Author's response to reviews

Title: Childhood Obesity Management shifting from Health Care System to School System: Intervention Study of School-Based Weight Management Programme

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Thank you very much for the expert comments on the revised submission. We have revised the manuscript to address the expert comments from referees.

Referee 2

1) It is unclear how selection is being performed of those who are overweight and obese. In Europe, this is amongst the major challenges in school-based programmes, since teachers experience difficulties in identifying overweight subjects and especially in discussing the issue of being overweight with the child and/or parents.

In Hong Kong, all students undergo anthropometric measurements annually with results recorded so teachers would identify overweight subjects. Teachers in Hong Kong are quite well equipped with skills in discussing sensitive issues such as overweight. They are quite comfortable to discuss the issues with students and parents if there is structured educational programme to help them emphasising positive living rather than negative images.

2) A total of 165 subjects were randomized, but only 106 subjects were enrolled in the study: what happened to the others? Did they leave the study before the start (were they disappointed about the intervention arm they were assigned to, did parents fail to participate?

Some students had other prior committed extra-curricular activities clashing with time schedule of this programme so only 106 subjects finally enrolled in the study. The numbers of students finally in intervention and control groups were not markedly different. They did not leave the study due to disappointment. It is not uncommon in Hong Kong that students enroll in many activities at different time points.

3) Whereas authors make clear this is a pilot study in the discussion, this should become clear much earlier in the text. Hence, an 8 month follow-up is not
very long. Some reviewers or readers, who underestimate the value of Chinese interventions and the combination of prevention and management may argue that 8 months is too short for an intervention study. This is of course different for a pilot study.

The revised version has made it clear earlier in the text that it is a pilot study so the follow up period is up to 8 months.

4) As this is a pilot study, authors could be clearer about their goals of the pilot: what challenges did they hypothesize to face? What went well, what were the difficulties? This manuscript would benefit enormously from a process-evaluation.

Results of feedback surveys from parents and students have been included at the end of the result section. Together with the section reporting on impact of project on empowering schools to foster a supportive healthy living environment, the results would provide a good overall view of process evaluation how the students, parents and schools perceived the usefulness of the programme. Under sub-section of the result section reporting exercise habits, more results have been included to show how parents adopted a more positive approach in motivating their children to do more exercise. The biggest challenges and difficulties were short duration of the intervention and not all eligible students would join the programme due to prior commitment of other activities. The issues have been discussed under limitations of discussion section.

Referee 3
1. There are grammar and spelling errors throughout the manuscript that must be corrected. Having the manuscript carefully checked for grammar and spelling errors would be highly recommended.

The manuscript has been edited by a colleague experienced in editing manuscript. (Also addressed comment from referee 1)

2. The sample size considerations do not seem correct. When I plug in values of $u = 0.84$, $v = 1.96$, $#0 = 0.15$ and $#1 = 0.1$, I get a value of $N$ that is larger than 300 (not 79). Moreover, when I compute a minimum detectable difference (MDD) with treatment and control group sizes of 40 each, I get an MDD of about 20 percentage points, which suggests much less power than the authors contend that they have with a sample of this size. Additional explanation for why a sample size
so small (N = 79) would provide so much power.

For sample size calculation, we sincerely apologise for some confusion of wrongly expressed 15% as unhealthy eating but in fact it should be prevalence of healthy eating taking from previous study (only 18.4% and 24% consumed adequate proportion of fruits and vegetables so we assumed 15% for healthy eating as overall estimation). The previous study only adopted educational approach with over 10% improvement so we expected greater improvement (30% of students would develop healthy eating habit) with this programme of more intensive interventions. Sample size would then become 52 per group (total 104). This has been rectified in revised version.

3. There is a significant difference in Age, BMI, and Waist to Height ratio at baseline between intervention group and control group students (Table 2). This seems important and is potentially damaging to the impact findings if not properly accounted for in the analyses. Did the authors properly control for these baseline differences in their analyses? They need to address this more directly in the Statistical analysis section. At a minimum, they need to state clearly why the methods used (McNemar Test, repeated measures analysis of variance, etc.) are appropriate for adjusting for the baseline differences.

