Reviewer's report

Title: WhatsApp embedded in routine service delivery for smoking cessation: Effects on abstinence rates in a randomized controlled study

Version: 0 Date: 09 Jan 2019

Reviewer: David Buller

Reviewer's report:

This is a generally well designed and conducted randomized trial of the effectiveness of adding a series of cessation messages delivered over the WhatsApp mobile app to a clinic-based smoking cessation program. The trial had reasonable inclusion/exclusion criteria and the sample was diverse and sufficiently large to provide adequate statistical power. Randomization was utilized. A single blind method was appropriate for testing this type of intervention. Point-prevalence abstinence was an appropriate outcome measure. Multiple follow-ups at 1, 3 and 6 months provided a description of the trends and persistence in cessation. Intention-to-treat analysis methods were appropriate with the low dropout rate. The WhatsApp messages were based on the transtheoretical model of change (TTM) and were reviewed by both experts and quitters to ensure they were appropriate. The WhatsApp messages appeared to substantially improve quitting and this improvement may be due to increasing adherence to clinic visits and use of NRT medication. This is an important contribution to the literature on technology-based smoking cessation interventions.

There are some weaknesses that the authors need to address to improve the manuscript.

1. Hypothesis 1 is based on the literature reviewed in the introduction but the authors do not provide a rationale for Hypotheses 2 or 3 either by reviewing past literature or making a coherent arguments for long-term cessation or effect on adherence to the clinic program, medication, and weight gain. This rationale should be provided.

2. When presenting and discussing the results on adherence to the clinic cessation visits, the authors use the term sufficiency but fail to define it. Unless there is a clear reason why a certain number of clinic visits is needed, it might be best to just describe this as a continuous measure of more or less visits.

3. The description of the WhatsApp messages would be improved by describing how the messages mapped onto the TTM concepts, whether they were sent in a particular order, timing, or intensity based on the TTM or practical considerations, and if the messages were tailored to personal characteristics of the smokers.
4. The authors need to clarify the test statistic reported on pages 13-14 when using the term a \( a xx \) fold increase. Is this an odds ratio? If so, report it as such.

5. Hypothesis 3 and in some points of the Discussion, the authors imply that the improvement in cessation rates may be due to the increase in adherence to clinic visits and continuity of medication use. This should be evaluated by conducting formal statistical tests of mediation. The design with multiple follow-ups would permit a strong test of mediation by predicting cessation at 6-months based on the mediators of clinic visits and medication continuity at 1- and 3-months. This would strengthen the understanding of the mechanisms by which the WhatApps intervention improved cessation rates.

6. On page 16, lines 352-354, the authors repeat that the sample was predominately male but they also need to speculate how this may have affected the outcomes of the WhatsApp intervention and the generalizability of the results.

7. The authors should note in limitations that the individuals in the sample were experienced using WhatsApp so the findings may not generalize to smokers who are less likely to use mobile apps.

**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.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
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Needs some language corrections before being published

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