Author’s response to reviews

Title: Exploring the factors affecting the implementation of tobacco and substance use interventions within a secondary school setting: a systematic review

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Authors (GW, TF, ELG, DNB) Responses to Reviewers Comments

Reviewer 1:

Comment: The authors have conducted a research synthesis review (described by the authors as a "narrative approach to synthesis" in one section) comprised of 15 quantitative and qualitative studies of school-based implementation outcomes and, in some instances, the factors influencing implementation outcomes. They draw on a number of elements of systematic reviews (reference to PRISMA, designation of criteria for assessing the quality of quantitative and qualitative studies). While the authors refer to the term systematic review in the title of their paper and throughout the text, this raises questions as to how best to designate the study - is it a systematic review, a research synthesis, or narrative review?

Since the 15 studies included are so disparate in content and methods, making it difficult to discern the relative importance of findings, designation of the work as a systematic review may not be warranted. In summary, it is possible to conduct a review systematically without it being a systematic review.

Given that the review includes: both quantitative and qualitative studies; with content of interventions ranging from tobacco, to alcohol, to other drugs, or some combination of these (not always specified in the paper); and intervention approaches delivered by a variety of personnel
(teachers, police, research project team members), it is very difficult to identify key findings that clearly indicate what approaches may be most evidence-informed or potentially effective in influencing implementation outcomes.

However, the authors may want to situate their review by drawing back from attempts to use components of systematic reviews when they may not be warranted - better to call in a narrative review, a synthesis, a scoping review or whatever the most appropriate description fits best with some of the limitations identified here.

Response: The review has been conducted systematically and has followed the structure of a systematic review adhering to the PRISMA guidelines; therefore we have changed the text to reflect this (page 5, line 147 and page 18, line 561).

The disparity in results is due to the limited evidence in this area and there are not enough papers to limit it to just alcohol interventions for example, or to focus on a specific school-based provider, but it was thought to be of use to summarize and review the findings generally.

However, the reviewer’s comment on this is valuable. In response, we have redeveloped the summary tables (pages 32-37) to more clearly report the key aspects of each study in relation to the (more clearly stated) review aim (page 5, lines 140-143), and to facilitate comparison across the studies for the reader to better judge the relevance of the included papers.

We’d argue this is a systematic review, as it followed the standard systematic review practice. The title is based on methodology and not on number of included studies. The method used was a standard qualitative narrative synthesis, which is appropriate for a qualitative systematic review.

Comment: I did not find the paper to be particularly easy to read. Parts of the paper lacked clarity (a few examples are raised below) but, more than that, the attempt to use the template for Normalization Process Theory, though potentially useful, did not seem to contribute to the review, but added yet another set of classifications that contributed to its complexity. Since, as the authors point out, the various studies were very heterogeneous, this makes the use of such classification designations limited.
Examples of lack of clarity include:

- page 4, line 37, "factors affecting the embedding of substance use interventions".
- page 7, line 41, "There was also a paper...". Perhaps say, "... an additional paper...".
- page 8, line 21, "The weakest papers...". Perhaps say, "The papers considered to be weakest...".
- page 9, line 4, "...there was no difference to whether other teachers...". Perhaps say, "...there was no difference as to whether....".
- Several locations in the paper the authors treat data as singular (e.g., data was, data is). These should read as data were, data are, etc.

Response:

We acknowledge in hindsight that the use of NPT as an organizing framework at the level of 16 domains was unduly complex for readers unfamiliar with the theory, made additionally complex by categorizing papers again by implementation outcomes. We thank the reviewer for these constructive comments and have restructured the results section entirely in response (pages 8-14, lines 246-425).

We have removed the classification by implementation outcomes and factors affecting implementation. We have now presented the findings regarding factors affecting implementation organized at the level of the 4 NPT constructs (pages 8-14, lines 246-425).

We have also addressed the issue of heterogeneity in the text (page 14, lines 428-445, and pages 18-19, lines 566-576).

All specific comments relating to clarity have been changed as requested.

