

Interdisciplinary Forensic and Pharmaceutical, Organizational and Legal, Clinical and Pharmacological Study of Abuse of Psychoactive Substances

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Abstract. Abuse of psychoactive substances is an actual medical and pharmaceutical, social and economic, pedagogical and educational, criminal and legal problem. Prevention should be the priority strategy for dealing with abuse. The most common psychoactive substances in abuse are: alcohol, nicotine, hemp, cocaine, heroin, medicinal drugs. Information about psychoactive substances prohibited for circulation in the state is aggressively disseminated through mass media, the Internet, films, and computer games. Abuse of psychoactive substances affects the quality of life and health, has negative physical, physiological, and psychological consequences. Forensic and pharmaceutical, criminal and legal studies indicate that the law enforcement agencies of Ukraine, under the procedural guidance of prosecutors of all levels, take operative and investigative

measures and investigative actions. In the structure of polydrug addiction, the syndrome of dependence due to the use of alcohol, which develops after multiple simultaneous use of psychoactive alcohol-containing liquids, alcoholic beverages (beer, vodka, wine), psychoactive alcohol drugs, prevails. Comorbid disorders associated with polydrug addiction were systematized. Estimated that 51.6% are mental illnesses. The results of an interdisciplinary forensic and pharmaceutical, organizational and legal, clinical and pharmacological study indicate the need for further multi-stage pharmacotherapy of polydrug addiction and related comorbid disorders during drug circulation.

Keywords: forensic pharmacy, organization of pharmaceutical business, clinical pharmacy, psychoactive substances, abuse.

Introduction. Contemporary problems, as noted by Antonio Guterres, United Nations Secretary-General [1-3], lie in the area of failure to eliminate clear injustice in relation to women, children and adolescents and their prospects for life, the basis of which are global crises associated with:

- COVID-19 pandemic and other infectious diseases [4-6];
- conflicts and extreme climatic situation;
- loss of access to education; approximately 80% of children living in 104 countries lost knowledge due to school closures;
- since the beginning of the global pandemic of COVID-19 – 10.5 million children have lost their parents or guardians;
- millions of children missed classes with teachers at school during the pandemic (many of them for more than a year);
- food security, hunger, and malnutrition;
- forensic pharmaceutical risks in the organization of pharmacotherapy of covid, post-covid, chronic, comorbid disorders of all contingents of patients, in particular ensuring the health of women and children, prevention of maternal mortality [7];
- early child marriages and the risk of intimate partner violence (adolescent depression, anxiety, etc.).

According to the experts of the World Health Organization (WHO), only in 2021 [8, 9]:

- about 25 million children were not vaccinated or were insufficiently vaccinated (6 million more than in 2019), which increases their risk of contracting deadly and debilitating diseases;

- global immunization coverage in 2021 still needs to be increased in 2022-2030 for *Haemophilus influenzae* type b (Hib), Hepatitis B, Human papillomavirus, Meningitis A, Epidemic mumps, Pneumococcal diseases, Poliomyelitis, Rotaviruses, Rubella, Tetanus, Yellow fever.

The transition to adulthood, which is characterized by the state of independence of adolescents from parents, teachers, and adults, causes adolescents to desire close ties with classmates, peers, friends, and older people. This age period is associated precisely with the experimentation of new lifestyles, eccentric ideas, and the adoption of a choice – a life path in adult life, which does not always turn out to be the right one. The newness of life and experimentation often lead to uncertain results, which force some young people to start excessively using tobacco, energy drinks, beer, alcoholic beverages, psychoactive drugs, narcotic drugs, psychotropic substances [10-14].

Joint abuse of psychoactive substances causes negative physical, physiological, psychological consequences, which affects their quality of life and health. Drug addiction among teenagers and young people in different countries begins with smoking cigarettes, spices, and drinking alcohol. Over time, it develops into the use of various psychoactive substances, leads to the formation of narcological and comorbid disorders. Compatible, simultaneous abuse of psychoactive substances is caused in adolescents by the desire to "smoke marijuana" in order to satisfy their own curiosity; the desire to imitate others, so as not to stand out from among one's peers; improve bad mood [28-30].

The last factor can arise as a reaction to daily life troubles, conflicts, stress, depressive state: the transition of the family from one way of life to another; problematic family relationships or parents living separately; risks associated with adolescence or the transition to adulthood; humiliation, physical or sexual harassment by adults; hooliganism and other illegal actions; lack of success in studies and sports; loss of friends; death of close relatives; illness or injury; parental unemployment or financial difficulties; moving to a new place, transferring to another school or not being able to play sports; constant presence on the Internet [31-36].

An interdisciplinary study of the causes and conditions causing drug crime, theft, robbery, murder, hooliganism, road accidents, bodily injuries of varying degrees of severity and the spread of addictive disorders, the development of schemes and methods of pharmacotherapy, the creation of new drugs, their industrial production and introduction into medical practice was studied by scientists of Ukraine from the position of forensic pharmacy, medicine, law: [Stefanov O.V.], [Sosin I.K.], [Chumak V.T.], [Voloshyn P.V.], [Trachtenberg I.M.], [Spizhenko Y.I.], Valentyn V. Shapovalov, Ponomarenko M.S., Tolochko V.M., Osyntseva A.O., [Danylenko V.S.], Shevchenko S.I., [Kutko I.I.], Vasina Yu.V., Omelchenko V.O., Kuryzheva O.O., Gudzenko A.O., Zbrozhek S.V., Galavan Z.S., Nikonov M.M., [Gubskiy Y.I.], Linskyi I.V., Chuev Y.F., Shapovalova V.O., Minko O.I., Gudzenko O.P., Khalin M.M., Galatsan O.V., [Mykhailov V.S.], [Vyshar H.M.], Vyrva O.E., Chaika L.O., Haiduchok I.G., Ryabukha O.I., Radionova T.O., Petrenko S.L., Movsisyan A.G., [Tykhonov O.I.], [Abrosymov O.S.], Peresyphkin O.V., Agapov D.O., Kapielnikova E.V., Ryazantseva N.M., Shapovalov V.V. and others [13, 14, 17-21, 28-33, 37-51].

