Dishonesty can cause tension in relationships and make it more difficult to ask for assistance.

Financial reliance is an additional warning sign for a gambling addiction. People may depend on others to fund their gambling activities or to rescue them from financial troubles resulting from gaming losses. This interdependence can perpetuate a loop of facilitating actions and worsen the economic ramifications of addiction.

Individuals afflicted with gambling addiction frequently persist in engaging in compulsive gambling, despite enduring adverse consequences on their financial situation, employment, education, and personal relationships. The unwavering determination exhibited in the face of challenges highlights the profound grip that gambling addiction can exert on an individual's existence.

Ultimately, gambling addiction is defined by a combination of indicators and manifestations that can significantly damage the lives of persons. The signs of gambling addiction encompass symptoms such as obsessive focus on gambling, heightened tolerance, failed attempts to quit, withdrawal manifestations, utilizing gaming as a means of escapism, pursuing losses, engaging in deceit and secrecy, financial reliance, and persisting in playing despite adverse outcomes. It is vital to be able to detect and handle gambling addiction successfully by recognizing these indications. Seeking professional help is often necessary for recovery.

1.9. The relationship between substance use disorder and gambling disorder

Substance use disorder and gambling addiction are significant health issues in contemporary societies. Gaining insight into the correlation between these two forms of dependency helps enhance our comprehension of how both individuals and societies can effectively manage these issues.

Prior to delving into the topic, it is crucial to grasp the fundamental distinctions between substance use disorder and gambling addiction. Substance use disorder is characterized by an individual developing an excessive and unmanageable dependence on substances obtained either illegally or legally. These substances frequently include alcohol, cigarettes, narcotics, or prescription prescriptions. Gambling addiction is characterized by an individual developing an

excessive and compulsive attachment to gambling, which ultimately has a detrimental impact on their lives.

The correlation between these two forms of addiction is intricate and can mutually impact one another. For instance, an individual grappling with substance abuse may resort to other detrimental behaviors, such as gambling, as a means to alleviate their addiction. Similarly, an individual with a gambling addiction may initiate or escalate their existing substance abuse.

Both types of addiction, namely substance addiction and behavioral addiction, frequently correlate with mental health issues such as stress, anxiety, or depression. Furthermore, both of these dependencies can have adverse effects on an individual's interpersonal connections, professional achievements, and general well-being.

Gaining insight into the correlation between substance abuse and gambling addiction is crucial for the development of effective treatment and prevention methods. For instance, if an individual grapples with substance abuse while also being susceptible to gambling addiction, it may be necessary to tackle both issues simultaneously during the treatment procedure. Similarly, when assisting an individual with a gambling addiction, it is important to be mindful of substance abuse and to implement essential precautions.

Ultimately, the connection between substance use disorder and gambling addiction is intricate and has multiple aspects. Gaining insight into this correlation can assist people and societies in formulating more efficient approaches to address these dependencies.

Individuals with a history of substance abuse appear to be at particularly high risk of developing problem gambling (Whelan et al., 2007). In their meta-analysis, Shaffer et al (1999) estimated that 15% of adults in treatment for a substance abuse disorder were identified as pathological gamblers during their treatment. An increased risk of problem gambling has been found in people with general substance misuse and in people who use alcohol, cocaine, opioids and cannabis.

The main benefits of including gambling disorder within addictive disorders are increased awareness and attention to co-morbidity between disorders(Lorains et al., 2011a). Among people with a gambling disorder, over 50% have a lifetime substance use disorder. Conversely, rates of gambling disorder are increased in people with substance use disorders compared with the general population(Petry et al., 2005)(Weinstock & Rash, 2014). Phenomenological data further support the link between behavioral and drug dependence, for example, high rates of GD and SUDs have been reported in adolescence and young adulthood(Chambers & Potenza, 2003).

There are common core characteristics of behavioural and drug addiction(Mack et al., 2016):
(1) repetitive or compulsive involvement in a behaviour despite negative consequences.
(2) A loss of control over the problem behaviour.
(3) A craving or urge to engage in the problem behaviour.
(4) A hedonic quality when performing problem behaviour.
These characteristics have led to the description of behavioural addictions as addictions in the absence of the drug.

1.10 Pathological gambling as a compulsive behavior

Pathological gambling is a compulsive behavior addiction marked by consistent and repetitive gambling actions that interfere with personal, family, or professional activities. Frequently, it is seen in conjunction with substance use disorders (SUDs), presenting considerable difficulties for afflicted people and healthcare systems. In Azerbaijan, as in many other nations, there is a high prevalence of both methamphetamine and opioid use problems. This makes them significant topics for comparative study about their correlation with compulsive gambling. This article seeks to examine and compare the occurrence of pathological gambling in persons with methamphetamine use disorders (MUDs) and opioid use disorders (OUDs) in Azerbaijan. It will explore the epidemiology, clinical features, underlying processes, and therapeutic implications of these conditions (Chen et al., 2024).

Azerbaijan is confronted with an escalating public health issue related to drug abuse and addictive behaviors. Notably, MUDs and OUDs are noteworthy for their unique pharmacological characteristics and significant effects on society. MUDs, while traditionally less common than OUDs in Azerbaijan, have shown an increase in popularity in recent years, particularly among younger age groups. However, Opioid Use Disorders (OUDs) continue to be a persistent problem. (Chen et al., 2024). People with MUDs and OUDs often exhibit similar clinical features, such as impulsivity, engaging in risky activities, and struggling with regulating their emotions. These characteristics are often seen in people with compulsive gambling, indicating similar underlying susceptibilities.

1.11. Fundamental Mechanisms

Multiple variables contribute to the simultaneous presence of compulsive gambling and SUDs in Azerbaijan. Neurologically, both MUDs and OUDs are linked to the disruption of reward pathways, particularly involving the dopaminergic systems. This dysregulation results in

increased impulsivity and compulsivity, which in turn contributes to addictive behaviors like gambling. Psychosocial variables, such as stress, trauma, and cultural influences, have a substantial impact on the development and persistence of these diseases. In Azerbaijan, the combination of socio-cultural norms and economic inequality may lead to higher levels of stress and the use of unhealthy coping mechanisms, which in turn increases the likelihood of experiencing several illnesses simultaneously (Chung et al., 2022).

1.12. Gambling disorder and Substance use

Pathological gambling is a maladaptive pattern of gambling behaviour that persists despite significant adverse consequences. Considerable amounts of money, time and emotional resources are expended by pathological gamblers(Alessi & Petry, 2003). The most widely used tool for assessing pathological gambling is the South Oaks Gambling Screen (Lesieur & Blume, 1987) (Petry, 2001). Scores equal to or greater than 5 on this instrument are an indication of pathological gambling (Lesieur & Blume, 1987). Pathological gambling is a common comorbid diagnosis in substance use disorders, and one explanation for the co-occurrence of substance use disorders and pathological gambling is that both may reflect an underlying personality trait such as impulsivity (Petry, 2001).

