Author's response to reviews

Title: Exploring comorbid use of marijuana, tobacco, and alcohol among 14 to 15-year-olds: Findings from a national survey on adolescent substance use

Authors:

Joanna White (j.white@hpa.org.nz)
Darren Walton (d.walton@hpa.org.nz)
Natalie Walker (n.walker@nihi.auckland.ac.nz)

Version: 7 Date: 20 February 2015

Author's response to reviews: see over
Author’s response to reviews

Title: Exploring comorbid use of marijuana, tobacco, and alcohol among 14 to 15-year-olds: Findings from a national survey on adolescent substance use

Authors:
Joanna White (j.white@hpa.org.nz)
Darren Walton (d.walton@hpa.org.nz)
Natalie Walker (n.walker@nihi.auckland.ac.nz)

Version: 6 Date: 20 February 2015

Author’s response to reviews: see over
February 20, 2015

Dear Biomed Central Editorial Team


Thank you very much for your letter of January 7, 2015 inviting us to revise and resubmit the above manuscript for consideration in BMC Public Health. We are pleased that all reviewers have felt this is an article of importance in its field.

In addition to this cover letter, I have also attached a full version of the revised manuscript (with track changes applied).

Our point-by-point response to the comments raised by the reviewers is appended to this cover letter. We thank the reviewers for their thoughtful and helpful suggestions. As you notice, we have agreed with all comments raised. I feel the manuscript has certainly improved, and hope that you will find the revision acceptable.

Sincerely,

Joanna White
j.white@hpa.org.nz
In response to my prior question on what harm arose from comorbid substance use, the authors utilized the term “behaviour frequency” and referred to it as an indication of harm. I find this terminology non-intuitive. In the substance use literature, harm from substance use is typically referring to consequences. So for example, binge drinking might lead to harmful consequences such as drunk driving, withdrawal symptoms, difficulty with relationships, or alternatively psychopathology or poor school performance. In the first part of the current analysis, the authors (as I understand it) tested whether using more types of substances was associated with greater level of use of each type of substance. First, I’m not sure how meaningful this finding is, as it is in a way using substance use (co-occurrence) to predict substance use (frequency), which seems a bit tautological. Second, if the authors decide to keep this analysis and present this finding, I think they need to adjust their language (a. specify what type of behaviour you are talking about when using the term “behaviour frequency”—or drop this term entirely, and b. drop the “harm” terminology) and justify why this analysis is important.

We feel it is useful to consider the relationship between behaviour frequency (as a proxy for risk of subsequent harm; eg, smoking frequency leads to greater addiction) and comorbidity as further evidence for the resulting harm of comorbid substance use. Our findings support the meaningfulness of this analysis as it allows us to profile different substance using groups; while only around half of those who engaged in binge drinking also used another substance, those who did so were more likely to binge drink more frequently.

In saying this, we agree that it is important to better clarify this study aim and to justify why this analysis is important. We have now included further text in the third paragraph of the introduction, “Further evidence for the resulting harm associated with comorbid substance use in adolescence comes from studies which show that it is related to frequency of substance use. Adolescents who engage in more frequent marijuana use, tobacco use and binge drinking are at greater risk of negative outcomes such as poor mental health and school performance [12], addiction [2], and engagement in other health risk behaviours [3].” (lines 70-74).

The second aim of the study is now described as, “to examine the relationship between the frequency of marijuana use, tobacco use and binge drinking and the comorbid combination of these behaviours” (lines 91-92).

