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БИОМЕДИЦИНА ВА АМАЛИЁТ ЖУРНАЛИ


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THE GROWING CHALLENGE OF SYNTHETIC CATHINONES AND PRESCRIPTION DRUG MISUSE IN UZBEKISTAN

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ABSTRACT

The increasing prevalence of synthetic narcotic substances and psychoactive pharmaceutical drug use has become a significant public health concern. This study analyzes trends in substance use in Uzbekistan from 2022 to 2024, focusing on demographic patterns, shifts in drug preferences, and the rising misuse of prescription medications. **Methods.** A retrospective observational cohort study was conducted using official national registries and medical statistical reports. The study included all registered users of synthetic cathinones, anticonvulsants, and other psychoactive substances during the three-year period. Descriptive and inferential statistical methods were applied, including trend analysis, chi-square tests, correlation analysis, and logistic regression modeling, to assess patterns of substance use by age, gender, and drug type. **Results.** The total number of registered users nearly doubled between 2022 (409 cases) and 2024 (933 cases), highlighting a sharp rise in synthetic drug use. Males accounted for approximately 89–90% of all cases, while the number of female users increased from 41 in 2022 to 102 in 2024. The 18–34 age group represented the highest-risk demographic, with nearly 70% of all cases. Among synthetic cathinones, α -PVP replaced mephedrone as the most commonly used stimulant, with cases rising from 36 in 2022 to 319 in 2024. Pregabalin misuse also increased, becoming the most frequently abused anticonvulsant (274 cases in 2024). While tropicamide use remained relatively stable (25–30 cases annually), its share in the overall structure declined. **Conclusions.** The findings indicate a rapid transformation in substance use patterns in Uzbekistan, with synthetic cathinones and prescription drugs gaining popularity. The dominance of α -PVP and the increased misuse of pregabalin underscore the need for stricter pharmaceutical regulation, targeted prevention strategies, and expanded access to treatment programs. Addressing these trends requires a comprehensive public health response.

Key words: synthetic cathinones, α -PVP, mephedrone, pregabalin, substance use trends, Uzbekistan, public health, prescription drug misuse, epidemiological analysis, addiction.

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Toshkent davlat tibbiyot universiteti, Toshkent, O'zbekiston**O'ZBEKISTONDA SINTETIK KATINONLAR VA RETSEPT BO'YICHA BERILADIGAN DORI VOSITALARINI SUISTE'MOL QILISH MUAMMOSINING KUCHAYIB BORISHI****ANNOTATSIYA**

Sintetik narkotik moddalar va psixoaktiv dori vositalarini iste'mol qilishning ortib borishi jamoat salomatligi uchun muhim muammolardan biridir. Ushbu tadqiqotda 2022–2024 yillar davomida O'zbekistonda psixoaktiv moddalar iste'moli tendensiyalari, demografik xususiyatlari, moddalarga bo'lgan afzalliklarning o'zgarishi hamda retsept bo'yicha beriladigan dori vositalarini suiiste'mol qilish holatlari tahlil qilindi.

Metodlar. Rasmiy milliy registrlar va tibbiy statistik hisobotlar asosida retrospektiv kuzatuvchi kohort tadqiqoti o'tkazildi. Uch yil davomida sintetik katinonlar, antikonvulsantlar va boshqa psixoaktiv moddalarni iste'mol qilgan barcha ro'yxatga olingan shaxslar qamrab olindi. Tavsifiy va inferensial statistik usullar, jumladan trend tahlili, χ^2 testi, korrelyatsion tahlil va logistik regressiya qo'llanildi. Natijalar. Ro'yxatga olingan bemorlar soni 2022 yildagi 409 holatdan 2024 yilda 933 holatgacha deyarli ikki baravar oshdi. Erkaklar 89–90% ni tashkil etdi, ayollar soni esa 41 tadan 102 tagacha oshdi. Eng yuqori xavf guruhi 18–34 yoshdagilar bo'lib, ular jami holatlarning qariyb 70% ini tashkil etdi. Sintetik katinonlar orasida α -PVP mefedronni siqib chiqarib yetakchi modda bo'ldi (36 dan 319 holatgacha). Pregabalin eng ko'p suiiste'mol qilinadigan dori vositasiga aylandi (274 holat, 2024 yil). Tropikamid iste'moli barqaror bo'lsa-da, umumiy ulushi kamaydi. Xulosa. O'zbekistonda psixoaktiv moddalar iste'moli tuzilmasi keskin o'zgarib, sintetik katinonlar va retsept dorilarining ulushi oshib bormoqda. α -PVP ustunligi va pregabalin suiiste'molining ortishi qat'iy nazorat choralari, profilaktik dasturlarni va davolash imkoniyatlarini kengaytirishni talab qiladi.