Forensic and pharmaceutical, forensic and medical, forensic and narcological, forensic and psychiatric, organizational and legal, technological, clinical and pharmacological researches search for ways to combat the illegal circulation of psychoactive substances, develop of new drugs and methods of pharmacotherapy.

The purpose of the study was to conduct an interdisciplinary forensic and pharmaceutical, organizational and legal, clinical and pharmacological study of abuse of psychoactive substances of different classification and legal groups.

Materials and methods. Data from the UN, WHO, analysis of scientific literature and publications, examples from forensic pharmaceutical practice, legislation and regulatory acts of the EU, Ukraine, Gambia, France, the USA, the National Institute on Drug Abuse (NIDA) and the National Institute of Health (NIH), International Charitable Foundation "Public Health Alliance" and Elton John AIDS Foundation, etc. The following research methods were used: representative survey in the system of legal relations "doctor – patient (offender) – pharmacist – lawyer", graphic,

documentary, retrospective, systematic, comparative, regulatory, tabular, forensic and pharmaceutical methods.

The study is a fragment of the research works of the Kharkiv Medical Academy of Postgraduate Education on the topics "Improvement of the organizational and legal procedure of providing drugs to patients from the position of forensic pharmacy, organization and management of pharmacy" (state registration number 0116U003137, implementation period 2016-2020), "Pharmaceutical and medical law: integrated approaches to the drug circulation system from the standpoint of forensic pharmacy and the organization of the pharmaceutical case" (state registration number 0121U000031, implementation period 2021-2026), Lviv Medical Institute LLC on the topic "Improvement of the drug circulation system during pharmacotherapy on the basis of evidentiary and forensic pharmacy, organization, technology, biopharmacy and pharmaceutical law" (state registration number 0120U105348, implementation period 2021-2026), Petro Mohyla Black Sea National University on the topic "Conceptual interdisciplinary approaches to the drug circulation system, taking into account organizational and legal, technological, biopharmaceutical, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmaco-economic, pharmacotherapeutic aspects" (state registration number 0123U100468, implementation period 2023-2028) and State Enterprise "Luhansk State Medical University" on the topic "Conceptual interdisciplinary approaches to pharmaceutical provision and availability of drugs, taking into account organizational and legal, technological, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmaco-economic, marketing, social and economic competence" (state registration number 0123U101632, implementation period 2023-2027).

Results and discussion. The task of medicine is to detect and treat addictive disorders, pharmacy is to provide pharmaceutical support to the victims, law enforcement agencies is to fight against the drug business, to identify the channels of illegal circulation of psychoactive substances. A survey of teenagers showed that [52]:

- 43% of teenagers explained that they use psychoactive substances because they like it;
- 27% – it was interesting to try the effect of psychoactive substances;
- 24% – could not explain anything;
- 6% – did not want to lag behind their friends.

The family doctor needs to find narcological and psychological mechanisms of formation among minors of attitudes towards a healthy lifestyle and sports. It is clear that such statements of teenagers during the survey record only external, superficial motives. In order to realize the complex, deep, really active motives of his behavior, a person must have a sufficiently high level of personality development, certain skills of introspection, and the desire to understand himself. The use of projective methods of personality research helped to identify various deviations in the motivational sphere of adolescents who abuse psychoactive substances, they include:

- the orientation of the motivational sphere has the opposite direction compared to the generally accepted one for ordinary teenagers (satisfaction, thanks, awards, praise);
- a source of positive emotions, that is, ordinary teenagers see this in their activities;
- it is necessary to predict the results of their activities, that is, ordinary minors believe that it is necessary to analyze the consequences of their actions and take responsibility for their actions.

Forensic pharmaceutical studies indicate that minors begin to use psychoactive substances [12-14, 53]: at 9 years old – mainly energy drinks, which can be easily bought; at the age of 12-13 – the first attempt to use narcotics (marijuana); at 13-15 years old – they use amphetamines. The absolute majority of drug addicts start using psychoactive substances as early as adolescence [54].

The main factor that encourages the abuse of psychoactive substances is their immediate environment. As narcological practice [55] shows, individuals who do not experience negative psychological influence from their loved ones do not start looking for drugs and using them on their own. One of the key motives for the first use of psychoactive substances is the desire to "blend into the company", not to stand out among others, to be accepted by peers, to conform to the fashion trend, to consider oneself more mature, authoritative, and cool, as well as banal curiosity, inability to manage oneself and lack of life experience.

The relationship between social and psychological causes of substance abuse and consequences shown below (Table 1).

Table 1. Interrelationships of social and psychological causes of substance abuse and consequences.

