

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Family-based habit intervention to promote parent support for child physical activity in Canada; protocol for a randomized trial
<b>AUTHORS</b>	Medd, Emily; Beauchamp, Mark R; Blanchard, Chris; Carson, Valerie; Gardner, Benjamin; Warburton, Darren; Rhodes, Ryan

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Anna-Karin Lindqvist Lulea University of technology Sweden
<b>REVIEW RETURNED</b>	12-Nov-2019

<b>GENERAL COMMENTS</b>	I would have liked to see an in-depth description of your theory base, but assume that it will be a question for the future publications in your project. Good luck with your important project!
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<b>REVIEWER</b>	Fiona Gillison University of Bath, UK
<b>REVIEW RETURNED</b>	25-Nov-2019

<b>GENERAL COMMENTS</b>	This is a very well written and comprehensive protocol of what looks to be a very interesting study. There were two small additions I think would be useful, first to add the eligibility criteria for children (the authors provide these for parents, but as far as I could see not for the children involved), and second to elaborate on the decision not to why they are not expecting to see or adjusting for seasonal or gender effects. Very often both of these effects are observed in physical activity interventions, so clarification of how how else these potential differences will be treated is warranted
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<b>REVIEWER</b>	Åsa Norman Karolinska Institutet, Sweden
<b>REVIEW RETURNED</b>	08-Jan-2020

<b>GENERAL COMMENTS</b>	This is an interesting protocol for an ongoing RCT on parental support for child physical activity that builds on previous work by Rhodes and colleagues. The protocol is well-written and provides detailed information about the study. I have included some comments regarding clarifications on some aspects of the protocol.  Limitations of the study could be elaborated further. - Recruitment bias: using a strategy where parents make contact (and relying heavily on social media), how does that impact on the
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	<p>final study sample and external validity. Also, Victoria as a study setting, how representative of Canada is it (SEP, cultural diversity etc.)?</p> <p>- Manipulation checks: considering that only self-report is being used this may rather be a limitation in the assessment of intervention fidelity than a strength.</p> <p>Intervention description The protocol states that “The intervention is conducted in-person with a research assistant and the family at the family home and includes take away material for the families to use later on.” (p.13). However, most of the text describing the intervention refers to the written material. Some reference to home-sessions are carried out by the assistants is made on page 14, 2nd paragraph, page 15 and 16, end of first paragraphs for the info-and planning arms, but no info on what the assistants provide for the habit group is included. Please describe the assistant sessions in more detail overall, e.g. length, possible work procedure i.e. how the assistant “supports family problem solving (BCT construct 1.2) as needed to promote adherence to the intervention (page 14)”. Does the assistant have a checklist/manual etc? Also, describe the professional background and the intervention-specific training of the assistants. Page 16 and 18, end of first paragraph “The expectation that the workbook is completed is made clear.” How is this done?</p> <p>Outcomes Please include that you are testing differences between the HABIT treatment arm relative to the other treatment arms. Self-reported PA – please include a rationale for why you included self-reported minutes/day and hours/week, when these are variables that could be derived from the primary outcome measured by accelerometry.</p> <p>Please describe the process evaluation in more detail. - Questionnaire: include examples of items and information on numbers of respondents and if both children and parents will respond. - Interviews: include either the specific topics that will be include in the interview or examples of key open-ended questions. Also, provide a rationale for why you chose to include closed questions in an interview as opposed to including these questions in the questionnaire. Provide detail on the numbers of interviewees and sampling strategy.</p> <p>There is no description of possible contamination in the protocol. For example, given that recruitment id done partly by “word of mouth” it may be that families randomized to different interventions arms know each other and therefore share information about their specific intervention arm, a possible situation of contamination.</p>
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**VERSION 1 – AUTHOR RESPONSE**

Reviewer: 1  
Reviewer Name: Anna-Karin Lindqvist  
Institution and Country:  
Lulea University of technology

Sweden

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

Please leave your comments for the authors below

1. I would have liked to see an in-depth description of your theory base, but assume that it will be a question for the future publications in your project.

The theory base for this study is referenced on page 5 – 6 (parental support of child PA), page 6 (multi process action control framework), and page 13 - 16 (habit formation, support behaviour). Additional discussion of this theory will be included in future outcome papers as suggested by the reviewer.

2. Good luck with your important project!

Thank you for this supportive comment.

Reviewer: 2

Reviewer Name: Fiona Gillison

Institution and Country: University of Bath, UK

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

Please leave your comments for the authors below

1. This is a very well written and comprehensive protocol of what looks to be a very interesting study.

Thank you for the positive comments.

