

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

This paper was submitted to a another journal from BMJ but declined for publication following peer review. The authors addressed the reviewers' comments and submitted the revised paper to BMJ Open. The paper was subsequently accepted for publication at BMJ Open.

(This paper received three reviews from its previous journal but only two reviewers agreed to published their review.)

ARTICLE DETAILS

TITLE (PROVISIONAL)	Comparison of the periodontal condition in Korean and Japanese adults: a cross-sectional study
AUTHORS	Furuta, Michiko; Takeuchi, Kenji; Shimazaki, Yoshihiro; Takeshita, Toru; Shibata, Yukie; Hata, Jun; Yoshida, Daigo; Park, Deok-Young; Ninomiya, Toshiharu; Yamashita, Yoshihisa

VERSION 1 – REVIEW

REVIEWER	Han Dong-Hun Seoul National University, Korea
REVIEW RETURNED	04-Jun-2018

GENERAL COMMENTS	1. keywords in 1st page and in 3rd page are different. 2. In Table 3, adjusting individual MetS components (model 3) made a change of OR from 1.68 to 1.80 whereas adjusting MetS showed no difference. Cold you explain why?
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REVIEWER	LORENZO-ERRO, SM School of Dentistry, Universidad de la República URUGUAY
REVIEW RETURNED	12-Jun-2018

GENERAL COMMENTS	<p>It is an interesting and well written manuscript addressing periodontal disease in Koreans and Japanese population. The comparison between these populations taking into account metabolic syndrome and its individual components is relevant issue and it has not been done before. Please find attached some suggestions that I think could improve the manuscript.</p> <p>ABSTRACT Pag. 3, line 40-46. Please add confidence intervals or p-value for prevalence of periodontal disease. In the age-adjusted analysis, consider indicating which variables had statistical significance in addition to diabetes and metabolic syndrome (number of filled teeth, dental visit in the last 12 months) and add p-value. Pag. 4, Lines 9-11- "These findings...", they do not correspond to the present investigation. The plausible hypothesis related with diet and dental health care system is well introduced in the Discussion section. The differences of dental health care system and dietary intake between two populations and the influence of them on periodontal</p>
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	<p>disease might be areas of further investigation due to their implication for periodontal disease.</p> <p>ARTICLE SUMMARY: STRENGTHS AND LIMITATIONS Pag. 5, lines 26-29- Please consider removing these lines. You can find the justification in the Abstract section comments and later in the text.</p> <p>INTRODUCTION Pag. 6, line 15, please include date.</p> <p>METHODS Pag.9, line 35: What is the reason because you have included “dental caries” ? Pag. 10, line 18: Could you provide intra-examiner Kappa value. Pag. 12, line 6: Please indicate if you have included occupation status as a proxy variable of socioeconomic status and specify which are “others” as they are 42% in the Japanese studied population. Pag 12, line 21: it should say “quantitative” instead of “continuous”. Pag 15, line 3: please remove “strongly” because using statistical analysis of sensitivity, you cannot affirm “strongly” contribute.</p> <p>RESULTS Table 1: please indicate the number of participants. Table 2: Why did you not include occupation in the model? Please justify (in Methodology section) the reason for including only participants with more than ten teeth. Table 3, If possible include the OR for the following variables: dental visit, current smoking, sex, age and occupation or at least which of them had statistical significance.</p> <p>DISCUSSION Pag. 17, lines 18-23: The information could be omitted. Pag. 19, lines 15: Expand the explanation of CPI weaknesses and consider the number of excluded sextants in each population. Then, in the discussion, discuss the impact of the number of excluded sextants in the investigation.</p> <p>Justify why you have not analyzed socioeconomic status of both populations.</p>
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REVIEWER	ANDRÉA MARIA DUARTE VARGAS Universidade Federal de Minas Gerais Brazil
REVIEW RETURNED	18-Jun-2018

GENERAL COMMENTS	It is a cross-sectional study, with relevant theme and well-defined, interesting and well-executed methodology. The discussion is very good and well elaborated, including study limitations.
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VERSION 1 – AUTHOR RESPONSE

Response to Reviewer 1:

1. Keywords in 1st page and in 3rd page are different.

Thank you for noting this error. We have removed the keywords from the third page.

