Author's response to reviews

Title: Evaluating Components of Dental Utilization among Adults with Diabetes and Matched Controls via Hurdle Models

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Author's response to reviews: see over
To,
The Editor,
Biomedical Central, Oral Health.

Subject: Revision of Manuscript MS: 2747975395914670

Dear Dr. Henderson,

We have carefully revised our manuscript to address your suggestions and comments. We really thank you and the reviewers for your kind help in improving our work. We believe the manuscript is much stronger as a result.

Please find enclosed the new version of our manuscript. As required, a point-by-point description of the changes is provided below.

Sincerely,
Monica Chaudhari

Comments from the Editor

1. Ethical Approval

In addition to the referees comments, can you please move your statement regarding ethical approval from the Acknowledgements to the Methods section of your manuscript.

As suggested, we have moved the ethical approval as the last statement under Data Sources & Study Period in the Methods section, page 6.

2. General Formatting

Please also ensure that your revised manuscript conforms to the journal style (http://www.biomedcentral.com/bmcoralhealth/). It is important that your files are correctly formatted.

Our manuscript adheres to specified file formats.

Comments from Reviewer 1 (Dr. Bjorn Soderfeldt)

1. Major compulsory revisions - None, excellent paper

2. Minor essential revisions –

   a. There is double documentation in many places. The actual results should appear EITHER in text OR in tables, not both.

   We have provided results of all analyses specified in the Methods section in tables. Important findings are also noted in the text. We believe that documenting important results in the text is important in order to highlight and contextualize these study results.
b. There is also lacking an argument why BMI (page 7) is grouped into categories and not used as a continuous variable.

BMI is not linearly associated with the odds of diabetes. We have therefore chosen standard, biologically meaningful BMI cut-points identified by previous studies of the association between BMI and health outcomes. This allows us to estimate the association between BMI and diabetes without assuming a fixed functional form for this relationship. To clarify this analysis, we have added BMI intervals that correspond to standard BMI groupings on page 8, line 1.

c. The authors should further give consideration to the risk for ecological fallacy using the geographical categorization.

We believe that there was some misinterpretation by this reviewer. Since the analysis uses data at the individual subject level, the risk for ecological fallacy is eliminated as no aggregated data has been used.

Comments from Reviewer 2 (Dr. Ira B Lamster)

1. The literature used to support the statement that "...one-third of people with diabetes have oral complications..." should be current, and published in peer-reviewed journals.

Agreeing with the reviewer’s suggestion, we have revised the statement to “Oral complications including gingivitis, periodontitis, oral soft-tissue pathologies and tooth loss are common in people with diabetes [1, 2, 3, 4, 5], with an estimated prevalence of about 1/3 (Newton et al. 2011) [6].

2. The medications that were included in the model are ACE-inhibitors and statins. Other medications should be included, such as antibiotics and anti-inflammatory drugs including NSAIDs and corticosteroids. These medications can certainly affect the presentation of oral diseases.

ACE-inhibitors and statins, unlike antibiotics and anti-inflammatory drugs have been linked to both diabetes and periodontal disease. In fact, the current guidelines promote the use of ACE-inhibitors and statins in all diabetics in age 40 and older to prevent cardiovascular disease. We therefore included these medications because they may act as confounders in our analysis. However, antibiotics and anti-inflammatory drugs are generally not recommended for treatment in patients with diabetes and we do not expect large differences in their use in diabetic vs. non-diabetic population. We believe that these medications are unlikely to act as confounders and instead we have opted for parsimony in our models.

3. Further clarification is needed of the coding used to define "prophylaxis” versus" periodontal maintenance". Essentially the same services are provided. Why and how are each of these codes used? Since this is a significant matter as related to the interpretation of the findings, a broader explanation is needed (see Discussion page 20).
We appreciate this reviewer’s comment and recognize that more clarity in our presentation is needed. The codes used to define "prophylaxis" vs. "periodontal maintenance" are included in Appendix D in the Supplementary document. To address the reviewer’s concern, we have modified the last paragraph on page 20 to the following:

“Upon evaluating preventive oral health services, we found that among patients using dental services, those with diabetes were less likely than matched controls to receive overall preventive dental cleanings that included both prophylactic and periodontal maintenance services. When viewed individually, patients with diabetes were less likely to receive prophylaxes but more likely to receive periodontal maintenance codes that unlike the former represent procedures used in the treatment of active oral disease or its maintenance once stabilized [44]. In addition, they received significantly fewer diagnostic procedures.”

4. Minor issues/comments:

It is interesting to note that the prevalence of diabetes mellitus in this population was 8.24%, which closely approximates the CDC-stated prevalence in the United States.

We have included the reviewer’s suggested statement on prevalence of diabetes in the Discussion section on page 19 - first paragraph.

5. The authors cite a 2004 review by Taylor that summarized the studies examining the relationship of periodontal disease in diabetes mellitus (page 19). A more recent, updated review was published in 2008, and this paper should be cited.

We have updated the Discussion with a more recent review published in 2008 (Taylor GW, Borgnakke WS. Review Periodontal disease: associations with diabetes, glycemic control and complications. Oral Dis. 2008 Apr; 14(3):191-203.) that summarized the studies examining the role of periodontal disease in diabetes mellitus (page 19).

Comments from Statistical Referee:

1. Minor essential revisions:

More discussion should be included on the clinical significance of the results, particularly given the large sample size. Some of the statistically significant differences in Table 2 seem quite small. Do the authors feel that these differences are clinically as well as statistically significant?

To address the reviewer’s concern, we have added the following in the discussion section on page 21-first paragraph.

“Some of the statistically significant differences in Table 2 are quite small. The statistical significance of these results may be attributable to our large sample size. Given the substantial and increasing prevalence of diabetes in the population (8.24% in our cohort), even small significant differences in highly used procedures like diagnostic services and preventive care or in less utilized but more expensive procedures like fillings, extractions or removable prosthetics are likely to have meaningful effect on population oral health and health care cost and utilization.”