Author’s response to reviews

Title: Effectiveness of Lifestyle Change plus Dental Care (LCDC) program on improving glycemic and periodontal status in the elderly with type 2 diabetes

Authors:

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Version: 2
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Author’s response to reviews: see over
Dear Editorial board of BMC Oral Health,

Please find attached our revised manuscript “Effectiveness of Lifestyle Change plus Dental Care (LCDC) program on improving glycemic and periodontal status in the elderly with type 2 diabetes ” (MS: 2072947886122603). All authors read and approved the revised manuscript. We appreciate the opportunity to revise our manuscript; thereby the comments of the reviewers were very helpful in order to improve the clarity of the paper. Our responses to the comments are given below. We hope that this revised version can contribute to the contents of BMC Oral Health and be of great interest to the journal’s international readership.

Kind regards
Saruta Saengtipbovorn DDS MPH
Dentist, Health center 54
Editor's comment:

I am particularly concerned about the use of t-test to examine differences in biomedical outcomes after three months without accounting for baseline measures. The final comparison should at least account for baseline measures, age and gender. Please consider assessing differences in improvement/deterioration of biomedical outcomes (variables indicating differences between baseline and 3 months measures). Please see reviewers' comments. Particularly address the significance of the study and the use of combined interventions, and justify inability to adjust for all possible confounding factors in the analysis.

Thank you for the opportunity to revise our manuscript. The multiple linear regression analysis has been added to examine differences in biomedical outcomes after three months with accounting for group affiliation, gender, smoking, duration of being DM, biomedical outcomes, and periodontal status at baseline. The improvement and deterioration of biomedical outcomes have also been addressed in the discussion section. The significance of the study and the use of combined interventions have also been addressed in the background section. We have addressed each comment of all reviewers. Please find below the point by point response to each reviewer.
Reviewer's report 1

Title: Effectiveness of Lifestyle Change plus Dental Care (LCDC) program on improving glycemic and periodontal status in the elderly with type 2 diabetes

Version: 1 Date: 4 April 2014

Reviewer: Bishal Bhandari

Reviewer's report:

Comment of the reviewer:

1. Major compulsory revisions- rationale and objective

The authors of this manuscript examined whether lifestyle change plus dental care improved glycaemic level and periodontal status in the elderly. According to authors, lifestyle care is effective in controlling diabetes and dental care in periodontitis. They concluded that combining the intervention had been effective in controlling both the diseases. However, the authors themselves were unsure whether the improvement was because of lifestyle change or dental care or their integration in one program (discussion- 2nd last paragraph). So the question need to be asked is why the two separate interventions were integrated in one program in the first place. Wouldn't it have been better if they have chosen either one of the intervention for both the diseases especially, as the authors themselves state that diabetes and periodontal disease have bidirectional relationship where controlling one would control the other as well (background 3rd paragraph). They could also have examined the two intervention separately and in combination.

Authors response:

The two separate interventions were integrated in one program because diabetes intervention programs alone prevent and control diabetic complications by decreasing HbA1c which only decreases the risk of periodontal infection. It does not prevent periodontal disease. Periodontal treatment programs alone improved periodontal status. However to control DM, patients should maintain healthy lifestyles and routinely control health levels, healthy eating habits, regular physical activity, and take diabetes medicine. Combined lifestyle change and periodontal care intervention are needed to prevent dental complications.

The details have been added in the background section, paragraph 4 with yellow highlight.
Comment of the reviewer:
2. Major compulsory revisions - background

The background of this paper doesn't make a strong case for this particular research. It needs to be rewritten making a strong case for why it is important to integrate these two completely different interventions. Discussion section have some of the materials which would have been better suited for the background, especially the material on effectiveness of dental care for glycaemic control and periodontitis.

Authors response:

The background was rewritten following suggestion. The details were added in the background section, paragraph 4 with yellow highlight.