2. In Table 3, adjusting individual MetS components (model 3) made a change of OR from 1.68 to 1.80 whereas adjusting MetS showed no difference. Could you explain why?

We agree that it is important to discuss the different odds ratios of the models in Table 3. We have explained these differences in the revised manuscript, as follows: "In this study, the strength of association between country and periodontal disease varied among models: the OR of country was 1.68 in Model 1, which included diabetes; 1.67 in Model 2, which included MetS; and 1.80 in Model 3, which included individual MetS components (Table 3). This might be due to varying associations between country and each of the following: diabetes, MetS, and individual MetS components. The association between country and diabetes or MetS was not significant among participants who underwent periodontal examination and had more than 10 teeth; however, the associations between country and individual MetS components were significant (data not shown). The OR of country differed in Model 3 because of inter-associations among independent variables, such as country and individual MetS components." (Page 17, Lines 8-18)

Response to Reviewer 2:

1. Pag. 3, line 40-46. Please add confidence intervals or p-value for prevalence of periodontal disease. In the age-adjusted analysis, consider indicating which variables had statistical significance in addition to diabetes and metabolic syndrome (number of filled teeth, dental visit in the last 12 months) and add p-value.

We appreciate this suggestion. We have added a description of statistically significant variables in the revised manuscript, as follows: "The age-adjusted prevalences of periodontal disease, defined as CPI score ≥ 3 , were 31.4% and 42.1% in South Korea and Japan, respectively ($p < 0.001$). The age-adjusted prevalences of diabetes ($p = 0.018$) and metabolic syndrome ($p = 0.001$) were higher in Korea than in Japan. The numbers of present and filled teeth and percentages of participants who visited a dental clinic in the last 12 months were higher in Japan than in Korea (all $p < 0.001$)." (Page 3, Lines 17-22)

2. Pag. 4, Lines 9-11- "These findings...", they do not correspond to the present investigation. The plausible hypothesis related with diet and dental health care system is well introduced in the Discussion section. The differences of dental health care system and dietary intake between two populations and the influence of them on periodontal disease might be areas of further investigation due to their implication for periodontal disease.

In accordance with the reviewer's suggestion, we have revised the manuscript as follows: "Further studies are needed to more clearly elucidate factors underlying the difference in periodontal conditions between the two populations, including those related to the dental health care system and dietary intake." (Page 4, Lines 4-7)

3. Pag. 5, lines 26-29- Please consider removing these lines. You can find the justification in the Abstract section comments and later in the text.

We have removed the fourth bullet point of the strengths and limitations sections and added the following limitation regarding periodontal assessment: "Periodontal condition was evaluated by using partial mouth assessment; thus, it was possible to underestimate the prevalence of periodontal disease." (Page 5, Lines 8-9)

4. Pag. 6, line 15, please include date.

We have added the date in the revised manuscript as follows: "national surveys from 1999 to 2012." (Page 6 Line 6)

5. Pag.9, line 35: What is the reason because you have included "dental caries" ?

We have explained the inclusion of dental caries in this study as follows: "We assessed dental caries by measuring the total numbers of decayed and filled teeth; this measurement was performed because tooth surface roughness, especially in cases of subgingival restoration, leads to the accumulation of plaque, which results in gingival inflammation.¹⁴" (Page 9, Lines 16-19)

6. Pag. 10, line 18: Could you provide intra-examiner Kappa value.

We did not evaluate the intra-examiner reliability because it was difficult to arrange a re-examination time convenient for both a gold standard KNHANES examiner and Japanese volunteers who had previously undergone examinations.

