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Commentary on Popova et al (2017) Perceived harms and benefits of tobacco, marijuana, and electronic vaporisers among young adults in Colorado: Implications for health education and research.
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Title: Commentary on Popova et al. (2017): Co-used and co-administered tobacco and cannabis (marijuana) require further investigation.

Citable summary: Tobacco and cannabis can be used concurrently (i.e. co-use of cigarettes and cannabis) or simultaneously (i.e. co-administered within the same product). We need to investigate the combined use of tobacco and cannabis in greater depth in order to develop effective interventions for young adults.

Young adulthood represents a significant phase in the development of addiction, as the transition from occasional, experimental use of tobacco and cannabis into dependent, problematic use of both may occur during this period. Usage patterns of tobacco, nicotine and cannabis products are shifting constantly against the backdrop of evolving product ranges and increasing legalization of cannabis. The research community needs to keep pace in order to develop relevant and effective prevention and treatment interventions for this age group.

Popova et al. [1] provide a comprehensive and thought-provoking analysis of perceptions of tobacco, cannabis and electronic vaporizers. Their paper investigates the perceived relative harms of each and provides a framework of how young adults conceptualize these. However, it does not investigate the perceived combined impact of using tobacco and cannabis concurrently (i.e. co-use of cigarettes and cannabis) or simultaneously (i.e. co-administered within the same product).

The most common route of cannabis consumption across Europe, and in some parts of the world is with tobacco; that is, co-administered in a single product. In the United States it is smoked more commonly without tobacco, but co-use (i.e. use of both products but not simultaneously) is increasing across all age groups [2-4]. Popova et al. [1] do not detail the usage patterns of their interviewees, but evidence suggests that many US young adults do co-use [3].

Research investigating the bi-directional impacts of cannabis and tobacco is gaining traction. For example, both 'gateway' and 'reverse gateway' effects can lead to the development of dependency and/or problematic use [5-7]. Both substances, used simultaneously, can impact cognition [8] and

co-use leads to poorer psychosocial, cessation and health outcomes [9, 10]. Indeed the most significant and consistent positive association shown for co-use is exacerbation of mental health symptoms [11]. Nevertheless, the psychological and physical impact that each substance has on the other, and on the user, still requires further investigation. This seems crucial, given the high rates of young adult use among both European and world-wide co-users. In light of the current socio-political environment surrounding cannabis, the subsequent effect on tobacco use and cessation requires monitoring in longitudinal population surveys.

The qualitative evidence presented by Popova et al. [1] suggests that young adults may use one product to quit another. While evidence on the impact of co-use is provided by a number of survey studies [3, 4, 12, 13], we still know very little about users' perspectives on interchanging products, whether or not this occurs consciously, and what are the perceived outcomes for users.

To prevent young adults developing problematic use of either substance, we need to investigate what significant factors relate to co-use, and what motivates co-use and quit attempts. The natural history of co-use, cessation and the potential for the substitution effect of cannabis and tobacco [14] also requires exploration particularly from their perspective of the user [3, 4, 12]. Additionally, we need to know which quit methods are practised and appear feasible and effective, whether dual quit attempts are simultaneous or sequential and what role other products such as e-cigarettes (and cannabis vaporizers [15]) might play. To develop effective interventions, we also need to test whether existing theoretical frameworks such as the Behaviour Change Wheel [16] are relevant for characterizing co-use and assisting dual quit attempts.

The close relationship between tobacco and cannabis operates across multiple domains, including cultural and psychosocial, in addition to biochemical and clinical interactions. The complexity of this unique relationship is enhanced by the frequently shared route of administration, and we propose that this relationship requires investigation. Tobacco and cannabis must be considered hand in hand, as the impact and harms of both may be greater than the sum of their parts.

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