Comment of the reviewer:
3. Major compulsory revisions - citation, quality of written English, data disposition, study design

The authors have failed to cite the previous literature appropriately and in some instances citation is missing (background 3rd paragraph, methods 4th paragraph). English language and general writing needs to be improved as it contains lots of grammatical errors. Data analysis is basic and limited. The authors should have at least attempted some complex analysis whereas they have not even attempted correlation and regression to predict the relationship. The authors themselves acknowledge in their discussion that as an experimental study design, it had severe limitations and it was not representative of the elderly population in that area (discussion- 2nd last paragraph). In such a scenario, I have a concern if the result and conclusion of this study should be considered without serious reservation.

Authors response:

The missing citations have been added in background 3rd paragraph and methods 4th paragraph with yellow highlight.

English language and general grammar has been improved by native English language speakers.

Multiple linear regression has been added in data analysis. The correlation was used to find the relationship. The details have been added in the results section, with yellow highlight, and table 4 and table 5.

Due to the severe limitation which was not representative of the elderly population because of the small number of centers, the LCDC program had the
effectiveness and acceptability that could be adapted into routine work by staff in the
health centers which could be implemented in the other health centers. The details
have been added in the discussion section, discussion- 2nd last paragraph with
yellow highlight.
Reviewers report 2

Title: Effectiveness of Lifestyle Change plus Dental Care (LCDC) program on improving glycemic and periodontal status in the elderly with type 2 diabetes

Version: 1 Date: 9 April 2014

Reviewer: Ok-Su Kim

Reviewer’s report:

Comment of the reviewer:

- Major Compulsory Revisions

1. In this study, 0.3mm mean differences of PD between two groups showed statistically significant. This difference usually can get clinically after well controlled toothbrushing. Do you mean that this difference is confirmed to improve periodontal status?

Authors response:

Yes, this mean difference is confirmed to improve periodontal status. The details have been added in the discussion section, paragraph 3 with yellow highlight.

Comment of the reviewer:

2. Describe to how to measure pocket depths and recession.

Authors response:

Pocket depth was measured by a level from the gingival margin to the most coronal extension of the epithelial attachment. Gingival recession was measured by a level from cement-enamel junction to the gingival margin. The pocket depths and gingival recession were measured by using a periodontal probe which measured the six surfaces including mesiobuccal, midbuccal, distobuccal, mesiolingual, midlingual, and distobuccal of every tooth in the diabetic patient’s mouth. The details have been added in the methods section, 2nd paragraph of outcome measurements with yellow highlight.

Comment of the reviewer:

3. SBI score or BOP(+)/-) is better that GI score to measure the gingival inflammation.

Authors response:

The percentage of bleeding on probing (BOP) has been added to measure the gingival inflammation.
Comment of the reviewer:
4. Please mention some brief explanations regarding the calibration between examiners.

Authors response:

The calibration between examiners was tested by another 5 diabetic patients were examined for periodontal status (plaque index, gingival index, pocket depth, gingival margin, and percentage of bleeding on probing (BOP)) by three dentists included one expert in periodontics (gold standard) and the other two dentists who conducted the present study to measure the agreement between examiners. The details have been added in the method section, 2\textsuperscript{nd} paragraph of the outcome measurements with yellow highlight.

Comment of the reviewer:
5. IRB number was missed.

Authors response:

The IRB number has been addressed in the ethical consideration section.

Comment of the reviewer:
6. In inclusion criteria, you selected participants with at least 16 natural teeth. On what basis?

Authors response:

The participants with at least 16 natural teeth were selected because at least 16 natural teeth was acceptable for scoring plaque and gingival index. The statement has been added in method section, 2\textsuperscript{nd} paragraph with yellow highlight.

Comment of the reviewer:
7. Are there any data on physical activity level or total caloric intake?

These are important potential behavioral confounders and would strengthen the manuscript considerably.

Authors response:

The physical activity level and total caloric intake would be not different due to random sampling of subjects in the intervention and the control groups. This study reduced selection bias by using random sampling.
Comment of the reviewer:
8. Was there any evidence for sex-interactions?

Authors response:
Yes, there was gender-interaction in this study. In the multiple linear regression analysis, the gender-interaction was found as one of the variables to predict the FPG at 3 month follow up. The details have been addressed in the result section, with yellow highlight, table 4 and table 5.

Comment of the reviewer:
- Minor Essential Revisions
1. In the table: t, $\chi^2$ values are removed and only describe p values. And present mean ± SD.

