Author’s response to reviews

Title: The Effect of Social Norm-based Intervention with Observable Behaviour on Physical Activity among Adolescents: A Randomized Controlled Trial

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Author’s response to reviews:

12th August 2020
To,
Dear Dr. Ciarán Martin Fitzpatrick
Editor

Dear Dr. Ciarán Martin Fitzpatrick,
Thank you for giving us the opportunity to revise and resubmit our manuscript. Please find below our responses to the helpful comments from the reviewers. The newly added or revised text is highlighted in yellow in the revised manuscript.

REVIEWER COMMENTS:
Reviewer 1:
This is a well structured and clearly written manuscript. I only have some minor comments.
Comment #1:
1. The introduction of the background is very short. One sentence about the background would be helpful.
Response #1:
We added a sentence in the abstract to include background information.
Background: The rising prevalence of childhood obesity in developing and developed countries poses a major public health challenge to policy makers and an effective strategy to promote physical activity among adolescents is warranted. This study aimed to evaluate the effectiveness of providing descriptive norms messages with personal identification in promoting physical activity among adolescents by measuring step counts via a randomized controlled trial (NCT03081013).

Comment #2:
2. Conclusions: this is more a repletion of the results than a conclusion. Interesting would be what the authors conclude out of their results.

Response #2:
We have revised the conclusion in the abstract section as follows. The highlighted portion is the newly added text.

Conclusions: Our findings indicated that the effect of providing descriptive norms messages containing personal identification on physical activity promotion was not evident in the main analysis. Future studies may consider using a more relevant reference group to use social norms as a tool to increase physical activity among adolescents.

Comment #3:
3. line 95: there is a reference missing.
Response #3:
We have provided a reference for the relevant sentence: Sharps M., Robinson E. Perceived eating norms and vegetable consumption in children. International Journal of Behavioral Nutrition and Physical Activity. 2015;12(1):135. The reference list has been updated.

Comment #4:
4. line 136 + 137: there are spaces missing before the references.
Response #4:
We have included spaces before the references. Please see below:

We hypothesized that, among those in Onymous Arm, girls and those who know other participants in their group will be more likely to be in a trajectory with increasing step counts because perceived peer pressure tends to be stronger among females than among males (22, 23) and among those who know each other compared to those who do not (24).

Comment #5:
5. Why did the authors not include a "passive" control group not receiving any ranked feedback?
Response #5:
The “passive” control group not receiving any ranked feedback was not included as the aim of the study was to compare the effectiveness of providing norm-based messages in an observable manner (Onymous) vs. when it was provided in a non-observable manner (Anonymous). We also needed to use the limited funding most effectively to answer the research question.

Comment #6:
6. line 216: This paragraph should be checked for grammar (Asian Adolescent depression Scale)?
Response #6:
We have revised the text as follows:

Asian Adolescent Depression Scale (AADS): Depressive symptoms were measured using AADS, a 20-item instrument that was developed in Singapore to assess depression among adolescents(32), and has been successfully used in other studies.(33) The total score is the sum of the 20 items. Possible score for this instrument ranges between 20 to 100. A higher score indicates higher level of depressive symptoms, a total score that exceeds 80 is an indicator of depression.(33)

Comment #7:
7. line 263: Please add brackets around the year.
Response #7:
We added brackets around the year. Please see the revised paragraph as follows:
Group-based trajectory modelling was used to investigate the step trajectories over the trial period.(38) Following the methods from Nagin and Odgers (2010) (38) we identified 4 group trajectories based on the following considerations: 1) obtaining a minimal increase in the Bayes Information Criterion for an additional trajectory group, 2) obtaining for each trajectory group a close correspondence between the estimated probability of group membership and the proportion assigned to that group based on the posterior probability of group membership, 3) ensuring that the average of the posterior probabilities of group membership for individuals assigned to each group exceeds a minimum threshold of 0.7, and 4) ensuring that the odds of correct classification based on the posterior probabilities of group membership exceed a minimum threshold of 5. The functional form of the trajectory for each group was based on the significance of the polynomial terms by iteratively dropping non-significant terms. Dummy variables on gender (female=1, otherwise=0) and knowing other participants in the group (know someone=1, otherwise=0) were created. They were then interacted with the Onymous Arm dummy variable (Onymous arm=1, Anonymous arm=0) and were used as predictors of trajectory group membership. All statistical analysis was performed using Stata 15.(39)

Comment #8:
8. Figure 1: Please add the reasons for the participants excluded.
Response #8:
We explained why the participants were excluded from randomization process under the methods section.

Randomization and Intervention Design
Randomization was performed after baseline assessment was completed. Of the 342 participants who registered for the study, 13 participants did not complete the baseline assessment and were excluded from the study. Eighteen of those who completed the baseline assessment were not contactable and were not included in the study. Participants were randomized based on gender and baseline step counts via block randomization. The randomization algorithm was pre-programmed by a statistician. The allocated arm was sealed in an envelope. A total of 311 participants who completed the baseline assessment (31 dropped out) were randomized to either Anonymous (n=155) or Onymous (n=156) Arms. The participants were informed of their allocated arms after they completed the baseline assessment. Since the aim of the intervention was to provide descriptive norm information about the participants, we could only start the intervention only when all 311 participants were recruited. However, since recruiting 311 participants could have taken us several months and we did not want participants who were recruited earlier in the study to lose interest, we decided to roll out the intervention in batches. A batch included one Anonymous Arm and one Onymous Arm, consisting of 12 participants in each arm. This method resulted in 13 batches in total. We chose 12 participants since we found this number to be large enough to create competition among group members, but small enough that participants can start the trial before they lose interest in the study. Figure 1 shows the recruitment and randomization process.

Reviewer 2:
Comment:
Congratulations for the job. It is a very important study given the growing prevalence of obesity amongst secondary school children. Although the descriptive norms were not showed to be effectiveness, the study highlights the importance to evaluated physical activity with an objective tool. To further studies, to recruited adolescents that share a proximal social network may reflect better results.

Response:

We thank you for the comment. We agree with the review that a more relevant reference group might have been more effective. We added this suggestion in the discussion section of the abstract.