No.	Social and psychological reasons	Consequences
1.	Living and raising in socially disadvantaged, single-parent, unstable families in which conflicts regularly occur	<p>Children do not feel the fullness of care from their parents, have a rather low moral and ethical level, observe the systematic consumption of alcoholic beverages and smoking by adults, and also adopt their antisocial behavior.</p> <p>There is no direct dependence of a bad lifestyle with the subsequent use of psychoactive substances. In some cases, living conditions can be satisfactory, up to very high material security. A key role is played by the individual psychological perception of the family microclimate, as well as the attitude of parents towards children.</p> <p>Protest against conflict situations in the family on the part of the child is not manifested in banal insults, but in the search for additional attention outside the walls of their own home – this leads to getting into unfavorable companies of different ages, where teenagers take the first steps in smoking, drinking alcohol and psychoactive substances</p>
2.	Low level of emotional and intellectual development	The low level of intellectual and emotional development of a person is manifested by limited interests, reduced morality, and orientation towards the satisfaction of the desire to have fun and consume. A large amount of free time, a low culture of leisure turns out to be a desire to saturate one's life with more intense sensations from the use of psychoactive substances
3.	Lack of clear and conscious personal goals in life	Uncertainty in one's life prospects, low social value leads to the search for a means that allows you to eliminate unpleasant thoughts, create a positive atmosphere, and feel happy. The most accessible, but at the same time harmful means is the use of psychoactive substances
4.	The desire to get rid of or temporarily forget one's own shortcomings or habits	Under the influence of modified psychoactive substances (semi-synthetic, synthetic narcotics, psychotropic substances), a person changes his psychological state: silent people become sociable, boring people become cheerful, and the body feels an influx of strength and energy, which allows for a short-term improvement of the psycho-emotional state, which leads to active addiction. Already after one or several uses, a person becomes addicted
5.	Lack of awareness about human exposure and danger of psychoactive substances and medicines	Low individual awareness of the effects of psychoactive drugs leads to abuse, turns into addictive dependence
6.	Imitation of idols, pop stars, fictional heroes, the desire to look like a socially	A clear consequence of this cause of drug use by celebrity idols is a large number of unjustified victims on the part of fans, which leads to addiction and subsequent degradation of psyche, behavior and physical health

	significant figure	
7.	Internal personal conflicts and psychological infantilism	The personal psychological characteristics of young people are associated with the desire for universal recognition, a high level of harassment, the psychologically difficult awareness of the impossibility of achieving the desired result, leading to acute psychological and neurological discomfort and abuse of psychoactive substances
8.	Advertising and promotion of narcotics and other psychoactive substances	Citizens of different age groups are encouraged to abuse psychoactive substances by advertising and latent propaganda, which: arouses desire, interest, consists in the praise of prosperous celebrities known for the use of psychoactive substances; accompanied by information distributed on the Internet and certain popular Internet resources and sites; active propaganda on the street forms a person's image of a psychoactive substance as a means that is used by prosperous people and does not cause significant harm to health

Specialists of the United Nations Children's Fund (UNICEF) are the organizers of the International Project "European Survey of Pupils on the Use of Alcohol and Other Narcotic Substances (ESPAD)", which has been carried out since 1995 with the support of the European Monitoring Center for Drugs and Drug Addiction (EMCDDA) in 45 countries, they conduct monitoring through survey every 4 years. Attention is drawn to the data obtained from April to May 2015 during the fourth wave of a nationally representative survey of 6,642 French schoolchildren [56]:

- 2.3% of students used prohibited psychoactive substances;
- 6.1% used permitted and prohibited psychoactive substances to improve sports results;
- men were more prone to doping (or food additives) than women;
- food supplements are produced with the addition of psychoactive substances, which are doping;
- the dynamics regarding the presence of influence, both at the school level and at the class level, on the individual use of permitted substances were revealed.

During the study, to distinguish the frequency of use of legal and illegal psychoactive substances, students were asked specific questions about each of the following substances: (1) energy drinks, (2) pain relievers or anti-inflammatory drugs, (3) dietary supplements (vitamins/caffeine), (4) cannabis, (5) stimulants, (6) corticosteroids, (7) anabolic steroids, or (8) other hormones. Energy drinks, pain relievers, anti-inflammatory drugs, and dietary supplements (vitamins/caffeine) are defined as permitted psychoactive substances. Prohibited psychoactive substances (cannabis, stimulants) affect doping, missing classes, frequency of sports, depression, use of prescribed anxiolytics, use of tobacco, alcohol, marijuana, etc.

For comparison, in 2019 in Ukraine, during the seventh wave of the national representative survey, 8,509 respondents (4,108 boys and 4,401 girls) aged 14-17, who are students of rural and urban general secondary education institutions, vocational technical education institutions, and vocational institutions, were covered. of preliminary higher education [57]. The results were obtained:

- ✓ 18% of teenagers (14-17 years old) have experience using narcotics of various classification and legal groups (marijuana, etc.); 18.3% of adolescent girls have experience of using narcotics during their lifetime, 16.6% of boys. In 2015, during the sixth wave of the ESPAD study, the data were as follows: 11.9% – among girls and 17.8% – among boys; in 2011, during the fifth wave of the ESPAD study, the data were as follows: 18.4% – among girls and 21.2% – among boys.
- ✓ 14% of respondents who abused two or more different narcotics and surfactants, who gambled at least 2-3 times a week during the last 12 months.

Among those adolescents who abused 2 or more psychoactive substances, there were also twice as many victims of bullying (21.2%) as among those who did not practice polydrug use (9.5%).

