Reviewer’s report

Title: An exploration of the dynamic longitudinal relationship between mental health and alcohol consumption: a prospective cohort study

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Reviewer: Emilio Ferrer

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An exploration of the dynamic longitudinal relationship between mental health and alcohol consumption: a prospective cohort study (BMC Medicine_Review)

This paper describes analyses examining the longitudinal interrelations between alcohol consumption and mental health in a large sample of adults. To investigate such interrelations, the authors used a bivariate latent change model suited to capture changes in alcohol consumption and mental health as well as lagged sequences between both processes.

The paper is methodologically sound, including a large longitudinal sample with repeated measurements and a strong analytic approach. The authors provide plenty of analytic details so readers can get a proper sense of the statistics and numerical results. They also include a reasonable interpretation of their findings in the context of some (yet rather limited) current literature and public policy.

Main Comments

There are several issues that I think the authors could address to strengthen this paper. First, the introduction is rather brief and lacks a theoretical framework from which hypotheses can be derived. The authors mention that the purpose of the paper is to compare competing theoretical models but, again, these are not described in the manuscript. It would be important to articulate some theoretical model to set the stage of the study and define specific hypotheses. This is also the case with the covariates. The possibilities that the authors describe regarding covariates are all reasonable, but it would make sense to articulate hypotheses from theory.

Participants who had not consumed alcohol in the year before baseline or those with missing values for either alcohol consumption or mental health variables at baseline were excluded from the analytic sample. One can argue that if these two processes are linked, this sample selection is likely to bias the results, as it is omitting people with certain behaviors (perhaps, they are healthier). There are methods such as two-part models that can handle the issue of having zeros for some of the processes (e.g., alcohol) and accommodate the entire sample.

I appreciate the authors’ effort to be comprehensive in their reporting of results. The tables, however, are rather busy and I wonder if the readers of this journal are interested in all these details. I would suggest that the authors have a first
table with just model fit across all specifications. In a separate table they can then include the estimates for the best-fitting model only. They could also include a few key estimates for all the models as well, but not so many, and not in so much detail. All the details could be included as supplementary material.

In all models, the intercept estimate for MCS reflects the observed initial value, approximately, which makes sense. But this is not the case for alcohol (17.15 vs. 14.6). I'm wondering why this discrepancy, which is true across all models. In a growth curve, this could be due to a lack of centering the slope, but the reason in this model is not evident.

Other Comments
Would it make sense to examine the separate effects of each type of alcohol?

The ellipsoid should contain 95% (or any other %) of all the data, not just data at baseline.

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests