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- ✱ **Epidemiology of SUD in elderly**
- ✱ **Prescription drug misuse**
- ✱ **Management challenges and solutions**

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Editorial

Ageing and Addiction: The Complex Reality of Substance Use in the Elderly

Preethy Kathiresan, Ravindra Rao



Substance use disorder has traditionally been conceptualized as a problem of the younger generation. It is commonly believed that substance use among older adults is less as majority of the individuals either 'mature out' of their drug use, as they grow older, or they die at an early age due to complications caused by substance use or related behaviour (1). However, the World Drug Report, 2018, noticed that the use of drugs among older adults has been increasing in the last decade. The report also noticed another concerning finding that the rate of drug use was increasing faster compared that

in the younger population (2) (3). Unfortunately, the available surveys on drug use in India either exclude the elderly or focus on very few substances. The Longitudinal Aging Study in India found the prevalence of smokeless tobacco use and tobacco use in smoking form among elderly (60 years and older) to be around 22% and 14% respectively. Similarly, the prevalence of having episodic alcohol use among elderly was around 5% (4). There is no national level data on the prevalence of other

drug use among elderly in India yet. Substance use in older adults can either be continuation of the substance use initiated during their young age or can be new onset in their older age. The factors that lead to initiation and continuation of substance use among elderly are important to understand that has been discussed in the first article by Dr. OP Jhirwal on "**Substance Use in Elderly: A Hidden Epidemic**". The article will delve into the various factors associated with substance use disorder in elderly population.

With the increase in longevity, the proportion of older adults is also increasing around the world. India is also experiencing a significant demographic transition, and it is expected that nearly one-fifth of the population will be elderly by 2050. With this demographic transition, along with the increase in the rate of drug use among older adults, it is necessary for us to understand the current prevalence of substance use disorder among older adults.

Among the various drug use disorder patterns, misuse of prescription drug is one pattern which is very common among elderly. With the increase in the prevalence of chronic medical disorders, majority of older adults take at least one prescribed medication, and slightly more than one-third take more than five prescribed medications at the same time. With the high prevalence of use of prescribed medications, there is increased risk of harmful side effects and drug-drug interactions (5). Also, with the increase in the number of prescribed

medications, there is increase in the risk of misuse also, especially among the older adults due to various reasons like cognitive impairment, difficulty in understanding the complex regimens prescribed, etc. Also, some elderly may take the medications more than what has been prescribed for recreational purpose. Prescription drug misuse due to any reason can lead to more harms in the elderly, due to physiological changes among them and we need to be mindful of the same. The article by Drs Akanksha Sonal and Richa Shukla in their article **“Prescription Drug Use vs Misuse in the Elderly: Navigating the fine line”** will delve deeper into this concept of prescription drug use and misuse in the elderly.

When it comes to management of substance use disorder among older adults, there are lot of challenges compared to younger adults,

Another major concern that doctors need to be mindful about, when it comes to prescription drug use, is the concept of ‘Pseudo-Addiction’. An elderly whose medical symptoms are not adequately treated may ask for more medications or go to multiple doctors in order to get improvement in their symptoms. However, the treating doctors may mistake it as addiction.

especially in Indian context. In some culture, some substance use is considered as a mark of social respect. For example, natural opium use in ‘Riyan’ a social gathering in Rajasthan is considered important to be part of the society (6). As elders are the chief decision makers and hold power in family in Indian culture, it may be difficult for the family members to being them to treatment for their substance

use, especially for legal substances like tobacco. Also, some of the diagnostic criteria for substance use disorder in the elderly may not be directly applicable as in the elderly. For example, due to increased sensitivity to drug use in elderly or due to medical comorbidities, reverse tolerance may occur more commonly than tolerance. Similarly, the withdrawal symptoms may overlap with symptoms due to medical illness. These are just few glimpses of the challenges faced while dealing with SUD among older adults. It is necessary to further delver deeper into these unique challenges faced by the treatment provider while dealing with an older adult presenting with substance use and the same has been described in detail in the article on **“Unique Challenges, Unique Solutions: Managing Substance Use in the Elderly”** by Drs Siddharth Sarkar and Merlin Mathew.

With these articles we hope to bring out the intricacies involved in unravelling the complexities of substance use among the elderly and work towards enhancing care and support for this vulnerable population.

Happy reading!



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THEMATIC ARTICLES

Substance Use in Indian Elderly: A Hidden Epidemic

Om Prakash



Substance use among the elderly in India remains an underappreciated public health issue. As the elderly population in India is projected to surge to 319 million by 2050, the complexity of substance use in this demographic requires immediate attention (1). The intersection of aging, chronic diseases, and substance misuse demands a nuanced, evidence-based approach to mitigate its profound health and societal implications.

Scope of the Problem

Recent data highlight concerning trends in substance use among India's elderly. The National Mental Health Survey (2015–16) found that 9.4% of individuals above 60 years consumed alcohol, with regional disparities linked to socio-economic and cultural factors (2). Tobacco use, both smoked and smokeless, is deeply embedded in societal norms, particularly in rural areas, where prevalence rates exceed 20% in some states (3). Prescription medication misuse, particularly opioids and sedatives, is also emerging due to the high burden of chronic pain and multimorbidity.

Determinants of Substance Use

There are several factors that may be linked to initiation and continuation of substance use in elderly population that are distinct and different compared to the younger population. Some of these include:

- 1. Psychosocial Stressors:** Loneliness, bereavement, and social isolation drive many elderly individuals toward substances as a coping mechanism (4). Migration of younger family members exacerbates this isolation.
- 2. Chronic Illness:** Aging is associated with an increased prevalence of pain and disability, leading to dependence on analgesics and sedatives.
- 3. Cultural Normalization:** In certain regions, the use of substances like alcohol and tobacco is socially ingrained, blurring the line between recreational and problematic use.
- 4. Mental Health Co-morbidities:** Depression and anxiety, common in the elderly, frequently co-occur with substance use disorders, complicating diagnosis and treatment.

Consequences of Substance Use

The physiological vulnerabilities of aging amplify the adverse effects of substance use,

making early identification critical. Some of the consequences of substance use in elderly include:

- **Exacerbation of Chronic Conditions:** Alcohol and tobacco contribute to worsening of non-communicable diseases such as cardiovascular disease, diabetes, and Chronic Obstructive Pulmonary Disease (COPD).
- **Cognitive Decline:** Prolonged alcohol use is a known risk factor for neurodegeneration and cognitive impairments resembling dementia (5).
- **Increased Risk of Falls and Injuries:** Alcohol impairs balance and coordination, while polypharmacy heightens the likelihood of harmful drug interactions.
- **Psychosocial Fallout:** Stigma associated with substance use prevents elderly individuals from seeking help, deepening their isolation.

Barriers to Care

Despite facing multiple consequences from their substance use, the elderly still do not seek treatment for their substance use problem and are reluctant to discuss the same with their physician. There are various barriers to care and treatment:

- **Underdiagnosis:** Substance use symptoms such as fatigue, confusion, and irritability are often mistaken for normal aging.
- **Stigma:** Societal perceptions of substance use as a moral failing discourage open discussions, further marginalizing the elderly (6).
- **Lack of Tailored Services:** Most addiction treatment programs and facilities in India cater to younger populations, leaving significant gaps in geriatric-specific interventions.

Strategies for Addressing the Issue

Taking into consideration the vulnerabilities of the elderly and barriers to care and treatment, several steps for improving treatment and care of substance use disorder in elderly can be carried out.

- **Integrated Screening:** Incorporate routine substance use screening into geriatric healthcare services, especially in primary care and community health settings.
- **Age-appropriate Treatment:** Develop tailored treatment protocols addressing the physiological and psychological needs of elderly individuals, with a focus on non-pharmacological pain management and social engagement.
- **Community-based Interventions:** Establish senior activity centers and peer support networks to reduce loneliness and enhance social connectedness.
- **Policy Enhancements:** Expand the scope of the National Programme for Health Care of the Elderly (NPHCE) to include specialized services for substance use disorders, ensuring resource allocation and training for healthcare providers (7).

Conclusion

Substance use among the elderly in India is a silent epidemic that requires immediate and concerted action. A holistic approach encompassing awareness, early detection, tailored interventions, and policy reforms is imperative. By addressing this hidden problem, India can pave the way for healthier and more dignified aging for its elderly population.

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Prescription Drug Use vs Misuse in the Elderly: Navigating the fine line

Akanksha Sonal, Richa Shukla



This article dives into the world of “prescription drugs,” a cornerstone of medical practice. By definition, the term “drug” refers to “...all medicines intended for internal or external use for or in the diagnosis, treatment, mitigation, or prevention of [disease or disorder in human beings or animals and manufactured] exclusively in accordance with the formulae described in, the authoritative books...” as per the Drug and Cosmetics Act, 1940 (1). And the “prescription” refers to a written order by the physicians to the pharmacists for the preparation and administration of the drug or medical device to patients” for legitimate treatment purposes for a wide array of indications. It should be in compliance with the rules of the above- mentioned act. The physician here refers to a qualified practitioner of any system of medicine. In the same vein, a “prescription drug” is a licensed medication that requires a doctor's approval to obtain, unlike over-the-counter drugs available without a prescription (2). Once the concept of “drug,” “prescription-drug”, its application and legal status are well understood, we need to acknowledge the wide ambit of the misuse of prescription drugs. This involves taking larger doses than prescribed, changing the dosage without medical guidance, taking someone else's medication, or using the drug for reasons beyond its intended use (3).