Among those teenagers who abused 2 or more psychoactive substances, aggressive behavior is 3.7 times more likely (17.4%) than among those who do not use these substances (4.7%).

Law enforcement bodies of Ukraine, under the procedural guidance of prosecutors of all levels, take operational and investigative measures and investigative actions aimed at identifying, recording and stopping the activities of the "drug business" and detaining criminals engaged in illegal activities related to the illegal circulation of psychoactive substances (narcotics means, psychotropic substances). The total cost of illicit traffic in psychoactive substances worldwide is estimated at 426-652 billion US dollars annually, which is almost 1% of world GDP – 142 trillion dollars, i.e. [58]. Each organized criminal drug group is directly or indirectly engaged in smuggling prohibited narcotics and psychoactive substances of other classification and legal groups. Growing demand for psychoactive substances in all countries of the world. The USA is the world's largest consumer of criminal psychoactive substances (cocaine, heroin, marijuana, methamphetamine, fentanyl).

This indicates that the state of Ukraine should properly protect children, minors, youth, and women from the illegal circulation of psychoactive substances [59].

We cite examples from forensic and pharmaceutical practice (No. 1-5) regarding the scale of organized drug trafficking in Ukraine and the cessation by law enforcement agencies of the illegal circulation of psychoactive substances by members of organized criminal drug gangs through places of mass gathering of citizens, cafes, bars using the Internet and modern electronic payment systems.

Example from forensic and pharmaceutical practice No. 1. In 2022, during raids, the policemen of the Novograd-Volyn district of the Volyn region issued 25 protocols against sellers and shop owners of the city of Novograd-Volynsk for selling alcoholic beverages to children and adults after 7:00 p.m. according to part 2 of the article 156 of the Code of Administrative Offenses of Ukraine sent to the court in relation to offenders [60].

Example from forensic and pharmaceutical practice No. 2. Criminal proceedings have been initiated under Part 2 of Art. 307 of the Criminal Code of Ukraine [61]. During the pre-trial investigation, it was established that on July 28, 2021, in the city of Kyiv, operatives of the Anti-Narcotics Department in Kyiv, the National Bureau of Investigation of Ukraine, together with the law enforcement officers of the Pechersk Department of the National Investigation Agency, under the procedural guidance of the Pechersk District Prosecutor's Office, with the force support of special forces of the National Investigation Agency No. 1 of the Kyiv police exposed and detained five members of an organized criminal drug gang (4 men, 1 woman, aged 19 to 29). In the course of operational search activities, a number of authorized searches were conducted on the territory of Kyiv, Kyiv and Zhytomyr regions, during which the following was seized from members of an organized criminal drug gang: more than 2.5 tons of precursors; about 5 kg of "alpha pvp" in a crystallized state and 100 liters in a liquid state; packaged cannabis; prepackaged mephedrone; money, mobile phones; devices for weighing and packing prohibited means and substances; overalls and protective masks-respirators. The total value of seized narcotics, psychotropic substances and precursors is over 70 million hryvnias. The experts established that for the purpose of the conspiracy, the laboratory was set up in the premises of the Zhytomyr Oblast Silo, its capacity allowed to illegally manufacture about 50 kg of psychotropic substances every month. The territory of the laboratory was equipped with 24-hour video surveillance cameras. The sale of psychoactive substances was carried out with the help of postal items and by means of "bookmarks". Money for sales was accepted to electronic wallets and subsequently withdrawn through bank cards. Three active members of the drug gang were detained in accordance with Art. 208 of the Criminal Procedural Code of Ukraine [62], and subsequently a preventive measure was chosen – detention. Forensic and narcological, forensic and medical, forensic and psychiatric, forensic and pharmaceutical, and forensic examinations were appointed for the case. The investigation is ongoing.

Forensic and pharmaceutical example No. 3. A criminal case was initiated by the investigators of the State Police in the Ternopil region under the procedural guidance of the Ternopil regional prosecutor's office [63]. Suspicion was reported to 2 organizers and 8 members of a drug gang that sold narcotic drugs and psychotropic substances in particularly large quantities through Telegram channels and virtual stores. Accused of: creation, leadership and participation in a criminal

organization - part 1, 2 of Art. 255; legalization of property obtained by criminal means (Part 2 of Article 209); use of funds obtained from the illegal circulation of narcotic drugs (Part 2 of Article 306); illegal production, manufacture, acquisition, storage, transportation, forwarding and sale of narcotic drugs, psychotropic substances (Part 3 of Article 307; Part 3 of Article 27 – types of accomplices and Part 4 of Article 28 – commission of a criminal offense by a criminal organization Ukraine) [62]. During the pre-trial investigation, it was established that since the beginning of April 2022 operatives of the anti-narcotics departments of the Ternopil region and the Khmelnytskyi region documented and exposed the criminal activities of a group of people in the city of Ternopil (2 organizers and 8 executors), who implemented through Telegram channels and virtual stores narcotics and psychotropic substances in particularly large quantities. Seven wholesale distributors, a marketer, and eight "hostages" took part in the drug business. First, citizen A., a resident of Khmelnytskyi, organized a "drug business" together with his roommate from the village of B., creating two online stores through which he sold psychoactive substances. In the future, the activity was expanded and two more online stores were created, and a total of 16 men and women were involved in illegal sales. Drug users were residents of Ternopil, Khmelnytskyi, Lviv and Ivano-Frankivsk regions. Among the assortment of the "drug business" were virtually all types of psychoactive substances prohibited for circulation in Ukraine. Seized: narcotics worth more than a million hryvnias; UAH 600000 and USD 2000 in cash. 6.5 million hryvnias obtained from the illegal circulation of narcotics and psychotropic substances were "laundered" through bank transactions and were partially used to continue the criminal activities that drug traffickers intensified during the war. The members of the organized criminal drug group were given preventive measures – detention. Forensic and narcological, forensic and medical, forensic and psychiatric, forensic and pharmaceutical, and forensic examinations were appointed for the case [64].