Comment: It is not entirely clear exactly how the current review is positioned relative to existing scientific literature regarding implementation outcomes, and factors associated with these, in relation to substance use interventions or related school-based interventions (physical activity, nutrition, sexual health). That is, what is the context of previous conceptual and empirical work in this area and how does that represent a gap in understanding that the current review addresses? Also related to context is the importance of mentioning that much of the earlier empirical findings in reviews of the effects of tobacco, alcohol and drug education programs did not
indicate it to be effective (or in some studies increased use). While this question is beyond the scope of the present review, it is nevertheless important contextual information that would add to both the introduction/background and discussion sections.

I found the Background section to be particularly limited in setting the stage for the methods and results of the review. Even the initial rationale statement is limited, since adverse health behaviors are not just "likely to be established" and "tracked" in adolescence but this is also an important life stage for experimenting and making decisions regarding some of these behaviors. This is an example of additional material that may serve to strengthen the Background section.

Response: We agreed that the background was limited- this was largely due to the restricted word count. However, by reducing the word count in the results section, it has allowed for further detail in the background and discussion. The paper is now 100 words over the Implementation Science word count for a systematic review, but we felt to address all reviewers comments this was necessary.

We have addressed the literature review by adding detail on school based substance use interventions (page 3, lines 81-98).

We have added a comment in the background section on experimentation, as requested (page 3, lines 74-79).

Comment: The Methods section identifies many of the characteristics and criteria influencing eligibility of studies for the review. The initial description in this section would read with greater clarity if written in a narrative (paragraph) style as opposed to simply using short categories (inclusion criteria, etc.).

In the list of key words described in the search strategy, there did not appear to be any specific listing of tobacco, alcohol, drugs or substance use. Are the authors confident that the most relevant studies were included in these content areas?
Response: The criteria have been written in a narrative style as requested (page 5, lines 150-160).

We are confident all relevant studies have been included at the point of searching, as the key search words for schools and implementation sought to highlight all of the papers relating to implementation in secondary schools. They were then reduced by focusing on substance use.

Additionally, all of the ‘gold standard’ papers found in scoping searches were identified in the final searches.

Comment: As mentioned above, the Results section is overly long and very descriptive, perhaps because the authors devoted considerable space to describing individual studies - material that for the most part is covered in the Table. The authors may wish to consider describing the most salient findings in this section and refer the reader to the tables for additional descriptive details. Also, as mentioned earlier, the heterogeneity of the 15 studies makes it difficult to interpret those findings that may be important but need to be considered as inconclusive at present.

Response: As previously stated the results have been rewritten and reorganized to further reduce duplication of reporting across sections (pages 8-14, lines 246-425), and the summary table, Table 3 (pages 32-37), has been redeveloped to include more of the key study details to ensure it is clear to readers which intervention is being focused on and to save space in the results section.

The discussion has also been rewritten (pages 14-18, lines 427-554), and includes further comments on the limitations of the review (pages 18-19, lines 556-582).

Comment: The Discussion section presents some interesting summary findings, though they may be better reported in the Results section, as mentioned. Some implications for school policy and practice are raised though, again, they must be considered tentative given the diversity of methods and content areas reviewed in the studies. In the limitations section the authors should expand on the issue of heterogeneity and discuss related limitations regarding the difficulty of assessing multiple topics and greatly different interventions and methods used to describe them.

Response: As mentioned, the discussion has been rewritten to address this comment and to move away from the discussion simply reporting results (pages 14-18, lines 427-554).
Comments have been added about the results being tentative, as requested, and has emphasized that this will be further explored in future work (page 18, lines 567-8).

We expanded on the issue of heterogeneity in the limitations section (pages 18-19, lines 566-576).

Reviewer Two:

Thank you for the opportunity to review this manuscript that reports the results of a systematic review focusing on the implementation of substance use interventions within secondary school settings. The manuscript takes on an important topic and incorporates a theory-drive approach to analyzing the data. However, the research questions are not clearly articulated and the paper is somewhat difficult to read as it includes a fair amount of jargon and lacks a clear structure. Moreover, its overall contributions to the field of implementation science are not particularly clear. I have several suggestions that I believe could potentially improve the manuscript.

