Journal of Pharmaceuticals and Natural Sciences

B-CRETA Publisher
Pharma Insight Solutions

Review

Effects of Abuse of Narcotics, Psychotropics, and Other Addictive Substances

Erwin Samsul, Widya Salsabila Putri Amiruddin, Fitri Hasanah, Tiara Sahfitri Wulandari*, Oktriani Basongan, Mawar Inrian Syam, Muhammad Yusuf, Kretentia Aprilia Gala, Nova Sri Rachmadani

Faculty of Pharmacy, University Mulawarman, Samarinda, 75119, East Kalimantan, Indonesia
* Correspondence: yayararasahfitri@gmail.com

Citation: Samsul, E., Amiruddin, W.S.P., Hasanah, F., Wulandari, T.S., Syam, M.I., Yusuf, M., Gala, K.A., Rachmadani, N.S. Effect of abuse of narcotics, psychotropics, and other addictive substances. J Pham Nat Sci 2025, 2(1), 28-36. https://doi.org/10.70392/jpns.v2i1.2836

Academic Editor: Prof. Dr. Laode Rijai

Received: December 10th, 2024
Revised: February 8th, 2025
Accepted: March 7th, 2025

Publisher's Note: B-CRETA publisher stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

ISSN: 3047-5457

Abstract

Substance abuse, including narcotics, psychotropic drugs, and other addictive substances, poses significant health, social, and economic challenges globally. This study aimed to identify the most commonly abused substances and evaluate their specific impacts on physical, psychological, and social health within the community. This research uses a qualitative and descriptive study with a narrative literature review method. Relevant literature was collected from scientific journals, government reports, and conference articles published in the last 10 years in Indonesian or English, focusing on the impacts and interventions for substance abuse. Initial searches yielded 17,083 articles from 2019–2024 using keywords such as "Drug Abuse," "Substance Abuse Cases," and "Psychotropic Abuse," with 25 articles meeting the inclusion criteria. The analysis was conducted descriptively, synthesizing information based on categories such as health impacts and policy effectiveness. The study identified commonly abused substances, including mephedrone, trihexyphenidyl, LSD, and amphetamines. The findings indicate that substance abuse causes significant adverse effects, including agitation (30%), addiction (20%), hallucinations (60%), aggression (50%), euphoria (70%), and disorientation (50%). These results highlight the urgency of addressing substance abuse and implementing effective prevention and intervention strategies. By focusing on emerging substances and their specific impacts, this study provides valuable insights to inform policy-making and community-level initiatives aimed at mitigating substance abuse and its consequences.

Keywords: Addictive Substance; Drug Abuse; Narcotics; Psychotropics Drugs; Social Health

1. INTRODUCTION

In Indonesia, there are various terms related to drugs. In addition to the term "drug," the illicit substance is also called "NAPZA" and "OBAT " (In Bahasa), so there are three terms that Indonesians use to refer to it. Here are some standard definitions of the three terms. While drug refers to narcotics, psychotropic substances, and addictive substances, drug refers to narcotics. Drugs and narcotics are considered a group of chemicals that generally have a risk of addiction for individuals who consume them. Based on Article 1 paragraph (1) of Law No.23/2006 on Narcotics, narcotics are substances or drugs derived from plants or non-plants, both synthetic and semi-synthetic, which can cause a decrease or change in consciousness, loss of taste, or reduce to eliminate pain, and can cause dependence. Narcotics are included in the classes stipulated in the Law or decree of the Minister of Health.

All levels of the neurocognitive system are impaired due to drug protection, both acutely and chronically. Disturbances in attention, verbal memory, executive function, working memory, recall, speed of information, including processing, psychomotor speed, transmission, and restraint response [1]. To gain a better understanding, the various types of drugs in question will be presented below:

1.1 Narcotics

1.1.1 Opioids (Morphine)

Opioids, also known as morphine, are substances extracted from opium by macerating opium with air and then precipitating it with ammonia. Opioids are commonly used as tranquilizers and pain relievers. Morphine is an opioid receptor agonist that primarily works by binding to and activating μ-opioid receptors in the central nervous system. The activation of these receptors induces effects such as pain relief (analgesia), sedation, physical dependence, euphoria, and respiratory depression. It is widely used for managing acute and chronic pain and is commonly administered as an analgesic before surgery, for regional anesthesia, and to alleviate joint pain. The analgesic properties of morphine are mediated through the μ-opioid receptor (MOR), a G protein-coupled receptor (GPCR) located on neuronal cells. When morphine binds to MOR, it activates G proteins and inhibits adenylyl cyclase. This inhibition reduces the release of cyclic adenosine monophosphate (cAMP), suppressing Ca^{2+} and Na^{+} ion channels, which contributes to its analgesic effects. Morphine's effects on the central nervous system can be categorized into two types: depressive and stimulatory [2].

1.1.2 Cannabis

Cannabis is an annual plant that is easy to grow. It is a plant that has two sexes, namely male and female. The female flower has a pointed hairy cover that produces a resin that has been dried. Cannabis leaves and resin contain active narcotic ingredients, specifically tetrahydrocannabinol, which can cause intoxicating effects and are often utilized as a tobacco blend for cigarettes. Cannabis use disorders result from interactions between the body's endocannabinoid system and external cannabinoids like tetrahydrocannabinol (THC). Tolerance and dependence on THC involve the CB1 and CB2 endocannabinoid receptors in the brain and peripheral tissues, leading to alterations in receptor sensitivity and regulation. THC's effects on the dopaminergic system increase dopamine release in brain regions such as the nucleus accumbens, reinforcing cannabinoid use behavior and contributing to addiction. Prolonged cannabis use can cause structural and functional changes in brain areas responsible for cognitive function, emotion, and motivation, including the hippocampus, amygdala, and prefrontal cortex [3].

1.1.3 Cocaine

Erythroxylum coca is the name of a tree native to South America whose leaves contain cocaine substances that can damage the lungs and weaken the nervous. Cocaine is a sympathomimetic drug that works by inhibiting the reuptake of noradrenaline, dopamine, and serotonin while also enhancing receptor sensitivity to these neurotransmitters. The cardiotoxic effects of cocaine result from multiple mechanisms. Firstly, it increases sympathomimetic activity, which elevates heart rate (HR), blood pressure (BP), and myocardial contractility, ultimately raising myocardial oxygen demand. Secondly, noradrenaline-induced vasoconstriction, combined with cocaine's prothrombotic effects, can reduce oxygen supply. This imbalance

between increased oxygen demand and reduced oxygen supply can lead to myocardial ischemia or infarction. As a result, cocaine is associated with acute myocardial infarction (AMI), the most common serious cardiovascular complication among its users [4].

1.2 Psychotropic

Psychotropic drugs are drugs or substances, either natural or synthetic, not narcotics, that can characteristically alter behavior and mental activity.

1.2.1 Ecstasy

3,4-Methylendioxymethamphetamine (MDMA), often known as ecstasy, is an amphetamine-derived compound that can cause excessive pleasure. The use of MDMA can cause serious health risks, including short-term hyperthermia, seizures, arrhythmias, hyponatremia, rhabdomyolysis, and long-term damage to the central nervous system [5].

1.2.2 Methamphetamine

Methamphetamine (MA) is a powerful stimulant agent for the central nervous system (CNS) that mainly functions by increasing the release as well as blocking the reabsorption of dopamine, norepinephrine, and serotonin in the brain. The direct impact on these neurotransmitters increases their concentration at synapses, which further increases CNS activation, thus resulting in higher alertness, concentration, and feelings of euphoria. These neurotransmitters are crucial in regulating mood, appetite, and sleep, among other functions. Notably, MA use can lead to changes in the expression of genes associated with dopamine signaling, synaptic plasticity, and reactions to stress. These changes are thought to contribute to the long-term impact of methamphetamine on the brain and behavior [6].

1.2.3 Benzodiazepines

Benzodiazepines are a class of psychotropic medications commonly utilized as sedatives, hypnotics, anxiolytics (tranquilizers), anticonvulsants, and muscle relaxants. In addition to their sedative properties, they also serve as muscle relaxants, anticonvulsants, amnestics, and hypnotics. Their mechanism of action involves binding to gamma-aminobutyric acid (GABA)-A receptors, which decrease neuronal excitability and induce a calming effect on the brain. However, it is important to note that benzodiazepine use can cause depressant effects on respiratory and cardiovascular systems, particularly in infants with fluid volume deficiency, potentially leading to hypotension [7].

