

Review of: "Exploring the Experiences and Perceptions of Young People's Recreational Nitrous Oxide Use"

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Potential competing interests: No potential competing interests to declare.

This investigation delved into the perceptions and experiences of young people's use of nitrous oxide recreationally with a cohort of Australian young adults. This is a necessary investigation given the oft-relegated aspect of inhalant/N₂O in lieu of research into more commonly abused substances. The paper does well to explain the background, their methods, and the presentation of their results. Overall, this investigation and associated paper will add to the dearth of research related to this type of substance use. I suggest a few very minor changes, including additional information and some word choices, be made prior to publication. Please see specific suggestions separated by section below.

General:

- The use of subscript to denote the chemical formula (N₂O as opposed to N2O) should be used in all instances consistently throughout the paper.
- There are a few extra spaces in some sentences within the document, particularly within the quotes and other places where a space is needed (e.g., pg. 10 "with participants reported'falling over" "experienced'*brain zap[s]*").
- Consistent capitalization of words and slang (e.g., "Nang" vs "nang" pg. 10); however, since these are quotes, I am unsure if the authors are directly reporting what the participants wrote or stated. Please use your discretion when addressing this critique.

Introduction:

- In the last sentence of the introduction, the authors should better define "positive and negative effects," as these may have the connotation of positive (symptoms or behaviors that are present that are not typically so) and negative (symptoms or behaviors that should be present but are not) as opposed to the way that it appears that the authors are using them (e.g., good or bad).
- Also in the last sentence of the introduction, the phrase "...motives for use..." should be removed as it is redundant with "...perceptions, **motives**, and experiences..." earlier within the sentence.

Methods:

- The authors state that they used "Snowball Sampling" and should state the number of individuals to whom this type of recruitment applied and the pairing between the participant IDs (possibly in Table 1). Additionally, the authors should address potential issues with this type of sampling (selection bias, similarity between reasoning, etc.) within the

strengths and limitations section.

Results:

- Some of the full quotes within the “nature of N₂O use” appear to overlap with the “perceptions of risk” category (e.g., “...there’s gonna be very limited oxygen you’re getting” & “...the more you do the quicker you lose oxygen and there’s been times where I’ve gone really blue... you’re pretty much passing out. The authors do well to discuss the overlap of their categories in the discussion; however, it may be beneficial to state somewhere in the methods that these categories are not mutually exclusive, given the exploratory nature and qualitative methods used for this study.
- The authors could provide some speculation related to the mechanism for the quote “a point where you only ever do two at a time because one would do nothing.” Would this likely be habituation/tolerance to N₂O, and if so, is this physical, mental, or likely a combination of both? This is of interest as it will impact how harm reduction strategies are created and what they target related to this component of N₂O use.
- The authors make a claim, “...demonstrating the competitive nature of N₂O may not be gender specific,” however, their participant sample only includes one female. While this was sufficiently addressed in the strengths and limitations section, it may be beneficial for the authors to state that, “more research related to this is necessary,” following this statement, given the gender dispersion of the sample.
- The phrase “Whilst five in seven participants....” should be changed to “Whilst five of the seven participants...” as this impacts the interpretation and generalization of this information.
- The claim, “It also highlights that young people’s use of N₂O is not entirely driven by its accessibility,” is a strong claim given previous investigations into inhalants generally (including some that the authors reference later in the discussion, e.g., Grigg and Lenton 2020). This may also be a result of the older sample that was collected in this study and their continued usage at these age ranges. Use is higher for 12-15-year-olds than older age brackets and declines while other substances rise in usage. It has been speculated that people transition from inhalants to other drugs of abuse as they age, somewhat related to inhalant’s availability. This may also be related to the focus on N₂O specifically as opposed to inhalants more generally. Readers may benefit from the authors providing some more context related to this claim, although it does align with the presented data.
- There is an extra comma in the following sentence, “...reduced concentration, and memory, and burns and infections.” The comma behind concentration should be removed as the authors intend that reduced concentration **and** memory are one component in their serial list, similar to that of “burns and infections.”
- Pg 10, I suggest slightly tempering the language of this statement from, “This suggests indifference towards....” to “This suggests ambivalence towards...”
- Include the word “use” in the following sentence, “These effects were stated to occur when N₂O **use** was...”
- It was stated that, “When asked if participants would do nangs in the future, most answered yes,” and it may be beneficial to state the proportion or ratio of your sample following most (e.g., 4/7 – 6/7) if the data is available or all participants were asked this question. If not all participants were asked, then please leave as it is currently stated.

Discussion:

- The authors state, “However, the findings from the present study identify three core factors (Figure 1) that underpin N₂O consumption.” However, I am struggling to observe the three core factors in the figure that the authors are referencing. The components that the authors intend to highlight in the figure should be better denoted within the figure.
- When discussing the “amusing effects of watching friends use N₂O or the act of doing a nang at the same time,” the component of competition that was mentioned within the results should also be mentioned in relation to social factors of use, as this may result in riskier behavior.

Strengths and Limitations :

- See previous comments related to snowball sampling.

Conclusion

- One of the points that was emphasized in the conclusion “with social risks overriding physical risks” is good and especially important for strategizing the mitigation of harm; however, it should be discussed more directly within the discussion.

Tables & Figures:

- Table 1:
 - The column “identify as first nations” may not be needed. There were no First Nation people in the study, and this information, as well as whether you wanted to convey that two participants (4 & 5) could be stated in a sentence within the results section, could be stated in a sentence within the results section.
- Figure 1:
 - There should be a figure description that better encapsulates what the figure conveys and the key components that the authors intend the reader to focus upon.