



Contents lists available at ScienceDirect

# Emerging Trends in Drugs, Addictions, and Health

journal homepage: [www.elsevier.com/locate/etdah](http://www.elsevier.com/locate/etdah)

Editorial

## Introducing the new open access Journal *Emerging Trends in Drugs, Addiction, and Health*



We are pleased to present the first issue of *Emerging Trends in Drugs, Addiction, and Health*. This is the official Journal of the International Society for the Study of Emerging Drugs, a new, Gold Open Access title. The mutual goal of both the Society and the Journal, is to provide a platform for the rapid exchange of multidisciplinary knowledge on novel psychoactive substances (NPSs), addictions, and their health effects.

### The emergence of novel psychoactive substances

In recent years, there has been a dramatic increase in NPSs detected across the world. NPSs include poorly regulated products often sold online as legal and safer alternatives to internationally controlled drugs, whose effects they tend to mimic (Corazza et al., 2014). The NPS market remains highly dynamic and is characterised by the emergence of large numbers of new substances in a growing number of countries. Between 2009 and 2018, 119 countries and territories reported the emergence of 892 NPSs to the United Nations Office on Drugs and Crime (UNODC), through the UNODC Early Warning Advisory on NPSs. Similarly, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), through the EU Early Warning System (EWS), monitors over 720 NPSs that have appeared since 1997. Of these, 90% has been reported in the last decade. The increase in NPSs' number and availability has primarily been driven by globalization, the internet, and rapid technology changes (EMCDDA 2019).

Based on their desired subjective and behavioral effects, four NPS categories have been proposed, stimulant, hallucinogenic, cannabinoid, and depressant, including a range of agents such as cathinones, psychedelics, dissociatives, synthetic cannabinoid receptor agonists, opioids and benzodiazepines (Tracy et al., 2017). However, due to their chemical structure, NPSs may exhibit complex combinations of these actions (Zawilska, 2015).

Synthetic cannabinoids (SCs) and cathinones are among the most commonly used NPSs (Assi et al., 2017; Fattore, 2016), with young men, who also use other substances, as typical users (Graddy et al., 2018). SCs, for example, emerged as drugs of abuse in the late 2000s. Currently, more than 150 SCs are known, with new analogs appearing rapidly, marketed as herbal blends, and often perceived as risk-free by inexperienced users (Armenian et al., 2018; Davidson et al., 2017; Fattore, 2016). Given SCs' structural complexity, there are ample chemical modification options that explain their market's scale and speed and make legal

control and analytical detection extremely difficult (Armenian et al., 2018; Potts et al., 2020).

### Novel psychoactive substances and health

Whereas many NPSs have unknown pharmacology, their molecular structure and user reports can indicate the expected behavioral and physiological effects (Davidson and Schifano, 2016). Claimed desired effects of cathinones and SCs, for example, are to enhance empathy and increase the ability to socialize (Assi et al., 2017). In addition to minor or moderate adverse effects, NPSs have been related to serious complications, including cardiovascular, neurological, and psychopathological reactions (e.g., agitation, psychosis), as well as to death (Assi et al., 2017; Graddy et al., 2018; Liechti, 2015). Although NPSs' risks can partially be predicted using structurally similar classical illicit substances as a reference (Dawson and Moffatt, 2012), more research is needed given the lack of data on risk factors and harms associated with long-term use of NPSs (Meader et al., 2018).

Major recently emerged problems have led to an increasing range of risks for people who use psychoactive substances. These include an increase in the number of highly potent NPSs on the market, many of which are synthetic cannabinoids or synthetic opioids, and health-related circumstances, such as, the Covid-19 pandemic, which might contribute to increase mental disturbances and addictive behaviours (Dubey et al., 2020; Rajkumar, 2020). Of note, special attention is needed for vulnerable groups such as patients with severe mental illnesses, or children and adolescents, as NPS-related short-and long-term effects might be more pronounced with increased underlying health-related disturbances (Bersani and Prevete, 2017; Orsolini et al., 2019).

