Author’s response to reviews

Title: Changes in Diet and Physical Activity Resulting from the Shape Up Somerville Community Intervention

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Dear BMC Pediatrics Editorial Board:

Accompanying this letter please find a revised version of our article, “Changes in Diet and Physical Activity Resulting from the Shape Up Somerville Community Intervention”, manuscript #7610741489151498 which we are submitting as a Research Article. We very much appreciate the reviewers’ comments and believe that they have strengthened the manuscript. Below, please find a point-by-point response to the comments.

Sincerely,

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RESPONSE TO REVIEWERS

Reviewer #1:

Background
Discuss briefly – has the intervention undergone implementation evaluation? That is, were the activities conducted and implemented as planned? (Minor Essential Revision)
We addressed this comment in the Methods section. We have added a statement and a reference related to the extensive process evaluation that was undertaken (Methods, final sentence of “Intervention” subsection, page 9).

**Methods**

The Methods section could better describe that it was up to the community of Somerville to carry out the multi-level interventions without researcher input in year 2. I was unaware of this aspect of the study until I read the discussion section of the paper. Although it is stated under Study Design that the intervention was transitioned to the community in Year 2, the meaning of this is not clear. *(Minor Essential Revision)*

We have edited this description to clarify that ownership of the intervention was transferred in the second year such that community leadership played a significant role in implementing activities (Methods, “Study Design” subsection, page 6).

Although Fig. 1 is a flowchart diagramming the flow of participants through the study, it is difficult to follow the paragraph under “participants” in relation to the Figure. For example, the last sentence states that the sample was 454 participants. Where is this number found on the figure? I also don’t understand the lines connecting the first boxes in the columns and the small inner boxes. The flowchart is confusing but necessary to explain what happened. Can the figure and paragraph be redone to make them more understandable? *(Minor Essential Revision)*

We appreciate this comment and regret that we failed to communicate study participation clearly. It relates somewhat the reviewer’s comment about consented, initial, and analytic samples, which complicate the description of study flow. We have revised both the Figure and the paragraph. We have asked colleagues unfamiliar with the study to review the revised version for clarity and are hopeful that this description and Figure are now clear. (Methods, “Participants” subsection, page 7; and Figure 1).

*How do you know the dietary questions were correlated with the Block Kids Food Screener? Were both tested on a subsample? The correlation was low – I would not say that they both gave the same information, even if the r values are significant.* *(Discretionary Revision)*

Correlations are low despite being significant and we have decided to remove reference to correlation to the Block Kids Food Screener based on this comment.

*What is the relevance of asking about hand washing?* *(Discretionary Revision)*

The hand washing question is not relevant to this study and we have removed reference to it (it had been in the “Outcome Measures” subsection).
What is the difference between the sample (n=454), total consented sample, initial sample and the analytic sample? I found the use of these different terms confusing. Are they the same? How are they each different from the overall study population? These terms need to be better described if they are to be used. (E.g. see last paragraph of page 14). (Minor Essential Revision)

We have revised the manuscript in several sections to address this issue. We believe Figure 1 as revised will help clarify the different samples that we discuss. We have also revised the third paragraph in Results (page 12) so that numbers are included that refer to Figure 1. Finally we revised the paragraph in the Discussion section that the reviewer mentions to remove the terms and refer more directly to what we meant (Discussion, page 17, first paragraph).

What baseline values were included as covariates in all models? (Discretionary Revisions)

We have clarified that we meant baseline values of the outcome (Methods, final paragraph of “Statistical Analysis” subsection, page 11).

Results

Why was only mother’s BMI reported? Isn’t father’s BMI relevant? Were all children living with their biological mothers? (Discretionary Revision)

Given that approximately 88% of the time it was the child’s biological mother that completed the Family Survey Form, mother’s BMI was likely to be the best measure to use. Although not perfect, there is evidence that mother’s BMI is independently associated with child’s BMI (Parsons TJ, Power C, Logan S, Summerbell CD. Childhood predictors of adult obesity: A systematic review. Int J Obes Relat Metab Disord. 1999 Nov;23 Suppl 8:S1-107). Note that the Family Survey Form was completed by the child’s biological father approximately 10% of the time, with the remaining 2% by a male or female guardian.