7. Pag. 12, line 6: Please indicate if you have included occupation status as a proxy variable of socioeconomic status and specify which are “others” as they are 42% in the Japanese studied population.

We have described occupation status in the revised manuscript as follows: “Socioeconomic status was measured by occupational status... “Other jobs” includes professional, skilled, and service workers, salespeople, farmers, and fishers.” (Page 11, Lines 3, 6-7)

8. Pag 12, line 21: it should say “quantitative” instead of “continuous”.

We have modified this to “quantitative variables” in the revised manuscript (Page 11, Line 16).

9. Pag 15, line 3: please remove “strongly” because using statistical analysis of sensitivity, you cannot affirm “strongly” contribute.

We have removed “strongly” from the revised manuscript (Page 14, Line 8).

10. Table 1: please indicate the number of participants.

We previously indicated the number of participants in each variable (Table 1; total number of participants for each group at the top of each column, total number for each variable contained in each row of the table as n (%)).

11. Table 2: Why did you not include occupation in the model?

We had no clear reason to omit occupation from Table 2; thus, we have included the age-adjusted frequency of occupations in the revised manuscript (Table 2).

12. Please justify (in Methodology section) the reason for including only participants with more than ten teeth.

We have described the reason for including participants with more than 10 teeth as follows: “We included participants who had more than 10 teeth in this analysis because all of them had at least one sextant in CPI.” (Page 11, Lines 23-24)

13. Table 3, If possible include the OR for the following variables: dental visit, current smoking, sex, age and occupation or at least which of them had statistical significance.

We have shown the OR of all variables in Table 3.

14. Pag. 17, lines 18-23: The information could be omitted.

In accordance with the reviewer’s suggestion, these sentences have been removed.

15. Pag. 19, lines 15: Expand the explanation of CPI weaknesses and consider the number of excluded sextants in each population. Then, in the discussion, discuss the impact of the number of excluded sextants in the investigation.

We agree that greater discussion is necessary regarding the limitation of CPI with respect to the number of excluded sextants. We have explained this limitation in the revised manuscript as follows: “when index teeth were not present, the exclusion of sextants may have led to an underestimation of periodontal disease. In this study, all participants with more than 10 teeth had at least one sextant. The percentages of participants with 0, 1, and 2-5 excluded sextants were 82.7%, 7.0%, and 10.3% in KNHANES and 81.7%, 8.5%, and 9.8% in the Hisayama study, respectively. Although the number of

excluded sextants was relatively low, a misclassification bias may have affected the magnitude of the observed associations.” (Page 18, Lines 12-18)

16. Justify why you have not analyzed socioeconomic status of both populations.

We used occupational status as an indicator of socioeconomic status, but did not directly assess income. We have described socioeconomic status in the revised manuscript as follows: “We used occupation as a socioeconomic status indicator; however, we did not directly assess income because the Hisayama study did not collect income data and the previous KNHANES study (2012) showed no significant association between income and periodontal disease.¹⁸” (Page 11, Lines 7-10)

Reviewer: 3

Authors must include a statement in the methods section of the manuscript under the sub-heading 'Patient and Public Involvement'.

We have added “Patient and Public Involvement” in the Methods section of the revised manuscript as follows: “KNHANES data used in this study comprise nationwide data, which is collected annually by the Korea Center for Disease Control and Prevention; these data are publicly available to researchers. Participants in the Hisayama study were recruited with the help of the Health C&C Center Hisayama, which provided healthcare services to the residents of Hisayama. None of our participants were involved in the recruitment or conduct of either study that has provided data for this report.” (Page 12, Lines 14-20)

We thank the reviewers again for their helpful comments. We feel that our manuscript has been substantially improved as a result of their suggestions.

VERSION 2 – REVIEW

REVIEWER	Dong-Hun, Han Seoul National University School of Dentistry, South Korea
REVIEW RETURNED	20-Sep-2018
GENERAL COMMENTS	This is a well designed study.