Author’s response to reviews

Title: Age estimation in three distinct East Asian population groups using southern Han Chinese dental reference dataset

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Author’s response to reviews:

Dear Editor-in-Chief,

We appreciate the reviewers’ comments on our work which have significantly improved the quality of the manuscript. We have addressed the Reviewers’ comments and have made point-to-point response to each comment.

Reviewer reports:

Junaid Ahmed (Reviewer 1): Needs extensive language correction including grammatical corrections

Response: The manuscript has been thoroughly revised. The language, syntax and grammatical errors have been identified and corrected.

Norliza Binti Ibrahim, DDS, MSc, PhD (Reviewer 2): Age estimation in three distinct East Asian population groups using southern Han
Chinese dental reference dataset.

1. Abstract: The conclusion is not similar to what mentioned in the results and discussion.

Result: "From six dental age calculations, few methods of DA accurately estimated the age of Filipino and Japanese subjects but overestimated the age of Thai"

Conclusion in abstract: "Based on the outcomes of this study, the southern Han Chinese reference dataset can be recommended for use on Japanese subjects, and with some reservations on the Thai and Filipinos."

Discussion: "In the Thai, whilst the age of males seems to be accurately estimated by the method, in the females it was overestimated."

The authors should mention the methods that accurately estimated the age of Filipino and Japanese.

This following conclusion should be highlighted in the abstract's conclusion:

Conclusion after discussion: "The reference dataset was shown to be the most accurate for Japanese, followed by Thai males and it was particularly ineffective for Thai females and Filipinos."

Response: We have included the methods that are accurate in the Results and have modified the Conclusion based on the Reviewer's recommendation.

“Results: From six dental age calculations, all methods of DA accurately estimated the age of Japanese and few methods in Filipino subjects (n-tds, 1/sd-tds, 1/se-tds). There was consistent overestimation of age for all the methods for Thai females (p&lt;0.05). "

“Conclusions: The southern Han Chinese dental reference dataset was shown to be most accurate for Japanese, followed by Thai males and it was particularly ineffective for Filipinos and Thai females.”

2. How can the authors ascertain ethnicity based on surnames especially in inter racial marriage?

Response: The ethnicity was ascertained based the following parameters:

1. Geographical area from where the samples are obtained.

2. Uniqueness of the name of the subjects included in the study relevant to the ethnic group.
3. Surnames of the parents and grandparents should be of same ethnicity without any inter racial marriage. This information was based on the surnames which is specific to a population, for example, in Japanese, it is presented as characters without addition of English names, etc. The same applies to Thai and Filipino populations. This study only identified the ethnicity of samples based on two generations, however any inter-racial mixtures beyond this generation could not be verified.

The following sentence in the Methods section has been modified to clarify this information:

“The ethnicity of each subject included in the study was verified from their surnames as indicated in the hospital records. In addition, ethnicity was further validated by uniqueness of the surnames of parents and grandparents to rule out any inter-racial marriage.”

3. The type of panoramic machines together with its magnification should be clarified because the magnification can influence the measurements.

Response: The following information has been included in the Methods section:

“A standard protocol of data acquisition of panoramic radiographs included digital images (Gendex Orthoralix 8500 DDE, Illinois, USA) and scanning the hard copies (Philips Orthoralix SD Ceph, Monza, Italy) at a resolution of minimum 300 dpi (Canon Scan 4400F, Canon Corp, US). All the radiographs had 3% imaging magnification and they were viewed on a 27-inch computer monitor at a magnification of 160% (27IE, Philips, Philips Corp, US).”

4. Bland and Altman analysis are mentioned in the abstract but not in the methods section.

Response: Information on Bland &amp; Altman plots have been included in the Methods section:

“Furthermore, Bland &amp; Altman plots in the form of scatterplots of CA-DA by CA were generated to visualize the variation in the difference between the dental age and the chronological age (CA-DA) estimated from the weighted average method (1/sd-tds) in the Japanese, Filipino and Thai subjects using the southern Han Chinese reference dataset.”

5. "Comparing differences between CA-DA, results show that the southern Chinese Han reference dataset overestimated the age of Filipino subjects"

6. Authors should mention the overestimation/underestimation values in the result section.

Response: Yes. Overestimation values for Filipino subjects have been included for better clarity.
“Comparing differences between CA-DA, results show that the southern Chinese Han reference dataset overestimated the age of all Filipino subjects. In males, all the dental age calculations over-estimated the age with a minimum difference of -0.17 years for 1/se-tds method to a maximum difference of -0.27 years for se-tds method. A similar overestimation was observed in females with a minimum difference of -0.13 years for 1/sd-tds and 1/se-tds methods and maximum difference of -0.23 years for sd-tds and se-tds methods.”

7. Although some paragraphs are well written, some of the sentences are difficult to understand e.g.

"In males, all the dental age calculations over-estimated the age ranging from -0.17 years (1/se-tds) to -0.27 years (se-tds)".