Among adolescents and young adults, polydrug use is a widespread phenomenon (Lopez-Rodriguez and Viveros, 2019), emphasizing the need to study the effects of drug-drug interactions (Zawilska and Andrzejczak, 2015). Further, data raise the possibility that the use of NPSs is often associated with the use of "traditional" drugs as well as with the occurrence of various forms of addictions, including behavioural addictions (EMCDDA 2017; EMCDDA 2019; Martinotti et al., 2014). Regarding patients with severe mental illnesses, a recent review of studies and case reports suggested that NPS use is underestimated in such at-risk population and that it can facilitate the exacerbation of preexisting psychotic disturbances (Bersani and Prevete, 2017). NPS-related adverse effects can, when mismanaged or misdiagnosed, be life-threatening (Smith and Robert, 2014).

<https://doi.org/10.1016/j.etdah.2020.100001>

Available online 20 November 2020

2667-1182/© 2020 Published by Elsevier Ltd on behalf of International Society for the Study of Emerging Drugs. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

## Future research and publication plan

In this rapidly changing field, developing a multidisciplinary collaboration and a global perspective on the issue is the way forward. A comprehensive study of NPSs and addiction-related phenomena, in fact, encompasses distant disciplines such as pharmacology, clinical practice, doping science, mental health, public health, forensic medicine, experimental psychology, genetics, molecular biology, internal medicine, neuroscience, health psychology, health policy, and health economics. In relation to detection, web monitoring activities, together with wastewater analyses, clinical and biological observations from healthcare centers, and analyses of fatal cases, will help in the detection of emergent substances and misuse trends in a time-efficient manner (Corazza et al., 2014; Couto et al., 2018). While the development of specific analytic techniques is needed (Martinotti et al., 2017), continued efforts to analytically define and confirm agents' presence in emergency department admissions or hospitalizations are necessary (Logan et al., 2017).

To understand these substances' safety profile, a well-defined system, including information about the NPSs' structure and activity, will hopefully allow increasingly fast and accurate communication about trends of misuse, novel challenges, and potential risks (Potts et al., 2020). This system will hopefully provide a practical framework enabling timely and reliable information provision for health professionals for whom this knowledge is essential when managing intoxication (Rivera et al., 2017).

Although NPSs' presence is hard to detect with standard screening tests, the clinical management of NPS-related physical and psychopathological symptoms hopefully will evolve in the future towards more specific evidence-based and molecule-focused treatment strategies (Schifano et al., 2017; Schifano et al., 2016). A better understanding of users' motives and profiles could tailor preventative strategies and harm reduction measures (d'Angelo et al., 2017; Martinotti et al., 2017).

The Journal's overall purpose is to contribute to improving the knowledge of complex interactions between NPSs, addiction, and health, with a comprehensive biological, psychological, and social perspective. By fostering and stimulating the collaboration between parties across nations on the topic of NPSs, this Journal intends to speed up the science and the knowledge on the topic, while aiming at enhancing the wellbeing of people who suffer, and at providing the latest information to health professionals.

K.P.C. Kuypers\*

*Department of Neuropsychology and Psychopharmacology, Faculty of Psychology and Neuroscience, Maastricht University, P.O. Box 616, 6200 MD Maastricht, The Netherlands*

F.S. Bersani

*Department of Human Neurosciences, Sapienza University of Rome, Rome, Italy*

R. Bruno

*College of Health and Medicine, School of Psychology Sciences, University of Tasmania, Hobart, Tasmania, Australia*

B.K. Vicknasingam

*Universiti Sains Malaysia Center for Drug Research, Minden, Malaysia*

A. Roman-Urrestarazu

*University of Cambridge Department of Public Health and Primary Care, Cambridge, United Kingdom*

O. Corazza

*Department of Clinical, Pharmacological and Biological Sciences, University of Hertfordshire, Hatfield, United Kingdom  
Department of Medico-Surgical Sciences and Biotechnologies, Sapienza University of Rome, Rome, Italy*

\*Corresponding author.

