

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Can the Healthy Primary School of the Future offer perspective in the on-going obesity epidemic in young children? – a Dutch quasi-experimental study
<b>AUTHORS</b>	Bartelink, N; van Assema, Patricia; Kremers, Stef; Savelberg, H. H.; Oosterhoff, Marije; Willeboordse, Maartje; van Schayck, Onno; Winkens, Bjorn; Jansen, Maria

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Joanne Clarke University of Birmingham, UK.
<b>REVIEW RETURNED</b>	29-Apr-2019

<b>GENERAL COMMENTS</b>	This paper presents the primary outcome of the study only. I would expect the primary outcome of the study to be presented as part of an overall results paper, including all outcomes plus highlights of the process evaluation. As a stand-alone paper I think that the context is lacking. For example, I cannot see any reason for excluding the presentation of child hip/waist circumference measurement outcomes. Also, the primary outcome BMI results need to be presented in the context of physical activity and dietary outcomes. In addition, the process evaluation results are crucial in aiding interpretation of the primary and secondary outcomes. In summary, I don't think that this paper 'works', and leaves too many unanswered questions.
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<b>REVIEWER</b>	Kathryn Reilly University of Newcastle, NSW, Australia
<b>REVIEW RETURNED</b>	13-May-2019

<b>GENERAL COMMENTS</b>	Thank you for the opportunity to review this manuscript. I found the study to be well planned and executed and the manuscript well written and thorough. The analyses appears to be very complete, including appropriate subgroup and sensitivity analyses. I would like to see some discussion regarding the intervention strategies and the acceptability and feasibility of strategies such as providing a school lunch, longer school day etc. and the schools capacity to sustain these strategies. Who covered the cost of the school lunch for example? Whilst recruitment is outlined elsewhere, I think it would add value for the reader to include some information on how these schools became involved in the study? Overall an interesting read that I feel only needs minor adjustments.
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<b>REVIEWER</b>	Dr. Yvonne Ellis University of Wollongong, Australia
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<b>REVIEW RETURNED</b>	25-Jun-2019
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<b>GENERAL COMMENTS</b>	<p>I appreciated the opportunity to review "Can the Healthy Primary School of the Future offer perspective in the on-going obesity epidemic in young children? - a quasi-experimental study." The manuscript is well organized and well written.</p> <p>1. Introduction was very good. Clear and tightly around the topic. Just a few minor comments.  Line 91: delete "and"  Line 94-96: Revise sentence  Line 98-100: Revise sentence, perhaps something like this:  Schools can play an important role in promoting healthy behaviours in children, since a large proportion of children day is spent here. As such, schools help to offer perspective in the on-going obesity epidemic in young children.  Line 116: specify "other" children</p> <p>A point to consider. As the study focus on implementing more PA in the schools, would it be worth mentioning something about the National PA recommendations for children? Do children in the Netherlands currently comply with the recommendations?</p> <p>2. Discussion  - Line 357: Therefore, effect sizes give a better indication....on what?...</p> <p>References:  There are variation (reporting of journals) between references.  Need to check very carefully throughout.</p>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Joanne Clarke

Institution and Country: University of Birmingham, UK.

Please state any competing interests or state 'None declared': None declared.

Please leave your comments for the authors below

This paper presents the primary outcome of the study only. I would expect the primary outcome of the study to be presented as part of an overall results paper, including all outcomes plus highlights of the process evaluation. As a stand-alone paper I think that the context is lacking. For example, I cannot see any reason for excluding the presentation of child hip/waist circumference measurement outcomes. Also, the primary outcome BMI results need to be presented in the context of physical activity and dietary outcomes. In addition, the process evaluation results are crucial in aiding interpretation of the primary and secondary outcomes. In summary, I don't think that this paper 'works', and leaves too many unanswered questions.

We understand the reviewer's concern and agree with her that information on the secondary outcomes, i.e., health behaviours, and the implementation process is lacking. We feel that including secondary outcomes and implementation process in this paper would have resulted in a manuscript that would be too overwhelming, unclear and superficial. At the same time, we also see that there would have been advantages in combining all effect outcomes and process evaluation. This is now acknowledged and addressed in the Introduction section. Moreover, we incorporated more details

about the implementation process in the Methods section without losing the focus on the main outcome. In addition, we have added the findings regarding the effects on children's health behaviours in the Discussion section. Finally, we also have included more information in the manuscript (Methods section) about why the measurements of hip and waist circumference were excluded from the analyses.