Prescription drugs fulfill multiple clinical requirements in the elderly (2). Some common prescription drugs that can be misused include 1) CNS depressants (barbiturates and benzodiazepines used for epilepsy, anaesthesia, insomnia, anxiety disorders, muscle relaxation, and alcohol withdrawal management) 2) opioids (codeine, morphine, fentanyl, methadone, buprenorphine, oxycodone, propoxyphene) for pain relief, dry cough, and opioid withdrawal and 3) CNS stimulants (dextromethorphan, methylphenidate) for cough, narcolepsy, etc.

Elderly people are the highest users of prescription medications. Between 2015 and 2016, nearly 88% of adults aged 65 and older had taken at least one prescription medication in the past month, compared to 67% of those aged 45–64 and 35% of those aged 18–44. Older adults are also the leaders of polypharmacy, i.e., taking five or more medications, with nearly 40% doing so, compared to 19% in the 45–64 age group and just 4% in younger adults.

However, the use of these prescription drugs comes with inherent risks as their use is fraught with complications stemming from interaction between pharmacological effects of drugs with

unique vulnerabilities in the elderly, such as altered drug metabolism, adverse drug reactions, potential for dependency, and multiple comorbidities. These factors also pave the way for prescription drug misuse (PDM). PDM is a global menace. But there is a dearth of studies assessing the prevalence specifically in the elderly in India or worldwide. Schepis et al, (2020)

Prescription drug misuse is defined as “the inappropriate use of the same medications by authorized individuals for intended or unintended purposes in higher dosages and frequencies for prolonged periods”. So, striking a balance between effective uses and preventing misuse remains a complex challenge.

did a Life Span analysis of PDM in his narrative which revealed two key age-related differences (4). First, the prevalence of PDM peaks in late adolescence-young adulthood, followed by a decline depending upon the medication class.

Elderly show a higher rate of opioid or benzodiazepine misuse compared to stimulants, which is still below the adolescent age group (4). Second, the increasing medical morbidity

in elderly associated with chronic pain, surgeries,

sleep disturbances, anxiety provides them an easy access to the culprit drugs like opioids and benzodiazepines (4). According to the recent National Survey on Drug Use and Health (NSDUH) data, elderly above 65 years utilize physician-prescribed opioid medication or procure these from relatives for free for pain relief instead of seeking high. The prevalence of lifetime benzodiazepine PDM has also increased in individuals aged 50 years and above. Similar to the opioid PDM, physician sources to help with sleep and relaxation are the chief contributors to benzodiazepine PDM in elderly. Stimulant PDM are relatively understudied in elderly age group.

Prescription medication misuse reflects a breakdown in both supply and demand within the healthcare system (5). On the supply side, factors include oversupply of banned or inefficacious drugs, weak regulatory controls governing their availability, poor prescribing practices that include faulty documentation, lack of proper knowledge leading to indiscriminate use of medications, aggressive pharmaceutical marketing, high-cost prescribing for personal benefits, diagnostic uncertainties, and poor patient education (6) (5). Along with this, pharmacists dispense medications based on availability or perceived norms, further contributing to misuse. On the demand side, consumer factors such as limited knowledge, “doctor shopping,” online pharmacy access, financial and time constraints, and psychosocial stressors also play a role (6) (5). Misuse, particularly with medications like benzodiazepines used inappropriately as chemical restraints, can lead to overmedication, often amounting to elder abuse.

Table 1: Supply and demand problems in prescription drug misuse

Supply related problems	Demand related problems
• Oversupply of banned or inefficacious drugs, • Weak regulatory controls governing their availability, • Poor prescribing practices that include faulty documentation, • Lack of proper knowledge leading to indiscriminate use of medications, • Aggressive pharmaceutical marketing, • High-cost prescribing for personal benefits, • Diagnostic uncertainties	• Poor patient education • Doctor shopping • Online pharmacy access • Psychosocial stressors

Elderly individuals are particularly vulnerable due to biological, cognitive, and psychosocial differences. Biologically, aging brings about pharmacokinetic and pharmacodynamic changes in the body (7). There is an increase in body fat content along with a reduction in body water, a decline in hepatic metabolism and renal elimination which increases the blood concentration of drugs, duration of action, and side effects of prescribed drugs (7). Age-dependent changes in drug-receptors-membrane interactions causes heightened sensitivity to drugs (7) and weakened homeostatic mechanisms increases time to re-establish steady state following drug therapy. Cognitively, there is a decline in information processing speed, response time, visuo-perceptual and visuo-spatial functioning. Psychologically, there is utilization of coping strategies like reminiscence, looking more inward, or taking mortality into consideration. Socially, there is a reduction in social circle due to deaths of family members, fewer responsibilities and occupational losses. These factors affect the onset, course, and treatment of substance use disorders in this age group, underscoring the need for tailored prevention and intervention strategies.

VULNERABILITIES IN ELDERLY

- Biological: pharmacokinetic and pharmacodynamic changes due to ageing
- Psychological: cognitive decline, reminiscence, more inward looking, thoughts of mortality
- Social: reduced social circle, fewer responsibilities and occupational loss

Drug misuse in older adults can lead to tolerance, dependence, and a range of harmful consequences. Psychological distress, like depression, may drive addictive behaviors, often requiring medications such as benzodiazepines. While these can alleviate symptoms

temporarily, long-term use is associated with worsening depression and cognitive decline. Though stimulants sometimes improve cognitive deficits, they also carry risks like cardiovascular problems (arrhythmias, heart attacks), psychiatric issues (psychosis, depression), and physical health impacts (weight loss and poor dental health) (6) (7). Substance abuse also increases vulnerability to chronic illnesses, including kidney disease, diabetes, neurological conditions, and cancer, while raising the likelihood of falls, fractures, and accidents (6). Additionally, drug misuse is linked to impaired motor skills, judgment, and cognition, sometimes resulting in fugue-like states ("Rambo Syndrome") or criminal activities, either unintentionally or in desperation to obtain drugs. These risks highlight the urgent need for awareness, prevention, and tailored care for the elderly to mitigate these significant health and social challenges.

Healthcare providers play a pivotal role in addressing prescription drug misuse. Physicians are instrumental in conducting comprehensive geriatric

assessments to recognize the risks of misuse, review patients' medication histories, and address underlying psychological conditions to mitigate self-medication (2). Clear communication about dosages, duration, and risks of prolonged use is essential, while persistent refill requests or outdated prescriptions should alert physicians to possible misuse.

Pharmacists are also crucial in identifying misuse by detecting illegitimate prescriptions (unusual prescribing patterns, evidence of forgery) and

educating patients about safe use, storage, and disposal of drugs. Nurses and allied health workers also support in the process by maintaining close interactions with patients, ensuring proper medication use, and recognizing signs of misuse, thus contributing to early intervention strategies. Hence, coordination amongst the different strata of healthcare providers is significant to strike a balance between effective medication use and preventing prescription drug misuse (2).

Prescription drug misuse is a significant health challenge affecting individuals across all age groups, including the elderly. Commonly misused medications, such as sedatives, tranquilizers, opioids, and stimulants, can lead to dependence by activating the brain's reward system. Recovery is possible but requires acknowledgment of the problem, a commitment to change, and the support of caregivers or treatment organizations. For older adults, extra

ROLE OF HEALTHCARE PROVIDERS

- Physicians: comprehensive assessments, clear communication about dose, duration, and risks of prolonged use, alert towards repeated refill requests
- Pharmacists: detecting illegitimate prescriptions, educating patients about safe use and storage of medicines,
- Nurses: close interactions with the patients, ensuring proper use of medications, recognising signs of misuse

caution is required. The lowest effective dose, dosing schedules, and formulations suitable for their age should be considered. We should taper and discontinue any potentially inappropriate medications, as outlined in the standard international guidelines, like the Beers Criteria. So, tackling prescription misuse requires a multi-faceted approach, combining patient education, careful prescribing, and supportive strategies to mitigate adverse outcomes for affected individuals. Prescription drug misuse is a significant health challenge affecting individuals across all age groups, including the elderly. Commonly misused medications, such as sedatives, tranquilizers, opioids, and stimulants, can lead to dependence by activating the brain's reward system. Recovery is possible but requires acknowledgment of the problem, a commitment to change, and the support of caregivers or treatment organizations. For older adults, extra caution is required. The lowest effective dose, dosing schedules, and formulations suitable for their age should be considered. We should taper and discontinue any potentially inappropriate medications, as outlined in the standard international guidelines, like the Beers Criteria. So, tackling prescription misuse requires a multi-faceted approach, combining patient education, careful prescribing, and supportive strategies to mitigate adverse outcomes for affected individuals.



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Unique Challenges, Unique Solutions: Managing Substance Use in the Elderly

Merlin Mathew, Siddharth Sarkar



Substance use disorder (SUD) has become an increasingly prevalent problem among the elderly population. Despite growing number of substance users, elderly population comprise the most underdiagnosed and untreated age group among individuals with SUD (1). The Treatment Episode Data Set-Admissions study found that the annual admissions for SUD among people above 55 years age increased by 190% from 2010 to 2018 in the United States, with an increase in admissions due to prescription drug use and illicit substances (opioids, methamphetamine) (2). Alcohol use disorder is the most common type of SUD in the elderly. An increasing trend towards prescription and over-the-counter drug use is also being seen among the elderly, especially elderly females.

Substance use in elderly is a complex, multifaceted phenomenon and differs from drug use in the younger population. Some of the challenging factors are:

- **Variability in clinical presentation:**

Symptom presentation differs between elderly and younger population, with lesser reporting of withdrawal, tolerance and dose escalation

(3). Establishing diagnosis of substance use disorders using the existing diagnostic criteria and scales is further complicated due to differences between the older and younger age groups in terms of amount or duration of problematic use as well as negative consequences which may be less visible in the older group. Presence of comorbid neuropsychological conditions such as dementia, delirium, or depression can complicate the presentation due to overlapping symptoms (agitation, mood swings, and cognitive decline) often leading to underdiagnosis of SUD in elderly populations.