E-mail address: [k.kuypers@maastrichtuniversity.nl](mailto:k.kuypers@maastrichtuniversity.nl) (K.P.C. Kuypers)

## References

- Armenian, P., Darracq, M., Gevorkyan, J., Clark, S., Kaye, B., Brandehoff, N.P., 2018. Intoxication from the novel synthetic cannabinoids AB-PINACA and ADB-PINACA: A case series and review of the literature. *Neuropharmacology* 134 (Pt A), 82–91. doi:10.1016/j.neuropharm.2017.10.017.
- Assi, S., Gulyamova, N., Ibrahim, K., Kneller, P., Osselton, D., 2017. Profile, effects, and toxicity of novel psychoactive substances: A systematic review of quantitative studies. *Hum. Psychopharmacol.* 32 (3). doi:10.1002/hup.2607.
- Bersani, G., Prevede, E., 2017. Novel psychoactive substances (NPS) use in severe mental illness (SMI) patients: Potential changes in the phenomenology of psychiatric diseases. *Hum. Psychopharmacol.* 32 (3). doi:10.1002/hup.2591.
- Corazza, O., Valeriani, G., Bersani, F.S., Corkery, J., Martinotti, G., Bersani, G., Schifano, F., 2014. "Spice," "kryptonite," "black mamba": an overview of brand names and marketing strategies of novel psychoactive substances on the web. *J. Psychoact. Drugs* 46 (4), 287–294. doi:10.1080/02791072.2014.944291.
- Couto, R.A.S., Gonçalves, L.M., Carvalho, F., Rodrigues, J.A., Rodrigues, C.M.P., Quinaz, M.B., 2018. The Analytical challenge in the determination of cathinones, key-players in the worldwide phenomenon of novel psychoactive substances. *Crit. Rev. Anal. Chem.* 48 (5), 372–390. doi:10.1080/10408347.2018.1439724.
- d'Angelo, L.C., Savulich, G., Sahakian, B.J., 2017. Lifestyle use of drugs by healthy people for enhancing cognition, creativity, motivation and pleasure. *Br. J. Pharmacol.* 174 (19), 3257–3267. doi:10.1111/bph.13813.
- Davidson, C., Opacka-Juffry, J., Arevalo-Martin, A., Garcia-Ovejero, D., Molina-Holgado, E., Molina-Holgado, F., 2017. Spicing up pharmacology: a review of synthetic cannabinoids from structure to adverse events. *Adv. Pharmacol.* 80, 135–168. doi:10.1016/bs.apha.2017.05.001.
- Davidson, C., Schifano, F., 2016. The potential utility of some legal highs in CNS disorders. *Prog. Neuro-psychopharmacol. Biol. Psychiatry* 64, 267–274. doi:10.1016/j.pnpbp.2015.07.010.
- Dawson, P., Moffatt, J.D., 2012. Cardiovascular toxicity of novel psychoactive drugs: lessons from the past. *Prog. Neuro-psychopharmacol. Biol. Psychiatry* 39 (2), 244–252. doi:10.1016/j.pnpbp.2012.05.003.
- Dubey, M.J., Ghosh, R., Chatterjee, S., Biswas, P., Chatterjee, S., Dubey, S., 2020. COVID-19 and addiction. *Diab. Metab. Syndrome* 14 (5), 817–823. doi:10.1016/j.dsx.2020.06.008, Retrieved from <https://pubmed.ncbi.nlm.nih.gov/32540735> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7282772/>.
- EMCDDA. (2017). High-risk drug use and new psychoactive substances. Retrieved from EMCDDA. (2019). European Drug Report Retrieved from Lisbon, Portugal:
- Fattore, L., 2016. Synthetic cannabinoids-further evidence supporting the relationship between cannabinoids and psychosis. *Biol. Psychiatry* 79 (7), 539–548. doi:10.1016/j.biopsych.2016.02.001.
- Graddy, R., Buresh, M.E., Rastegar, D.A., 2018. New and emerging illicit psychoactive substances. *Med. Clin. North Am.* 102 (4), 697–714. doi:10.1016/j.mcna.2018.02.010.
- Liechti, M., 2015. Novel psychoactive substances (designer drugs): overview and pharmacology of modulators of monoamine signaling. *Swiss Med. Wkly.* 145, w14043. doi:10.4414/smw.2015.14043.
- Logan, B.K., Mohr, A.L.A., Friscia, M., Krotulski, A.J., Papsun, D.M., Kacinko, S.L., . . . Huestis, M.A., 2017. Reports of adverse events associated with use of novel psychoactive substances, 2013–2016: a review. *J. Anal. Toxicol.* 41 (7), 573–610. doi:10.1093/jat/bkx031.
- Lopez-Rodriguez, A.B., Viveros, M.P., 2019. Bath salts and polyconsumption: in search of drug-drug interactions. *Psychopharmacology (Berl)* 236 (3), 1001–1014. doi:10.1007/s00213-019-05213-3.
- Martinotti, G., Corazza, O., Achab, S., Demetrovics, Z., 2014. Novel psychoactive substances and behavioral addictions. *Biomed. Res. Int.* 2014, 534523. doi:10.1155/2014/53452310.1155/2014/534523, Retrieved from <https://doi.org/>
- Martinotti, G., Santacroce, R., Papanti, D., Elgharably, Y., Prilutskaya, M., Corazza, O., 2017. Synthetic cannabinoids: psychopharmacology, clinical aspects, psychotic onset. *CNS Neurol Disord. Drug Targets* 16 (5), 567–575. doi:10.2174/1871527316666170413101839.
- Meador, N., Mdege, N., McCambridge, J., 2018. The public health evidence-base on novel psychoactive substance use: scoping review with narrative synthesis of selected bodies of evidence. *J. Public Health (Oxf)* 40 (3), e303–e319. doi:10.1093/pubmed/fdy016.
- Orsolini, L., Chiappini, S., Corkery, J.M., Guirguis, A., Papanti, D., Schifano, F., 2019. The use of new psychoactive substances (NPS) in young people and their role in mental health care: a systematic review. *Expert Rev. Neurother.* 19 (12), 1253–1264. doi:10.1080/14737175.2019.1666712.
- Potts, A.J., Cano, C., Thomas, S.H.L., Hill, S.L., 2020. Synthetic cannabinoid receptor agonists: classification and nomenclature. *Clin. Toxicol. (Phila)* 58 (2), 82–98. doi:10.1080/15563650.2019.1661425.
- Rajkumar, R.P., 2020. COVID-19 and mental health: A review of the existing literature. *Asian J. Psychiatry* 52. doi:10.1016/j.ajp.2020.102066, 102066–102066. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/32302935> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7151415/>.
- Rivera, J.V., Vance, E.G., Rushton, W.F., Arnold, J.K., 2017. Novel psychoactive substances and trends of abuse. *Crit. Care Nurs. Q.* 40 (4), 374–382. doi:10.1097/cnq.0000000000000174.