Forensic pharmaceutical example No. 4. Under the procedural guidance of the Dnipropetrovsk regional prosecutor's office, the investigators of the SSU in the Dnipropetrovsk region were informed of the suspicion of the organizer and 5 five members of the organized drug trafficking group under Articles 1, 2, and 3 of Art. 255, Parts 2, 3, 5 of Art. 27, Part 4 of Art. 28, Part 3 of Art. 307 of the Criminal Code of Ukraine [62, 65]. During the pre-trial investigation, established that on October 04, 2022 in the city of Dnipro, during the "detection operation" – a complex of operational and search measures, the SSU operatives together with the territorial administration of the State Bureau of Investigations in Poltava region, under the procedural guidance of the prosecutors, detained the citizen K., the organizer of an organized criminal drug gang. They were involved in the illegal circulation of methamphetamine. To the organized criminal drug gang of K. involved 5 more acquaintances, each of whom performed their functions according to a pre-agreed plan. Illegal production of psychotropic substances was carried out in a special drug laboratory. The psychotropic substance was imported from abroad, orders for which were accepted via messenger. Marketing and sale of methamphetamine to citizens in wholesale batches and to individual drug addicts was carried out on a small scale throughout the territory of the Dnipropetrovsk region. Obtaining a monthly profit from illegal circulation amounted to about 5 million hryvnias. During court-sanctioned searches of the residences of members of an organized criminal drug gang, the following was seized: methamphetamine, classified as a psychotropic substance; special laboratory equipment; mobile phones, bank cards; 4 vehicles that were used for illegal traffic; cash in the amount of 20 thousand US dollars. The suspects are in custody by court order. Forensic and narcological, forensic and medical, forensic and psychiatric, forensic and pharmaceutical, and forensic examinations were appointed for the case. The investigation is ongoing.

The given examples from forensic and pharmaceutical practice indicate that a very high level of criminal actions – crimes provided for by Art. 27, 28, 209, 255, 306, 307 of the Criminal Code of Ukraine [62] in all regions of Ukraine. Profits from the drug business (from 500% to 2000%) allow drug gangs to operate for a long time (including under the cover of some "policemen", a separate article will be devoted to this issue in the future), which allows different segments of the population to be involved in drug consumption. Forensic and pharmaceutical monitoring shows, however, that the first latent drug user involves 10 to 30 people in the first attempt, of which about 1/3 become

active users of criminal drugs and commit other crimes (thefts, robberies, traffic accidents, hooliganism, suicides, etc.). Abuse of psychoactive substances not prescribed by a doctor causes the development of addictive and comorbid disorders. Monitoring of forensic and pharmaceutical practice, legislation and normative legal acts of Ukraine regulating the system of legal relations "doctor-patient-pharmacist-lawyer-controlling and law enforcement bodies" were carried out during 1996-2023 on the basis of the "Regional Drug Hospital", healthcare institutions, pharmacy institutions of Ukraine with the participation of the pharmacy department of the Department of Health Care of the State Administration of Ukraine under the leadership of prof. Sosin I.K., Galatsan O.V., prof. Shapovalova V.O., by the following directions [66-79]: selective study of medical records of drug patients with comorbid disorders; selection, analysis, grouping and systematization of drugs by clinical and pharmacological groups; analysis of data from a questionnaire survey of doctors and pharmacists regarding drug lists for pharmaceutical correction; study and generalization of data on the pharmacoeconomic characteristics of drugs for pharmacotherapy; analysis, generalization and determination of the technological composition and control regime parameters of extemporaneous drugs for the pharmacotherapy of polydrug addiction; studying and working out the rule-making practice with personal participation regarding the development of organizational-legal and medical-pharmaceutical measures to prevent and counter the spread of addictive disorders and the illegal circulation of psychoactive substances at the regional and state levels. Based on the received data, the substantiation of the principles of pharmaceutical correction of polydrug addiction and the technology of creating new combined drugs (tablets, capsules, ointments, syrups, solutions, caplets, etc.).

In the course of our research, we determined the characteristics of comorbid disorders in polydrug addiction regarding (Fig. 1): an increase in the share of pathologies, which determines the relevance of the problem of nosological comorbidity in polydrug addiction; psychoactive substances affecting the formation and development of polydrug addiction.

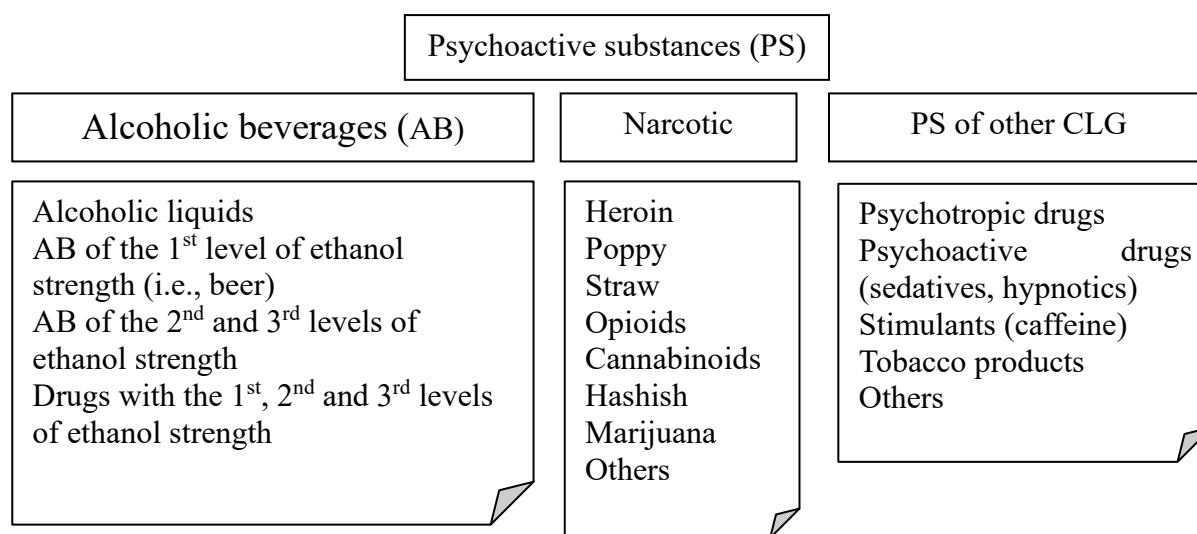


Fig. 1. The influence of psychoactive substances of different classification and legal groups (CLG) on the formation and development of polydrug addiction among citizens of different age groups in Ukraine.

During the processing of UN and WHO materials, as well as statistical data of the Ministry of Health of Ukraine, established that the following psychoactive substances prevail in the structure of mental and behavioral disorders in 2017 [80-83]: alcoholic beverages (87.4%); opioid drugs (7.2%); cannabinoids (1.2%); combinations of narcotic drugs and psychoactive substances of other classification and legal groups (3.7%); sedative drugs and sleeping pills (0.01%); stimulants (caffeine) – 0.4%; tobacco (0.05%).

We add that in 2019, 28338 offenses involving actions related to the illegal circulation of psychoactive substances of various classification and legal groups were detected. Law enforcement agencies seized the following number of psychoactive substances of classification and legal groups [84] from illegal circulation following the completion of criminal proceedings: 2017 – 4615.24 kg; 2018 – 2662.40 kg; 2019 – 4737.28 kg. The structure of withdrawals in the section and their specific weight was: 53.4% – cannabis; 42 – poppy straw; 2.7% – heroin; 0.5% – methadone; 0.4% – amphetamine; 0.2% – cocaine; opium, tramadol, LSD; others – 0.8%.

The number of deaths due to poisoning (overdose, low-quality substances): 2015 – 141; 2016 – 168; 2017 – 202; 2018 – 335; 2019 – 421.

Research has established that the simultaneous use of psychoactive substances of different classification and legal groups, alcoholic beverages, and beer leads to the development of mental and behavioral disorders. The latter are classified by the ICD-10 under codes F10. They lead to the formation and development of polydrug addiction and comorbid disorders in accordance with the order of the Ministry of Health of Ukraine No. 681 dated September 21, 2009 "On the approval of clinical protocols for the provision of medical care in the specialty "Narcology" [12, 27, 45, 46, 48-50, 85]. Code F10 according to the ICD-10 includes 46 headings (Table 2).

Table 2. Classification of the F10 code according to the ICD-10.

No.	F10 Code	Naming of the disease
1	2	3
1	F10.00	Acute alcohol intoxication
2	F10.00	Acute intoxication uncomplicated
3	F10.01	Acute intoxication with trauma or other bodily injuries
4	F10.02	Acute intoxication with other medical complications
5	F10.03	Acute intoxication with delirium
6	F10.04	Acute intoxication with perception disorders
7	F10.05	Acute intoxication with coma
8	F10.06	Acute intoxication with convulsions
9	F10.07	Acute intoxication with pathological intoxication
10	F10.1	Use of a substance associated with harm to health
11	F10.2	Alcohol addiction syndrome
12	F10.20, F10.200	Dependence syndrome is currently maintained. Early remission
13	F10.201	Addiction syndrome. Partial remission
14	F10.202	Addiction syndrome. Complete remission
15	F10.21	Dependence syndrome is currently in custody, but under precautionary conditions
16	F10.22	Addiction syndrome currently under clinical supervision on a maintenance or substitution regimen (controlled addiction)
17	F10.23	Dependence syndrome currently abstinent, but treated with aversive or blocking drugs
18	F10.24	Addiction syndrome to current substance use (active addiction)
19	F10.240	Addiction syndrome for the current use of the substance (active addiction). Without somatic signs
20	F10.241	Addiction syndrome for the current use of the substance (active addiction). With somatic symptoms
21	F10.25	Addiction syndrome. Constant use
22	F10.26	Addiction syndrome, episodic use (dipsomania)
23	F10.3	State of abstinence (alcohol)
24	F10.30	The state of abstinence is uncomplicated
25	F10.31	A state of abstinence with convulsions