1.2.4 Amphetamine

Amphetamine is one of the most commonly abused drugs and belongs to the second category of psychotropic drugs. Amphetamines stimulate the release of various neurotransmitters, including dopamine, noradrenaline, and serotonin. An increase in these neurotransmitters will increase energy stimulation, increase physical endurance and performance, and create a feeling of pleasure [8].

1.3 Other Derivate Substances

Addictive substances include everything beyond drugs and psychotropic substances, including alcohol, ethanol, menthol, tobacco, inhaled gases, or solvents that can cause dependence. Alcohol, also called ethanol or ethyl alcohol, results from fermentation or fermentation of carbohydrates derived from grains, cassava, grape juice, and sap [9].

Many countries, including Indonesia, are struggling against drugs, psychotropic substances, and other addictive substances or NAPZA. This phenomenon affects not only a single user but also families, communities, and the country as a whole. Various factors often trigger drug use, including social pressure, economic problems, and lack of knowledge about the dangers of these substances. The trend of drug coverage has increased in recent years, especially among adolescents and young adults. This suggests that awareness of the dangers of drugs is still minimal among this population. In addition to contributing to rising crime rates and violence in society, drug support can lead to a variety of physical and mental health problems.

In Indonesia, drugs have spread to all areas, and it can even be said that no area in big cities is affected by drugs today. The situation of drug problems, especially in big cities, has become a highly complex issue. Currently, the number of drug

abusers is increasing significantly. Drug abuse now targets various layers of society, no longer limited to specific groups [10]. The number of drug users in Indonesia in 2021 reached 3.66 million people [11,12,13]. Based on data from the National Narcotics Agency (BNN), the number of drug cases in Indonesia was 1,184 in 2021, with 1,483 suspects and 12.4 tons of evidence, increasing to 1,350 in 2022, with 1,748 suspects and 12.4 tons of evidence

2. MATERIALS AND METHODS

2.1. Material

This research used articles and journals from databases such as Google Scholar, Pubmed, and BNN (Badan Narkotika Nasional). The keywords used in the search were "Drug Abuse," "Substance Abuse Cases," and "Psychotropic Abuse." In the initial search stage, 17.083 articles from 2019 to 2024 were found. After a screening process based on inclusion criteria, articles relevant to drug abuse, and its impact, four journals were selected for further analysis.

2.2 Instrument

In collecting data, the tools used included search features in online databases and manual analysis of selected articles. The researcher used specific keywords, namely "Drug Abuse," "Substance Abuse Cases," and "Psychotropic Abuse." In addition, the screening process was conducted in stages to ensure that only articles with high validity were included in this review.

2.3 Method

This research uses the narrative literature revie, which aims to collect, compare, and analyze existing theories on the issues discussed. This process is done by studying relevant literature from various sources, such as scientific journals, government reports, and conference articles.

The approach includes descriptive analysis, where the researcher evaluates data from the selected journals to understand various drug abuse cases (Table 1). In this study, four key journals were analyzed based on the inclusion criteria that included drug abuse cases and their adverse effects. The analysis process was conducted in two stages:

1. Screening Stage: Articles were screened based on title and abstract to ensure their suitability to the research topic.
2. In-depth Analysis Stage: Articles that met the inclusion criteria were read in full to identify relevant data, such as health impacts and policy effectiveness related to drug abuse.

Table 1. Analyzed Journal Data

No.	**Journal Identity**
1.	Dewi *et al.* (2019). Kasus Agitasi Akibat Pemakaian Mephedrone. *Indonesian Journal of Legal and Forensic Sciences, 9*(1), 413525 [14]
2.	Archimada. (2021). Penegakan Hukum terhadap Penyalahgunaan Narkotika oleh Anak di Kabupaten Sleman. *Lex Renaissance, 6*(3), 493-504 [15]
3	Lisa. (2023). Perilaku Remaja Menghisap Lem di Jalan Revolusi Kelurahan Lok Bahu Kecamatan Sungai Kunjang. *Ejournal Pembangunan Sosial, 11*(3), 196-206 [16]
4.	Aziz *et al.* (2024). Laporan Kasus: Hubungan Pemakaian Metamfetamin dengan Gangguan Kepribadian Anti Sosial. *Medical Profession Journal of Lampung, 14*(1), 20-25 [17]

