Author’s response to reviews

Title: Promoting parenting strategies to improve tooth brushing in children. Design of a non-randomised cluster-controlled trial

Authors:
Maddelon de Jong-Lenters (m.lenters@acta.nl)
Monique L’Hoir (M.LHoir@ggdnoog.nl)
Erica Polak (erica@opvoedpoli.nl)
Denise Duijster (d.duijster@acta.nl)

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The Shine! intervention: promoting parenting strategies to improve children’s tooth brushing behaviour. Design of a non-randomised cluster-controlled trial

BMC Oral Health

Dear Editor,

Thank you and reviewer Peter Milgrom for taking the time to review a second revision of our manuscript. Please see our responses to the reviewers’ comments below.

Reviewer 1: Peter Milgrom

1. The authors have generally been quite responsive and the changes have improved the manuscript. The primary problem remaining is the description of the behavioral outcome. They describe it as the (parental) practice of twice daily toothbrushing in children. In fact, the measure is to be constructed from three measures: (self-report) of parent toothbrushing of the child (apparently a dichotomous measure but not described clearly); a self-efficacy scale score; and the child's dental plaque score at examination. However, the authors do not explain how they will
derive their actual measure. In the analysis section, they treat each of these outcomes separately. Moreover, there is really no rationale given for combining these measures to derive the proposed behavioral outcome score.

We understand the concern of the reviewer, and we agree that there is no rationale and appropriate method to combine the three measures into one behavioural outcome. It has become apparent to us, based on the comment of the reviewer, that the use and analyses of the behavioural outcome(s) did not become clear from the text; therefore, we made the following changes in the manuscript:

• **Outcome measures:** We initially talked about one behavioural outcome, namely the practice of twice daily toothbrushing in children. We understand that this raises the suggestion that we will create one measure out of the three variables, so instead we now report that the study has three separate tooth brushing-related outcomes. This has been changed in the description of outcome measures (see Methods, page 15 and Abstract, page 2):

“The tooth brushing-related outcomes of this trial are:

- Parents’ self-efficacy (confidence) in brushing their children’s teeth when experiencing barriers,

- Tooth brushing frequency in children,

- Children’s dental plaque scores.

These outcomes are measured at T0, T1 and T2. The clinical outcome of the trial is children’s dental caries experience, measured at T2.”

• **Aim:** The description of the aim has been adjusted accordingly (see Background, page 7): “The aim of the study is to assess the effect of the intervention on tooth brushing-related outcomes, including 1) parents’ self-efficacy in brushing their children’s teeth, 2) toothbrushing frequency in children, 3) children’s dental plaque scores, and on children’s clinical dental caries experience over a period of 24 months.

• **Hypothesis:** The rationale for these three tooth brushing-related outcomes is incorporated in the description of the hypothesis and in Figure 1 (see Background, page 7 and Figure 1): “The hypothesis of the ‘Shine!’ intervention is that the promotion of specific parenting strategies will increase parents’ self-efficacy (confidence) in brushing their children’s teeth when experiencing barriers, which in turn, will lead to the improved practice of twice daily tooth brushing with fluoride toothpaste in children and reductions in children’s dental plaque scores. This is hypothesised to subsequently result in lower development of childhood dental caries. Figure 1 shows the components and hypothesised outcomes of the ‘Shine!’ intervention.”
• Data collection and statistical analysis: The data collection section is modified accordingly; we now describe the three tooth brushing-related variables (self-efficacy, tooth brushing frequency and plaque scores) (see Methods, Data collection, page 15 & 16). The response options for the self-report question on tooth brushing frequency are now provided. The description of the analysis is also adjusted accordingly (see Methods, Statistical analysis, page 19): “Differences in the three tooth brushing-related outcomes between children in the intervention and control group at T1 and T2 will be analysed using ordered logistic or logistic regression (for tooth brushing frequency in children; either treated as a ordinal variable or dichotomous variable, depending on the distribution of responses), and linear or negative binomial regression (for parental self-efficacy scores and children’s plaque scores).”

• General: The term ‘behavioural outcome’ has been replaced by ‘tooth brushing-related outcomes’ throughout the manuscript, and the word proxy measures have been removed.

2. The remaining problems are largely grammatical. As the journal does little editing, the authors need to address these problems:

Page 4, line 17. Insert "by the parent" after fluoride toothpaste.

Page 4, line 29. Delete "does" and add an s to "lead"

Page 4, line 43. Qualitative focus group interviews should be changed to "qualitative research".

Page 4, line 48. Reword "They also expressed to be motivated.." to They also say they are motivated.

Page 4, line 51. Delete "common barriers were associated with" Start the sentence as "Non compliant child behavior is often due to…(delete e.g.)"

Page 4, line 56. Delete "rarely"

Page 6, line 5. Delete the comma after children.

Page 8, line 7. Delete the word allocated. Reword the sentence to say that "Practices that volunteered to be part of the intervention group" will implement….

Page 8, line 46. Substitute the word "included" for the word "covered."

Page 9, line 31. Substitute the word "Parents" for the word "Subjects."

Page 10, lines 53-56. Reword this sentence once the outcome variable is clarified.
Page 15. Revise the description of the behavioral outcome measure as discussed above. Also modify the data collection section. Also provide a justification for measuring these things at T1, which appears to be an intervention.

Page 18. Co-variates. These are either mediators or moderators of the behavioral and clinical outcomes. They should be discussed as such and their inclusion justified.

We thank the reviewer for spotting these errors and for the grammatical suggestions. We have made the changes accordingly.

Regarding the comment “Also provide a justification for measuring these things at T1, which appears to be an intervention.”: T1 is a contact moment 6 months after delivery of the intervention (no intervention will be given at T1). T1 is used to collect follow-up data on the tooth brushing-related outcomes.

Regarding the comment “Co-variates. These are either mediators or moderators of the behavioral and clinical outcomes. They should be discussed as such and their inclusion justified.”: We now describe that we collect information on these variables because they are known moderators of the tooth brushing-related and clinical outcomes, and they therefore need to be adjusted for in the analyses (see Methods, Data collection, Co-variates, page 17).

3. The discussion is overly long and much of the theoretical material is either duplicative or not necessary. The discussion should be cut by one-half.

We have reduced the discussion by 393 words and taken out duplicate information (see Discussion, page 20-23).