Dear Editor

Re: Manuscript NO: 30131-manuscript revision

Reviewer response letter for "Consequences of bullying victimization in childhood and adolescence: A systematic review and meta-analysis"

Thank you for the opportunity to revise this manuscript. We thank the reviewers for their comments which we believe have improved the paper.

The manuscript has been reformatted as requested with the references changed to the journal style. There are some references for which a DOI and a PMID were unavailable generally when these were books.

We have submitted a word version of Figure 1 the PRISMA flow chart as requested.

Please note that we have also submitted a supplementary material file which contains supplementary material and figures.

Below are the responses to each of the suggestions provided by the reviewers.

Kind Regards

James Scott

Associate Professor

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Measurement of Bullying: Reviewers 1 and 2

1. How is it possible to measure bullying in an objective way - in particular, in a retrospective study? - how reliable are individual memories regarding bullying? (Reviewer 1)
2. How was the bullying is assessed? Is there any objective or subjective measures for that? (Reviewer 2).
3. How is the severity of the bullying measured, especially in retrospective studies? (Reviewer 2)

Response:. Measurement of bullying is a challenge and there is a lot of debate as to how this should be done. We have stated this with existing text in the introduction.

"*While contextual and cultural differences influence prevalence estimates [17], this variation is most frequently explained by differences in measurement strategy [18-20]. As a result, researchers continue to call for greater consensus in the definition and measurement of bullying behaviours* [17, 21, 22]".

To address the specific comments of the two reviewers, we have revised the limitation section of the manuscript to further highlight this issue. This section now reads "*Additionally inconsistencies would have occurred in the analysis due to methodological differences in the way bullying victimization is defined and measured throughout the studies as there is no consensus on the best way to measure bullying victimization* [18, 19]. ***In order to address this, a quality effects model was used giving higher scores to those studies which provided respondents with a definition and utilised a validated measure of bullying.*** *There are also methodological issues in regards to the adverse outcomes reported, as some have been self-reported, while others were reported by teachers, parents, clinicians or through objective measures. This issue was also addressed with the use of a quality effects model in which studies using well-validated and standardised diagnostic instruments to assess the outcome were assigned a higher quality score than those where outcomes were self-reported on a non-validated scale* [44]. ***In spite of this methodology, the assessment of exposure to bullying and the assessment of a wide range of outcomes remains a challenge. In particular, there will always be some uncertainty pertaining to the measurement of bullying, especially when retrospectively reported as a result of the respondent's subjective perception of the actions and behaviours of others***."

4. What are acute biological-psychological effects of bullying like stress reactions etc.? (Reviewer 1)

Response: Whilst this is an interesting question, our systematic review did not identify any studies reporting these acute responses. As such, we cannot comment on the acute effects of bullying in relation to causing stress reactions, acute stress disorder or biological responses in the acute phase.

5. Further, the question whether there might be a psychological disposition making children prone both to victimization and to drug addiction or other psychosocial health problems, thus indicating a non-causal correlation between victimization and health problems, should be mentioned in the introduction, not only in the discussion. (Reviewer 1)

Response: Thank you for this suggestion to raise this in the introduction so readers may consider alternative explanations for associations other than just a causal association. We have added the following text to the introduction **"*It is plausible that there are factors which predispose individuals to being bullied in childhood but independently also increase the risk of adverse health and other psychosocial problems. Rigorous appraisal of the literature is required to consider both the possibility of a causal association but also other plausible explanations for any significant associations*."**

6. The authors stress that they included data from high- as well as low income countries – I wonder: were there any differences? Where cultural differences visible?

Response: We are unable to comment on cross cultural differences however, using the World Bank classification system, we undertook a meta analysis comparing the association between bullying and depression, anxiety, suicide ideation, suicide attempts, illicit drugs and alcohol in high income versus low-to-middle- income countries. There were only 22 studies in total that were classified as low-to-middle-income. Similar odds of developing depression and other mental health outcomes were observed in high- and low-to-middle income countries except for illicit drug use were association was stronger in low-to-middle income countries. We had not presented these results but, in response to reviewer's comment, we have now added these results to Tables and text and also updated the methods section.

7. Did any of the papers looked if the victims were a bully themselves or not and did that affect the result or not?

Response: This is an important issue as it is recognised that some who are victimised are also bullied. This study did not aim to examine this, nor did many studies report where people were both victims and perpetrators. We have reported this in the limitations.

"*The majority of studies included in this meta-analysis did not identify individuals who were both victims and perpetrators of bullying. Previous research has suggested those who are both perpetrators and victims are at even greater risk of adverse mental health outcomes [28] however we were unable to confirm this with the current study*. "

8. You have mentioned 'sometimes bullied' and 'frequently bullied', how were these 2 measured in the studies.

Response: The severity of bullying in the sub-group analysis was classified in the following way. If a study included in the meta-analysis reported the participant had been bullied at least once a month (which would also include more frequent bullying as for example weekly), our study categorised this bullying which occurred at least once a month as 'frequently bullied'. If the study reported bullying less than once a month, they were included as 'sometimes bullied'. Many of the studies included in the meta-analysis did not specify a dosage, rather they asked the participant if they

had been bullied in a particular time period but not how often. These studies were not included in the sub-group analysis.

We have now updated the methods section as follows:

"Furthermore, in order to address the effects of important study characteristics and explore heterogeneity this study conducted subgroup analyses, dependent on data availability, for sex of participants in the sample, ***geographic location and income level (high income versus low-to-middle income), severity of the bullying (frequent – at least once a month, versus sometimes – less than once a month****), age of bullying victimization (before 13 years of age versus after 13 years of age), and type of study (prospective versus cross-sectional)."*