2. There were two small additions I think would be useful, first to add the eligibility criteria for children (the authors provide these for parents, but as far as I could see not for the children involved), and second to elaborate on the decision not to why they are not expecting to see or adjusting for seasonal or gender effects. Very often both of these effects are observed in physical activity interventions, so clarification of how else these potential differences will be treated is warranted.

a) Children's eligibility criteria

Children's eligibility criteria are detailed in the Participants section of Methods on page 10. We believe this might have been missed by the reviewer, but would be happy to add any other information if required. Eligibility criteria for parents is to have a child who meets this criteria.

b) Seasonal and gender effects (pg. 8)

While seasons and gender have been found to impact physical activity participation, there are a few reasons that the hypothesis states that no effect of gender or season is expected. The climate in Victoria is relatively mild and it is common for outdoor activities to continue in all seasons. Seasonal effects (for example, potentially less physical activity participation during winter months or less structured sport participation during summer the summer) are also expected to be balanced to a certain extent by the selected recruitment method. Rolling recruitment ensures that participants are at all stages of participation during all seasons. Finally, there is not sufficient evidence at this point to support that boys and girls will respond differently to a habit-based PA intervention. This rationale has been included on page 8. Although no effects are expected, these hypotheses will be tested. Both season and gender will be evaluated to determine any effects on outcomes as detailed on page 27 of the manuscript.

Reviewer: 3

Reviewer Name: Åsa Norman

Institution and Country: Karolinska Institutet, Sweden

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

Please leave your comments for the authors below

1. This is an interesting protocol for an ongoing RCT on parental support for child physical activity that builds on previous work by Rhodes and colleagues. The protocol is well-written and provides detailed information about the study. I have included some comments regarding clarifications on some aspects of the protocol.

Thank you for the thorough review and comments.

2. Limitations of the study could be elaborated further.

a) Recruitment bias: using a strategy where parents make contact (and relying heavily on social media), how does that impact on the final study sample and external validity. Also, Victoria as a study setting, how representative of Canada is it (SEP, cultural diversity etc.)?

The reviewer raises a good point. To clarify, social media is the platform we have had the most success with for recruitment to date however it was not intended as the primary recruitment method. The wording on page 11 has been adjusted to better reflect this. Having most participants to date recruited through Social Media indicates that parents have access to a smartphone and/or computer as well as an internet connection which is the vast majority of people in Victoria and other "Western" cities throughout the world. The fact that the majority of participants engage with Social Media is likely also applicable to other similar populations. Social media use patterns related to recruitment will be considered when interpreting the results and communicated when reporting the results.

Recruiting for family based physical activity interventions is challenging as participation is voluntary. Since participants self-select, application of the results will be limited to families already interested in increasing their physical activity. Victoria is representative of a Canadian city: according to data from the 2016 Canadian census, the age distribution, family structure, and income of Victoria residents are similar to those of Canada (Statistics Canada, 2017). These details have been included in the manuscript on pages 10- 12.

b) Manipulation checks: considering that only self-report is being used this may rather be a limitation in the assessment of intervention fidelity than a strength.

The reviewer raises an interesting point; because habit is a psychological construct we are limited to self-report of its antecedents at this point (Rebar, Gardner, & Rhodes, 2018). While this may not be ideal, having some form of assessment is better than no assessment and therefore we consider inclusion of a manipulation check to be a strength. We do agree that there is room for improvement as research evolves over time.

3. Intervention description

The protocol states that "The intervention is conducted in-person with a research assistant and the family at the family home and includes take away material for the families to use later on." (p.13). However, most of the text describing the intervention refers to the written material. Some reference to home-sessions are carried out by the assistants is made on page 14, 2nd paragraph, page 15 and 16, end of first paragraphs for the info-and planning arms, but no info on what the assistants provide for

the habit group is included.

The description of the intervention delivery for the HABIT group on page 17- 19 has been updated to improve clarity of delivery methods including the workbook and support from Research Assistants during intervention delivery.

a) Please describe the assistant sessions in more detail overall, e.g. length, possible work procedure i.e. how the assistant “supports family problem solving (BCT construct 1.2) as needed to promote adherence to the intervention (page 14)”.

As per the reviewer’s recommendation, the intervention section (page 13-19) has been updated to provide clarity on the intervention delivery procedure, specifically including details on the role of the Research Assistant. As well, the length of sessions has been included on page 13 (intervention delivery) and page 14 (check ins). To clarify the specific example provided by the reviewer, the following phrase has been included in the manuscript on page 15: “Based on what the family expresses as personal challenges or barriers, the Research Assistant will re-emphasize strategies that address that concern.” This phrase is followed by an example which was provided in the original manuscript.

b) Does the assistant have a checklist/manual etc?