Why is Table 2 not mentioned in the results section? If it is important, shouldn’t it be part of the paper rather than a supplementary file? (Discretionary Revision)

We refer to Table 2 twice in the Results section. We’ve added a reference to it in response to Review #2’s comments about children meeting recommendations at baseline (page 12, first full paragraph). We had also referred to Table 2 in the paragraph that states the intervention effects on these outcomes (page 12, third full paragraph). In our submission, we included Table 2 as a separate file simply because of its formatting. We would like to be informed by the editors if this was an incorrect procedure. Table 2 represents the main outcomes of this study and is therefore very important.
Discussion
Were the behavioral changes reported sufficient to account for the lower BMI in the [intervention] communities? (E.g. 15 min less of screen time, 2 oz/day less of sugar sweetened beverages, increased participation in sports). (Minor Essential Revision)

We have added a paragraph that addresses this question (paragraph 1, page 13).

If the amount of fruits and vegetables served at school increased, then is it correct to state in the discussion that fruit and vegetable consumption did not increase? Should this be ‘home’ fruit and vegetable consumption did not increase? (Discretionary Revision)

We believe it is appropriately stated in the manuscript that “we did not observe an intervention effect on fruit and vegetable consumption”. We have explained that parent/caregiver report was likely to capture consumption that took place mainly in the home, and may have missed changes in other environments.

Does the second to last sentence on page 14 refer to Table 2? (Discretionary Revision)

We have removed the clause “as the data suggests” since it involves an extrapolated comparison between Table 2 data and national data.

References
Some incomplete (e.g. #12, #22) (Minor Essential Revision)

We have reviewed all references for completeness.

Table 1
How was weight category derived? (Minor Essential Revision)

We have added this information to the table (as superscript information).

Why only mom BMI reported? (Discretionary Revision)

We have addressed this per the comment on Results.

Where is the information to explain the superscript for rules? (Discretionary Revision)

This was an inadvertently superscript, which we have removed. Rules are explained in the Methods section.
Reviewer #2:

Abstract

*Overall the abstract does not fully describe the study. The purpose of this study was to describe the outcomes of Shape Up to counteract childhood obesity? To create environmental and policy change? Or to describe behavioral changes in children? This purpose is also unclear throughout the main paper.*

We edited the Abstract to clarify that the purpose of this study is to describe behavioral changes in children that resulted from Shape Up Somerville, itself an intervention designed to create environmental and policy change. We have additionally edited the final paragraph of the Background section to clarify the purpose.

*How were the communities recruited? Why? What was the age range of children recruited and completing the study? State the length of time over which intervention was administered. Indicate how the intervention items were assessed particularly fruit and vegetable consumption.*

We have edited the Abstract so that it now provides these details.

*Conclusion: How much does it cost? Would it be feasible to roll out for free, or would people have to pay? How do the results compare with other interventions?*

We appreciate the comment and recognize that cost is an very important factor in the sustainability and replicability of any intervention. We are currently conducting full cost and cost-effectiveness analyses related to Shape Up Somerville and expect to report on these in a separate manuscript, and do not do so here. We have added a sentence that describes how the results of this behavioral study compare with other interventions.

Main Paper

*Background*

*You describe Shape Up as an approach to childhood obesity prevention and stated that it resulted in a significant reduction in BMI z-score, yet this study was about behavioral changes in children as an outcome of a community-based program, so authors should focus their introduction on the previous literature about children’s diet, physical activity, sedentary habits and its recommendation values as well as evidence from other community based programs in order to support your findings.*

We have added a substantial paragraph to the Background section that describes how children’s actual behaviors fall short of recommendations (new paragraph 3). We have provided evidence from other community-based programs that a similar multi-level, multi-
setting strategy is feasible and effective in changing behaviors that contribute to childhood obesity (paragraph 1, page 4).

Methods
This section should be improved. The authors send us to another article to fully understand the details of the program. Nevertheless, the results depend on the evaluation of each intervention activity. Here it should be described which concrete activities took place, how many? On a daily basis? How were they administered? What do you mean by the breakfast program? What changes were made to school lunch, etc. Since this is not clear, the study cannot be replicated elsewhere, so authors are encouraged to fully describe all the intervention activities of the program (how, where, how many). In the discussion you disclose a little bit more of these activities. This should be brought to methods.

