Author’s response to reviews

Title: A feasibility study of ‘The StepSmart Challenge’ to promote physical activity in adolescents

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Author’s response to reviews:

Reviewer comments

(Received 23rd September 2019) Thank you for the opportunity to revise the manuscript. The comments from the reviewers and editor have helped improve the manuscript. All changes to the revised manuscript have been highlighted in tracked changes.

Reviewer 1: Author response:

I would suggest to insert this sentence in the manuscript around the same lines.
“We believe, the class teachers were well placed to have knowledge regarding perceived physical activity levels, based on, for example, whether adolescents were involved in sports teams or not” We have now added the following sentences for clarity (Methods, recruitment of schools, participants):

“We believe, the class teachers were well placed to have knowledge regarding perceived physical activity levels, based on, for example, whether adolescents were involved in sports teams or not”

I understand that for feasibility study a sample size calculation is not necessary. It is usually the pilot study that provides data so that sample size can be computed for actual study. Can you delete the sentence "Fifty adolescents is indicative.....". The following sentence has now been removed:

“Fifty adolescents is indicative of approximately two classes in post-primary schools in Northern Ireland and the study team felt that this would ensure representation of Year 9 pupils in each school”

In Table 4, please can you clarify for the accelerometer outcomes, why n’s at baseline are similar to 22 weeks and 52 weeks. This looks like you included only those participants who provided valid data on all time points. However, for the subsequent outcomes, in the same table, the n’s vary suggesting that maximum data was used to describe the summary statistics. For accelerometer outcomes we only included participants that provided valid accelerometer data at baseline. At 22 the weeks and 52 weeks analysis, we included data from these participants or used the Last Observation Carried Forward method to treat missing data. That is why the n’s at baseline are similar to 22 weeks and 52 weeks.

In the subsequent outcomes, in the same table, the n’s vary as the maximum data was used to describe the summary statistics.

You say that following information was not available.

The average duration of weartime hours per day. And The average days with valid weartime &gt;8h
This is hard to believe because, as a regular user of actigraph software myself, I am sure this information can be requested. The readers would like to know cause of proportion of valid data. Is it due to less weartime duration or due to less no of days worn?

The reason why I am insisting on this information, is because that it relates to Aim 3 of the paper: "Assess the appropriateness of proposed outcome measures based on completion rates, missing data and proportion of valid data provided;"

We have provided extensive detail in Supplementary File 2 / table S2 regarding validity of accelerometer data. This includes number of Actigraphs provided, number of Actigraphs returned, Actigraphs with valid data, Actigraphs with non-valid data and number of participants not given Actigraphs. We have also clearly detailed our accelerometer processing parameters and valid data requirements in the Methods section. We have also explored the issue of accelerometer wear time and valid data during the focus groups. Therefore, we believe we have provided extensive details in the manuscript in relation to Aim 3.

Discussion page 11.

"Difficulties were encountered within one of the control schools which accounted for 47% of accelerometers lost and reduced monitor wear time at T2" However from the supplementary table. file 2. calculation do not match.

At T2, school A. Actigraph given 35.
Actigraphs not returned. 11 so 11/35= 31.4%.
Actigraphs with invalid data 15
So of the 11+15=26
26/35= 74.2%
So I don't know how the 47% was derived. I am suggesting to report two information separately say specifically among one of the boys' school.

"Difficulties were encountered within one of the control boys schools which accounted for (11/35) 31.4% of accelerometers not returned and of those who returned only (9/24) 37.5% provided valid data. Thank you for pointing this out. The 47% was not derived by calculating the T2 data for School A.
The 47% was derived by calculating the Total number of ActiGraphs not returned by School A 
(21)/Total ActiGraphs not returned by all schools (44) = 21/44 = 47.

The sentence has now been revised as suggested to reflect T2:

"Difficulties were encountered within one of the control boys schools which accounted for 
(11/35) 31.4% of accelerometers not returned and of those who returned only (9/24) 37.5%
provided valid data.

There is also some syntax error in the Total N (%) in the same table. Change 61393.3% to I 
guess 613 (93.3%) “61393.3%” has now been changed to “613 (93.3%)”

In figure 1. Notice the last bottom part "Analysis"

The sentence should read, 126 participants with valid Actigraph data at "all time points" All 
other sentences for intervention and control group in analysis needs to make this clear.

Using this format, it could be shortened.

Valid data at all time points:
Actigraph: 126
WEMWS: 126
PSS for PA: 123
SDQ: 132

Do the same for the control group. Thank you for your suggestion.

The sentence “126 participants with valid Actigraph data" has now been changed to “126 
participants with valid Actigraph data at all time points”.

The following section refers to T2 data and has been shortened as suggested:
Originally:

126 participants completed the Warwick Edinburgh Mental Wellbeing scale
125 participants completed the Perceived Social Support for Physical activity Scale
123 participants completed the Time Preference scale
132 Strength and Difficulties Questionnaires were completed by teachers

Changed to:

Valid data at T2:
Actigraph: 126
WEMWS: 126
PSS for PA: 123
SDQ: 132

Reviewer 2

"Actually most statisticians are generally not enthusiastic about using a pilot study results as the basis of a power calculation." I agree this needs caution but would imagine things like Standard Deviation of the primary outcome and retention can be informative for subsequent calculations? There are various treatments and guidance e.g. using sensitivity analysis for trial sample size based on pilot data; perhaps a sentence could be added to this effect i.e. explain next steps/ how scaling up for trial will require such.

Our conclusions suggest the need for further feasibility work to address issues around boosting accelerometer retention in future studies, and how the intervention can be embedded within the school curriculum. Therefore, at this stage, we do not think it is appropriate to comment on issues such as power calculations which would be more relevant following a pilot study (rather than a feasibility study such as this).