3. RESULT AND DISCUSSION

3.1. Mephedrone Abuse Case

One of the cases of agitation caused by drug and drug abuse occurred in the Netherlands; a 36-year-old man injured himself by smashing a window. Although police officers were able to perform resuscitation efforts, the victim remained beyond help and died. An autopsy showed multiple superficial skin injuries, bruising, and mild brain swelling. However, the exact

cause of death was unknown. The discovery of evidence in 96 green tablets with a captagon logo on one side and a circle R on the other supported the initial hypothesis that the man had consumed mephedrone.

In the above case, the toxic substance in question is mephedrone, which is a synthesis of cathinone. Cathinone drugs have long been recognized and banned in Indonesia and other countries. The effects and chemical structure of cathinone drugs are similar to amphetamines. Although the toxic dose of mephedrone varies, excessive doses, such as 200 mg orally and 3.8 g intramuscularly, have been reported to cause serious side effects, including death. Conditions such as agitation, heart rhythm disturbances, and other toxic effects may result from the use of these high doses. Long-term use of mephedrone can cause an increase in blood pressure, which can lead to stroke, depression, anorexia, insomnia, hallucinations, heart rhythm disturbances, and psychotic disorders [14].

Because mephedrone is a stimulant that can produce psychoactive effects, including euphoria, enhanced vigor, and vitality, people frequently take it. Mephedrone's mode of action involves raising dopamine and norepinephrine levels in the brain, which produces these effects. Furthermore, social aspects are significant in life. These include peer support, the impact of social settings like parties, and the ease of access to mephedrone when it was still seen as a "legal high." The growing number of people using mephedrone has also been attributed to a lack of knowledge about its risks and potential hazards.

Mephedrone abuse can have adverse physical and psychological effects. Although mephedrone has psychological side effects such as anxiety, paranoia, and depression after use, it can also cause mood swings, increased energy, and euphoria. Dependence on mephedrone is very high, and repeated use can increase the desire to consume it, potentially leading to dangerous patterns of use such as binge use. In physiological terms, mephedrone affects the central nervous system by increasing neurotransmitters such as serotonin and dopamine levels. This not only has a strong stimulating effect but also causes physical and mental health problems, such as heart and behavioral disorders. In addition, the social context when using mephedrone can also affect the user experience; social interactions increase the reinforcing effects of this drug but can also lead to a decrease in social preferences for a given dose. Mephedrone use is also associated with increased levels of stress hormones such as corticosterone, which can affect behavior and response to the drug. Overall, mephedrone abuse can have a significant negative impact on a person's mental, physical, and social health. Therefore, further research is needed to understand the mechanisms responsible for these effects and to develop effective prevention and intervention methods [18].

3.1. Trihexyphenidyl Abuse Case

A teenager with the initials EY, a 14-year-old junior high school student, was found by residents in an unconscious condition on the side of the road in the Sardonoharjo area, Ngaglik, Sleman. The incident attracted the attention of residents, who then decided to conduct further investigations. When searched, two pills with the brand name Trihexyphenidyl, better known as cow pills, were found. These pills are often abused due to their effects that can cause hallucinations or euphoric sensations despite actually having certain medical functions. This case is in the spotlight because it involved a very young student, raising concerns regarding drug abuse among adolescents [15].

Trihexyphenidyl is a type of anticholinergic drug used to relieve symptoms of Parkinson's disease and tremors. In addition, extrapyramidal disorders (movement disorders caused by the side effects of drugs that block dopamine receptors) arising from side effects of drugs that affect the central nervous system, such as reserpine and phenothiazines, can also be treated with trihexyphenidyl. This drug can also be used to treat mental problems in schizophrenic patients. This drug works by blocking acetylcholine receptors. This reduces muscle stiffness, saliva production, tremors, and the ability to control movement [19].

