Author's response to reviews

Title: Association between the longest job and oral health: Japan Gerontological Evaluation Study project cross-sectional study

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Author's response to reviews: see over
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Dear Dr. Wael Sabbah:

I am submitting herewith our revised manuscript entitled, “Association between the longest job and oral health: Japan Gerontological Evaluation Study project cross-sectional study” for consideration for publication in BMC Oral Health.

We wish to thank the referees for their careful critique of our manuscript. We have made every effort to implement their recommendations, and we feel that the paper has been improved as a result. The revised parts were highlighted with blue. We hope you will find the manuscript suitable for publication in your journal.

Sincerely yours,

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Response to Editor
Please elaborate on the use of occupational classification as a marker of SES, how important it is to health and behaviour in the Japanese population.

Our response: Thank you for comments. We have added two paragraphs to explain the importance of occupational classification in oral health (page 4, lines 6-15).

It would have been useful to the analysis if the duration spent in the longest job was accounted for.

Our response: We do not have the data on the duration spent in the longest job. We have mentioned this as a limitation (page 13, lines 3-7).

The first paragraph of the introduction appears little out of context.
Our response: We deleted the paragraph including its references, as suggested.

Response to referee 1

Minor Essential Revisions

1. Background: Page 4: Line 12: It should be "positions" rather than "position".
Our response: We have revised the sentence (page 4, line 16).

2. Methods: Page 5: Line 18: The number of municipalities is "31" here although you say "30" in other parts.
Our response: The questionnaire used in one municipality did not include questions used in the present study. Therefore, we excluded all subjects in that municipality. We have added this explanation in the Methods section (page 5, lines 21-23).

3. Results: Page 9: 1st paragraph: You need to put "the" in the front of "lowest" and "highest".
Our response: We have added ‘the’, as suggested (page 9, lines 5-9).

Our response: We have revised the sentence (page 10, lines 19-23).

5. Discussion: Page 10: Line 15: According to your manuscript, there is no category for "unskilled jobs". Did you mean the category of "unskilled and semiskilled workers" or all categories except "skilled workers"?
Our response: According to the reviewer’s comments, the sentence was revised (page 10, lines 19-23).

6. Discussion: Page 10: Line 19: It should be "classes" rather than "class".
Our response: The word has been changed (page 10, line 25).

Discretionary Revisions

1. Background: Page 4: Line 19-20: The statement should be based on evidence; therefore, a reference may be required.
Our response: We have deleted the sentence to avoid confusion.

2. Background: Page 4: Line 21: As poor oral health status even among children in the area is reported, there may be other causes of poor oral health rather than
occupation.

**Our response:** We have deleted the sentence.

3. Methods: Page 6: Line 21: I wonder the definition of “no occupation”. The question asked was "for most of your working life" according to the text. Does it mean that housewives, who worked in a technical field for a year before marriages, were counted as "technical workers" rather than no occupation even if the non-working period was longer than working period because it was considered "in their working life". If so, does "no occupation" indicate people who never worked in their life? It might need to be clear.

**Our response:** As the referee pointed out, housewives who worked in a technical field for a year before marriage were counted as "technical workers" rather than no occupation even if the non-working period was longer than working period in the present study. We have added the sentences in the Discussion section as a limitation (page 12, lines 3-7).

4. Methods: Page 7: The population of study were people aged 65 or older; therefore, the household income may be pension for employed professional/technical workers. On the other hand, those with working for agriculture or forestry may still work as they do not have physical disabilities according to the text. This may generate the difference in time flexibility or household income. You might need to consider these factors in the discussion part.

**Our response:** Thank you for your comments. We analyzed the association between the longest job and present working situation and receipt of pension. As the referee pointed out, the percentage of subjects who still work was highest in agriculture/forestry/fishery workers (47% for males, 36% for females). We have added this information (page 11, lines 18-23). However, we did not add any information for pension because almost all (99%) of the subjects received pension in the present study.

5. Results: Page 9: Line 19-22: How was the density associated with oral health and behaviour? e.g. positively or negatively etc.

**Our response:** According to the referee’s comments, we have added the sentences “Subjects in municipalities with lower density of dentists were less likely to have subjective poor oral health and to visit dentists.” (page 9, line 25 – page 10, line 1) and “Subjects in municipalities with lower population density were less likely to have 20 or more teeth and to visit dentists.” (page 10, lines 3-4).
6. Discussion: Page 11: Line 1: How was it associated? e.g. higher income was associated with more use of dentures.