- **Underreporting and poor referrals:**

Limited self-awareness about substance use leads to poor reporting and lower treatment seeking for substance use, while a higher referral seeking is seen for other physical illnesses. The divide is greater for prescription drug users, who are often prescribed opioid analgesics for chronic pain. Mood altering effects of these medications may also result in misuse. The situation is further complicated by lesser screening and SUD being misdiagnosed as stress,

MANAGING PRESCRIPTION DRUG MISUSE: CHALLENGES

- Variability in clinical presentation
- Underreporting and poor referrals
- Presence of comorbidities
- Presence of sensory deficits
- Changes in pharmacokinetics
- Lack of established treatment guidelines

anxiety or mood disorders by primary care providers. This is reflected in the low number of referrals (ranging from 11- 13% across studies) by primary care providers to specialists in treatment of SUD (2,4). Stigma associated with substance use is perceived more commonly in the elderly which leads to poorer treatment seeking.

- **Comorbidities:**

Ageing is associated with a higher prevalence of physical and psychiatric comorbidities. SUD can itself lead to development of other medical disorders. This may include, for example, hepatic dysfunction, dyspepsia, and cardiovascular disorders due to alcohol, stomach ulcers and chronic obstructive pulmonary disorder due to tobacco, or malnutrition due to opioid use (5).

- **Sensory deficits:**

Declining vision and hearing is extremely common in elderly which leads to difficulty accessing healthcare services. Mobility impairments further limit physical visits which are of particular importance in methadone/buprenorphine dispensing centers where regular follow-ups and evaluations are required.

- **Pharmacokinetic differences:**

Lower lean body mass and decrease in total body water in elderly leads to greater psychotropic effects of substance, greater risk of drug-induced delirium and longer time to recover from intoxication. Lipid-soluble drugs such as benzodiazepines can lead to higher risk of adverse effects, including confusion and falls, or reduced hepatic and renal clearance that can further lead to toxicity and adverse events. Similarly, stimulants can lead to greater cardiovascular morbidity (6).

- **Lack of established treatment guidelines:**

There is dearth of sufficient evidence-based research on pharmacological and non-pharmacological management of substance use disorders in elderly. There may be poorer tolerance and greater risk of fall due to disulfiram and naltrexone; higher risk of ischemic attacks due to use of varenicline in patients with history of cardiovascular disease; and prolonged QT interval due to methadone leading to difficulty in titration of dose (7). Non-pharmacological interventions such as motivational interviewing, cognitive behavioral therapy are often difficult to do for patients with hearing impairment and cognitive decline.

Management of SUD in elderly

Management of SUD in elderly requires a multifaceted approach incorporating pharmacological and psychosocial interventions catering to specific needs of the elderly. The

5M (matters most, medications, mind, mobility, multi-complexity) model is an example of providing age-friendly multidimensional care system incorporating important focus areas in geriatric management (8). Interventions for improving care for elderly should focus on

- **Providing evidence-based care:**

Low intensity interventions such as motivational interviewing and brief interventions have been found to be successful. Prioritizing harm reduction over complete abstinence can lead to overall better outcomes. While evidence-based medicine is the mainstay of treatment in younger adults, lack of research in elderly and higher rates of comorbidities and polypharmacy highlights the need for a patient-centric approach with regular assessment of drug-drug interactions and of adverse events due to medication (9).

- **Working at grassroots level:**

Most elderly patients avail treatment services from primary care settings for physical morbidities and rarely seek isolated SUD services. Training primary care providers in screening for SUD and providing brief intervention and appropriate referral services can significantly improve the existing treatment gap. Identification and acute management of addiction-related emergencies (alcohol and opioid withdrawal, opioid overdose, seizures due to intoxication/withdrawal) should be a part of training as the clinical presentation is often complicated in elderly with overlapping of symptoms with other neuropsychological conditions. Brief intervention at primary health care level has been found to be as effective as subspecialty care in patients with alcohol use disorder (10).

- **Reducing stigma and improving awareness:**

Perceived stigma about substance use is a common reason for underreporting and poor treatment seeking. A more welcoming approach with non-judgmental and empathetic attitude is needed from medical and paramedical staff, including addressing patient's misconceptions about substance use and concerns about treatment. A non-argumentative tone should preferably be maintained while offering feedback or advice. Visual aids may be used to create awareness about substance use, using larger fonts and visual symbols which are easy to interpret. Engagement of family members or caregivers and community stakeholders in creating awareness about harms of addiction holds high importance in geriatric care as most elderly patients have poor insight about their substance use.

Isolated SUD services are usually not accommodating of elder needs and can lead to lower engagement due to perceived stigma and difficulty to access. An integrated care model including primary health services for common comorbid disorders would help in covering the treatment gap significantly.

Two in five elderly patients suffer from a physical disability limiting access to essential health services. Provision of age-appropriate infrastructure is lacking in most centres providing SUD services as they mostly cater to young and middle-aged adults. Provision of patient assistance

Installation of ramps, providing wheelchairs, wider doorways, non-slippery flooring, seating areas with cushions and back supports can improve accessibility. Streamlining the process of visitation should include reducing the number of counters to be visited from registration to medicine dispensing. Designated days for geriatric clinics can further aid the elderly.

providers can help in easing the process.

Opioid treatment facilities providing Methadone/Buprenorphine dispensing are often limited in age-friendly approaches due to dispensing schedule restrictions. Services such as medication dispensing vans in underprivileged neighbourhoods and delivering medicines at homes to patients with limited mobility can improve treatment retention rates. Provision of evidence-based treatment for SUD in assisted living facilities,

day care facilities, and nursing homes for elderly is another novel approach to increase accessibility. Temporary clinics in community centres can bring services closer. Subsidised public transportation and starting shuttle services for elderly patients in areas with high prevalence of substance use can further aid treatment seeking.

While treating for prescription drug use, providing alternative management for underlying psychiatric complaints such as insomnia, anxiety, somatic symptoms, and stress should be given due importance. Provision of services for assessment and management of medical comorbidities can improve treatment retention and patient satisfaction. Grief due to loss of loved ones and social isolation are seen more commonly in elderly compared to other age groups. Involving family members in treatment and encouraging patient participation in support groups (e.g. seniors in sobriety, narcotics anonymous) and community driven events improve success of treatment.

Conclusion

The quantum of substance use disorders in elderly is increasing. There is a need to recognize the differential presentation and complications in them including development of more sensitive assessment tools and greater evidence-based strategies to manage the same. A patient-centric integrated care approach addressing medical and psychiatric comorbidities hold the potential for more successful management of SUD in elderly.



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WHAT'S NEW

ADDICON 2024

A Note From the Organisers

Abdul Majid



The fourth Annual National Conference of APSI, ADDICON 2024, was organized by the Department of Psychiatry (Advanced centre for Mental Health and Addiction Medicine), Sher-e-Kashmir Institute of Medical Sciences (SKIMS) from 17 to 19 October 2024 at SKIMS Medical College Bemina, Srinagar. The conference was aimed at addressing the increasing prevalence of drug addiction and related problems in our society. The theme of this year's conference, "Nature to Nurture: preventing Relapse and maintaining Recovery," is highly relevant, as many patients struggling with addiction face difficulties in maintaining adherence to treatment and recovering from setbacks at various fronts in their lives. Factors such as individual behaviour, lack of social or family support, clinical challenges related to the illness and treatment, and barriers within the health system contribute to non-adherence, ultimately worsening the burden of addiction in our society. The experts which included distinguished and eminent speakers from across India and abroad shared their expertise and insights, enriching the academic program. The valuable contributions from participating delegates, addressing the various aspects of substance use, helped explore solutions to improve treatment compliance and enhance the successful management of addiction disorders.

The Inauguration ceremony was presided over by Prof Mohd Ashraf Ganie, Director (SKIMS Soura) and Ex-Officio Secretary to the Govt of Jammu and Kashmir along with Prof Iffat Hassan Shah, Principal / Dean, Govt Medical College, Srinagar as the guest of honour. Dr PK Dalal, Dr Shariq Rasheed Masoodi, Dr Aijaz Ahmad Rather (Registrar SKIMS Medical College) graced the occasion as special guests. Prof Atul Ambekar (Secretary General of APSI), Prof Mohammad Maqbool (HOD Psychiatry, IMHANS) and Prof Abdul Majid (HOD psychiatry, SKIMS Medical College, Bemina) also spoke on the occasion. The speakers emphasized on the need for research in the area and collaboration by different stake holders like Health, Education, law enforcement agencies, NGO's, social work, youth service and sports, religious organisations for tackling this condition.

The inauguration was followed by panel discussion where experts from different fields of the likes of Mr. Lateef U Zamaan Deva, IAS, former Chairman PSC, Dr Seema Naz, Director College of Education, Dr Yasir Hassan Rather, professor of Psychiatry, Dr Tahir Magray, Revenue attorney from divisional administration and Mr Mohammad Shafi, JKPS, Additional SP police crime branch discussed the situation of drug addiction in Jammu and Kashmir and ways to address this problem.

A very important academic event of the conference was an invited symposium was organised in which Shri Dinesh Bodh, Narcotics Control Commissioner, Government of India, Dr Lotika Khajuria, State Drug Controller (Jammu and Kashmir) and Prof Atul Ambekar, NDDTC, AIIMS, presented their views on regulation of psychotropics in India and how the challenges therein could be tackled to facilitate mental health professionals for smooth running of services in the netter interest of patient care.