1.13. Significance and Difficulties in Treatment

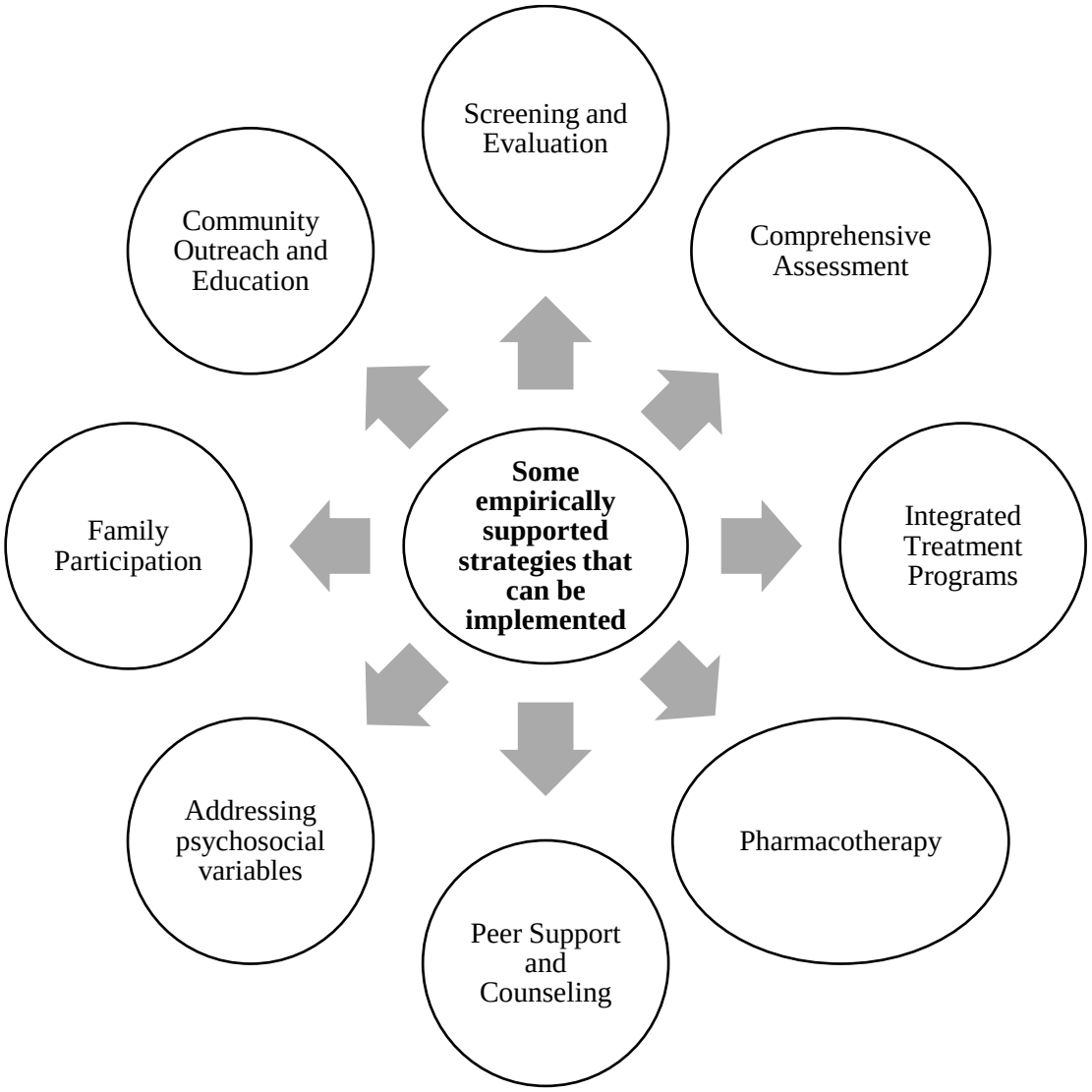
Effective management of concurrent compulsive gambling and substance use disorders (SUDs) requires integrated treatment techniques that address both addiction and mental health concerns. Currently, there are limitations on the availability of specialized medical services for patients with dual diagnosis in Azerbaijan. Treatment facilities sometimes face a dearth of proficient professionals and a lack of comprehensive protocols for efficiently managing complex situations. Furthermore, there is apparent existence of societal stigma and prejudice associated with mental health and substance abuse disorders in Azerbaijan. This kind of stigma and prejudice hinders people from seeking help, leading to underreporting and delayed interventions (Chung et al., 2022).

To address the challenges posed by the concurrent presence of compulsive gambling and SUDs in Azerbaijan, many strategies may be used. It is crucial to have enhanced screening and assessment procedures in healthcare settings to accurately identify individuals with dual disease. Developing training programs for healthcare practitioners on integrated treatment modalities might improve patient outcomes. Furthermore, implementing public awareness

initiatives aimed at diminishing social stigma and encouraging individuals to seek assistance might facilitate early interventions and mitigate the impact of these coexisting conditions on individuals and society (Soleimani et al., 2019).

Implementation of comprehensive treatment approaches is essential to successfully manage the coexistence of compulsive gambling and substance use disorders in Azerbaijan. It is important to customize these tactics to meet each person's specific needs, considering the complex interplay between addiction, mental health, and social issues. Some empirically supported strategies that can be implemented include (Soleimani et al., 2019):

Schema 1. Some empirically supported strategies that can be implemented



Source: Soleimani et al., 2019

Screening and Evaluation: It is possible to immediately identify and intervene in people with dual diagnoses by using standard screening techniques for compulsive gambling and substance use disorders (SUD) in health services.

Comprehensive Assessment: Comprehensive assessments are necessary to examine the extent of gambling activity, drug use patterns, co-occurring mental states, and psychosocial stressors. This comprehensive approach facilitates the development of individualized treatment strategies.

Integrated Treatment Programs: Integrated treatment services that address gambling addiction and drug use simultaneously need to be provided. These programs may include cognitive-behavioral therapy (CBT), motivational interviewing, relapse prevention measures, and family therapy.

Pharmacotherapy: In case of serious problems arising from accompanying disorders, it is necessary to use medication as an adjunct treatment to psychotherapy. Medications, especially for impulsivity, appetite and mood management, may have positive effects.

Peer Support and Counseling: Participation in peer support organizations such as Gamblers Anonymous and Narcotics Anonymous should be encouraged by providing people with social support and coping mechanisms.

Addressing psychosocial variables: Treatments aim to address key psychosocial variables that contribute to addictive behaviors, including trauma-focused therapy, stress management strategies, and life skills training.

Family Participation: In order to strengthen support networks and increase communication within the family system, active participation of family members in treatment and education programs should be encouraged.

Community Outreach and Education: Participating in community outreach and education efforts by partnering with local groups, schools, and businesses may be a good choice to increase knowledge and understanding about gambling addiction, drug use disorders, and the many treatment options available (Soleimani et al., 2019).

Generally, the study conducted in Azerbaijan highlights the complex correlation between addictive behaviors and drug usage by comparing compulsive gambling in individuals with MUDs and OUDs. In order to successfully manage the coexistence of many disorders, it is crucial to use a holistic approach that considers several factors including neurobiology, psychosocial variables, and cultural effects. Azerbaijan may significantly alleviate the impact of both compulsive gambling and SUDs by implementing comprehensive and coordinated therapeutic approaches. This will result in enhanced health outcomes and an elevated quality

of life for those affected by both illnesses. In addition, drug users have been widely discussed in recent years for committing many crimes. The problem of drug crimes is a complex topic with global impact, including in Azerbaijan. Gaining insight into the relationship between drug use and criminal behavior is essential to understanding the underlying factors and adopting effective approaches to address these challenges. Azerbaijan, like many other countries, is struggling against the effects of drug-related crimes on its social fabric and law enforcement agencies. The prevalence of drug crimes is indicative of both personal decision-making and broader societal problems related to substance abuse, addiction, and psychological well-being (Cinayətkarlıq və hüquqpozmalar., 2024).

A significant obstacle is the convergence of drug use with criminal behavior such as theft, assault and human trafficking. Drug addiction can impair cognitive function and self-regulation, leading people to engage in illegal activities to maintain their addiction or obtain drugs. This repetitive pattern fosters a cycle of criminal activity and substance abuse that creates substantial barriers to law enforcement and the general protection of the public. In addition, the availability and ease of obtaining drugs significantly affects the number of crimes. Azerbaijan, located at the crossroads of important drug trafficking routes, has difficulties in the fight against drug trafficking. The existence of well-structured criminal syndicates engaged in illegal drug trafficking exacerbates the problem and leads to an increase in drug-related crimes. Addressing these concerns requires a comprehensive strategy that includes prevention, treatment, and law enforcement tactics. Prevention interventions such as education efforts, awareness programs, and community projects are important in increasing knowledge about the dangers of drug use and promoting the adoption of healthy lifestyles (Tsai et al., 2021).

In addition, it is necessary to provide resources to invest in addiction treatment and rehabilitation programs to provide critical assistance to those struggling with substance abuse disorders. Offering access to high-quality medical care, counseling and social support to people with drug addiction can effectively break the pattern of addiction and reduce the likelihood of involvement in criminal activity (Tsai et al., 2021).

Efforts to disrupt drug trafficking networks, strengthen border control measures and strengthen communication with foreign partners are important aspects of a holistic approach in law enforcement. To reduce the availability of drugs and deter people from participating in drug-related crimes, authorities can focus on disrupting illegal drug supply networks and destroying criminal syndicates (Cinayətkarlıq və hüquqpozmalar., 2024).

Additionally, efforts aimed at reducing the social stigma associated with drug addiction and offering ex-convicts' chances to reintegrate into society can contribute to long-term crime prevention efforts. Providing people with the necessary tools and assistance to lead productive lives without reliance on drugs can significantly increase the safety and well-being of society. As a result, the spread of drug crimes in Azerbaijan shows that there are complex social, economic and legal obstacles. Solving these problems requires a comprehensive strategy that combines prevention, treatment and law enforcement measures. Azerbaijan can strive to create a safer and healthier society for its residents by addressing the root causes of drug-related crimes and aiding those suffering from drug addiction (Tsai et al., 2021).