Kalit so'zlar: sintetik katinonlar, α -PVP, mefedron, pregabalin, psixoaktiv moddalar iste'moli tendensiyalari, O'zbekiston, jamoat salomatligi, retsept dorilarini suiiste'mol qilish, epidemiologiya, qaramlik.

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Ташкентский государственный медицинский университет, г. Ташкент, Узбекистан**НАРАСТАЮЩАЯ ПРОБЛЕМА УПОТРЕБЛЕНИЯ СИНТЕТИЧЕСКИХ КАТИНОНОВ И ЗЛОУПОТРЕБЛЕНИЯ РЕЦЕПТУРНЫМИ ЛЕКАРСТВЕННЫМИ ПРЕПАРАТАМИ В УЗБЕКИСТАНЕ****АННОТАЦИЯ**

Рост распространенности синтетических наркотических веществ и психоактивных лекарственных препаратов представляет собой значимую проблему общественного здравоохранения. В исследовании проанализированы тенденции употребления психоактивных веществ в Узбекистане за 2022–2024 годы с учетом демографических характеристик, структуры предпочтений и роста злоупотребления рецептурными препаратами.

Методы. Проведено ретроспективное когортное исследование на основе данных

национальных регистров и медицинской статистики. Используются методы описательной и инференциальной статистики, включая χ^2 , корреляционный анализ и логистическую регрессию.

Результаты. Число случаев увеличилось с 409 (2022) до 933 (2024). Мужчины — 89–90%. Основная группа риска — 18–34 года (~70%). α -PVP стал доминирующим стимулятором (36 → 319 случаев). Прегабалин — ведущий препарат злоупотребления (274 случая). Тропикамид стабилен, но доля снижается.

Выводы. Отмечается трансформация структуры употребления ПАВ с ростом роли синтетических катинов и рецептурных препаратов. Требуется усиление контроля, профилактика и расширение лечения.

Ключевые слова: синтетические катиноны, α -PVP, мефедрон, прегабалин, тенденции употребления, Узбекистан, общественное здравоохранение, злоупотребление рецептурными препаратами, эпидемиология, зависимость.

Introduction

The use of synthetic narcotic substances and psychoactive pharmaceutical drugs has emerged as a growing public health concern worldwide [1,2]. In recent years, many countries, including Uzbekistan, have reported a rising prevalence of synthetic cathinones, prescription drug misuse, and changes in drug consumption patterns. Synthetic cathinones, commonly known as "bath salts," are potent stimulants that mimic the effects of amphetamines and have been linked to severe psychiatric complications [3].

Parallel to the rise of synthetic stimulants, the misuse of prescription medications, particularly anticonvulsants such as pregabalin and gabapentin, has become increasingly common [4,5]. Pregabalin, originally developed for treating epilepsy and neuropathic pain, has anxiolytic and sedative properties, making it an attractive option for recreational use and self-medication. The growing accessibility of these substances—both through illicit drug markets and the diversion of pharmaceuticals—has contributed to an evolving substance use landscape that demands systematic investigation.

Substance Use Trends in Uzbekistan. Although global studies have extensively documented the patterns of synthetic drug and prescription medication misuse, limited research has focused on Uzbekistan and the broader Central Asian region. Given the rapid emergence of new psychoactive substances (NPS) and the increased availability of prescription drugs, understanding local epidemiological trends is crucial for developing effective prevention, treatment, and policy interventions.

Study Objectives. The primary aim of this study is to analyze trends in synthetic cathinone and prescription drug use in Uzbekistan from 2022 to 2024.

Materials and Methods

Study Design

This study employs an observational retrospective cohort design to analyze trends and factors influencing the use of synthetic narcotic substances and psychoactive pharmaceutical drugs in Uzbekistan between 2022 and 2024. The research is based on official data concerning registered individuals who consume these substances, sourced from national reports and official databases.

Study Population

This study examines all individuals officially registered as users of synthetic narcotic substances and psychoactive pharmaceutical drugs in Uzbekistan from 2022 to 2024. Data were obtained from national registries and medical statistical reports, ensuring a comprehensive overview of substance use trends during this period.

1. **Inclusion and Exclusion Criteria.** The study population consists of all registered users of the specified substances within the designated timeframe.

2. **Sample Characteristics.** To provide a structured understanding of the study population, several key parameters were considered:

Gender distribution: The dataset includes both male and female users, allowing for a comparative analysis of substance use patterns by sex.

Age groups: The population is categorized into distinct age brackets (0–14, 15–17, 18–19, 20–24, 25–29, 30–34, 35–39, 40–64, and 65+ years), facilitating an age-specific evaluation of substance use trends.

Categories of substances consumed: synthetic cathinones (including α -PVP and mephedrone); anticonvulsants (such as pregabalin, gabapentin, and carbamazepine); tropicamide.

3. Population Size and Trends. Over the three-year period analyzed, the number of registered users was 1972.

Data Collection Methods

Data were collected through a retrospective analysis of national medical reports and epidemiological summaries. The following sources were utilized: official statistics and national registries containing annual records of registered users of narcotic and psychoactive substances.

Independent and Dependent Variables

The study assesses independent and dependent variables to identify patterns of substance use and the factors influencing them. Independent variables included the type of psychoactive substance used and demographic characteristics (age, gender)..

The dependent variable was frequency of substance use, trends in substance consumption, age and gender differences in the consumption of various substance groups.

Statistical Data Analysis

A combination of descriptive and inferential statistical methods was employed to analyze the data, ensuring the assessment of normality and adherence to statistical assumptions. The analysis was conducted using SPSS version 29.0.2.0.

Descriptive Statistics

Mean values, medians, standard deviations, and interquartile ranges were calculated for continuous variables. Percentage distributions were reported for categorical variables (gender, age groups, types of substances used).

Data were visually represented using histograms, boxplots, and scatter plots.

Normality Testing.

Normality of continuous variables was assessed using the Shapiro-Wilk test and the Kolmogorov-Smirnov test. Parametric methods (t-tests, Pearson correlation) were applied when normality assumptions were met. Nonparametric methods (Mann-Whitney U test, Spearman correlation) were used when data deviated from normality.

Comparison of Categorical Data

The Chi-square (χ^2) test was utilized to determine gender-based differences in substance use prevalence. The Kruskal-Wallis test and Mann-Whitney U test were employed to compare substance use across different age groups, particularly in cases where data were not normally distributed.

Trend Analysis

Longitudinal trends in substance use from 2022 to 2024 were evaluated using linear trend analysis. Changes in the number of registered users were examined through linear regression modeling.

Correlation Analysis

Relationships between age, gender, and substance use were assessed through correlation coefficients: Pearson correlation for normally distributed data; Spearman correlation for non-normally distributed data; logistic regression analysis was conducted to explore potential interactions between age, gender, and substance choice.

Statistical Significance Criteria

All statistical tests were performed at a significance level of $p < 0.05$. The Bonferroni correction was applied to account for multiple comparisons.

Results

Over the three-year period, the number of identified substance users has nearly doubled, highlighting an escalating public health concern (2022: 409 registered cases; 2023: 630 cases (+54% compared to 2022); 2024: 933 cases (+48% compared to 2023).

The majority of registered users are male, accounting for approximately 89–90% of cases. While women represent only 10–11% of cases, their numbers have increased steadily, from 41 cases in 2022 to 102 in 2024.

Young adults aged 18–34 years are the most at-risk group, comprising nearly 70% of all recorded cases. The 25–34 age group is the most affected, accounting for approximately 50% of users in 2024. The 30–39 age group is expanding, indicating a gradual broadening of the age range associated with substance use.

Trends in Substance Use

The structure of psychoactive substances consumed has changed in 2022–2024. Key results are summarized in Table 1.