Please note that the manuscript no longer refers to the hierarchical harm scale. On the advice of Reviewer 1 we have
<table>
<thead>
<tr>
<th></th>
<th>replaced the hierarchical harm scale with a simplified scale that groups the dependent measure into whether 0, 1, 2 or 3 behaviours were present. (This change is discussed in more detail below.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I like the authors’ change from using “alcohol use” to “binge drinking”, as it is more accurate. I suppose the authors can similarly change “alcohol consumption” into “binge drinking” (potentially with a new citation) in the first paragraph of the introduction. I think this would further improve the paper.</td>
</tr>
<tr>
<td>1</td>
<td>Despite the authors’ citation of a previous paper by Waa et al. (2011), I am not convinced that the two parenting items can be combined. Parental monitoring/knowledge is a distinct and well-established construct in the literature which reflects the parent-adolescent relationship (so that, for instance, the adolescent would disclose where he/she is going). The parental rule enforcement item seems vaguely termed and not conceptually overlapping with monitoring/knowledge. For example, what does “trouble” mean? It could well be “rule enforcement” based on a good behavior plan. Alternatively, it can possibly mean that a parent gets deregulated and yell at the adolescent. The authors need to both conceptually and statistically make a case for combining the two items if they wish to keep the current approach (i.e., include correlation between the two items at the very minimum, and then state how the two items are conceptually linked). Ideally, the authors would present analyses with the two parenting items separated (footnote this) and see if the results converge or not. Then, the authors can decide whether to use both items combined or separately, or even just use one and drop</td>
</tr>
<tr>
<td></td>
<td>We have now presented each of the parenting items separately (lines 40, 161-167, 234, 260; Tables 2 and 3). We decided to retain all three parenting items in the paper as all showed significant associations with comorbid substance use in the adjusted ordinal logistic regression model. We thank the reviewer for this suggestion and feel it is useful to distinguish the range of parental items associated with comorbid substance use.</td>
</tr>
<tr>
<td>1</td>
<td>Reasons for a Statistical Review: The “harm hierarchy” is presented on page 8 of the revised manuscript. It appears that over 75% of the students endorsed no substance use in the past month. In other words, the distribution of this hierarchy is zero-inflated. Are ordinal and multinominal logistic regressions robust in this situation? More importantly, some of the categories have very small percentages (e.g., only marijuana smoking = 1.8%, and tobacco and marijuana smoking = 1.4%). I believe a person-centered analytic approach such as latent class analysis would be ideal in identifying subgroups of students who have different degrees of substance use and potentially avoid very small categories. The question then becomes whether the current analytic approach is acceptable, and whether the small percentages in the middle of the ordinal scale would lead to unstable/unreliable model estimation. We thank the reviewer for drawing this to our attention and have given this suggestion detailed consideration. Following the reviewer’s comments we tested alternative configurations of the dependent variable and different types of models (including dichotomised logistic regression and multinomial logistic regression). We found that by grouping the dependent variable into whether respondents had engaged in none, one, two or three behaviours gave us a model that fit the data better than the original model, and which met the proportional odds assumption (being the main assumption for ordinal logistic regression models). The model is described on lines 181-184. We feel this model is robust because the set of predictor variables and their associations with comorbid substance use have remained essentially the same regardless of model used; except for gender, which has now become significant. We feel it is important to use an ordinal model to take advantage of the ordinal nature of the data and for ease of interpretation.</td>
</tr>
<tr>
<td>4</td>
<td>The first objective of the paper is to estimate prevalence. It is impossible to calculate prevalence for a national sample without the use of population weights. If the authors want to calculate the prevalence of use in the Nation, the need to correct the estimates by the use of population weight. All the analysis should use the survey commands of Stata, to include the weights. We would like to assure the reviewer that our population estimates are indeed weighted using Stata’s survey command (svy). We agree that it is important to clarify this in the manuscript. We have modified the text in the first paragraph of the analysis section to, “The sample was weighted to adjust for non-response, selection probability and to match the sample’s gender and ethnicity breakdown with the total for all New Zealand Year 10 students. Weighted population estimates were calculated for substance use behaviour prevalence and the outcome measures.</td>
</tr>
</tbody>
</table>
|   | Ninety-five percent confidence intervals (95% CI) were calculated using jack-knife variance estimation” (lines 172-176).
We also now clarify that the estimates are weighted proportion estimates in the results section (lines 199, 201, 215) and in Tables 1-3. We also now include the 95% confidence intervals for the estimated prevalence of comorbid substance use configurations (lines 206-213). |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Since the authors are aiming to estimate a national prevalence, a detailed description of sampling should be included (in deep details), since they will only obtain correct prevalence with a correct national sample. The reader must have data to decide if it is a real representative sample.</td>
</tr>
<tr>
<td></td>
<td>We have modified the text in the participants and sampling procedure section to describe the sampling procedure in greater detail, “The YIS uses a two-stage cluster sample design to obtain a nationally representative sample of New Zealand Year 10 students (predominantly 14 and 15-year-olds). A sample of 186 schools was randomly drawn from the list of all eligible schools with Year 10 students in New Zealand. Probability of school selection was proportional to roll size. One Year 10 class in each sample school was then randomly drawn from a list of all mutually exclusive Year 10 classes. Each Year 10 student had only one chance to participate and an equal opportunity of selection. All students in selected classes were invited to participate. Further detail on the YIS methodology is described in a methodology report [23]” (lines 114-123).</td>
</tr>
<tr>
<td>4</td>
<td>In epidemiological studies it is important to include the exact p value in the table, not an approximation in the foot note.</td>
</tr>
<tr>
<td></td>
<td>We have now included the exact p values in Tables 4 and 5.</td>
</tr>
</tbody>
</table>