Comment: 1) The overall research question(s) that this study is attempting to address could be made much more clear.

The authors' stated aim to "develop an understanding of the factors affecting implementation of substance use interventions in the secondary school setting" is broad. I initially read this as a study to identify determinants of implementation specific to these settings; however, the review seems to focus on both implementation strategies and determinants without being particularly clear about when the focus shifts to focus on one or the other.

Response: The aim has been modified to emphasize that the review was aiming to ‘identify and synthesize the factors affecting implementation’ (page 5, lines 140-143).
The article has been checked to ensure the focus of this has been maintained throughout the paper.

Comment: 2) The introduction is very underdeveloped.

a. The authors should consider making a stronger argument for why the implementation of substance use prevention interventions in secondary school settings is unique, which would help set this systematic review apart from other more general reviews that comprehensively document determinants (Flottorp et al., 2013) or review the effectiveness of implementation strategies.

b. It would have been helpful to have some review of the types of interventions that are being implemented in secondary school settings, the extent to which they are backed by a robust evidence base, and any studies that demonstrate that they are not often implemented well.

c. It would be helpful if the authors provided some background about what has been learned from the broader implementation literature about barriers and facilitators (if that is the focus of this review) and/or implementation strategies (to the extent to which that is also a focus).

d. More context for the use of Normalization Process Theory is needed. First, it is important to understand why the authors chose to use this theory to guide the review. What makes it an appropriate choice, and how specifically will it be used to provide structure to the data collection and analysis within this study. Were other frameworks considered, and if so, why was NPT chosen? Note that I am not suggesting it is inappropriate, but that the authors need to communicate to the reader why and how it was used. Second, more attention to actually describing NPT is needed, so that readers can understand the theory and how it is guiding the current review.

Response: As per reviewer one comments, we have expanded on the rationale as to why this review is important in relation to the previous work in the field, leading to the background being rewritten (pages 3-5, lines 67-137).
A greater level of context has been provided for the use of NPT and the background seeks to describe the theory and how it was used as an analytical framework. A table has been added, Table 1, to show the different NPT constructs (page 30), and more explanation has been added to why it was used (pages 4-5, lines 119-137).

These additions combined with a simpler use of the NPT as an analytical framework (reduced to the four key construct categories, rather than the 16 detailed domains), we feel the value of using NPT to frame the synthesis is now more evident.

Comment: 3) I was not able to access the PRISMA diagram through the submission site or through the included manuscript; however, the number of studies included seemed rather low to me given that the inclusion criteria were rather broad. I would like to see more attention given to that and some explanation of the small number of studies. Presumably the PRISMA diagram would provide the excluded studies and reasons for exclusion.

Response: We apologize for an inaccessible PRISMA diagram, although this was provided in the submission process. The same figure, using the standard PRISMA diagram template will be reattached.

Pre-review, scoping searches were conducted and it was identified that the number of papers was likely to be limited; therefore we were not surprised by the final number of eligible papers.

Comment: 4) The beginning section of the results section and the way that papers are actually categorized was unclear. The authors reference Proctor et al.'s (2011) implementation outcomes; however, they include categories that fall outside of that taxonomy (e.g., evaluation). They also talk about "factors affecting implementation, such as provider perceptions or organizational factors, guided by the implementation outcomes work by Proctor et al." This was unclear to me, and in my view, actually made the results section rather difficult to read. The authors might consider a different a more intuitive way of organizing the results, as this seems pieced together in an incoherent way. In my view, part of this stems from the fundamental problem that there is a lack of a clear research question (or set of questions).
Response: As both reviewers discussed this, we all agreed that this classification by implementation outcomes did not help with reporting the findings, and we have therefore omitted this from the restructured results section that was suggested by reviewer one. Therefore, the results section has been rewritten (pages 8-14, lines 246-425).

Comment: 5) The description of the included studies is incomplete. The specific data that should be extracted depends upon the research questions; however, it is impossible for the reader to glean any information about critical components of implementation research.

First, I wasn't able to understand the research questions being asked in the included studies.