During this conference, delegates from across the country and from abroad presented their research work on this complex issue in the form of Symposia, Invited lectures, workshops and free papers. Faculty from reputed institutions like NIMHANS Bangalore, PGI Chandigarh, and AIIMS New Delhi deliberated upon various aspects of addiction related disorders which would help in better understanding of this problem hence prove beneficial for the patients, family and society at large for safeguarding the interests of our future generations. Some prominent faculty included Prof Debashish Basu, HOD Psychiatry, PGI Chandigarh, Prof P K Dalal, Professor & former HOD KGMU Lucknow, Prof Sandeep Grover (PGIMER), Prof Abdul Majid HOD Psychiatry from SKIMS Srinagar, Dr Arun Kandasamy, Prof & HOD, Centre for Addiction Medicine, NIMHANS Bangalore, Prof. Ravindra Rao, Prof Siddarth Sarkar, Prof Koushik Sinha Deb, Dr Alok Agrawal, Dr Roshan Bhad, Dr Shalini Singh from AIIMS Delhi, and Dr Raghav Shah from SMS Jaipur who deliberated on various aspects aimed at preventing relapse and maintaining recovery. In addition, a national ADDICON quiz final round was conducted where in the 6 qualified teams from preliminary rounds were AIIMS New Delhi, GMCH Chandigarh, J J Hospital Mumbai and SKIMS Medical College Srinagar. The first, second and third position was bagged by jointly by AIIMS- SKIMS team, AIIMS New Delhi, and GMCH teams respectively.

The conference concluded with recommendations for augmenting the efforts for prevention, early detection, intervention, relapse prevention and maintenance of recovery in patients with drug addiction and related problems which is only possible by coordination among various stakeholders in addressing this complex issues.

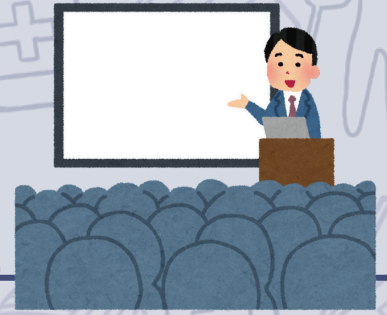
The organising team comprising of Dr Mohammad Maqbool, Dr Abdul Majid, Dr Nizam ud din, Dr Junaid Nabi, Dr Aijaz Suhaff, Dr Himayun, Dr Farhana Rafiq, Dr Gulzar Ahmad, Dr Ajmal Anjum, Dr Abrar, Dr Sajid, Dr Shagun Saini, Dr Insha, Dr Rouf, Dr Vikas, Dr Masood, Dr Nowfeena, Dr Gaurav and Dr Firdous, were complimented by one and all for organising the event meticulously. The conference was attended by more than 350 participants.





Attending ADDICON 2024 An Experiential Account

Deepali Negi



I had the privilege of attending the fourth Annual National Conference of the Addiction Psychiatry Society of India (APSI), ADDICON 2024 in October 2024. Held from the 17 to 19 October 2024 by the Department of Psychiatry at SKIMS Medical College Bemina, Srinagar, the conference focused on the theme "Nature to Nurture: Preventing Relapse, Maintaining Recovery."

Entering my second year of the DM Addiction Psychiatry course, I was eager to participate in this prestigious national conference. Unlike general psychiatry conferences, ADDICON deals exclusively with addiction medicine. It was an excellent opportunity to listen to notable figures in the field of addiction psychiatry. I was pleased that my abstract for an e-poster was selected, and I was given the chance to be part of a symposium. Besides the academic content, the serene beauty of Srinagar was much appreciated. It offered a perfect backdrop for this entire experience.

The event boasted a scientific programme featuring a variety of plenaries, symposia, and paper presentations on addiction treatment and policy, held concurrently in three halls. Some of the symposia I attended included "Addiction Treatment Facilities (ATFs) as a mechanism to enhance service provision for substance use in India," "Alcoholism and Cinema: A Case of a Cloud with a Silver Lining," "Navigating Digital Addiction: Way Forward for Digital Balance," "Substance Use and Internet Addiction in the Elderly: Addressing Risks and Promoting Healthy Aging," and "Neuromodulation for Substance Use Disorder – Accentuating Experience of the Drug De-addiction and Treatment Centre, PGIMER, Chandigarh." In addition, I also attended plenary lectures such as "Is There a Need to Reform Our Policies Regarding Cannabis?" by Prof. PK Dalal, "Unconventional Substances of Abuse - An Unconventional Talk!" by Prof. Debashis Basu, and "Nature and nurture in CBT in Relapse Prevention - How it Plays Up" by Dr Ashish Deshpande.

Among these, Dr Basu's talk on unconventional substances of abuse stood out for its engaging and informative content. It shed light on the evolving landscape of substance abuse. The symposium on ATFs also provided comprehensive insights into their establishment, operation, and effectiveness across the country, highlighting efforts to increase accessibility to addiction treatment services in India. Presenting my e-poster and participating in a symposium on India's cannabis policies and their public health implications

were incredibly rewarding experiences.

Although I was nervous about the Q&A element and received a few comments and some unexpected questions, I felt that I was able to address all of them satisfactorily. Sharing my work with such an informed audience was gratifying. It stimulated thoughts on further possibilities for improvement. A major highlight and the most interactive part of the conference for me was the ADDICON quiz. From unique team names to elements of pop trivia, the quiz was a delightful experience from start to finish. It was enjoyed not only by the participants but also by the audience. Watching young residents, as well as consultants, eagerly compete to answer questions from the audience was quite entertaining.

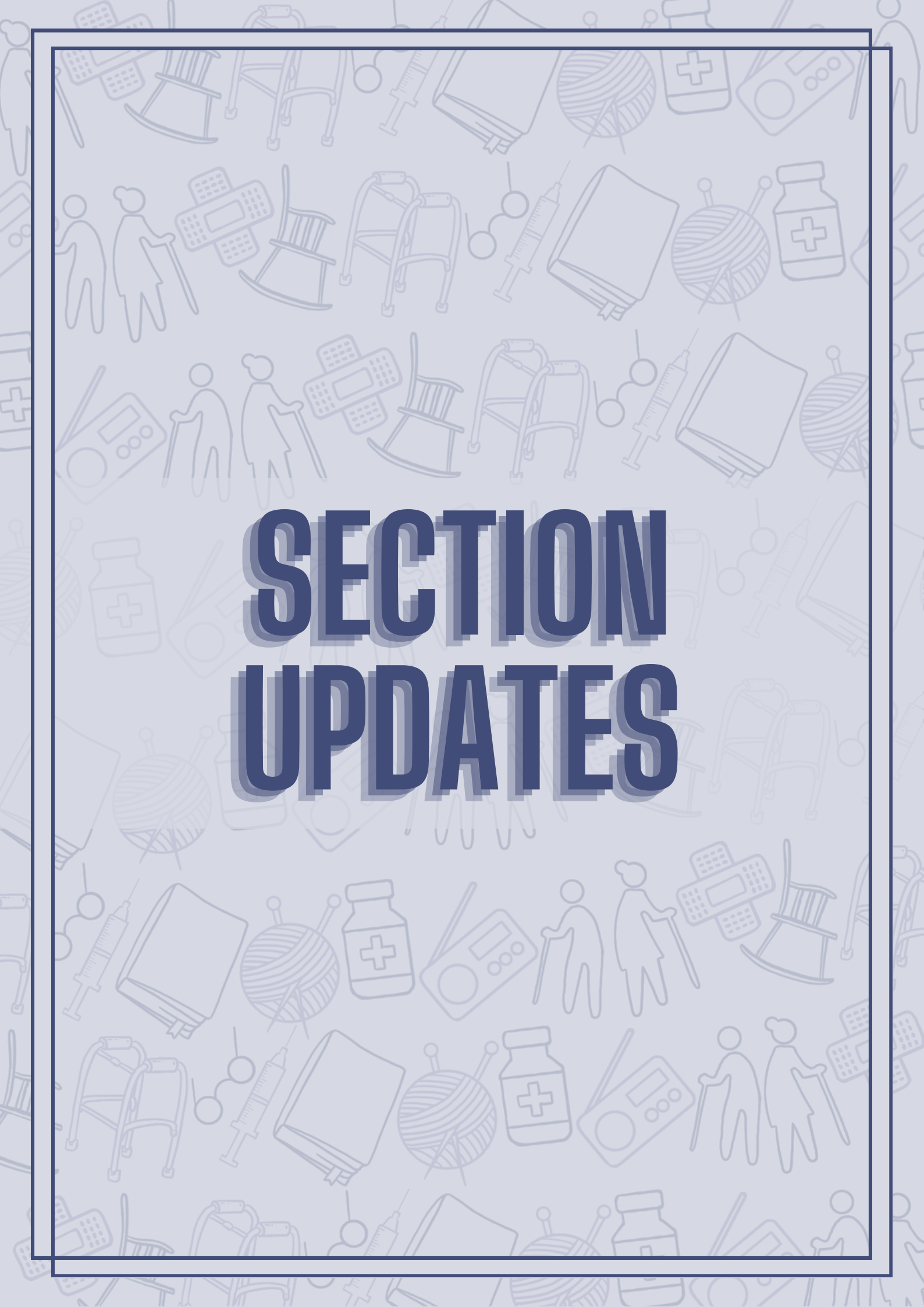
One of the most enriching aspects of the conference was the opportunity to network with attendees from other institutions. Initially apprehensive about this, I ended up thoroughly enjoying it. While waiting for my turn to present my e-poster, I was able to interact with other residents and had lively discussions about research being carried around in our respective institutions. The conference also arranged networking opportunities, including free lunch and dinner, which encouraged conversations in a more relaxed environment.