Page 5-6, Line 139-147: The aim of the current study was to assess the effect of HPSF on children's BMI z-score after one and two years' follow-up and to investigate whether HPSF has different effects within specific subgroups of children. The current study is part of an overall study to investigate HPSF. The overall study has a broad scope and includes a multi-disciplinary research group, which focuses on many different outcomes, such as children's health behaviours, educational achievements, and well-being. The studies that have been published previously, focused on the implementation process of HPSF [31] and the effects of HPSF on children's dietary and PA behaviours [32]. The current study explicitly concentrates on children's BMI z-score to focus in much detail on the primary outcome as described in the study design of Willeboordse et al. [28].

Page 6, Line 160-165: Three collaborating organisations, i.e., the regional educational board 'Movare', the regional public health services and Maastricht University, developed the idea for HPSF [28]. In March 2013, 12 out of 53 schools governed by the Movare educational board were informed about the initiative. Four schools gave their initial consent and spent a whole school year (2014/2015) creating bottom-up support for HPSF.

Page 7, Line 183-189: The two changes, i.e. providing daily a free healthy lunch and structured PA sessions after lunch, were both led by external pedagogical employees provided by childcare organizations to not increase the workload of teachers even further. This integration of the childcare organization during school hours is not to provide a temporary solution, but to change the school's organization in a sustainable way. The aim for the future is to bring school and childcare more together and thereby create an integrated day for children, whereby children are supervised by the same people prior, during and after school hours.

Page 7, Line 192-197: A health promoter from the regional Public Health Services was assigned to each school to provide support when needed. In this study, researchers from Maastricht University monitored and fed back results to the schools to support the processes of change. Funding for implementation of HPSF is provided by the provincial authorities until the end of 2019. However, the four schools have committed to continued implementation after 2019 and make the changes sustainable in their school.

Page 8, Line 203-216: Teachers and parents were involved from the start in the adoption decision and the process of adapting the several changes into the school context. Moreover, all four schools used a children voice group, with representatives from each class in school, to get insight into the opinion of children regarding HPSF. In this way, the experiences of children were being heard and the changes could be further contextualized to fit better to the children's needs and wishes. Each of the four intervention schools selected a teacher as school coordinator, who managed HPSF in their school. Overarching, HPSF was led by an executive board with representatives of the three collaborating organisations: Movare, the regional public health services and Maastricht University. They discussed the study design, the relevant outcome measures, and the interpretation of the results. The representative of Movare advised explicitly on school and participant recruitment and the communication to schools. A project team was created with representatives of all partners involved: the four schools, Movare, regional Public Health Services, Maastricht University, the Limburg provincial authorities, childcare organizations, the caterer, and sports and leisure organizations. No patients were involved in this study.

Page 9, Line 252-261: Anthropometric measurements, i.e., height, weight, hip and waist circumference, were conducted in children from study year two to eight. The measurements were integrated in the school hours allocated to physical education. Weight was measured to the nearest 0.1 kg (Weighing Scale 803, Seca, Hamburg, Germany) and height was measured to the nearest 0.1 cm (Stadiometer 213, Seca, Birmingham, United Kingdom). Hip and waist circumference were measured with a measuring tape to the nearest 0.1 cm (model 201, Seca, Hamburg, Germany). Children were measured with light sports clothing and no shoes. All anthropometric measurements were performed twice, and a third measurement was conducted if the difference between the first two measurements exceeded a pre-set limit (weight  $\geq 0.2$  kg, height  $\geq 0.5$  cm, hip and waist circumference  $\geq 1.0$  cm). Unfortunately, hip and waist circumference were excluded from further analyses due to measurement errors.

Page 13, Line 364-373: The favourable effects on children's BMI z-scores seem to indicate that the children improved their health behaviours. Indeed, significant favourable intervention effects were found after one- and two-years' follow-up for the full HPSF on children's dietary behaviours for, among others, school water consumption and lunch intake of vegetables and dairy products [32]. Children's sedentary time and light PA significantly improved after two years' follow-up. Almost no significant favourable results on children's health behaviours were found in the partial HPSF. Since it is the co-existence and interaction of several nutrition and PA behaviours that results in a positive (or negative) energy balance and weight gain (or loss) [41, 42], the results suggest that many small improvements on several different health behaviours have occurred in the children of the partial HPSF, leading to the favourable effects on their BMI z-score.

