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MDPV and  $\alpha$ -PVP use in humans: The twisted sisters

Laurent Karila, Geneviève Lafaye, Amandine Scocard, Olivier Cottencin, Amine Benyamina



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Laurent Karila (1, 2), Geneviève Lafaye (1), Amandine Scocard (3), Olivier Cottencin (4) Amine Benyamina (1)

(1) : Addiction Research and Treatment Center, Paul Brousse Hospital, Paris-Sud University, F-94800 Villejuif, France

(2) : INSERM U1000, Orsay, France

(3) : Service de psychiatrie et d'addictologie, F-33000 Bordeaux, France

(4) : Univ. Lille, CNRS, CHU Lille, UMR 9193 — Psychiatry and Addiction Medicine Department, F-59000 Lille, France

Corresponding author : Laurent Karila – laurent.karila@aphp.fr

## Abstract

The new psychoactive substances phenomenon continues to represent a considerable public health challenge. Synthetic cathinones are  $\beta$ -keto amphetamine analogues, also known as legal highs, research chemicals, bath salts. These drugs have surfaced as a popular alternative to other illicit drugs of abuse, such as cocaine, MDMA, and methamphetamine, due to their potent psychostimulant and empathogenic effects. Pyrovalerone cathinones ( $\alpha$ -pyrrolidinophenones) form a distinct group of designer cathinones, such as MDPV. After being listed as an illegal product, “second generation” compounds such as  $\alpha$ -PVP, sharing a very similar chemical structure with MDPV, were developed. Clinical effects of these compounds are individual, dose- and route of administration-dependent. Both of them have been involved in an increased number of, not only acute intoxications but also fatalities over the past few years, raising concerns in the medical field. In this paper, we will review the available data regarding the use and effects of MDPV and  $\alpha$ -PVP in humans in order to highlight their impact on public health. Health actors and general population need to be clearly informed of potential risks and consequences of these 2 novel psychoactive substances spread and use. The literature search conducted led to the identification of potentially 83 relevant articles. All articles were screened from their abstracts to determine their relevance in the framework of the current review.

**Keywords:** alpha-PVP, MDPV, synthetic cathinones, new psychoactive substances, adverse effects, fatalities

## 1. Introduction

The new psychoactive substances phenomenon continues to represent a considerable public health challenge [1]. Named as designer drugs, they include, among others, synthetic cathinones, synthetic cannabinoids, phenethylamines, tryptamines and phencyclidine-type substances, aminoindanes [2] [3-5]. Synthetic cathinones are one class structurally related to the cathinone, a psychoactive alkaloid found in khat plant (*Catha Edulis*). This plant has been used for hundreds of years for its mild stimulant properties in East African and Middle Eastern regions and known by Europeans in the late 18<sup>th</sup> century. These  $\beta$ -keto amphetamine analogues are also known as legal highs, research chemicals, bath salts, plant food or glass cleaner and labeled « not for human use » [6]. They have surfaced as a popular alternative to other illicit drugs of abuse, such as cocaine, MDMA, and methamphetamine, due to their potent psychostimulant and empathogenic effects [7]. Mephedrone

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