During my stay in Srinagar, we also met and befriended quite a few locals. One of the highlights was interacting with an auto driver I encountered on day two on our way to the venue, who was on opioid agonist medication from an ATF centre in Srinagar. He recounted how Opioid Agonist Treatment had changed his life positively. This encounter led to an impromptu visit to the ATF centre, where we interacted with the staff and patients. The cultural activities with my colleagues, including a boat ride on Dal Lake and a visit to the Mughal Gardens, added a unique dimension to the conference experience.

In terms of feedback, I would suggest incorporating more interactive sessions and workshops to facilitate hands-on learning and skill development. Additionally, attendance and time management seemed to be an issue as some sessions were shortened due to poor time management. Perspective from the private sector also seemed to be missing.

The conference was instrumental in updating me with the latest research and treatment approaches. It was an excellent opportunity to interact with leading experts in the field and foster professional connections, which will contribute to my academic and professional growth in addiction psychiatry. Overall, the conference was a resounding success, and I look forward to attending future ADDICONs!



The background of the slide is a light blue-grey color with a repeating pattern of white line-art icons. These icons represent various aspects of healthcare and elderly care, including: medical supplies like syringes, band-aids, pills, and bottles; mobility aids like wheelchairs and walkers; elderly figures, some using canes; and domestic items like rocking chairs and books. The icons are scattered across the entire background.

SECTION UPDATES

Basics of Addiction

Is Brain Age Gap (BAG) the new biomarker for cognitive functioning in substance use disorder?

Ankita Chattopadhyay, Sayani Bisoi



Estimation of brain age relative to the chronological age of the individual is an upcoming interesting biomarker of brain health and cognitive functioning. Calculation of brain age from structural and functional indices of brain is being increasingly investigated as a potential biomarker for brain involvement in neuropsychiatric disorders. Machine learning models are being used to predict the brain age and its difference from chronological age is being calculated as the brain age gap (BAG).

In a recent study, the authors tried to study the BAG in individuals with lifetime history of alcohol use disorder (AUD) as well as in those with high family history of AUD (thus being at risk of AUD) (1). With the use of XG Boost regression model to predict the brain age from 187 brain morphological features of cortical thickness and brain volume, the authors found increase of 1.70 years in the brain age of individuals with AUD with respect to the chronological age. The corresponding increase in those with higher family history density (FHD) was 0.09 years (1.08 months). Also, this BAG was associated with poor performance on executive functioning test in both AUD and high FHD individuals, leading the authors to make an impression that BAG can act as a proxy marker for cognitive functioning and thus, brain health.

Similarly for tobacco, a study utilised structural magnetic resonance imaging data stored in the UK Biobank ($n = 33,293$) and trained a brain age predictor using machine learning technique (2). It was seen that the smokers showed a larger Brain Age Gap ($+0.304$ years, Cohens'd = 0.083) than the controls. The gap was further found to be dependent on the smoking pattern, with more BAG being found in active regular smokers ($+1.190$ years, Cohens'd = 0.321), whereas a moderate Brain Age Gap ($+0.478$, Cohens'd = 0.129) was found in light smokers. Also, a longer duration of quitting smoking in ex-smokers was associated with smaller BAG. Smoking was also associated with poorer cognition and this relationship was partially mediated by BAG.

Global and regional BAG across substances other than alcohol and tobacco were also explored by Scheffler and colleagues that was published in 2024 (3). The Enhancing Neuro Imaging through Meta-Analysis Consortium (ENIGMA) Addiction Working Group study was a cross-sectional study including data from 38 global sites, with 2606 participants, of whom

1725 were cases with a substance use disorder (alcohol, cannabis, cocaine, amphetamine-type stimulants or nicotine) and 881 were healthy controls. The authors generated global and regional brain age estimates using T1 weighted magnetic resonance imaging (MRI) scans and used the Kaufmann brain age prediction algorithms for brain age estimation. In this study, no significant differences were observed for individuals with cannabis, cocaine and nicotine use disorder when compared with controls. Similar to the study by Kamarajan and colleagues, alcohol use disorder ($\beta = -5.49$, $t = -5.51$, $p < 0.001$) was associated with higher global BAG. An interesting finding in this study was that amphetamine-type stimulant use disorder ($\beta = 3.44$, $t = 2.42$, $p = 0.02$) was associated with lower global BAG in the substance-specific model. The authors have further explained that the model predicted an older age for those with an amphetamine-type stimulant use disorder, but less than that predicted for the healthy controls, thus giving a smaller, but still positive BAG in this group. The authors have commented that there is a possibility of a type II error because of less number of individuals in the amphetamine-type stimulant use disorder group in the background of use of different diagnostic and screening measures to recruit the individuals in the study.

To conclude, Brain age gap (BAG) seems to be an upcoming marker for cognitive health in neuro-psychiatric disorders, including substance use disorders. There is a need for future studies that focus on cross-validating the brain age prediction algorithms to further increase the precision of predicting and utility in identifying a standardized biomarker of cognitive health.



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Alcohol and Tobacco

Psilocybin-Assisted Therapy in Alcohol Use Disorder Treatment: Tread with caution

Ishita Gandhi, Mohit Varshney



Psilocybin, the active compound in certain psychedelic mushrooms, acts as a serotonin 2A receptor (5-HT_{2A}R) agonist. This interaction is thought to modulate neural plasticity and connectivity, particularly within networks implicated in cognition, emotion, and self-perception. Functional magnetic resonance imaging (fMRI) studies in both healthy individuals and those with psychiatric conditions suggest that psilocybin disrupts habitual patterns of thought and emotion, creating a "window of opportunity" for psychological transformation. These effects align with observed decreases in negative affect, enhanced emotional regulation, and increased cognitive flexibility(1). In a world where psilocybin's role, particularly in depression, is being highlighted, one needs to deep dive into the quality of research before planning larger clinical trials or policy recommendations.

In one double-blind study from USA, 95 participants (44% females) were randomised to two sessions of either psilocybin (49 participants) or an active placebo (diphenhydramine, 46 participants), along with psychotherapy (motivation enhancement and cognitive behaviour therapy) in both groups. The percentage of heavy drinking days during the 32-week period was 9.7% in the psilocybin group compared to 23.6% in the diphenhydramine group. Participants receiving psilocybin also reported higher rates of abstinence and reduced overall alcohol intake(1).

Psilocybin-assisted therapy integrates pharmacological and psychotherapeutic elements, emphasizing preparation, guided experience during dosing, and integration of insights post-session. Ensuring safety is paramount, requiring controlled environments and trained therapists to mitigate potential adverse reactions. Recent randomized clinical trials underscore psilocybin's potential to reduce alcohol consumption among patients with AUD.

A subgroup of 14 participants (6 in psilocybin and 8 in active placebo) were also enrolled in an ancillary fMRI study, wherein they completed task-based fMRI with a mean range of 2–3 days before and 1–2 days after receiving their first dose of their medication. Visual alcohol and emotionally valenced (positive, negative, or neutral) stimuli were presented in block design. Across both the stimuli, psilocybin increased activity in the medial and lateral prefrontal cortex (PFC) and left caudate, and decreased activity in the insular, motor,

temporal, parietal, and occipital cortices, and cerebellum. Greater PFC and caudate engagement and concomitant insula, motor, and cerebellar disengagement suggests enhanced goal-directed action, improved emotional regulation, and diminished craving.

However, these trials were had some notable limitations: The pilot fMRI Study had limited sample size reducing generalizability. Short follow-up missed long-term effects, and placebo group differences impacted comparability. Single-dose psilocybin and brief assessment window constrained insights into sustained neural and clinical changes. The earlier study also had small sample size due to the COVID-19 pandemic. Self-reported outcomes could induce risk bias despite EtG validation (which is only valid for a few days). High unblinding risk weakens placebo comparison, and psychotherapy's combined effect limits psilocybin-specific conclusions. Also, brain imaging comparisons assume baseline equivalence, which might not hold true in real world.

As research progresses, key questions remain. These include understanding the optimal dosing schedule, identifying predictors of treatment success, and comparing psilocybin to existing AUD treatments in efficacy and cost-effectiveness. Secondly, Psilocybin assisted therapy versus Psilocybin as a pharmacological molecule needs to be studied separately. As evidence mounts, this therapy could represent a paradigm shift in how AUD and other substance use disorders are treated, but requires extreme caution before being advocated at a policy level.

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Illicit Drugs

Evolving non-medical cannabis laws and implications for youth health

Shinjini Choudhury



In 2024, we witnessed South Africa and Germany passing significant legislations aligning their cannabis regulatory frameworks further towards legalisation of non-medical cannabis use. Although recreational cannabis use was already legal in South Africa since 2018, the Cannabis for Private Purposes Act, gazetted on June 3, 2024, lays down specific provisions regulating cultivation, possession, and use of cannabis by adults in private settings (1). The German Cannabis Act (Cannabisgesetz or CanG) legalised cannabis possession and use for those 18 years or older. It also legalizes private cannabis self-cultivation by adults and cooperative, non-commercial, cultivation within associations for personal use (2).

A recent systematic review and metanalysis assessed current evidence relating to adolescents' knowledge of cannabis use and perception of risks from analysis of 133 studies (3). It was seen that increased knowledge and perception of risk of cannabis frequently correlated with lower levels of current use and intent to use cannabis in future, and vice-versa. The included studies also showed that the perceived risk and harmfulness of cannabis decreased over time in adolescents, which correlated with increase in use of cannabis. Majority of prevention-based studies that focused on interventions intended to create changes in knowledge or perception of risk reported uniform increases in cannabis-related knowledge after exposure to the intervention. Many studies also demonstrated a reduction in cannabis use in adolescents exposed to the intervention.

As the list of countries legalizing cannabis keeps growing, concerns arise about its impact on youth as nations balance regulatory approaches to promote public health while managing cannabis-related risks. An important factor associated with cannabis use in adolescents is risk perception on use of cannabis, which is seen to be linked to knowledge related to cannabis.

The systematic review also looked into studies that explored changes in knowledge and perception of risk in the context of legislative changes in cannabis use. It was seen that, overall, medical marijuana legislation was found to correlate with lower risk perception over time in most studies identified although with little effect overall on adolescent cannabis use patterns. Results relating to recreational marijuana legislation were more divided, with the majority of studies ($n = 4$) failing to demonstrate any change in perception of risk, two studies reporting a decrease, and one study reporting an increase in perception of risk.

There is ample converging evidence that early and more frequent cannabis use in adolescence is linked to higher risk of psychotic, mood and addictive disorders as well as adverse cognitive and psychosocial outcomes, both in adolescence and adulthood (4). A recent meta-analysis of 63 studies found moderate-certainty evidence of probable association between cannabis use in adolescents and young adults and adverse academic outcomes such as lower grades, less chances of completing high school, diminished likelihood of enrolling in university or attaining a postsecondary degree, higher rates of school dropout, and increased absenteeism (5).

A major limitation was that most studies in the systematic reviews were from developed countries such as the USA. Such studies are also needed from developing countries. The legal changes introduced in South Africa can be a good avenue for such studies in a developing country. The long-term outcomes of cannabis law reforms and the effectiveness of the above approaches are yet to be determined, but undoubtedly legal frameworks should incorporate strong protective measures, including strict age limits, restrictions on advertising, and comprehensive education campaigns. Ongoing research is essential to assess the effectiveness of policies and make necessary adjustments to safeguard young populations. By analysing global trends and adapting strategies to local needs, policymakers can achieve a balanced approach to cannabis regulation that prioritizes youth protection and public health.



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Special Populations

The proliferation of synthetic nicotine & the emerging risk for children & adolescents: Recent updates on policy & research

Tamonud Modak

NICOTINE

There has been a recent surge globally in synthetic-nicotine-containing products marketed specifically for recreational use. Unlike nicotine that is derived from tobacco leaves, synthetic nicotine are basically variations of nicotinic acid (Vitamin B3) that is further processed to manufacture synthetic nicotine. The manufacturers and proponents of these products have been quick to equate these products with nicotine replacement therapy - a medical intervention designed to treat those with tobacco use disorder. They base their arguments on the widespread notion that the health hazards of tobacco use stem from the smoke and tar generated by the combustion of tobacco, rather than nicotine going as far as to claim that nicotine is as harmless as caffeine. Indeed, Michael Russel, the father of tobacco harm reduction, has been quoted as saying “People smoke for nicotine, but they die from the tar”. However, scientific evidence has started emerging which describing the adverse effects of nicotine on respiratory and cardiovascular health, cancers, and brain maturation. In this context, concerns have also been raised over the proliferation of synthetic nicotine containing products and how to best regulate them.

A recent World Heart Federation Policy Brief by Dorotheo et al. (2024) has detailed the adverse impact of nicotine on various body functions (1). Nicotine exerts its effects via stimulation of the nicotinic acetylcholine receptors (nAChRs) located in the central nervous system, at inter-ganglionic junctions of the autonomic nervous system, and on target organs throughout the body as part of the parasympathetic autonomic nervous system. The stimulation of these receptor exerts acute cardiovascular effects, including increased blood pressure and heart rate, while stimulation of the sympathetic nervous system leads to catecholamine release and muscle sympathetic nerve excitation. The authors argue that the potent addiction from use of synthetic nicotine products can cause extensive harm. They contend that all tobacco products are in essence nicotine

While the effects of synthetic nicotine appear less harmful than other tobacco smoke components, nicotine has been shown to contribute to atherosclerosis and acute cardiovascular events. In addition to adverse cardiovascular events, nicotine has also been shown to adversely impact brain development, cause cognitive and behavioral impairment besides causing a potent and difficult to treat addictive illness.

delivery devices and WHO Framework Convention on Tobacco Control extends not only to tobacco products but also to synthetic nicotine products. Indeed, the World Health Organization (WHO) has expressed concern in its recent report that decline in tobacco use has been supplanted by increasing synthetic nicotine use among youth (2). A recent survey among more than 1500 adolescents in the US showed that most youth were unaware regarding the source of that nicotine in e-cigarettes. There was also low-to-moderate awareness that e-cigarettes contained synthetic nicotine. Indeed, marketing of synthetic nicotine as 'tobacco-free nicotine' increased the intention of youth to purchase these products (3). There has been a recent policy update on this in India as well. Since 2018, India has had a liberal policy with regards to the availability of nicotine replacement therapies (NRTs). NRTs containing up to 2 mg of nicotine are exempt from chapter IV of the Drugs and Cosmetics Act in November 2018. This allowed for over-the-counter sale of these products and availability outside of pharmacies. However, in a recent meeting of the Drugs Technical Advisory Board (DTAB), there has been a proposal to make NRTs containing up to 2 mg or 4 mg of nicotine available only through a prescription.⁴ The policy update is a reflection on the changing patterns of nicotine consumption among the youth and the risk posed to them by synthetic nicotine.

These updates highlight the need for regulation of synthetic nicotine products to safeguard the youth. The shift from over-the-counter to prescription-based sale can reduce the likelihood of early initiation. However, this is just one aspect of regulation. There is also a need to curb appealing marketing strategies and controlling the availability of flavored options to reduce the allure of nicotine products among young individuals. Protecting youth from nicotine exposure not only benefits their immediate health, but also helps to prevent the long-term consequences of tobacco use, fostering a healthier future generation.



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3. Kowitt SD, Seidenberg AB, O'Shea NCG, et al. Synthetic nicotine descriptors: awareness and impact on perceptions of e-cigarettes among US youth. *Tob Control* 2024; 33: 713-719.
4. MINUTES OF THE 89TH MEETING OF DRUGS TECHNICAL ADVISORY BOARD, <https://cdsco.gov.in/opencms/resources/UploadCDSCOWeb/2018/UploadCommitteeFiles/Minutes%20of%2089th%20DTAB%20held%20on%2010.05.2023.pdf> (2023, accessed 18 November 2024).

Newer Issues

Shocking Solutions: Rewiring the Brain to Combat Gaming and Smartphone Addictions

Gaurav Singh, Vinit Patel



Internet Gaming Disorder (IGD) and smartphone addiction have emerged as growing public health concerns, recognized for their behavioural and neurobiological parallels with substance use disorders. Core features such as impaired inhibitory control and heightened cravings contribute to the persistence and relapse of addictive behaviours.

A randomized, double-blind, sham-controlled trial investigated the efficacy of transcranial direct current stimulation (tDCS) over the dorsolateral prefrontal cortex (DLPFC) in improving response inhibition and reducing cravings in individuals with Internet Gaming Disorder (IGD). The study included 24 male participants diagnosed with IGD, who were

randomly assigned to either active or sham tDCS groups and subjected to 10 sessions over two weeks. Behavioural assessments included the stop-signal task (SST) for inhibitory control and visual analogue scales (VAS) for cravings, along with pre- and post-intervention fMRI scans(1). The results demonstrated a significant improvement in response inhibition in the active tDCS group compared to the group that received sham tDCS. Functional connectivity analyses revealed increased connectivity between the DLPFC and anterior cingulate cortex (ACC) in the active group, which correlated with improved stop-signal reaction time (SSRT) performance. However, craving levels decreased in both groups but showed no statistically significant group-by-time interaction ($p = 0.435$). This highlights tDCS as a promising tool for targeting cognitive deficits in IGD but underscores its limited effect on motivational aspects of addiction. Limitations, including a small sample size, male-only participation, and lack of long-term follow-up, necessitate further studies to validate these findings.

Non-invasive brain stimulation techniques, including transcranial direct current stimulation (tDCS), have shown promise in modulating neural activity associated with addiction. By targeting prefrontal regions implicated in executive control, tDCS offers a potential intervention to address cognitive deficits underlying these behavioral addictions.

A separate study evaluated the efficacy of tDCS and exergames in mitigating smartphone addiction among 36 university students (2). Participants were randomized into three groups—control, tDCS, and exergames. Exergames are technology-driven physical activities, such as video game play, that requires participants to be physically active or exercise to play the game. The interventions were administered twice a week for four weeks. Assessment

measures included the Smartphone Addiction Scale (SAS-C), Iowa Gambling Task (IGT) scores, and neurophysiological indicators such as P300 and Feedback-Related Negativity (FRN) amplitudes obtained through EEG recordings. Results showed that while all the groups exhibited reductions in SAS-C scores, the tDCS group showed the most substantial improvement. Behavioural improvements in the IGT reflected enhanced decision-making strategies, with statistically significant improvements in post-intervention scores. Neurophysiological changes were also notable; the tDCS group demonstrated significant increases in P300 amplitudes at electrode sites and reduced FRN amplitudes. These findings indicate enhanced attentional control, cognitive processing, and feedback monitoring, suggesting improved executive functioning. While exergames also showed benefits, their reliance on behavioural engagement highlights a potentially different mechanism of action compared to the neurostimulation effects of tDCS. However, like the earlier study, limitations such as a short follow-up period and the homogeneity of participants (young, university students) restrict generalizability, warranting larger trials with diverse samples.