The daily dose of trihexyphenidyl is 2 mg taken 2-3 times daily, totaling 10-20 mg depending on each individual's response and tolerance. Daily doses above 15-30 mg may cause serious side effects. Severe side effects, such as the return of psychotic symptoms like hallucinations, aggressiveness, and confusion, may occur while using this drug. Such side effects are known as toxic psychosis. In addition, side effects of trihexyphenidyl which blocks muscarinic acetylcholine receptors (GPCRs that mediate neurotransmission, are widely distributed in the CNS and peripheral tissues, and regulate parasympathetic

responses), may include blurred vision, constipation, decreased saliva flow, photophobia, reduced sweating, hyperthermia, sinus tachycardia, urinary retention, memory problems, asthma, narrow-angle glaucoma, ejaculatory inhibition, retrograde ejaculation, and even delirium, therefore, WHO issued a warning regarding the use of trihexyphenidyl due to the many side effects associated with this drug [20].

Abuse from trihexyphenidyl can potentially have anxiolytic, euphoric, hallucinogenic, and sexually stimulant effects, which has prompted research into its possible enhancement. For thrill-seeking teenage boys, this drug is becoming one of the most widely used options. Its use can be done orally or by smoking tobacco powder. Reported abuse of trihexyphenidyl in schizophrenia patients ranges from 6.5 to 34%, with triggered doses ranging from 28 mg to 200 mg per day. Male gender, poverty status, other illicit substance use, family history of substance dependence, long-term trihexyphenidyl use, and severe mental disorders are all contributing risk factors. Trihexyphenidyl abuse is usually done to relieve symptoms of depression and other negative complaints by using analgesics, sedation, or euphoria.

The literature addressing dependence on trihexyphenidyl is currently minimal regarding its availability, although there are some reports of dependence regarding trihexyphenidyl. This is because the symptoms are similar to primary psychiatric disorders, which often leads to misdiagnosis and lack of awareness of this drug [21]. The impact of trihexyphenidyl abuse affects many things, such as physically, psychologically, and socially. Physically, it can cause nervous system disorders, sedation, euphoria, weight loss, pallor, and weakness. Users often experience psychological problems such as hallucinations, difficulty concentrating, and decreased desire to learn or work. On the social side, it encourages unproductive behavior, such as staying up late, slacking off, and getting drunk while at school. All of these lead to poor academic performance and educational delays. From a social perspective, this abuse leads to unproductive behaviors, such as staying up late, studying lazily, and getting drunk during class, resulting in decreased academic performance and delays in learning. Negative behavioral changes, such as aloofness, irritability, and difficulty controlling emotions, also worsen the abuser's mental state and social relationships [22].

3.3 Lysergic Acid Diethylamide (LSD) Abuse Case

NF (Initial Name), aged 18, was found to be smoking glue mainly at night and in a closed room. NF started smoking glue at the invitation of a friend and became addicted to the sensation caused by the glue, along with his problems. Fox glue is dangerous, Lysergic Acid Diethylamide (LSD), containing its active substance [16].

Glue is a material used to glue objects, often by teenagers, to commit acts that violate norms and laws. Smoking glue is the process of removing everything contained in the glue to get a free experience. Some types of glue used in "*ngelem*" activities include fox glue, "*aibon*" glue for a cozy effect, furniture glue, and household glue. These glues contain various chemicals that are quite tempting to consume. The habit of smoking, especially among teenagers, is a way to reduce stress. In addition, it is also influenced by friends as a form of solidarity among students. Smoking is often a requirement to be accepted in social circles or even in specific communities [23].

In the text, Lysergic Acid Diethylamide is the missing substance that is very easy to incorporate into adhesive glue. The effect of glue is hazardous because the chemical affects the wearer's nervous system when inhaling its scent. The substance derived from the glue refers to the happiness of its users. Due to its legal status as a glue, LSD is an addictive drug that is also quite difficult to obtain. Lysergic acid diethylamide (LSD) is also known as acid, smile, known as acid, smile, blotter, and sugar cube. Blotter and sugar cubes are semi-synthetic substances derived from d-lysergic acid, which is produced by various fungi that grow on black (rye) plants. The physiological results of inhaling Lysergic Acid Diethylamide are growth inhibition, damage to brain cells, and lung damage. Not only does it damage the child's body, but it also has an impact on their psychology. Children will experience a loss of control over emotions, disorientation, depression, interest, panic, and a feeling of invincibility, same with fantasy [24].