Our response: According to the referee’s comments, we revised the sentence as “Significant association was observed between low income and not using denture/bridge (data not shown).” (page 11, lines 6-8).

7. Discussion: Page 11: 2nd paragraph: I could not find the results about the relationship between oral health status and behaviours. (In the conclusions: Page 12: Line 25 as well)

Our response: We deleted the sentences.

8. Discussion: Page 11: Line 14: the word of "access" has some interpretations (e.g. physically or financially etc) ; therefore, "time flexibility" might be better in this context.

Our response: We have revised the word, accordingly (page 11, lines 18).

Response to referee 2
This study assessed the association between occupation and outcomes in dental health in a large sample of Japanese elders. The theme is relevant to dental public health; this hypothesis has not been studied and entails novelty. The manuscript was well written and the study is well organized. A relevant database and appropriate analytical methods: I agree with methodological options. Authors made a strong case in the Discussion. I congratulate authors for their beautifully done study; I am sure to state that this study will be a relevant acquisition for the assessment of dental health of the elderly.

Our response: Thank you for your comments.

Response to referee 3
Major Compulsory Revisions
1. The characteristics of the analyzed population (n=23191) is representative of target population (n=46009)? Or, is the age and gender distribution of the analyzed sample similar to actual Japanese old population?

Our response: Thank you for your comments. The characteristics of the analyzed population might not represent that of the target population. Because municipalities denied providing us demographic data on the target population, we could not evaluate representativeness of the analyzed population. Our
previous study, which had been done in 2003 in one municipality using the same survey method (response rate: 55.5%), showed that people under the age of 80 and middle to high levels of household income were more likely to respond to a questionnaire survey (Suemori K: Tendency to non-response. In Kondo K, ed. Health inequalities in Japan: an empirical study of older people. Melbourne, Australia: Trans Pacific Press 2010:222.).

We used subjects who did not already have a physical or cognitive disability, defined by not receiving public long-term care insurance benefits, at baseline. Therefore, the age and gender distribution of the analyzed sample is not similar to actual Japanese old population.

We added this limitation in the Discussion section (page 13, lines 7-14).

Minor Essential Revisions

1. Why the subjects with 9 or less teeth were excluded in the analysis of interdental brush-use? Is there any reason that people with 9 teeth do not use interdental brush? Since the number of teeth was obtained from self-administered questionnaire, this exclusion criteria might be ambiguous.

Our response: In the questionnaire, we asked about the use of an interdental brush or dental floss. People having few teeth, especially only one tooth, may not need to use these instruments. Moreover, respondents were asked to indicate the number of remaining teeth as 20 or more, 10-19, 1-9 or 0. Therefore, the subjects with 9 or less teeth were excluded in the analysis.

Because we used a self-administered questionnaire to obtain data on the number of teeth, it could be argued that the questionnaire used did not provide a full and accurate picture of the differences in numbers of teeth. However, self-reported number of teeth is a well-established and reliable measure that has been used in national epidemiological surveys (Pitiphat et al. J Public Health Dent 2002, 62:122–128). High agreement between self-reported and examined number of teeth (Pearson’s correlation coefficient: r=0.97) was reported in 50 community-dwelling individuals aged 70 or older in the US (Douglass et al. J Public Health Dent 1991, 51:220–222.). The mean (standard deviation) difference between self-reported and examined number of teeth was 0.02 (3.92) in a study of 2,496 Japanese people with a mean (standard deviation) age of 59.0 (12.7) (Ando et al. J Dent Health 1997, 47:657-662.).

We have added the explanation in the Methods section (page 8, lines 15-17).

2. It is strange for the reviewer that oral health status or tooth retention is poor in
Our response: Thank you for your comments. A study in Japanese male workers aged 20-69 years also showed that salespersons and service occupations were more likely to have periodontitis compared to professionals (Morita et al. J Clin Periodontol 2007, 34:952-956.). Another study using the same population also showed that service occupations were more likely not to have 20 or more teeth compared to professionals (Morita et al. Eur J Oral Sci 2007, 115:275-279.).