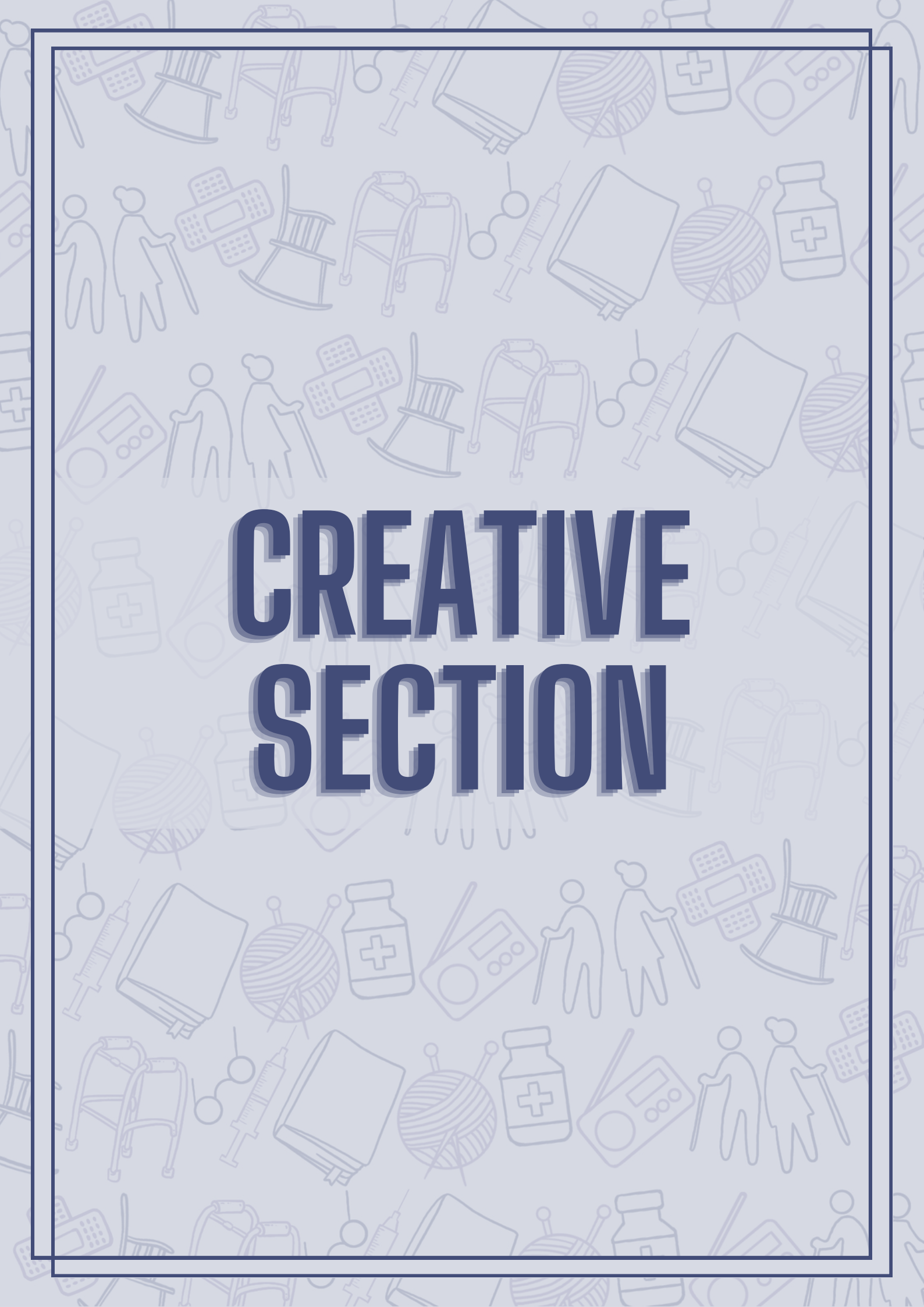
Both studies underscore the potential of tDCS as a non-invasive neuromodulation technique to address deficits in inhibitory control, a core feature of IGD and smartphone addiction. Enhanced connectivity between the DLPFC and ACC highlights a neural mechanism through which tDCS may exert its effects, aligning with broader evidence supporting prefrontal modulation in addiction therapies. However, the lack of impact on cravings in IGD and the relatively short intervention periods in both studies suggest that tDCS may be most effective when combined with complementary interventions targeting motivational and emotional drivers of addictive behaviours.

Future research should prioritize larger, more diverse cohorts and assess the durability of effects through longitudinal designs. Additionally, exploring the integration of tDCS with cognitive-behavioural therapy or pharmacological treatments could refine its clinical application. Investigating multi-modal approaches, such as pairing tDCS with behavioral or physical interventions like exergames, may further enhance therapeutic outcomes. As behavioural addictions continue to rise globally, interventions leveraging brain stimulation hold promise, but optimization and validation through rigorous trials remain imperative.

References

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2. Chen J, Jia YQ, Zhu YX, Liu Q, Cheng F, Yang B, et al. Treatment strategies for smartphone addiction: efficacy study of transcranial direct current stimulation and exergaming. *Front Public Heal*. 2024;12(November):1–10.

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The background of the entire page is a repeating pattern of light blue line-art icons. These icons represent various aspects of healthcare and elderly care, including: medical supplies like syringes, band-aids, pills, and books; mobility aids like wheelchairs, walkers, and rocking chairs; and human figures, some of which are using canes. The icons are scattered across the page, creating a textured, thematic backdrop.

CREATIVE SECTION

Art Work

A girl rolling bidis

Upendra Bhojani



Art Work

A girl rolling bidis

Upendra Bhojani



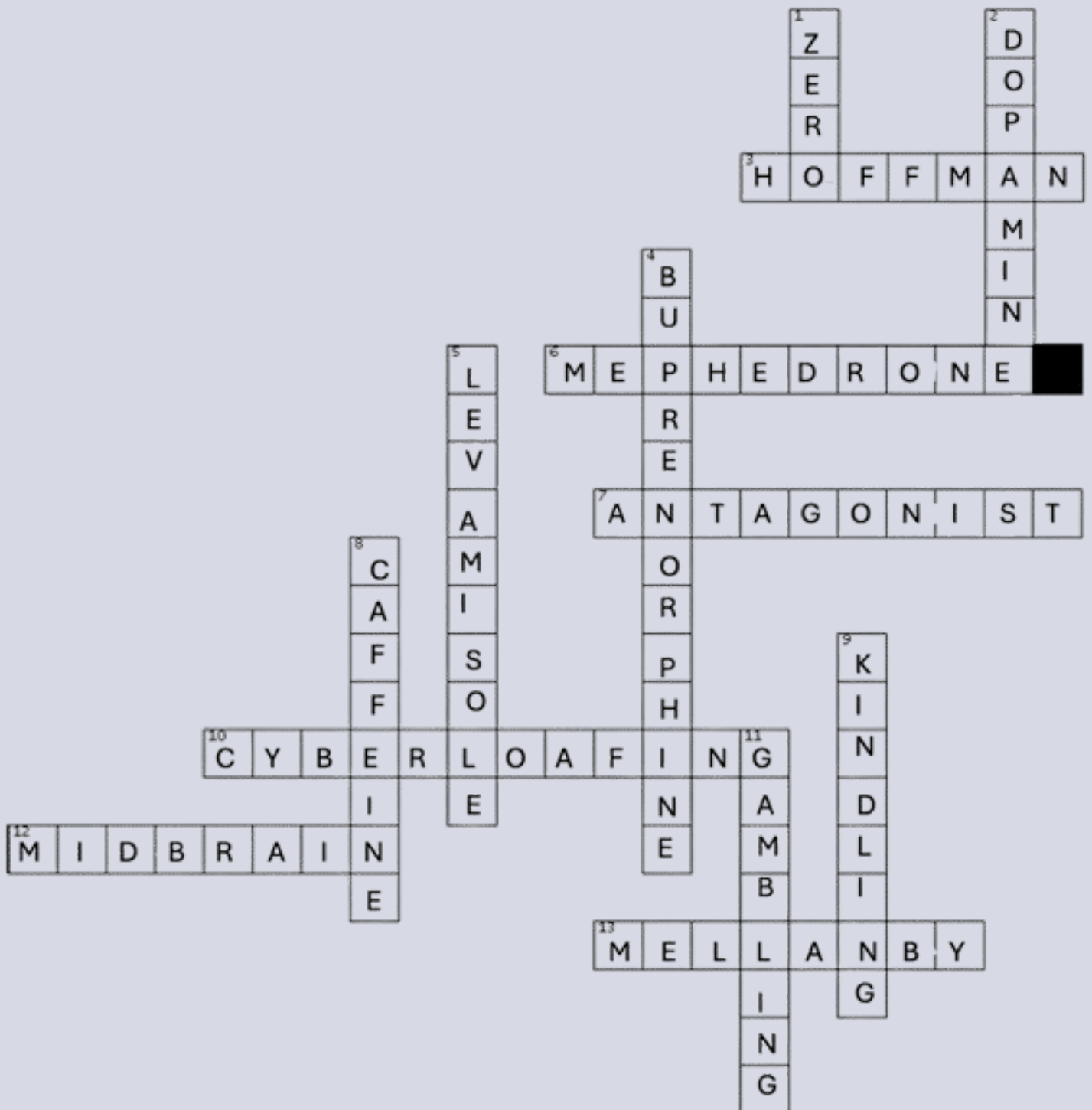
This sketch is of an adolescent girl from a town in Rajasthan (India). She rolls 500 bidis a day earning about 25 rupees. Beedis, to smoke tobacco, were possibly invented in the 17th century in southern Gujarat, a region where tobacco was initially cultivated. Laborers rolled tobacco leftover in broad leaves of certain trees. Compared to hookah (and later, Chillum), beedis provided easier and portable means for individuals to smoke tobacco that was also beyond the confines of castes. In the early part of the 20th century, the bidi industry expanded, benefiting from the popular rejection of 'foreign' cigarettes as part of the Swadeshi Movement. By the mid-20th century, factory-based production of bidis declined, and it became a cottage industry.