Reviewer: 2

Reviewer Name: Kathryn Reilly

Institution and Country: University of Newcastle, NSW, Australia

Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

Thank you for the opportunity to review this manuscript. I found the study to be well planned and executed and the manuscript well written and thorough. The analyses appear to be very complete, including appropriate subgroup and sensitivity analyses. I would like to see some discussion regarding the intervention strategies and the acceptability and feasibility of strategies such as providing a school lunch, longer school day etc. and the schools capacity to sustain these strategies. Who covered the cost of the school lunch for example? Whilst recruitment is outlined elsewhere, I think it would add value for the reader to include some information on how these schools became involved in the study?

Overall an interesting read that I feel only needs minor adjustments.

We would like to thank the reviewer for her positive judgement. We have incorporated the suggestions as follows:

Page 5-6, Line 139-147: The aim of the current study was to assess the effect of HPSF on children's BMI z-score after one and two years' follow-up and to investigate whether HPSF has different effects within specific subgroups of children. The current study is part of an overall study to investigate HPSF. The overall study has a broad scope and includes a multi-disciplinary research group, which focuses on many different outcomes, such as children's health behaviours, educational achievements, and well-being. The studies that have been published previously, focused on the implementation process of HPSF [31] and the effects of HPSF on children's dietary and PA behaviours [32]. The current study explicitly concentrates on children's BMI z-score to focus in much detail on the primary outcome as described in the study design of Willeboordse et al. [28].

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Reviewer: 3

Reviewer Name: Dr. Yvonne Ellis

Institution and Country: University of Wollongong, Australia

Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

I appreciated the opportunity to review "Can the Healthy Primary School of the Future offer perspective in the on-going obesity epidemic in young children? - a quasi-experimental study." The manuscript is well organized and well written.

We would like to thank the reviewer for her positive judgement and detailed look at the manuscript.

1. Introduction was very good. Clear and tightly around the topic. Just a few minor comments.

Line 91: delete "and"

We would like to thank the reviewer for noticing. We have deleted the word.

Line 94-96: Revise sentence

We revised the sentence as follows:

Page 4, Line 98-101:

Promoting healthy behaviours at an early age may help to improve children's health on the short and long run [10]. Moreover, promoting health behaviours could also lead to better educational and academic achievements, which have been found to be related to improved health in later life as well [15].

Line 98-100: Revise sentence, perhaps something like this: Schools can play an important role in promoting healthy behaviours in children, since a large proportion of children day is spent here. As such, schools help to offer perspective in the on-going obesity epidemic in young children.

We thank the reviewer for her suggestion. We revised the sentence as follows:

Page 4, Line 103-106: Schools can play an important role in promoting healthy behaviours in children since a significant proportion of a child's day is spent there and they reach all children [16-18]. As such, school-based interventions may be an important instrument to offer perspective in the on-going obesity epidemic in young children.

Line 116: specify "other" children

We changed the sentence as follows:

Page 5, Line 120-123: Cook-Cotton et al. found that children's socio-economic background can be an influential factor and that children already having overweight can respond more slowly or to a lesser extent to school-based interventions than children with a healthy weight [19].

A point to consider. As the study focus on implementing more PA in the schools, would it be worth mentioning something about the National PA recommendations for children? Do children in the Netherlands currently comply with the recommendations?

We agree with the reviewer and included this in the introduction section of the manuscript. We not only included this information regarding PA but also regarding healthy nutrition.

Page 4, Line 91-94: The health behaviours of children in the Netherlands are suboptimal. For example, 42% of children (aged 4–9 years) consume at least 150 g of fruit per day, which drops to 20% for 9–12 year olds [8]. Regarding PA, only half (48%) of Dutch children (aged 4–12) meet the guidelines for PA of 60 min of moderate-to-vigorous physical activity (MVPA) per day [9].

## 2. Discussion

- Line 357: Therefore, effect sizes give a better indication....on what?...

To clarify what we mean, we revised the sentences as follows:

Page 14, Line 392-395: Effect-modification analyses showed no significant interactions at T1 and T2. However, effect sizes give a better indication since the big difference in group sizes in the subgroups of, for example, children's weight status, influenced the p-value. All effect sizes showed similar patterns to the overall analyses.

## References:

There are variation (reporting of journals) between references. Need to check very carefully throughout.

We would like to thank the reviewer for noticing this variation. We checked all references carefully.

## VERSION 2 – REVIEW

<b>REVIEWER</b>	Kathryn Reilly University of Newcastle, NSW Australia.
<b>REVIEW RETURNED</b>	11-Sep-2019
<b>GENERAL COMMENTS</b>	Thank you for making the recommended changes/inclusions. It has made the manuscript stronger.