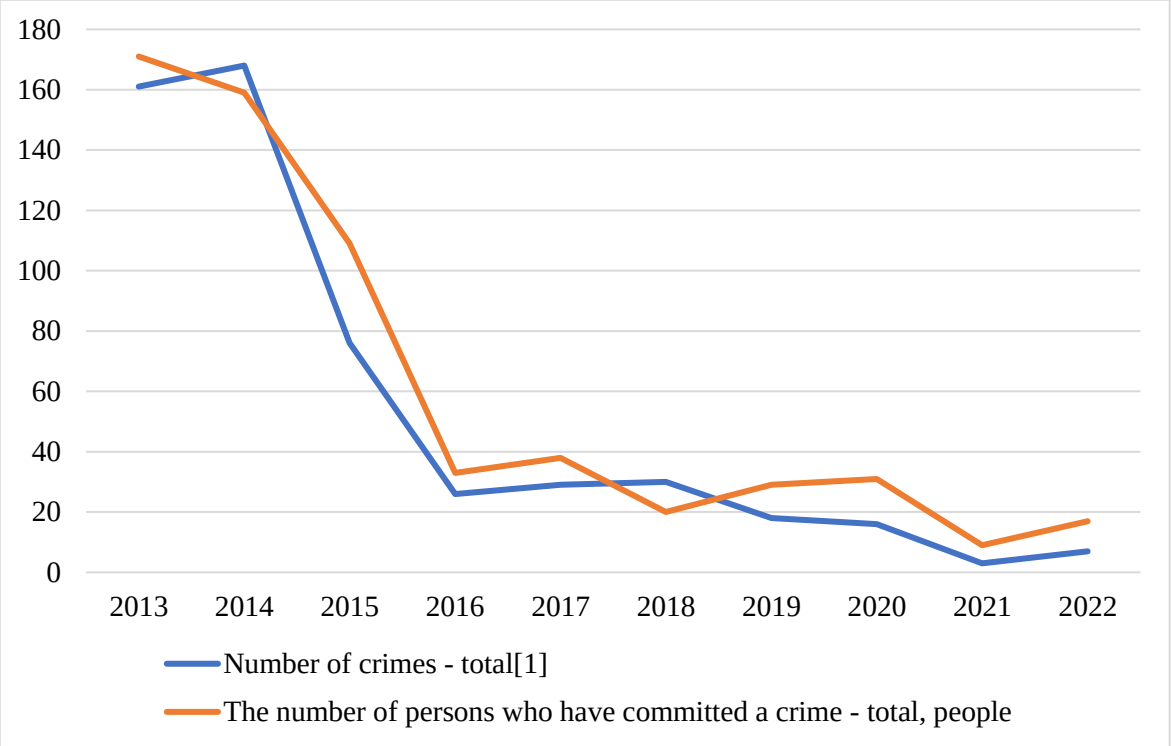
Table 5. The number of crimes committed under the influence of drugs and the number of criminals

	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Number of crimes - total[1]	**161**	**168**	**76**	**26**	**29**	**30**	**18**	**16**	**3**	**7**
The number of persons who have committed a crime - total, people	**171**	**159**	**109**	**33**	**38**	**20**	**29**	**31**	**9**	**17**

Source: Cinayətkarlıq və hüquqpozmalar., 2024

[1] Crimes committed in connection with the illegal circulation of narcotic drugs and psychotropic substances under the influence of drugs.

Figure 1. The number of crimes committed under the influence of drugs and the number of criminals



Source: prepared according to: Cinayətkarlıq və hüquqpozmalar., 2024

[1] Crimes committed in connection with the illegal circulation of narcotic drugs and psychotropic substances under the influence of drugs.

CHAPHTER 2: METHODOLOGY

2.1 Study Objective

The aim of this study was to test the hypothesis that pathological gambling is more prevalent among those with methamphetamine use disorder than among those with opioid use disorder.

In addition, we wanted to examine if there is a moderation effect of impulsivity on the relationship between drug use and gambling behavior.

If the study confirms the hypothesis, methamphetamine abusers with gambling disorder may represent a special population that requires assessment and treatment that includes both disorders.

2.2. Materials and Methodology

The research was conducted in a state-funded, medical, residential addiction treatment centre in Azerbaijan. The lead author of this paper is employed as a clinical psychologist at the centre. After completing the study, the primary data were analysed and interpreted. The sample consisted of 118 residents of an inpatient addiction centre in Baku, Azerbaijan. Participants were aged between 18 and 55. A demographic characteristic generally shared by this population is low socioeconomic status. Participants included 28 females (23.7%) and 89 males (76.3%). Each person underwent a formal substance use disorder assessment to obtain a chemical dependency diagnosis. For the diagnostic assessment at the centre, ICD-10 was used. A survey instrument for the measurement of pathological gambling was administered with 118 participants. The study was conducted in 2024 over a period of 7 weeks. It was a convenience sample of available subjects. The two grouping variable in this study is the group membership - methamphetamine use disorders and a second group of opioid use disorders. In terms of demographics, inpatients were asked of their employment status, age and presenting problem, the population found at the centre is considered to be a fairly homogeneous group of individuals. The inclusion criteria were: (a) age ≥18 years, (b) current MUD and OUD diagnosis, and (c) able to attend the clinical center for assessment. This research excluded subjects who: (a) needed emergency care or presented unstable medical illness; (b) showed clinically significant abnormalities on physical examination; (c) were unable to complete the study procedures; (d) demonstrated psychotic symptoms; and (e) did not provide written consent to participate in the study. All participants were informed of the eventual use of the data. Neither identifying information was asked nor an incentive was provided for participations. The study was approved by the Ethics committee of Khazar University.

Finally, inpatients were asked of their demographic characteristics. Gender was a binary variable (1= Female, 2=Male). Age was a continuous variable. Marital status comprised five categories (0=Single, 1= in a relationship, 2 = Married, 3= Divorce and 4= widow). The highest level of educational attainment was measured using a Likert scale – 1= incomplete secondary, 2= complete secondary, 3= incomplete higher, 4= vocational and 5= higher education. Those out of employment were coded 0, while the rest were as follows – 1= in employment, 2=student and 3= pensioner.

2.3. Measures

Prior to the actual study two scales which are the South Oaks Screen and the Barratt Impulsivity Scale that were used in this study were translated and adapted to Azerbaijani language.

Following informed consent, participants initially completed demographic information (sex, age, marital status, employment and educational level). Participants also completed the translated and adapted version of SOGS i(Lesieur & Blume, 1987) in Azerbaijani language. The SOGS is a 20-item self-report measure of gambling-related problems. A score of 3 or 4 is an indication of possible problem gambling, and a score of 5 or more indicates the likely presence of pathology (Weatherly, 2012). Finally, participants completed the translated and adapted version of BIS-21 in Azerbaijani language. The Barratt Impulsivity Scale (BIS-21), originally published by Patton et al. (Patton et al., 1995), was used to measure levels of impulsivity and consists of 21 items, scored on a four-point scale: (1) rarely/never, (2) occasionally, (3) often, (4) almost always/always. The total score is the sum of the scores of all the items. The overall level of impulsivity is reflected in the total score. Higher scores indicate a higher level of impulsivity, whereas lower scores indicate a lower level of impulsivity.

Finally, participants were asked about their demographic characteristics. Gender was a binary variable (1= Female, 2=Male). Age was a continuous variable. Marital status comprised five categories (0=Single, 1= in a relationship, 2 = Married, 3= Divorce and 4= widow). The highest level of educational attainment was measured using a Likert scale – 1= incomplete secondary, 2= complete secondary, 3= incomplete higher, 4= vocational and 5= higher education. Those out of employment were coded 0, while the rest were as follows – 1= in employment, 2=student and 3= pensioner.

2.4. Analysis

Having been translated into the Azerbaijani language, the South Oaks Gambling Screen and the 21-item Barratt Impulsiveness Scale were conducted as a pilot study due to their adaptation. The purpose of this pilot study was to examine the reliability, validity and classification accuracy of SOGS and the BIS-21 in a sample of the Azerbaijan population. The participants in this study were selected at random from the general population through the use of an online questionnaire platform. A total of 180 participants took part in the pilot study.

EFA AND CFA was applied using R programming language. ‚lavaan'package of R programming language was used to perform confirmatory factor analysis.

Confirmatory factor analysis (CFA) is a method that allows you to test whether your data fit a pre-defined model of factors and indicators. CFA is used when you have a clear theoretical or empirical basis for a model and you want to test its validity and reliability. CFA makes it possible to estimate the factor loadings, the correlations between the factors and the measurement errors of each indicator.

Exploratory factor analysis (EFA) is a method of exploring the possible structure of your data without imposing a pre-existing model. EFA involves extracting the factors, rotating them to make them easier to interpret, and assigning the indicators to the factors based on the loads.