26	F10.4	A state of abstinence with delirium (alcohol)
27	F10.40	A state of withdrawal with delirium without a seizure
28	F10.41	A state of withdrawal with delirium with convulsions
29	F10.5	Psychotic disorder due to alcohol consumption
30	F10.50	Schizophrenic-like psychotic disorder
31	F10.51	Psychotic disorder, mainly delusional
32	F10.52	Psychotic disorder, mainly hallucinatory
33	F10.53	Psychotic disorder, mostly polymorphic
34	F10.54	A psychotic disorder, mainly a depressive symptom
35	F10.55	Psychotic disorder, mainly manic symptom
36	F10.56	Psychotic disorder, mixed
37	F10.6	Amnestic syndrome
38	F10.7	Residual and remote psychotic disorder
39	F10.70	Residual and remote psychotic disorder, reminiscence
40	F10.71	Residual and remote psychotic disorder with personality and behavioral disorders
41	F10.72	Residual and remote psychotic disorder with affective disorder
42	F10.73	Residual and remote psychotic disorder with dementia
43	F10.74	Residual and remote psychotic disorder with other persistent cognitive impairment
44	F10.75	Residual and remote late-onset psychotic disorder
45	F10.8	Other mental and behavioral disorders
46	F10.9	Unspecified mental and behavioral disorders

In addition, in the structure of polydrug addiction, the syndrome of dependence due to alcohol consumption prevails (code F10.2, item 11 of Table 2), which develops after multiple simultaneous use of psychoactive alcohol-containing liquids, alcoholic beverages, beer, wine, and alcoholic drugs. Comorbid disorders associated with polydrug addiction were systematized (Fig. 2).

The research results obtained by the author close to the data of scientists from Gambia, France, and the USA. Drug abuse, as noted by Bah Y.M. (University of The Gambia), is considered in The Gambia as a social and health problem. They have serious consequences for the physical, social, psychological, and intellectual development of individuals, especially street and homeless children [86]:

- ❖ the level of abuse of narcotic drugs and psychotropic substances;
- ❖ negative consequences for human life and health as a result of abuse;
- ❖ preventive methods of combating the abuse of narcotics and other substances;
- ❖ identifying the cause of abuse of psychoactive substances and finding ways to counter it in the community and among street children,
- ❖ the level of knowledge about the social support and treatment services that the victim needs.

A structured questionnaire was used to collect data from thirty-five participants (one driver and six random students from each of the five car parks). There is a high level of awareness of drug abuse due to peer influence with the ultimate goal of getting high to relieve stress. Minors are aware of the negative consequences associated with fights, thefts, and mental illnesses. In order to finance the purchase of illegal psychoactive substances, young people engage in all types of dangerous anti-social behavior. Most often, marijuana is abused. They began to experiment: cocaine, hashish, heroin with cola. Drug addicts are reluctant to seek services from specialists because they fear social stigmatization, isolation, discrimination, and mistreatment by specialists.