THE STRUCTURE OF PSYCHOACTIVE SUBSTANCES CONSUMED

| Substance Category | 2022 | 2023 | 2024 |
|------------------------------|------|------|------|
| Synthetic Cathinones (Total) | 183 | 315 | 538 |
| – including α -PVP | 36 | 208 | 319 |
| – including Mephedrone | 133 | 102 | 181 |
| Anticonvulsants (Total) | 201 | 286 | 365 |
| – including Pregabalin | 171 | 213 | 274 |
| – including Gabapentin | 21 | 20 | 22 |
| – including Carbamazepine | 6 | 0 | 7 |
| Tropicamide | 25 | 29 | 30 |

Key Findings

- Synthetic cathinone use has surged, with cases tripling between 2022 and 2024. In 2022, mephedrone was the most commonly used synthetic cathinone. By 2023–2024, α -PVP had replaced mephedrone as the dominant synthetic stimulant. In 2024, α -PVP was identified in 319 cases, making it the most widely used synthetic narcotic.

- Pregabalin remains the most commonly misused anticonvulsant, with 274 cases recorded in 2024.

- Gabapentin and carbamazepine play a minor role, with approximately 20 recorded cases annually.

- Tropicamide usage has remained relatively stable, with 25–30 cases per year, although its overall proportion within the dataset has declined.

Correlations and Patterns

The relationship between gender, age and type of substance used is quite clear in the data. The main correlations and patterns observed are:

- Young males (18–34 years) represent the highest-risk demographic.
- Synthetic cathinones are primarily consumed by younger users (18–29 years), while pregabalin is more common among older individuals (30+ years).

- Women are more likely than men to use tropicamide, though female users remain a minority overall.

Discussion

The findings of this study reveal a significant increase in the number of registered users of synthetic cathinones, anticonvulsants, in Uzbekistan from 2022 to 2024. The data highlight several concerning trends, including the rapid rise in synthetic cathinone use, shifts in substance preferences. These trends point to an evolving drug consumption landscape that necessitates targeted policy responses and public health interventions.

Rising Prevalence of Synthetic Cathinones

The study demonstrates a threefold increase in synthetic cathinone use over the three-year period, with cases rising from 183 in 2022 to 538 in 2024. While mephedrone was the dominant cathinone in 2022, its prevalence declined in 2023 and 2024, coinciding with a sharp increase in α -PVP use. By 2024, α -PVP had become the most commonly used synthetic stimulant, recorded in 319 cases, compared to 181 cases of mephedrone. This shift is particularly concerning as α -PVP is associated with more severe neuropsychiatric effects, including aggression, paranoia, and prolonged psychotic states. The growing preference for stronger, more addictive synthetic drugs suggests that users may be seeking more potent psychoactive effects, leading to increased health risks and treatment challenges.

Sustained Increase in Anticonvulsant Misuse

The misuse of anticonvulsant medications, particularly pregabalin, has also seen a steady rise. Pregabalin cases increased from 171 in 2022 to 274 in 2024, making it the most frequently misused pharmaceutical in this category. Given pregabalin's anxiolytic and sedative properties, its increasing misuse may be linked to self-medication for anxiety, withdrawal symptoms, or recreational effects. While gabapentin and carbamazepine play a smaller role in substance misuse, the sporadic re-emergence of carbamazepine cases in 2024 warrants further monitoring. Unlike synthetic cathinones, which are typically obtained through illicit markets, pregabalin is a prescription drug, raising concerns about pharmaceutical diversion.

Gender and Age Disparities in Substance Use

A clear gender disparity exists in the study population, with males accounting for nearly 90% of all registered users. Although female users represent a small proportion (10–11%), their numbers have steadily increased from 41 cases in 2022 to 102 in 2024. In terms of age distribution, the highest rates of substance use are concentrated in the 18–34 age group, which accounts for approximately 70% of all cases. However, an expansion in the 30–39 and 40–49 age groups in 2024 suggests a gradual aging of the user demographic. This trend may be indicative of long-term substance dependence, changes in drug availability, or the spread of substance use beyond younger populations.

Conclusions

The findings suggest that Uzbekistan is experiencing a notable rise in substance use, marked by the increasing consumption of synthetic cathinones and the growing misuse of prescription medications. The shift toward more potent substances like α -PVP raises significant concerns for public health and addiction treatment services. Effectively addressing this issue requires a comprehensive approach, incorporating stricter regulatory measures, expanded access to treatment, and well-targeted prevention efforts to reduce the prevalence of synthetic and psychoactive substance use.

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