This essay will explore the findings of a CFA (Confirmatory Factor Analysis) conducted using two specific measurement scales: the Baratt Impulsiveness Scale (BIS-21) and the South Oaks Gambling Screen (SOGS).

The BIS-21 is a commonly employed self-report survey created to gauge impulsivity, whereas the SOGS evaluates gambling conduct. Both scores are essential for comprehending psychological structures and actions associated with impulsivity and gambling.

Results

1.An overview of the findings from Confirmatory Factor Analysis (CFA)

1.1.Confirmatory factor analysis (CFA) results for the BIS-21 scale:

The CFA done on the BIS-21 scale indicated that the model matches the observed data quite well. The ML estimator and NLMINB optimization approach were employed to test the model. The analysis involved the assessment of 45 parameters based on 102 observations.

Model Fit Assessment: The user model demonstrated satisfactory fit indices, such as a Comparative Fit Index (CFI) of 0.931 and a Tucker-Lewis Index (TLI) of 0.884, indicating an acceptable fit for the model.

Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR): The model's fit was further reinforced by a Root Mean Square Error of Approximation (RMSEA) score of 0.071 and a Standardized Root Mean Square Residual (SRMR) of 0.07.

The factor loadings, which were standardized, varied from 0.311 to 1.648. This indicates that there are significant connections between the latent factors (Factor1, Factor2, Factor3) and the indicators.

Covariances: The estimated covariances between factors indicate possible links among the latent constructs, offering insights into the underlying structure of the measured variables.

Confirmatory Factor Analysis (CFA) Results for BIS-21

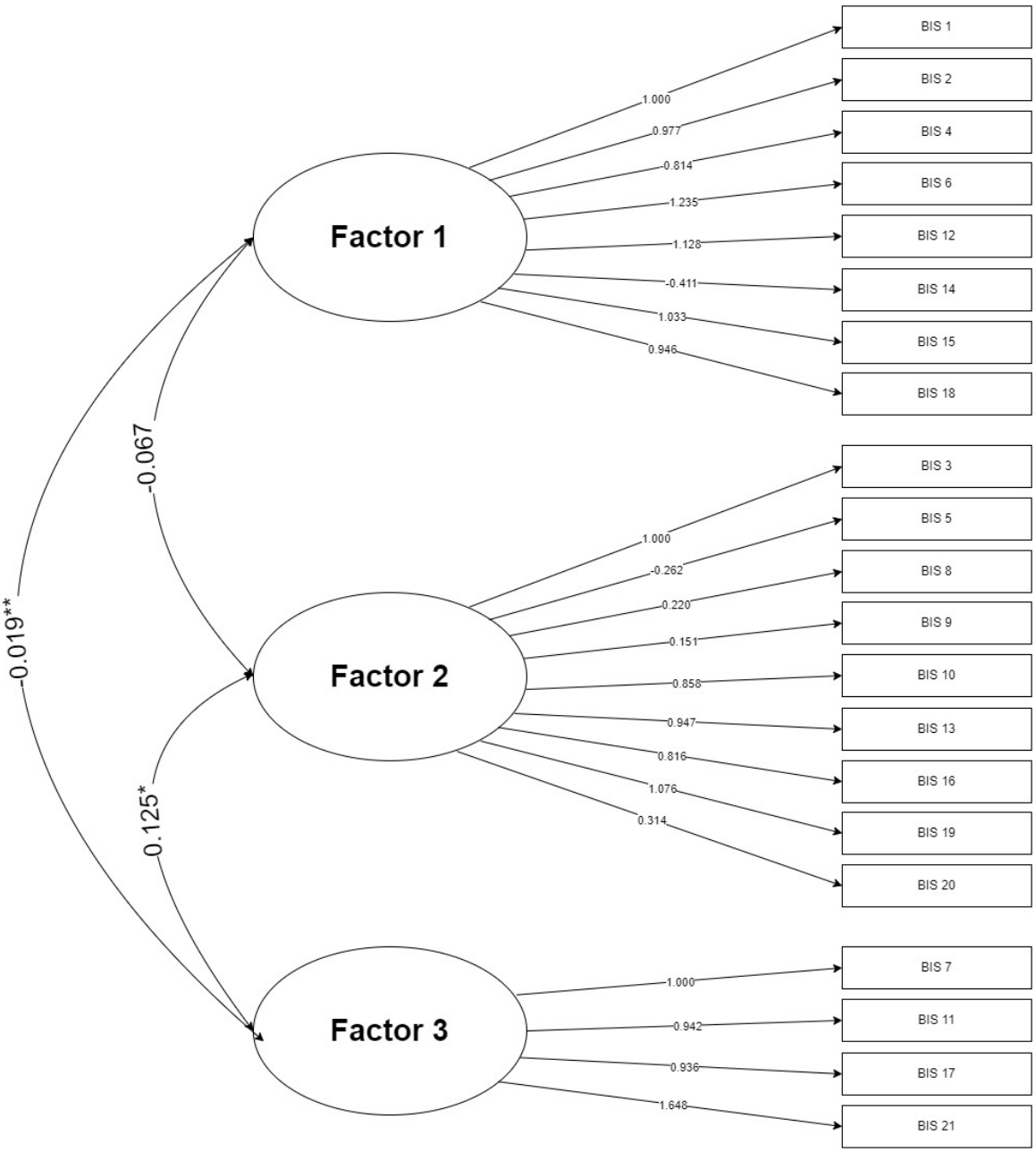
The lavaan 0.6.17 analysis concluded after 52 iterations, employing the ML estimator and the NLMINB optimization method. The model comprised 45 parameters, evaluated against 102 observations.

Table 1.

Fit Indices for Confirmatory Factor Analysis of BIS-21

χ^2	DF	P value	CFI	TLI	RMSEA
81.375	186	0.001	0.931	0.884	0.071

χ^2: Chi-square; DF: degrees of freedom; CFI: comparative fit index; TLI: Tucker-Lewis Index; RMSEA: root mean square error of approximation



Conclusion:

The Confirmatory Factor Analysis revealed a model that fits reasonably well to the observed data, providing insights into the underlying structure of the measured variables.

1.2.CFA results for the SOGS Scale:

Similarly, the CFA done on the South Oaks Gambling Screen (SOGS) scale demonstrated a model that exhibits a satisfactory level of fit to the observed data. The model utilized the diagonally weighted least squares (DWLS) estimator and NLMINB optimization approach, incorporating 32 parameters based on 102 data.

The model fit assessment indicates that the user model demonstrated satisfactory fit indices, with a Comparative Fit Index (CFI) of 0.972 and a Tucker-Lewis Index (TLI) of 0.950, suggesting a good fit.

The RMSEA value of 0.120, with a 90% confidence interval of 0.082 - 0.158, indicates that the model fits reasonably well. This is further confirmed by the robust RMSEA value.

The factor loadings revealed a robust correlation between the observable variables and the latent variable (GD), indicating a significant link between them.

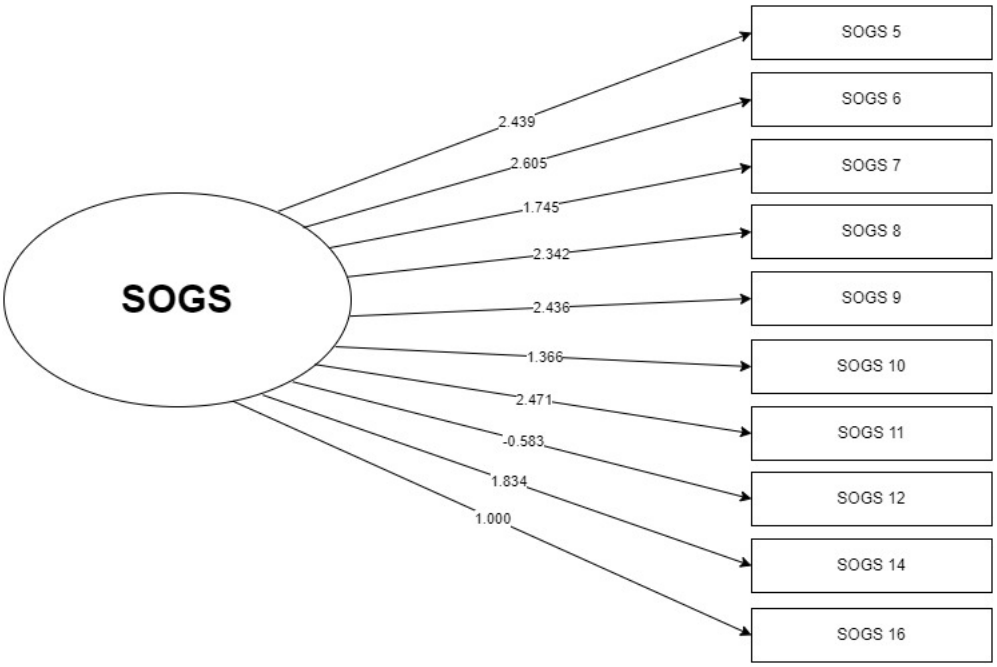
The estimated covariances and variances provide further understanding of the fundamental structure and unpredictability of the data.

Table 2.

Fit Indices for Confirmatory Factor Analysis of SOGS

χ^2	DF	P value	CFI	TLI	RMSEA
61.314	25	0.001	0.972	0.950	0.120

χ^2: Chi-square; DF: degrees of freedom; CFI: comparative fit index; TLI: Tucker-Lewis Index; RMSEA: root mean square error of approximation



Conclusion

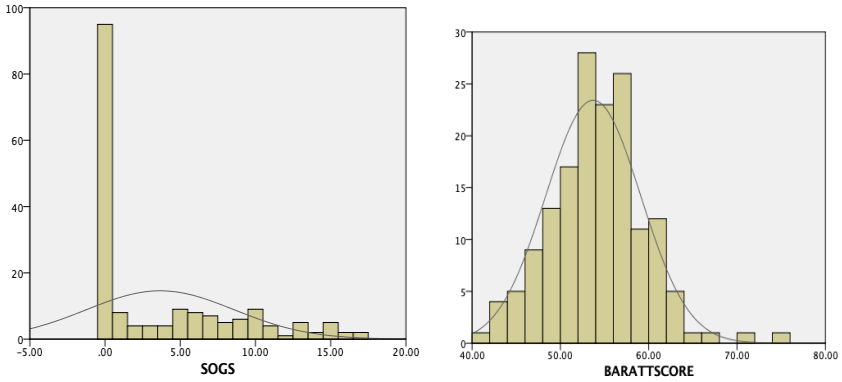
The Confirmatory Factor Analysis revealed a model that fits reasonably well to the observed data, as evidenced by the satisfactory fit indices and parameter estimates. The significant

loadings of the observed variables on the latent variable suggest a strong relationship between them. Additionally, the covariances and variances provide further insights into the underlying structure and variability of the data.

Overall, both CFA analyses demonstrated models that adequately matched the observed data, offering useful understanding of the fundamental patterns of impulsivity and gambling behavior as assessed by the BIS-21 and SOGS scales, respectively. These findings enhance the validation and comprehension of these psychological conceptions and behaviors, hence advancing research in related domains.

Data were analyzed using SPSS 28.0.1.0. Prior to deciding on whether to use a parametric or non-parametric test, the normality of distribution regarding both dependent variables was checked. While Shapiro–Wilk test of normality for the Barratt Impulsivity Score indicated normal distribution, the p-value for the SOGS was <0.05 ($p=0.001$), indicating a non-normal distribution (see Graph 1). The violation of normal distribution can be attributed to a significant number of non-gamblers in the sample. As this assumption was violated, a non-parametric test of the Kruskal-Wallis test was chosen. Unlike a one-way ANOVA F-test, which compares mean values, the Kruskall-Wallis test compares mean ranks (Field, 2009), or in some circumstances, median values of dependent variables across multiple groups to test in-between group differences (Hoffman, 2019) regarding the incidence of pathological gambling and the level of impulsivity. When K-W showed a significant difference ($p<0.05$), the post-hoc Dunn test was used to specify the group differences. To test H3, a subsample ($n=64$) was created, as H3 targeted only individuals with pathological gambling (those with scores above 5 on SOGS). Since we were interested in testing the correlation between pathological gambling and impulsivity, a bivariate correlation test was run. Due to the continuous type of both variables, the Pearson correlation test was chosen.

Figure 2. Distribution of values for dependent variables (n=178)



Similar to previous research, in this study, effect sizes for mean ranks comparisons were obtained through Cohen's d coefficient, considering 0.5>|d|>0.20 to be a small effect, 0.8>|d|>0.5 to be a moderate effect and |d|>0.8 to be a large effect. Once new variables were computed for both the SOGS and Barratt Impulsivity Scale, the Z-score was calculated to identify outliers. None of the participants recorded a Z-score -+3, and thus, all participants were retained. Finally, increases in the type-I error due to multiple comparisons were controlled for using Bonferroni correction.

CHAPTER 3: DISCUSSION

3.1. Interpretation and discussion of results

It is clear that there is a need for a co-occurring approach to the treatment of substance abuse that includes the treatment of pathological gambling. The results of this study show that methamphetamine abusers in particular may be particularly prone to gambling. It is logical to suggest that assessment of pathological gambling should be a priority for clinicians working with methamphetamine-dependent populations. If an addiction is treated but there is no co-occurrence of a second or third addiction, the addicted user remains an addict at the end of treatment.

The research sought to conduct a comparative investigation of compulsive gambling in patients with drug use disorders in Azerbaijan, with a specific emphasis on methamphetamine use disorders and opioid use disorders. By conducting a thorough examination of current literature and gathering original data, numerous significant conclusions were discovered.

In terms of the incidence of pathological gambling is expected to be higher in patients with methamphetamine use disorder compared to the group including patients with opiate use disorder (H1) and the incidence of pathological gambling is expected to be higher in patients with methamphetamine use disorder compared to a control group of non-drug users (H2), the results of our analysis revealed that there is a significant difference in the frequency of pathological gambling among methamphetamine use disorder patients compared against the group including opiate use disorder and non-drug users. A number of findings suggest that gambling can produce effects that are very similar to the effects of psychostimulant drugs. Problem gamblers use strikingly similar language to describe a gambling episode to that used by psychostimulant abusers to describe the effects of their drug use (e.g. arousal, agitation, increased concentration, increased self-confidence)(Hickey et al., 1986).The profile of a gambling episode and psychostimulant use is also similar in that both are characterized by marked behavioral persistence(Zack & Poulos, 2004). For this reason, it is difficult to say whether it is methamphetamine or gambling that has led to a second addiction.

With regard to H3, the level of impulsivity was not associated with the level of pathological gambling in three groups. Among polysubstance users, impulsivity appears to be associated with greater severity of substance use: those with multiple substance dependence report greater trait impulsivity than those with single substance dependence(O'Boyle & Barratt, 1993)(Hayaki et al., 2005). Alessi and Petry (2003) reported that impulsive choices were predicted by severity of gambling problems. Furthermore, above and beyond the variance accounted for by impulsivity, severity of gambling problems predicted the degree of impulsivity in this

task(Alessi & Petry, 2003). On the basis of these studies, the lack of a relationship between impulsivity and pathological gambling can be explained as follows: the lack of polysubstance users in this study and also the limited sample size.

Initially, it was shown that the occurrence of pathological gambling was notably greater among those with methamphetamine use disorders in comparison to those with opioid use disorders. These findings indicate a significant correlation between the use of methamphetamine and the development of compulsive gambling tendencies. Therefore, it is necessary to conduct more study to understand the underlying processes and explore viable treatment strategies.

Furthermore, the research emphasized the intricate relationship between drug use disorders and compulsive gambling, underscoring the need for integrated treatment strategies that tackle both diseases concurrently. Healthcare practitioners must prioritize the screening of gambling issues in patients seeking treatment for drug use disorders, and vice versa, to guarantee thorough and efficient care.

Additionally, the research emphasized the significance of cultural elements in influencing gambling practices and attitudes towards drug use in Azerbaijan. Local settings may need customized therapies that are attentive to the effect of cultural norms and society attitudes on the occurrence of co-occurring illnesses.

Furthermore, the results highlighted the harmful effect of concurrent pathological gambling on the effectiveness of therapy and general state of well-being. People who have multiple illnesses typically encounter more difficulties in their recovery process and may need specific support services to effectively meet their complicated requirements.

To summarize, this comparative study provides insight into the complex connection between pathological gambling and substance use disorders in Azerbaijan. It emphasizes the importance of specific interventions, culturally sensitive care, and additional research to enhance our comprehension of these interrelated problems. To enhance outcomes and quality of life for patients with various concurrent diseases, healthcare practitioners should address these difficulties in a holistic manner.

3.2. Implications for Further Research

Despite valuable insights, the current study has several limitations and further research can address them. First, the present analysis has smaller sample size, which reduces the statistical power of the analysis compared to studies with greater sample sizes. Second, the demographic make up of the sample has gender and employment biases. Further research should try to attain a more balanced group of patients.

In more detail...