Second, I was not able to understand the specific interventions that were implemented (i.e., what was implemented).

Third, I was not able to understand the implementation strategies that were used (if any) to implement the substance use prevention interventions (i.e., how they were implemented).

Finally, it was not easy to determine the specific outcomes that were assessed without combing through the key results narrative. It would be helpful if all four of these components were presented in more detail, using existing taxonomies of interventions, implementation strategies, and outcomes as well as standards for reporting these interventions as appropriate.

Response: The summary table, Table 3, has been modified to reflect the research questions. Also a column has been added in Table 3 to make clear how each paper stated they were assessing/measuring implementation (pages 32-37).

Through the addition of a column in Table 3 we have more clearly identified the type of intervention being implemented. The initial results statement in the paper has been modified to identify how many of each type of paper there are (page 8, lines 225-228).
Many papers did not report the use of implementation strategies and so we were unable to go into detail on this, but a statement was added to reflect this in the results section (page 8, lines 229-230).

By clarifying that the paper aims to assess the factors affecting implementation (page 5, lines 140-143), the results column in the summary table has been modified to focus on these (pages 32-37).

Comment: 6) In terms of clarity of presentation, I might suggest that after clarifying the research questions, the authors reorganize the results section. For example, if the authors’ purpose is to convey specific determinants that influenced implementation and NPT is an organizing structure, it may be helpful to go through each of the NPT toolkit steps. That would provide the opportunity (either in the introduction or results section) to provide a brief introduction to the steps, and then synthesize findings across the studies that are relevant to that particular step.

Response: The results have been reorganized using the four NPT constructs, instead of using the toolkit (pages 8-14, lines 246-425). This hopefully increases the clarity of the results for readers.

Comment:
7) I would recommend a table that synthesizes results according to a theoretical framework (NPT or another framework such as CFIR, TDF, or Flottorp et al., 2013).

Response: A table has been added that synthesizes by NPT, Table 4 (pages 38-39).

Comment: 8) I would recommend that any data extraction forms be made available as supplementary files.

Response: These will be added with the submission.
Comment: 9) The discussion section is thin and does not connect the findings to the extant literature aside from doing so in a very cursory way with references to the the Greenhalgh review. I would recommend expanding the discussion and paying particular attention to what this review adds in the way of findings about barriers/facilitators and/or implementation strategies. Much like I would like to see in the introduction, it would be helpful if specific links were made to what is unique about implementing both substance use prevention interventions and in schools. In my view, there is a fair about mot literature in both areas that is not referenced in this review, which limits the readers' understanding of the broader context and value of the review.

Response: The discussion has been rewritten to reflect these comments and similar comments from reviewer one (pages 14-18, lines 427-554).

Comment: 10) Similar to the comment above, the authors mention wanting to develop a conceptual framework for implementation in schools (or perhaps implementing substance use prevention interventions in schools). Some frameworks already exist that may be relevant, including one specific to schools (Domitrovich et al., 2008) and one specific to public service sector settings (Aarons, Hurlburt, & Horwitz, 2011). It might be helpful to reference these either in this paper or moving forward with this line of research.

Response: Thank you for the useful references. The Domitrovich framework has been referenced in the review (page 4, lines 110-111 and page 19, lines 599-600), and both will be used in the future progression of the work.

Comment: 11) It would be helpful to give readers a sense of how these findings will be used to inform future research. Being explicit about what is new or extends our knowledge of implementation determinants, strategies, or methods, and linking these insights into implications for future research efforts may be helpful.

Response: The discussion has been rewritten to have a greater focus on novel elements (pages 14-18, lines 427-554) and has been linked to how it has informed future work by using NPT to identify not only key areas but gaps in the knowledge (pages 17-18, lines 526-554).
Comment: 12) The authors might consider removing jargon to the extent possible, including referencing the numbers of the NPT toolkit throughout the manuscript. The manuscript also needs to be proofread for minor errors/typos.

Response: The use of the toolkit was removed. The results are now written taking into account the four NPT constructs (pages 8-14, lines 246-425), which is supported by the addition of Table 1 (page 30).

Further proofreading for typos has been undertaken.