This glue has many chemicals that are very dangerous if consumed. One method of reducing stress is "*ngelem*," especially among teenagers. Friends also encourage them to do so because of the solidarity among street children. In certain groups and neighborhoods, "*ngelem*" is often used as a condition for acceptance. The risks posed by "*ngelem*" vary, and sometimes

people with a substance use disorder do not realize what illnesses it can cause to their bodies. The dangers affect organs such as the brain, heart, and lungs and make it easier for viruses to enter. According to Aswadi et al. (2018) [23], this will not only interfere with physical health but can also interfere with their mental, emotional, and spiritual health.

3.4 Methamphetamine Abuse Case

A 29-year-old man was brought to the emergency room of Lampung Province Mental Hospital by his wife for complaining of anger and throwing stones at houses in the past month. The patient has two children and works as a farmer. He also showed symptoms such as difficulty sleeping, feeling jealous of his partner, believing that others could read his mind, and not feeling tired or hungry. The patient felt that his wife was having an affair with his friend in retaliation for his treatment of women at nightspots. Since one year ago, the patient has become suspicious, sensitive, and irritable. Others can tell that he believes in his thoughts, and every time he uses methamphetamine, stones are thrown at people's houses. The patient thinks ants or animals are crawling when using methamphetamine, although, in reality, no creatures settle. The individual is often awake at night because he feels that someone is watching outside the house, although there is no one. The patient secures all apps and phones that the patient has. For trivial reasons, the patient became very sensitive and often hit his wife while using methamphetamine. Prior to his admission to the hospital in the last month, his symptoms began to worsen. Since junior high school in 2010, the patient smoked and drank alcohol at the invitation of his friends. The patient rarely drank alcohol.

Even though they know the consequences, patients still do it. If they do not have enough money to buy methamphetamine, patients sell their home appliances. Patients do not fast and rarely worship. Patients do not perform community service, Kenduri, or joint activities. Patients only wanted to attend social gatherings with fellow users. Based on physical examination, the patient's consciousness was within normal limits at the hospital emergency room. Examination from head to toe showed no problems. The patient appeared clean and well-groomed. The patient appeared cooperative in the psychomotor assessment. Although eye contact was often broken, they tended to be quiet and could answer questions well and fluently. The patient can respond to statements clearly and with adequate quantity and quality. The patient's mood is altered. The patient's impact appears limited to feelings of jealousy and broadcast. There were preoccupations with suicide and killing her aunt, who took away her money. The thought process was considered coherent as the ability to test the truth (RTA) compromised the social value with a rating of 4 while in the ED [17].

The toxic dose of amphetamine is also different for each person. The literature notes problems with 30 mg use; however, in some cases, patients do not die after taking 400 to 500 mg [25]. The patient began using methamphetamine daily in increasing amounts, starting with 0.5 grams daily. The patient last used the drug one day before admission to Lampung Province Mental Hospital [17]. Long-term methamphetamine abuse damages interpersonal relationships and has been linked to antisocial behaviors, such as physical and sexual violence, as well as a high frequency of attacks on the surrounding environment. This may be due to biases or a lack of understanding of social information, such as the inability to perceive others' feelings. Emotion recognition - also known as emotion recognition - is essential for good social functioning as it bridges social communication and helps develop effective interactions [17].

4. CONCLUSION

Substance abuse, such as narcotics, psychotropic substances, and other addictive substances, has serious consequences, physically, mentally, and socially. Physical consequences include neurocognitive impairment, cardiovascular problems, and physical deterioration. Mentally, the use of these substances can cause anxiety, paranoia, and depression. While in the social realm, the effects can be seen through increased aggressiveness, decreased academic performance, and damage to interpersonal relationships. Commonly abused substances include mephedrone, trihexyphenidyl, LSD, and amphetamines, which can cause symptoms such as agitation, dependence, and hallucinations. The most significant risk factors include peer influence, lack of knowledge, and easy access to these substances. This study emphasizes the importance of effective policy and intervention efforts to reduce the level of substance abuse in society.

CONFLICT OF INTEREST: The author declares no conflict of interest.

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