We totally agree that confounders should be properly accounted for. All models were adjusted for the baseline age and sex as reported under statistical analysis section. Under Table 3, it has stated that linear mixed model adjusted for baseline age and sex, and repeated measure of ANOVA adjusted for baseline age and sex. Under Table 4, it has stated that repeated measure of ANOVA adjusted for baseline age and sex.

The primary outcome of this study are BMI z-score and body fat percentage as BMI varies as part of normal development. Therefore BMI z score as relative BMI adjusted for the child’s age and sex is a preferred indicator for evaluating treatment success in longitudinal studies. There’s no statistical significant difference in baseline BMI z-score and baseline body fat percentage between the intervention and control groups (Table 2). We have elaborated this part in first paragraph under result section.

Although the difference of mean age 10.1 vs 10.7 was found to be statistical significant, the impact on health behaviours would be minimal. This point is
mentioned under limitation of discussion session.

4. The authors report results about exercise and not physical activity which seems to be the more appropriate outcome measure. Some discussion about why there is a focus on exercise and not, more broadly, physical activity in the questionnaires and results is warranted.

We want to encourage regular exercise among primary school students as we want to embed it into their daily activity before reaching adolescent period.

5. The text about study limitations in the Discussion section is lacking. The authors need to provide more substance about their study limitations. For example, is the small sample size an issue? What about attrition that occurred? Was attrition accounted for in the analyses? The authors suggest that there are better behavior outcomes that could have been used—why weren’t they used in the current study?

The paragraph on limitation has been substantiated. The issue of small sample size resulting lack of power in detecting statistical significant difference between intervention and control groups with regard to behaviours is addressed as limitation. More complex measurements of behaviours were not used for this pilot study to avoid overburdening participants. The primary analysis was performed on an intention-to-treat (ITT) basis, with all participants included in the analysis according to original group allocation using linear mixed models to evaluate group differences in BMI z-score and body fat percentage at baseline and 4 months. Completer analysis was performed by the repeated measures analysis of variance using only intervention and control participants who attended the 4 month follow up. Both demonstrated statistical significant difference between intervention and control groups for BMI z score and body fat percentage.

Minor Essential Revisions
1. More information about the Attitude and behavioral changes outcomes would be beneficial. Was the questionnaire given to students a named questionnaire or was it just generic? What are some of the questions students were asked and how were the questions phrases? A table with a list of all the items would be warranted.

2. Same suggestion for the parent questionnaire—provide a list with the items or at least provide a few examples of how the questions were asked. Appendix II includes the items used for student and parent questionnaires.
3. On page 11, the authors use the term “completer analysis.” Is this the same thing as complete-case analysis? May want to clarify that for the reader.

*Completers analysis means the cases completing all stages of assessment. This has been added as footnote under the table.*

4. The last sentence of the first paragraph in the discussion section, starting with “One of the challenging observations in this study…” is difficult to understand. Please reword or clarify with additional text the point being made here.

*The sentence has been re-phrased with additional text.*

**Discretionary Revisions**

1. Consider including more and different keywords. Consider keywords that are listed in other similar manuscripts that have already been published.

*More and different keywords are included.*

2. It may be worthwhile to place more emphasis in the introduction and/or discussion sections about what stands out about this study. The authors mention at the end of the introduction that this is one of very few studies delivered in schools that were implementing a broader HPS initiative. Is there something else that sets this study apart entirely? Is this study the first of its kind in the country it is being implemented in, for example?

*This study stands out the possible synergistic effect of existing HPS approach in schools in improvement of weight control among students reflected by anthropometric measures. It might explain why some school based health promotion initiatives did not manage to demonstrate significant outcomes.*

We sincerely hope you would consider the revised manuscript for publication. Please kindly advise if further revision and clarification will be needed.

Thank you for your kindest attention!

With best regards,

Albert Lee  
(Professor and Centre Director)