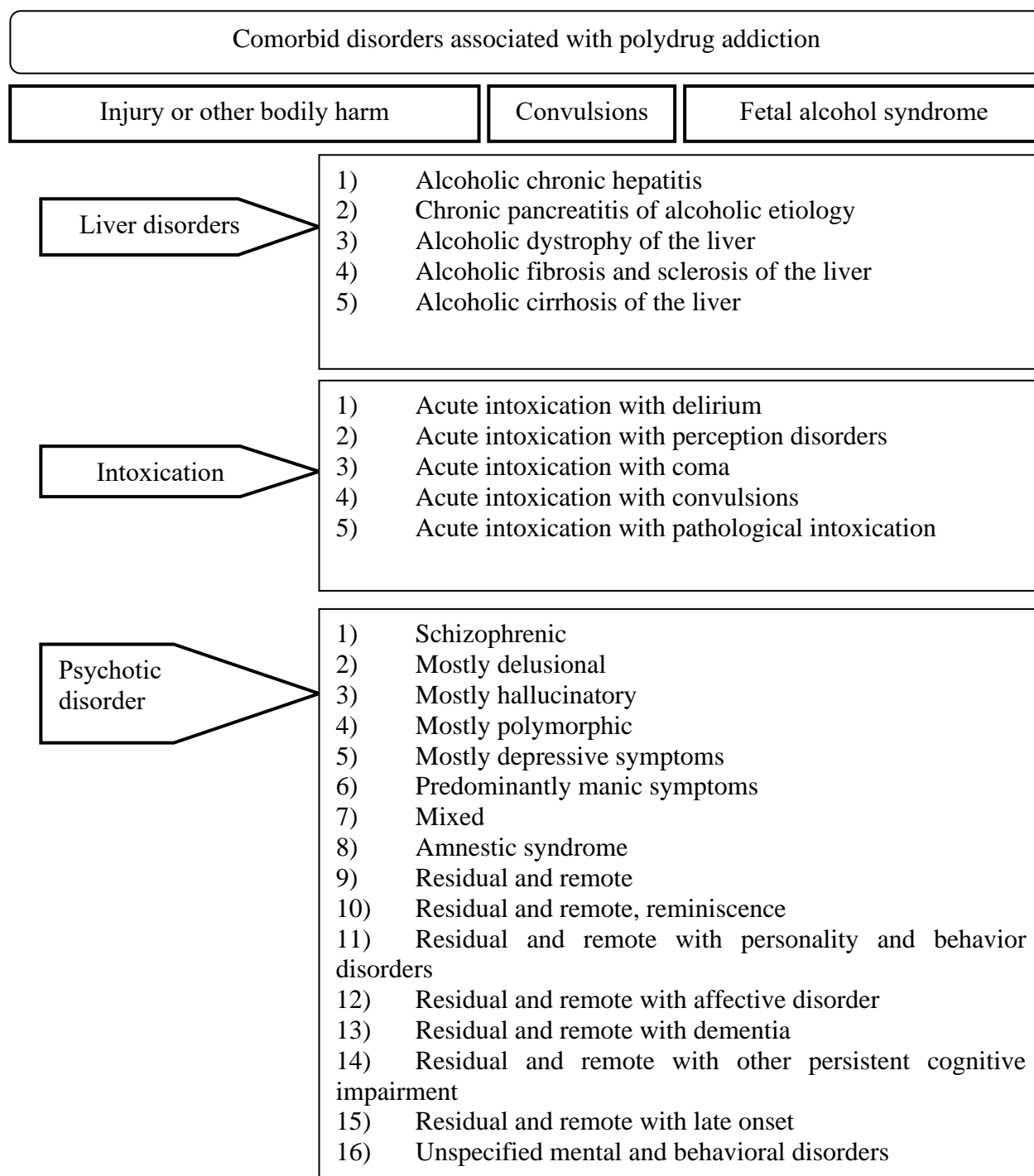


Fig. 2. Comorbid disorders in the structure of polydrug addiction.

According to the National Institute on Drug Abuse (NIDA) [87], more than 5700 young people in 2014 reported that they used psychoactive stimulants, analgesics, depressants, and prescription drugs for the first time without a doctor's prescription (Table 3).

Table 3. Consequences and forensic pharmaceutical risks of psychoactive prescription drug abuse.

No.	Consequences of abuse of psychoactive drugs	Forensic and pharmaceutical risks of prescription drugs abuse
1.	Prescription drug abuse carries risks of HIV/AIDS, sexually transmitted infections	Insufficient information and educational work among minors, youth, and parents
2.	Stimulants when abused in large doses have side effects similar to cocaine:	One in four teenagers believe that prescription drugs can be used as a learning aid; nearly 1/3 of parents believe ADHD

	paranoia, dangerously high body temperature, irregular heartbeat	medication can improve their child's academic or test performance
3.	Opioid analgesics act on the same parts of the brain as heroin; can cause drowsiness, nausea, constipation, slowing of breathing and well-being	Unsafe storage and disposal of psychoactive drugs: 2/3 of teenagers who abused painkillers got them from family, friends, and home medicine cabinets
4.	Abuse of depressants causes slurred speech, shallow breathing, fatigue, disorientation, lack of coordination, and seizures	Lack of proper dispensing of prescription drugs from pharmacies

In the US, the National Institute on Drug Abuse (NIDA) is a division of the National Institutes of Health (NIH). Developed NIDA's Science of Drug Abuse website for teenagers. The site provides explanations, courses to educate teenagers, their parents, teachers, social workers, pharmacists, and doctors about the abuse of psychoactive prescription drugs.

Cooperation of specialists within the framework of the work of the International Charitable Foundation "Public Health Alliance" [88] for the provision of harm reduction services to teenagers who use drugs in Ukraine. Adolescents aged 10-18 who abuse prohibited psychoactive substances, as well as their sexual partners, received comprehensive harm reduction services; access to condoms; covered by voluntary counseling and testing services. Employees of children's affairs services gained knowledge and practical skills in the methodology and organization of providing quality harm reduction services for children and adolescents who abuse prohibited psychoactive substances, injectable drugs, and psychoactive medications. Abuse of psychoactive substances by teenagers is an actual social and economic, pedagogical and educational, criminal and legal problem. Its priority coping strategy should be prevention. The most common psychoactive substances for Ukrainian teenagers are: alcohol, nicotine, hemp, cocaine, heroin. Information about psychoactive substances prohibited for circulation in the state is aggressively disseminated through mass media, the Internet, films, and computer games.

Conclusions. The conducted interdisciplinary forensic and pharmaceutical, organizational and legal, clinical and pharmacological study of the abuse of psychoactive substances of different classification and legal groups showed that minors start using psychoactive substances from the age of 9. The given examples from forensic pharmaceutical practice indicate that the very high level of criminal actions – crimes provided for in Art. 27, 28, 209, 255, 306, 307 of the Criminal Code of Ukraine in all regions of Ukraine. Forensic pharmaceutical monitoring shows, however, that the first latent drug user involves 10 to 30 people in the first attempt, of which about 1/3 become active users of criminal drugs and commit other crimes (thefts, robberies, traffic accidents, hooliganism, suicides, etc.). Abuse of psychoactive substances not prescribed by a doctor causes the development of addictive and comorbid disorders. During the researches, the characteristics of comorbid disorders in polydrug addiction were established regarding: an increase in the share of pathologies, which determines the relevance of the problem of nosological comorbidity in polydrug addiction; psychoactive substances affecting the formation and development of polydrug addiction. Research has established that the simultaneous use of psychoactive substances of different classification and legal groups, alcoholic beverages, and beer leads to the development of mental and behavioral disorders. Further studies in the system of legal relations "doctor-narcotic patient-pharmacist-lawyer" are ongoing.

Ethical approval. Ethical clearance was obtained from the administration of communal health care facility Kharkiv Regional Narcological Dispensary. A permission statement for conducting the experiments was received from the administration of communal health care facility Kharkiv Regional Narcological Dispensary. Before any data collection, the main purpose of the study was clearly explained to each department (concerned personnel).

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