The Shape Up Somerville intervention has been described extensively in three other published papers and we also included a link to a website that provides a full description of the intervention activities. However, we understand the reviewer’s concern and have provided additional detail to the description of the intervention (“Intervention” subsection, starting on page 7). We believe we now provide readers with enough information within this paper to understand the results.

You should explain why you chose those criteria to include the two other communities.

We have provided additional information about the choice of the intervention and control communities under (“Setting” subsection, starting on page 6).

What was the age range of children?

We have indicated that children in grades 1 to 3, who were the primary intervention target, are typically ages 6 to 8 (“Participants” subsection, page 7).

The Family Survey Form had 68 items, so does it mean that regarding diet there were only two questions about fruits and vegetables and sugary beverages? Did it explain what a “serving” means? How would parents describe the fruits and vegetables, were these listed? Did it explain what should be considered as a typical day?

We have added detail regarding these questions (second paragraph of “Outcome Measures” subsection, page 9).

Results
Results are well-described, but it would have helped if in this paper, daily recommendation values (children’s consumption of fruit and vegetables, physical activity/day, limited time
for screen viewing...) should have been stated and this would then enrich the paper. 

(Discretionary Revision)

We have added a paragraph (now the second paragraph in Results, page 12) describing how children’s baseline behaviors compare to recommendations.

Discussion
The first paragraph, again state that the Shape Up program is an intervention to realize significant effect on BMI z-score. This confuses the reader and again the purpose of this particular paper was not to assess reduction in children’s BMI.

We have removed the phrase about BMI z-score from the first sentence of the Discussion. However, we do refer to it at that end of the paragraph, where in response to Reviewer #1’s comments, we discuss whether the reported behavioral changes may have contributed to the changes in BMI z-score.

Be more specific. Although you compare your results with other studies, you should specifically compare the size of the changes quoted, on each intervention activity, in the other studies with those that you found. Overall is your intervention more or less effective than others, and why?

We completely agree, in principle, with this comment. It would be best to report the effect sizes from the similar studies that we reference and compare these directly with our effect sizes. However, due to the differences in both measurement methodology and reporting, it is not possible to compare results in this way. For example, while the APPLE Study also found a reduction in sugar-sweetened beverage consumption, it is reported as “67% of that consumed by control children”; neither servings nor ounces are specified. Travis County CATCH reports the percent of children with 2 or more hours of screen time per day (% NOT meeting the recommendation) and compares pre and post percentages – an actual effect size in terms of minutes per day is not reported.

Furthermore, although the other studies we refer to also used a multi-level ecological approach, the exact intervention activities differed. This is because of the nature of working so closely with individual communities and utilizing CBPR principles, such that specific activities were developed in partnership with the community and tailored for that community.

Again it would help if you had compared your results with the recommended values for fruit, vegetables, physical activity, and screen time.

We added a sentence to the first paragraph that refers to baseline results regarding the behavioral recommendations. “Baseline data indicate that there was a great need for
effective programming to help children meet behavioral recommendations related to obesity prevention.” (page 13)

A key weakness that should be stated is that these results refer to almost a decade ago.

We have added this as a weakness. (end of the first paragraph, page 17)

Another[weakness] is the lack of longer-term follow-up. Most studies of this type who an initial positive impact, but few are able to demonstrate sustainable change over a period of 2 years. In this particular program it would be interesting if the author could also suggest if after a period of 10 years this community has changed its characteristics or remained the same.

We appreciate this comment. We now state that Shape Up Somerville initiatives have been sustained and expanded, and refer to a recent report that indicates that weight outcomes have continued to improve over the past decade. (page 17, final paragraph)

Conclusion
A key question is how much the intervention costs per participant? Would it be feasible to roll out for free within a community, or would people have to pay? If so, would it be attractive to families on low incomes?

While a full cost analysis has not been done to date, we have added a brief discussion of cost issues to the Conclusion. (page 18, final paragraph)