Bidis are primarily rolled by women and children in their households wherein they roll tobacco in cut tendu leaf and then tie it with a thread. The leaf is tucked in at the end using a sharp knife. Men are involved in other aspects of bidi production including being contractors. Children are preferred by contractors given their nimble fingers for rolling bidis. Bidi rolling has occupational hazards including body pain, postural health conditions and high incidence of lung diseases including bronchial asthma and tuberculosis due to inhalation of fine tobacco dust. Wages remain typically low, often below the minimum wages specified by governments and exploitation of workers by middlemen or contractors is also widely documented. Effective tobacco control requires provision of safer and viable alternatives to tobacco-based livelihoods.

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Solutions

APSI Mindbender 4



Solutions

APSI Mindbender 4



Please Note: The Black Box in Across 6 Row – We had given one extra blank cell by mistake in the APSI Mindbender-4 crossword in the previous issue.

ACROSS

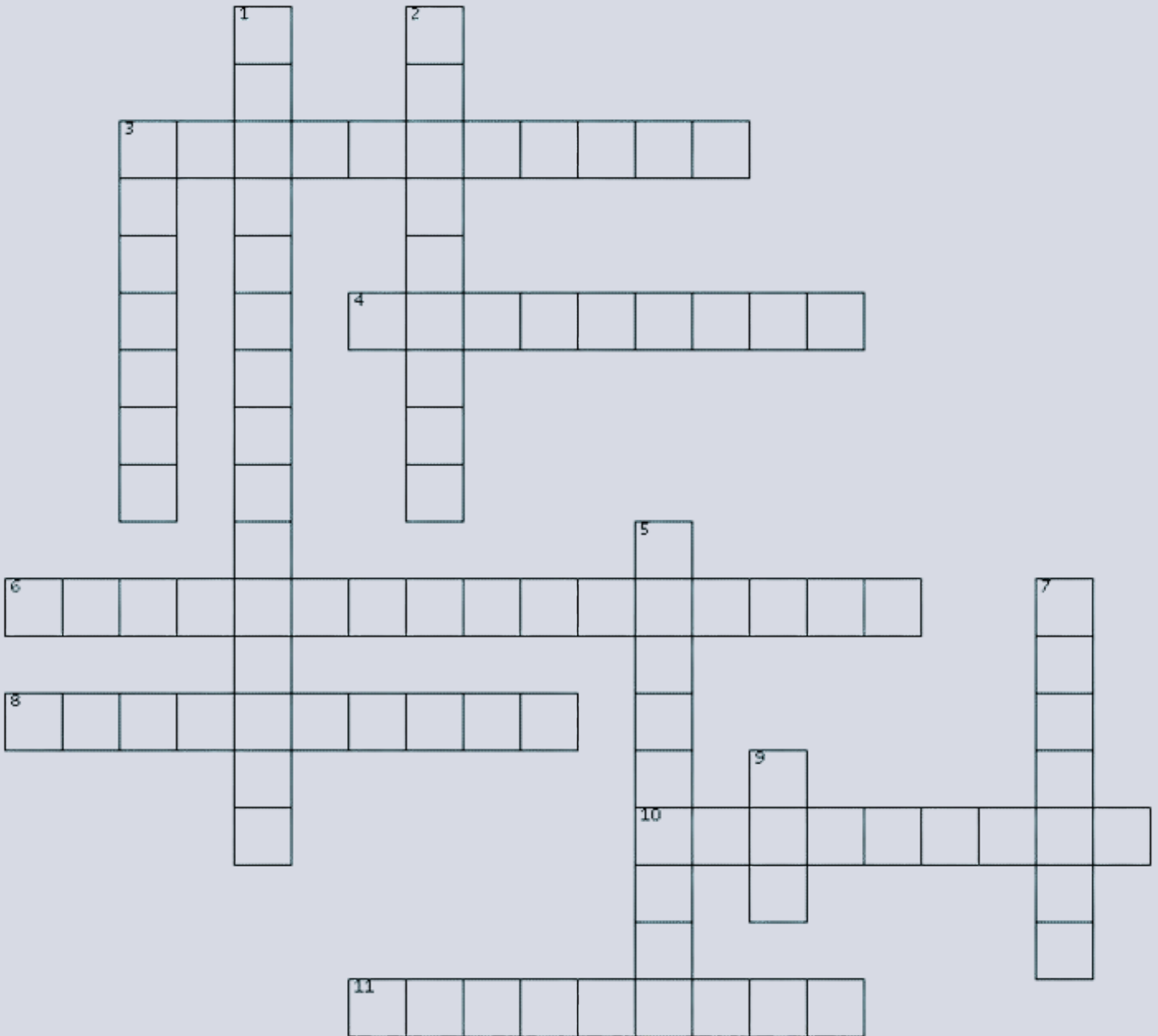
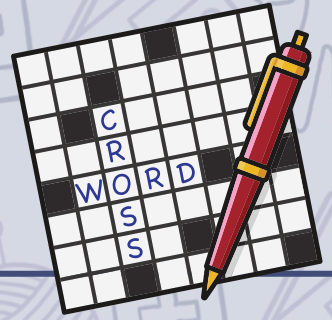
- 3. Last name of the person who synthesized LSD for the first time - Hoffman
- 6. "Meow-Meow" is the street name for which drug? Mephedrone
- 7. Mechanism of action on Buprenorphine on kappa opioid receptors. Antagonist
- 10. Use of internet for personal use, while pretending to use it for work purpose. Cyberloafing
- 12. Where in the brain is the ventral tegmental area located? Midbrain
- 13. The term used to describe acute tolerance in case of alcohol is Effect. Mellanby

DOWN

- 1. The metabolism of alcohol follows which order kinetics? Zero
- 2. Neurotransmitter which is primarily associated with the reward system. Dopamine
- 4. The medication of choice for agonist maintenance treatment for opioid use disorder in pregnancy. Buprenorphine
- 5. Which anti-parasitic agent is used as an adulterant in cocaine and also enhances its action? Levamisole
- 8. Name the psychoactive substance, whose 'Use disorder' has been included under 'Conditions for Further study' in DSM 5? Caffeine
- 9. Increasingly severe withdrawal symptoms experienced with repeated detoxifications is due to _____ phenomenon. Kindling
- 11. Which behavioral addiction is included under 'Substance-Related and Addictive Disorders' in DSM5? Gambling

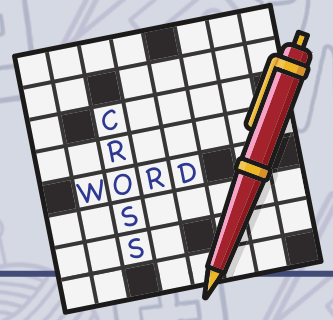
APSI Mindbender 5

Challenge your brain!



APSI Mindbender 5

Challenge your brain!



ACROSS

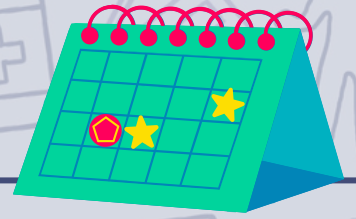
3. The term used to emphasize the subjective experience of expanded consciousness produced by hallucinogens
4. Humans who smoke tobacco get reinforcement from the irritant effects of nicotine on the tissues of the mouth and throat
6. The study of how a person's genes affect their response to drugs
8. The term used to emphasize the subjective feeling of emotional openness caused by MDMA
10. Psychoactive component in Peyote
11. The term used for hallucinogens to emphasize the spiritual aspects of the experience when used

DOWN

1. The term that is used to stress the similarity between hallucinogen intoxication and psychotic illness
2. Benzodiazepines increase the of GABA mediated chloride ion channel opening
3. Street name for recreational drugs belonging to Alkyl Nitrate Group
5. The perceived benefit of tobacco smoking by some depressed patients is due to inhibition of oxidase enzyme
7. Ability for workers at heights to walk in a straight line despite motor impairment from alcohol intoxication is called as ____ tolerance
9. Psychoactive drug derived from Claviceps Purpurea

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Upcoming Events



National Mid term CME, 2025



Organised by: Department of Psychiatry, JIPMER

When: 21-22 March, 2025

Where: JIPMER, Puducherry

Link: <https://apsimidtermcme2025.com/>

Annual ISAM Global Congress 2025

Organised by: International Society of Addiction Medicine and Institute for Interdisciplinary Addiction and Drug Research (ISD)

When: May 26-28, 2025

Where: Hamburg, Germany

Link: <https://www.isam-hamburg.com/>



2025 NIDA International Forum



Organised by: National Institute on Drug Abuse (NIDA)

When: June 13 and 14, 2025

Where: New Orleans, Louisiana, USA

Link: <https://nida.nih.gov/international/international-forum/2025-nida-international-forum>



**WE WANT YOUR
FEEDBACK**

[Click here](#)

Share your personal experience /
Narrative / Painting / Poem



Contact Details

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Links to the Addiction Psychiatry Society of India below