The results of this study have several ramifications for future investigations in the domain of concurrent pathological gambling and drug use disorders in Azerbaijan:

Longitudinal studies are important for tracking the course of compulsive gambling and drug use disorders over time. They give insights into the temporal link between these illnesses. Longitudinal data may be used to identify risk factors, protective variables, and putative causal pathways, which can then be used to guide focused preventative and intervention measures.

Studying the neurobiological processes that cause both compulsive gambling and drug use disorders will help us better comprehend the same neural pathways and changes in brain chemistry that contribute to their co-occurrence. Neuroimaging investigations and molecular analysis may help us understand shared or unique pathways, which can then inform the creation of pharmacological interventions and individualized therapies.

Examining the influence of cultural influences on gambling habits and drug use patterns is crucial. Qualitative studies, surveys, and ethnographic research provide the potential to explore cultural norms, beliefs, and social attitudes that influence how people experience co-occurring illnesses in a more comprehensive and detailed manner. This information may be used to develop culturally relevant treatments and preventative methods.

Assessing the effectiveness of integrated treatment strategies for individuals with both compulsive gambling and drug use disorders is of utmost importance. Randomized controlled studies that compare integrated therapies to conventional care may evaluate clinical outcomes, treatment adherence, and cost-effectiveness. Long-term longitudinal studies are necessary to investigate relapse rates and the long-lasting consequences of recovery.

Examining the comorbidity of pathological gambling and substance use disorders with other mental health conditions, such as depression, anxiety, or personality disorders, would enhance our understanding of shared symptoms and treatment implications. Further research is necessary to investigate the effects of using several drugs on gambling practices.

It is crucial to investigate the training requirements of healthcare specialists, such as psychiatrists, psychologists, addiction counselors, and primary care doctors, in order to effectively handle the simultaneous occurrence of compulsive gambling and drug use disorders. Designing and assessing training initiatives aimed at improving healthcare workers' understanding, abilities, and attitudes towards integrated care may lead to better patient results and less social stigma.

By tackling these areas of insufficient study, the discipline may make progress towards developing more customized and efficient approaches for preventing, detecting, and treating

the simultaneous occurrence of compulsive gambling and drug use disorders in Azerbaijan and other regions. Meaningful progress in this field requires collaboration among academics, physicians, policymakers, and community stakeholders.

There is a limited amount of research on the comorbidity of methamphetamine abuse and pathological gambling. Very few studies of pathological gambling have been specific to methamphetamine abusers, although stimulant abusers have been included in overall research on pathological gambling. Previous research has shown that cocaine and alcohol abusers tend to have higher levels of pathological gambling than other substance abusers. However, there has been little research on this issue specifically among methamphetamine abusers. Results of this study provide an evidence-based platform for further advances in treatment of dual methamphetamine gamblers.

CHAPTER 4: CONCLUSION

4.1. Descriptive statistics

Table 1 shows demographic statistics for 3 groups separately. Since this study compares 3 groups, group comparability based on demographics was examined. Overall, male participants were represented statistically significantly more than female. Thus, a pairwise t-test showed a statistically significant difference (f=-3.764), p <.05) between the number of male and female participants. Overall, that the males constitute a greater proportion of the total sample compared to females can be explained by the makeup of the clinic. With regard to the male-based addiction centre and the fact that there are fewer women than men, the significant difference between the genders is normal.Another statistically significant demographic difference between groups was related to age (f=-10.352), p <.001), as the average age for meth users was 30.39 years (SD=6.23, min-max 19-44, median=30.5), while the figure for opioid users was 35.2 years (SD=7.54, min-max 19-55, median=34).

Table 6. Demographic statistics for 3 groups (absolute number and percentages)

	Meth (n=58)*		Opioid (n=60)**	Control (n=60)***
Indicator – M (SD)				
Marital status 1.22 (1.20)	Single	26 (44.8)	27 (45)	18 (30)
	Married/ In a relationship	26 (44.8)	37 (61.7)	37 (61.7)
	Divorce/widow	6 (10.3)	5 (8.4)	5 (8.4)
	Female	20 (34.5)	8 (13.3)	23 (40)
	Male	38 (65.5)	52 (86.7)	37 (60)
	Unemployed/student/pensioner	48 (82.8)	47 (78.3)	20 (33.3)
Gender 1.69 (0.56)	Employed	10 (17.2)	13 (21.7)	40 (66.7)
	Incomplete secondary	9 (15.5)	4 (6.7)	11 (18.3)
	Complete secondary	29 (50)	34 (56.7)	18 (30)
Employment 0.17 (0.38)	Incomplete higher	3 (5.2)	3 (5)	7 (11.7)
	Vocational	3 (5.2)	3 (5)	6 (10)
	Undergrad and over	14 (24.)	16 (26.7)	18 (30)
Education 2.72 (1.44)				

*Age – mean (SD) 30.39 (6.23), Median 30.50, min-max 19-44

** Age – mean (SD) 35.20 (7.54) Median 34.00, min-max 19-55

*** Age – mean (SD) 38.98 (14.76), Median 35.00, min-max 19-84

Table 7. Demographic statistics for 3 groups (mean and standard deviation)

	Meth (n=58)	Opioid (n=60)	Control (n=60)
	M (SD)	M (SD)	M (SD)
Indicator – M			
Marital status	1.22 (1.20)	1.16 (1.09)	1.45 (1.04)
Gender	1.69 (0.56)	1.86 (0.34)	1.63 (0.51)
Employment	0.17 (0.38)	0.28 (0.52)	0.91 (0.69)
Education	2.72 (1.44)	2.88 (1.40)	3.05 (1.56

Table 8. The prevalence of pathological gambling and the level of impulsivity for the overall sample

	Pathological gambling	**The level of impulsivity**
Mean (SD)	3,68 (5.25)	53,71 (5.38)
Median	0	54
Mode	0	52
Minimum	0	41
Maximum	33	74

Table 9. The prevalence of pathological gambling and the level of impulsivity for 3 groups

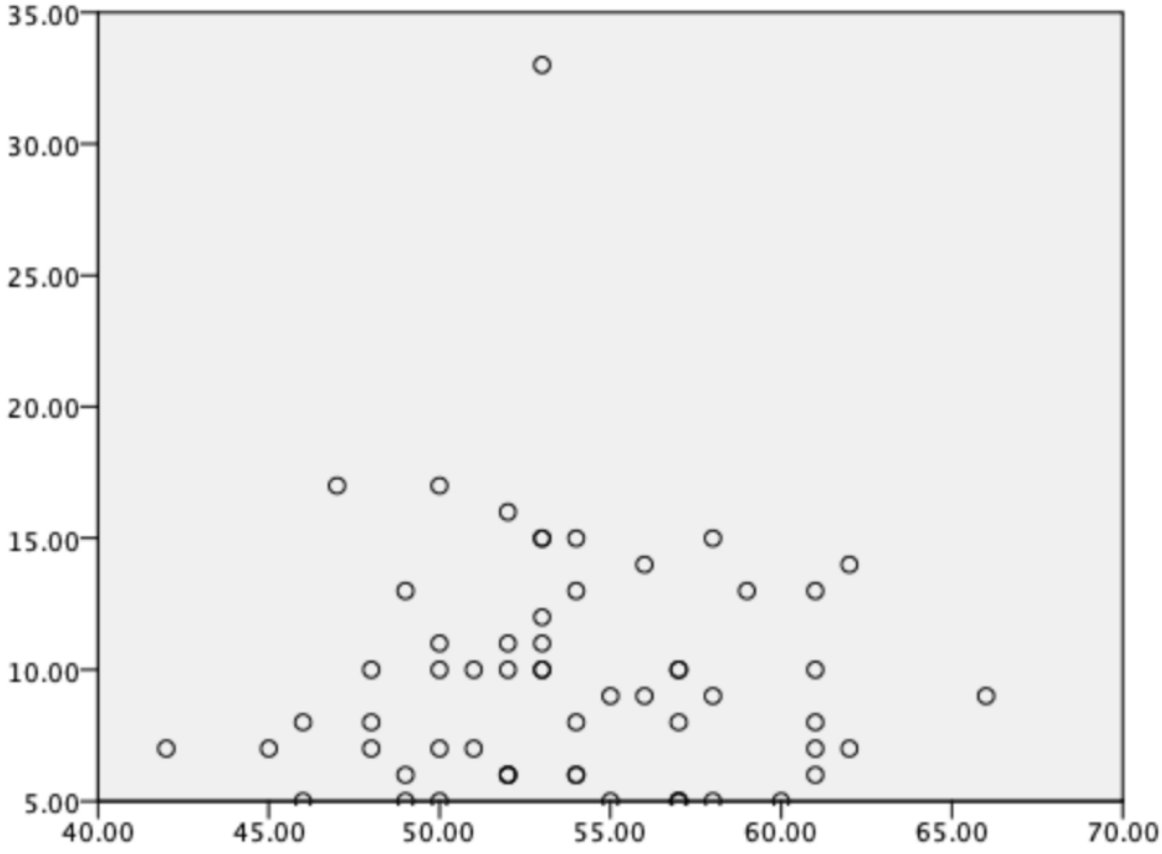
Items		Barratt Score	SOGS
Meth (n=58)	Mean (SD)	53.67 (5.51)	6.76 (5.58)
	Median	54.00	7.00
Opioid (60)	Mean (SD)	53.36 (4.73)	2.60 (4.95)
	Median	53.50	0
Control (60)	Mean (SD)	54.26 (6.07)	1.66 (3.59)
	Median	55	0

Kruskal-Wallis test results

The results confirmed both H1 and H2, as the p-value of the Kruskal-Wallis test for the three groups indicated statistical significance (F=27.564, p<0.001). As indicated by the Table 3, the median value of SOGS for meth users was 7, while the remaining groups registered 0. Thus, there is a statistically significant difference regarding the incidence of pathological gambling among patients with methamphetamine use disorder compared to the group including patients with opiate use disorder.