- Schifano, F., Orsolini, L., Papanti, D., Corkery, J., 2017. NPS: medical consequences associated with their intake. *Curr. Top. Behav. Neurosci.* 32, 351–380. doi:[10.1007/7854\\_2016\\_15](https://doi.org/10.1007/7854_2016_15).
- Schifano, F., Papanti, G.D., Orsolini, L., Corkery, J.M., 2016. Novel psychoactive substances: the pharmacology of stimulants and hallucinogens. *Expert Rev. Clin. Pharmacol.* 9 (7), 943–954. doi:[10.1586/17512433.2016.1167597](https://doi.org/10.1586/17512433.2016.1167597).
- Smith, C.D., Robert, S., 2014. 'Designer drugs': update on the management of novel psychoactive substance misuse in the acute care setting. *Clin. Med. (Lond.)* 14 (4), 409–415. doi:[10.7861/clinmedicine.14-4-409](https://doi.org/10.7861/clinmedicine.14-4-409).
- Tracy, D.K., Wood, D.M., Baumeister, D., 2017. Novel psychoactive substances: types, mechanisms of action, and effects. *Bmj* 356, i6848. doi:[10.1136/bmj.i6848](https://doi.org/10.1136/bmj.i6848).
- Zawilska, J.B., 2015. "Legal Highs"—an emerging epidemic of novel psychoactive substances. *Int. Rev. Neurobiol.* 120, 273–300. doi:[10.1016/bs.irm.2015.02.009](https://doi.org/10.1016/bs.irm.2015.02.009).
- Zawilska, J.B., Andrzejczak, D., 2015. Next generation of novel psychoactive substances on the horizon - A complex problem to face. *Drug Alcohol Depend.* 157, 1–17. doi:[10.1016/j.drugalcdep.2015.09.030](https://doi.org/10.1016/j.drugalcdep.2015.09.030).