The Research Assistant training manual (explained in question “c” below) includes scripts for Research Assistants to follow during intervention delivery and check in sessions. The script follows the layout of the workbooks provided to families which functions as a checklist as each section must be reviewed during intervention delivery. This information has been included in the manuscript on page 13 of the manuscript.

c) Also, describe the professional background and the intervention-specific training of the assistants.

The Research Assistants are Kinesiology and Psychology undergraduate and graduate students. These are paid positions that involve thorough training in the lab and in the field. Training involves review of a training manual, study materials, shadowing sessions with experienced Research Assistants, practicing sessions and successfully demonstrating participant appointments to the Project Coordinator to confirm that they are ready to take the lead on these deliveries and check in's w/participants on their own.

This information, as well as information on the Fitness Testers’ qualifications has been included in the Enrolment section on page 12 and 13.

d) Page 16 and 18, end of first paragraph “The expectation that the workbook is completed is made clear.” How is this done?

During the intervention session the Research Assistant tells families that by being part of the study they are agreeing to participate in the intervention which includes completing the workbook. This applies for families in the PLANNING and HABIT conditions since the EDUCATION condition only includes information and no exercises to complete. This has been clarified in the manuscript on page 17 (PLANNING) and 19 (HABIT).

#### 4. Outcomes

a) Please include that you are testing differences between the HABIT treatment arm relative to the other treatment arms.

This information has been included in the manuscript, see page 19.

b) Self-reported PA – please include a rationale for why you included self-reported minutes/day and hours/week, when these are variables that could be derived from the primary outcome measured by accelerometry.

The Physical Activity Questionnaire for Children actually asks about types of PA, frequency, and intensity; the measure of minutes per day and hours per week is referring to parent report of child PA which was accidentally left out of the manuscript and has now been included on page 20-21. This will provide information on how active parents think their children are compared to how active they are. Child self-report PA was included as it is not an identical measure to PA measured by accelerometry. The value in measuring self-report PA is that it tends to assess more volitional activity (Troiano, McClain, Brychta, & Chen, 2014). As well, including self-reported PA did not significantly increase the time to complete the questionnaire. For parents, self-report is the only method of measuring PA: the Godin Leisure-Time Exercise Questionnaire does measure minutes. Parent report of family-based PA was also missed and has now been included in the manuscript on page 21.

c) Please describe the process evaluation in more detail.

- Questionnaire: include examples of items and information on numbers of respondents and if both children and parents will respond.

The process evaluation includes two components, the selected quantitative questions in the questionnaire and the wrap up interview. The questionnaire questions are included in the parent 6 month questionnaires only. The wrap up interview is conducted with families (parents and children) during the 6 month lab session. This information has been included in the manuscript on page 24. Examples of questions from the questionnaire are provided on page 24.

- Interviews

- i. include either the specific topics that will be include in the interview or examples of key open-ended questions.

Key questions from the wrap up interview includes family physical activity type and frequency, barriers, and changes over the course of the study. The PLANNING and HABIT group participants are also asked if they used the material, found it useful in promoting PA, and why/why not. These details have been included in the manuscript on page 24-25.

- ii. Also, provide a rationale for why you chose to include closed questions in an interview as opposed to including these questions in the questionnaire.

Although certain closed questions were asked (intervention material use and usefulness), participants had the opportunity (and were encouraged) to elaborate on each of their responses. These questions were similar to those included in the questionnaire process evaluation questions but provided the opportunity for participants to explain their answer. This has been clarified in the manuscript on page 24.

- iii. Provide detail on the numbers of interviewees and sampling strategy.

All families must participate in the wrap up interview. It is conducted during the final lab session after the child fitness testing and questionnaires. This information has been included in the manuscript on page 24.

d) There is no description of possible contamination in the protocol. For example, given that recruitment is done partly by “word of mouth” it may be that families randomized to different intervention arms know each other and therefore share information about their specific intervention arm, a possible situation of contamination.

The reviewer raises a good point. Participants are asked not to share information with any acquaintances who happen to also be participating in the study. This information has been included in the manuscript on page 13. Another source of potential contamination is acknowledged in the Limitations section (page 4): participants in one group could possibly unknowingly adopt techniques from another condition which would affect the results.

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Åsa Norman Karolinska Institutet, Sweden
<b>REVIEW RETURNED</b>	14-Feb-2020
<b>GENERAL COMMENTS</b>	Thank you for the possibility to review this manuscript once again. The authors have responded to all my comments in a very thorough and clear manner and the manuscript makes very interesting reading.  I wish the authors all the best with this interesting project.