The post-hoc Dunn test showed moderate effect sizes as to the magnitude of the difference between meth users and opioid users (*d*=0.26) and meth users and control group (*d*=0.28). Unlike H1 and H2, the test results rejected H3. Across three groups, the level of impulsivity was not related to the level of GD (*r*= -0.005, p=0.968). Graph 2 visualises the distribution of the values on a scatterplot.

Figure 3. Scatterplot displaying the relationship between GD and the level of impulsivity

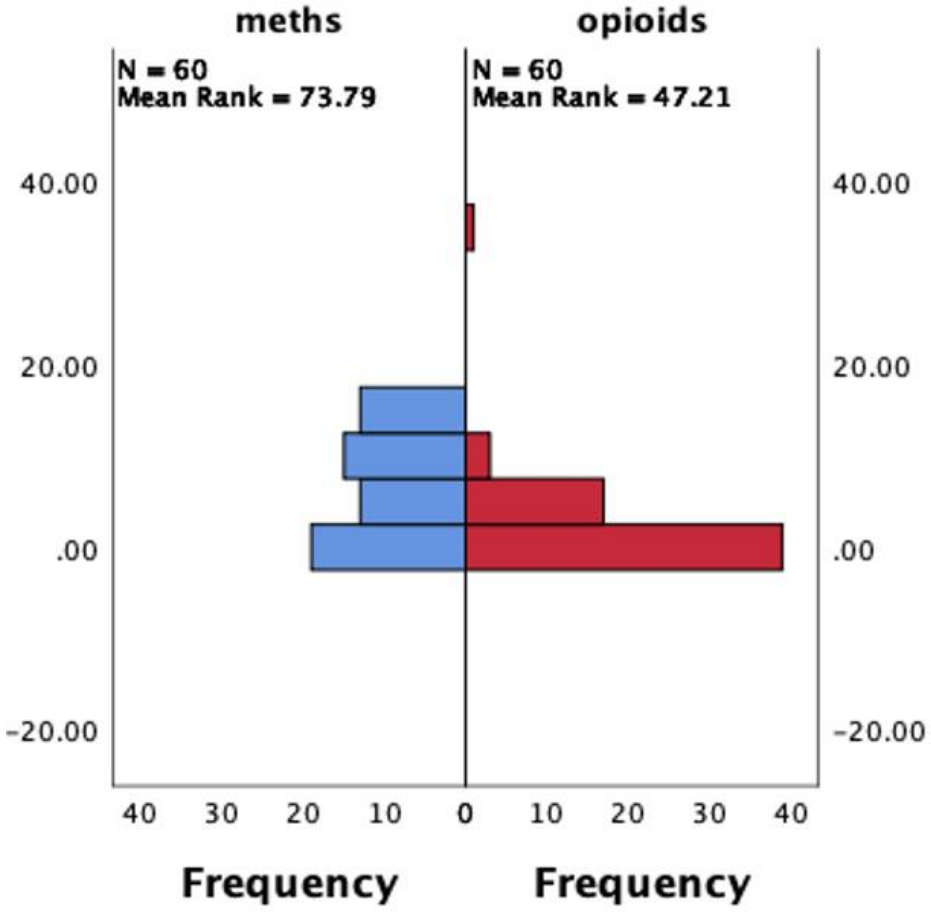


4.2. Inferential statistics

The Mann-Whitney test indicated a statistically significant difference between the groups, as the prevalence of GD was greater among methamphetamine use disorders compared to opioid use disorders (U= 10.02, p<0.001). Regarding the magnitude of the difference in terms of mean,

standard deviation and median values, the results were as follows: methamphetamine use disorders (mean=6.76, SD=5.85, median=7.00) and opioid use disorders (mean=2.60, SD=4.95, median=0). Overall, the test confirmed the hypothesis.

Figure 4. Visualisation of The Mann-Whitney test. Vertical axes represent SOGS score, while the horizontal axes represents the frequency of the observations



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APPENDIX

Hörmətli İştirakçı,

Qiymətləndirməmizə xoş gəlmisiniz və iştirak etməyə razı olduğunuz üçün sizə təşəkkür edirik. Bu gün siz iki növ sorğu vərəqəsi dolduracaqsınız: Cənubi Oaks Qumar Ekranı (SOGS) və Barratt İmpulsivlik Cədvəli (BIS). Cənubi Oaks Qumar Ekranı qumar oyunlarında davranışınızı araşdırmaq və anlamaq üçün nəzərdə tutulub. Barratt İmpulsivlik Cədvəli sizin şəxsiyyətinizi və davranışınızı impulsivlik baxımından qiymətləndirmək üçün nəzərdə tutulub. Sizin dürüst cavablarınız həm şəxsi, həm də klinik cəhətdən aydın olmaq üçün mühüm olan xüsusiyyətləriniz və şəxsiyyətiniz haqqında dəyərli məlumat verməkdə önəmli rol oynayacaq.

Təqdim etdiyiniz məlumat qətiyyən məxfidir və dəstək təklif etmək məqsədilə və zəruri hallarda əlavə müayinə və ya müalicə tövsiyə etmək üçün istifadə olunacaq.

Zəhmət olmasa bütün suallara bacardığınız qədər dürüst cavab verin. Burada doğru və ya yanlış cavablar yoxdur. Sizin açıq və dürüst cavablarınız bu prosesdə ən vacib olan məqamdır.

Təlimatlar:

1.Hər sualı diqqətlə oxuyun.

2.Hər suala son 12 aydakı təcrübənizə əsaslanaraq cavab verin.

3.Əgər sual sizə aid deyilsə və ya təsvir olunan vəziyyətlə qarşılaşmamısınızsa, zəhmət olmasa, müvafiq cavab variantını seçməklə bunu qeyd edin.

Bu seçim prosesində iştirakınıza və dürüstlüyünüzə görə təşəkkür edirik. Bu proses zamanı hər hansı sualınız və ya narahatlığınız yaranarsa, baş həkim və ya digər əməkdaşlar ilə əlaqə saxlamaqdan çəkinməyin.

Bizə vaxt ayırdığınıza görə və əməkdaşlığınız üçün bir daha təşəkkür edirəm.

Hörmətlə,İlahə Novruzova

1.Ad:

2. Doğum tarixi:

(Gün/Ay/İl)

3. Cinsiyyət:

a) Kişi
b) Qadın

c) Qeyri-binar
d) Deməməyə üstünlük verirəm
e) Digər:

4. Ailə vəziyyəti:
   a) Subay
   b) Evli
   c) Boşanmış
   d) Dul
   e) Ayrılmış

5. Təhsil səviyyəsi:
   a) Natamam orta təhsil
   b) Tam orta təhsil
   c) Natamam kollec
   d) Peşə-ixtisas dərəcəsi
   e) Bakalavr dərəcəsi
   f) Magistr dərəcəsi

6. Məşğulluq dərəcəsi:
   a) İşlə təmin olunub
   b) İşsiz
   c) Tələbə
   d) Təqaüdçü
   e) Digər (zəhmət olmasa qeyd edin)

7. Peşə:

a) (Zəhmət olmasa qeyd edin)

CƏNUBİ OAKS QUMAR EKRANI

(SOGS)

1. Həyatınız boyu aşağıdakı göstərilən hansı qumar oyunu növü ilə məşğul olduğunuzu göstərin. Hər növ üçün bir cavabı qeyd edin: "qətiyyən yox", "həftədə bir dəfədən çox olmayaraq" və ya "həftədə bir dəfə və ya daha çox".

qətiyyən yox	həftədə bir dəfədən çox olmayaraq	həftədə bir dəfə və ya daha çox	
			a. pul müqabilində kart oynamaq

			b. atlara, itlərə və ya digər heyvanlara mərc etmək (cıdırdan kənar, cıdırda və ya bukmeykerlə mərc etmək)
			c. idmana mərc (parley kartları, bukmeykerlə və ya jai alai)
			d. pul müqabilində zər oyunları (o cümlədən krəps, yuxarı və aşağı və ya digər zər oyunları) oynamaq
			e. kazinoya getmək (qanuni və ya digər şəkildə)
			f. rəqəmlərlə oynamaq və ya lotereyalara mərc etmək
			g. bingo oynamaq
			h. fond və/və ya əmtəə bazarında oynamaq
			i. oyun avtomatları, poker maşınları və ya digər qumar maşınlarında oynamaq
			j. bowling, bilyard, qolf və ya pul üçün başqa bir oyun oynamaq

2.İndiyə qədər qumar oynadığınız ən böyük məbləğ nə qədər olub?