Authors response:
The $t$ and $\chi^2$ were removed from every table.

Comment of the reviewer:
Statistical review
1. Analysis would be carried out in order to adjust for potential confounders as age, gender, education, smoking, BMI, dyslipidemia, participants’ physical ability.

Authors response:
In the multiple linear regression analysis, group affiliation, gender, smoking, duration of being DM, FPG, HbA1c, plaque index, gingival index, pocket depth, CAL, and BOP have been adjusted.

Comment of the reviewer:
Quality of written English: Needs some language corrections before being

Authors response:
English language and general grammar has been improved by native English language speakers.

Comment of the reviewer:
Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Authors response:
Multiple linear regression has been added in data analysis. The correlation was used to find the relationship. The details have been added in the results section, with yellow highlight, table 4, and table 5.
Reviewer's report 3

Title: Effectiveness of Lifestyle Change plus Dental Care (LCDC) program on improving glycemic and periodontal status in the elderly with type 2 diabetes

Version: 1 Date: 19 April 2014

Reviewer: Sudaduang Krisdapong

Reviewer's report:

Comment of the reviewer:

Major comment:

This study was conducted with a sound and thorough methodological procedure. Manuscript was well written with a good structure and clear descriptions. However, my concern is about the significance of findings. This study seems not to provide any new knowledge. The design does not match with study's justification and therefore, findings cannot fill the gap of knowledge. Justification of this study relates to a lack of knowledge on the effectiveness of combined intervention (lifestyle change plus periodontal care), whereas the effectiveness of each single intervention (against routine programme as a control) is generally known. Many previous studies on the effectiveness of single interventions (either lifestyle approach or oral care program) were referred to in Background and Discussion. Therefore, to test the effectiveness of the combined intervention, single intervention should be used as a control group. In other words, to see whether there is any additional benefit gained from combined intervention, compared to single ones. However, this study applied routine program as a control group, as a consequence, better outcomes can certainly be expected. In addition, authors mentioned about bidirectional relationship between DM and periodontal health. Previous studies also showed that the improvement of either could effect the other one. Therefore, additional cross-benefit obtained from combined intervention might be another interesting outcome. ie. Comparing periodontal improvement between groups with single behavioural change intervention and combined intervention, and comparing DM improvement between single oral care intervention and combined intervention.

Authors response:

The two separate interventions were integrated in one program because diabetes intervention programs alone prevent and control diabetic complications by decreasing HbA1c which only decreases the risk of periodontal infection. It does not prevent periodontal disease. Periodontal treatment programs alone improved
periodontal status. However to control DM, patients should maintain healthy lifestyles and routinely control health levels, healthy eating habits, regular physical activity, and take diabetes medicine. Combined lifestyle change and periodontal care intervention are needed to prevent dental complications.

The details have been added in the background section, paragraph 4 with yellow highlight.

Comment of the reviewer:

Another comment relating to the above mentioned, authors referred to a previous study in Thailand (paragraph 3 of Discussion) where DM improvement was not significant after periodontal conventional treatment. This point confuses the issue because the conventional or routine care (either giving advice on lifestyle change or periodontal treatment without serious oral hygiene instruction) is known to be ineffective. Throughout this study and from existing knowledge, effective single interventions refer to kinds of carefully and seriously given instructions (eg. MI technique, counseling). Thus, there is no use to mention about the ineffectiveness of routine care/treatment.

Authors response:

The ineffectiveness of routine care/treatment in paragraph 3 of discussion has been removed.

Comment of the reviewer:

Minor comment:

Although relevant details are completely provided, writing for publications needs to be more concise, than dissertation style. Figure can be deleted if description in texts is already clear. Tables 2-7 could be put together or some could be deleted. For example, Tables 4, 6 can be deleted, and findings on the non-significance at baseline can be described in texts. Then, Tables 5,7 can be put together of which some variables can be presented in one row, eg. ‘toothbrush (yes)’ instead of 2 rows ‘yes’ and ‘no’. Tables 2-3 can also be together.

Authors response:

According to the reviewer’s recommendation, figure has been deleted. Table 4 and 6 have been removed. Table 2 and 3, and table 5 and 7 have been combined. Some variables in table 5 and 7 were presented in one row.