Reviewer’s report

Title: Study Protocol of a Randomized Controlled Trial to Test the Effect of a Smartphone Application on Oral-health behavior and Oral Hygiene in Adolescents with Fixed Orthodontic Appliances.

Version: 1 Date: 24 Aug 2017

Reviewer: Robert Jones

Reviewer's report:

The abstract should mention that this study will examine if a behavior intervention based app can improve oral health behaviors during the time period studied. Stating that it will work outside of the study time has limitations.

Discussion on the intention of having a dual academic and private practice environment for the study. Will these environments be controlled regarding the number of subjects in each group.

This statement was not clear "In order to prevent contamination, the patients of the control group do not have access to the intervention, since the app is locked by a personal code that only can be used once."

Please elaborate on the sentence "A peer model will demonstrate how to clean teeth with fixed braces". It is unclear what this statement means and if there are health privacy concerns using this type of model system.

The authors mention that 3 minutes is a suitable time for brushing duration for the 5 point step, but it is not clear that the app makes this recommendation. Why is the brushing timer optional for the app? Is it related to having a patient interact with the selfie evaluation part to learn on their own the need to brush longer.

The app has an AI system/image registration algorithm to evaluate the selfie image and conclude if the brushing is adequate. More information should be provided in this area.

The authors mention four 'care as usual' parts. Two of these parts (use of mouth rinse and nutrition) are not included in the psychological analysis scoring (see page 13 line 2). Please address why these parts were not included in the study.

Modified Silness and Loë Plaque Index is appropriate and robust for the study.

The app seems to be well designed and interactive for their behavior intervention study.

Intention-to-treat (ITT) principle for data analysis seems appropriate for this study.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

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