_____heç vaxt qumar oynamamışam

_____100 dollardan 1000 dollara qədər

_____10 dollar və ya daha az

_____1000 dollardan 10 000 dollara qədər

_____10 dollardan 100 dollara qədər

_____10.000 dollarından çox

3. Valideynlərinizin qumarla bağlı problemləri olub?

___həm atam , həm də anam həddən artıq qumar oynayır (yaxud qumar oynayıb).

___atam çox qumar oynayır (və ya qumar oynayıb).

___ anam çox qumar oynayır (və ya qumar oynayıb),

___çox qumar oynamır (və ya oynamayıb)

4. Qumar oynadığınız zaman itirdiyiniz pulu qaytarmaq üçün adətən növbəti gün geri qayıdırsınız?

_____Heç vaxt

_____ Bəzi vaxtlar (yarı hallardan az) itirmişəm

_____ Çox vaxt itirmişəm

_____ Hər dəfə itirmişəm

5. Heç qumar oynayarkən pul qazandığınızı iddia etmisiniz, amma əslində bunu etmədiyiniz halda ? Həqiqətən itirmisiniz?

_____ heç vaxt (və ya heç vaxt qumar oynamamışam)

_____ bəli, itirdiyim vaxtlar yarıdan az olub

_____ bəli, çox vaxt

6. Heç qumar probleminiz olubmu?

_____ Xeyr

_____ bəli, keçmişdə, amma indi yox

_____ Bəli

Bəli Xeyr

7. Nə vaxtsa nəzərdə tutduğunuzdan çox mərc etdinizmi?

___ _____

8. İnsanlar qumar oyununuzu tənqid ediblərmi? ____ ____

9. Qumar oynamağınıza və ya qumar oynadığınız zaman baş verənlərə görə özünüzü günahkar hiss etmisinizmi?

10. Heç qumar oynamağı tərgitmək istədiyinizi, amma bu~~nu bacarmay~~acağınızı düşünmüsünüz?

11. Həyat yoldaşınızdan, övladlarınızdan və ya həyatınızdakı digə~~r önəm~~li ~~insan~~lardan nə vaxtsa mərc vərəqələrini, lotereya biletlərini, qumar pullarını və ya qumar oyununun digər nişanələrini gizlətmisinizmi?

12. Heç xoşunuza gələn insanlarla pulla necə davrandığınızla bağlı mübahisə etmisinizmi?

13. (12-ci suala "bəli" cavabını vermisinizsə): **Heç qumarla bağlı pul mübahisəniz olubmu?**

14. Heç kimdənsə borcalıb, qumar oynadığınız üçün geri qaytara bilmədiyiniz hal olub?

15. Qumar oyununa görə işdən (və ya məktəbdən) qaldığınız olub? ____ ____

16. Əgər qumar oynamaq və ya qumar borclarını ödəmək üçün pul borc almısınızsa, onu haradan götürmüsünüz? (Hər biri üçün "Bəli" və ya "xeyr"cavabını yoxlayın)

17.

a. ev pulundan		
b. həyat yoldaşınızdan		
c. digər qohumlardan və ya həyat yoldaşı tərəf qohumlardan		
d. banklardan, kredit şirkətlərindən və ya kredit ittifaqlarından		
e. kredit kartlarından		

f. sələmçilərdən (Şeyloklardan)		
g. nağdlaşdırılmış səhmləriniz, istiqrazlarınız və ya digər qiymətli kağızlarınız		
h. şəxsi və ya ailə əmlakını satmısınız		
i. çek hesabınıza kredit götürdünüz (yoxlamalardan pis keçdi)		
f.bukmeykerdə kredit xəttiniz var (olmuşdur).		
k.kazinoda kredit xəttiniz var (olmuşdur).		

BARRATT İMPULSİVLİK CƏDVƏLİ (BIS)

	1.Demək olar ki, heç vaxt / Heç vaxt	2.Arabir	3.Tez-tez	4. Demək olar ki, həmişə / Həmişə
1. Tapşırıqları diqqətlə planlaşdırıram				
2. Səfərləri əvvəlcədən planlaşdırıram				
3. Hər şeyi düşünmədən edirəm				
4. Mən tamaşalarda və ya mühazirələrdə “qıvrılıram”				
5. Mən özümü idarə edə bilirəm				
6. Mən asanlıqla özümü toplaya bilirəm				
7. Hər şeyi düşünmədən deyə bilirəm				
8. Yaşayış yerlərimi dəyişirəm				
9. Mən müntəzəm olaraq qənaət edirəm				
10.Mən ani qərarla hərəkət edirəm				
11.Mən hər şeyi ani qərarla alıram				
12.Mən diqqətli düşünən insanam				
13.Düşüncə problemlərini həll edərkən tez darıxıram				

14.Hobbiləri dəyişirəm				
15.Mən işin təhlükəsizliyini planlaşdırıram				
16.Mən anın təsiri ilə hərəkət edirəm				
17.Qazandığımdan daha çox xərcləyirəm və ya alıram				
18.Mən sabit düşünən adamam				
19.Düşündüyüm zaman çox vaxt kənar fikirlər yaranır				
20.Mən gələcəyə yönümlü insanam				
21.Mən teatrda və ya mühazirələrdə narahatam				

Appendix 2

ABSTRACT

The objective of this study is to evaluate the prevalence of pathological gambling among patients admitted to an Azerbaijan Narcology Centre who have been diagnosed with opioid and methamphetamine use disorders. The translated and adapted version of the South Oaks Gambling Screen (SOGS) was used for this assessment. In addition, the study investigated impulsivity in individuals with both pathological gambling and substance use disorder, utilizing the translated and adapted version of Barratt Impulsivity Scale, version 21 (BIS-21). The study analyzed the relationship between drug use, impulsivity, and the severity of gambling behavior. The results indicated a higher occurrence of pathological gambling in group of patients with methamphetamine use, in comparison with opioid use and control groups. These findings emphasize the necessity for comprehensive therapies that target both substance use and gambling addictions.

Key words: substance abuse, Gambling disorders, SOGS, impulsivity, methamphetamine use

Appendix 3

REFERAT

Bu tədqiqatın məqsədi opioid və metamfetamin istifadəsi pozğunluğu diaqnozu ilə Azərbaycan Narkoloji Mərkəzinə daxil olan xəstələr arasında patoloji qumar oyunlarının yayılmasının qiymətləndirilməsidir. Bu qiymətləndirmə üçün South Oaks Gambling Screen (SOGS) tərcümə edilmiş və uyğunlaşdırılmış versiyasından istifadə edilmişdir. Bundan əlavə, tədqiqat üçün Barratt İmpulsivlik Şkalası tərcümə edilmiş və uyğunlaşdırılmış versiyası, versiya 21 (BIS-21) istifadə edilərək, həm patoloji qumar, həm də maddə istifadəsi pozuqluğu olan şəxslərdə impulsivlik müəyyən edilmişdir. Tədqiqat narkotik istifadəsinin, impulsivlik və qumar davranışının şiddəti arasındakı əlaqəni təhlil etdi. Nəticələr opioid istifadəsi və nəzarət qrupları ilə müqayisədə metamfetamin istifadə edən xəstələr qrupunda patoloji qumar oyunlarının daha yüksək olduğunu göstərdi. Bu tapıntılar həm maddə istifadəsini, həm də qumar asılılığını hədəf alan hərtərəfli müalicələrin zəruriliyini vurğulayır.

Açar sözlər: maddə asılılığı, qumar oyunları, SOGS, impulsivlik, metamfetamin istifadəsi

Appendix 4

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Appendix 5

LIST OF FIGURES AND TABLES