"Figures 2 to 4 show the variation in the difference between CA and DA (CA-DA) by chronological age in the three test samples."

This sentence has been changed to:

Response: These sentence have been modified to:

“"In males, all the dental age calculations over-estimated with a minimum difference of -0.17 years for 1/se-tds method to a maximum difference of -0.27 years for se-tds method."

“Figures 2 to 4 show the variation in the difference between CA and DA (CA-DA) in the y-axis and chronological age in the x-axis for all three test samples.”

8. "Regardless of the method used to estimate dental age and indicating that the southern Chinese RDS reference dataset best matches the Japanese sample (Table 4), compared to the others."

In the result section, authors should mention their results with respect to the type of method used.

Response: The results has been elaborated to include relevant significant findings.

“Japanese subjects

The age of Japanese subjects was also overestimated from the method, showing minimal CA-DA differences. CA-DA differences were all statistically insignificant for both sexes (p\textless 0.05), regardless of the method used to estimate dental age and indicating that the southern Chinese RDS reference dataset best matches the Japanese sample (Table 4), compared to the others. This ranged from 0.03 years for sd-tds and se-tds methods to 0.09 years for 1/sd-tds method in males. Similarly, for females, the difference ranged from -0.01 years for se-tds method to 0.09 years for 1/se-tds method.”
The use of subheadings will make it easier for the reader.

Response: Relevant subheadings were included to distinguish the findings observed in the three population groups: Filipino subjects, Thai subjects, Japanese subjects, and Bland & Altman scatter plots.

9. Discussion: "Whether this indicates a close similarity in dental maturation between the Japanese and the southern Chinese populations due to shared population history or similar growth environments is not known." Provide reference.

Response: The following reference has been added to support the statement on genetic similarity between Han Chinese and Japanese populations:


10. Clarify this statement: On the other hand, population-specific methods may also be difficult to justify as application of the method across "similar" populations result in both reliable (Japanese) and unreliable (Filipino) outcomes.

Response: The above sentence has been modified for clarity:

“For example, in Japanese subjects, no statistically significant difference was observed between the CA and DA estimated from the southern Han Chinese data showing that the reference data is reliable. In contrast, significant difference was observed between CA and DA in Filipino subjects.”

11. Authors mentioned that age distribution among the samples were not equal. This could be one of the limitations of the study.

Has this limitation affected the outcome of the study? Is this a major limitation? If so, then the authors should reconsider re analyzing equally distributed samples among the 3 populations.

Response: During planning of this study, we attempted to collect equal number of samples across all ages in the three population groups. The panoramic radiograph acquisition protocol was found to be different in Japan, Philippines and Thailand and so we could not meet equal sample distribution. Whilst this is certainly a limitation, we do not consider this affected the outcome of the study. The data in this study was clearly presented in the Tables and Figures with appropriate description of the sample mean age, standard deviation etc. We have acknowledged this limitation as well as provided directions for future research in the Discussion section:
“This uneven age distributions among the samples resulted from limitations to access to radiographs from the university-based teaching hospitals in Japan, Philippines and Thailand. This can be considered as a limitation and the results of this study can be further confirmed with equal and possibly, higher number of samples allocated to each age range in the respective populations.”

Reviewer 2 (Reviewer 3): PEER REVIEWER ASSESSMENTS:

OBJECTIVE - Full research articles: is there a clear objective that addresses a testable research question(s) (brief or other article types: is there a clear objective)?

No - there are minor issues

DESIGN - Is the current approach (including controls and analysis protocols) appropriate for the objective?

No - there are minor issues

EXECUTION - Are the experiments and analyses performed with technical rigor to allow confidence in the results?

Yes - experiments and analyses were performed appropriately

STATISTICS - Is the use of statistics in the manuscript appropriate?

Yes - appropriate statistical analyses have been used in the study

INTERPRETATION - Is the current interpretation/discussion of the results reasonable and not overstated?

Yes - the author's interpretation is reasonable

OVERALL MANUSCRIPT POTENTIAL - Is the current version of this work technically sound? If not, can revisions be made to make the work technically sound?

Probably - with minor revisions

PEER REVIEWER COMMENTS:
GENERAL COMMENTS:

Dear editor,

Thank you for the invitation to review the manuscript "Age estimation in three distinct East Asian population groups using southern Han Chinese dental reference dataset". This is an interesting study about age estimation of three different Asian populations, using a Han Chinese dental reference dataset. Overall, it was detected that this dataset may estimate properly the age of Japanese individuals, but caution should be used when estimation individuals from Thailand and Philippines. However, few aspects of the Methods section need to be properly expressed in order to be further considered for publication. Despite of that, the study is well-written and very informative.

REQUESTED REVISIONS:

Dear authors, congratulations for the study. Overall, the study is well-written and very informative. However, few aspects of the Methods section need to be properly expressed in order to be further considered for publication.

Background

* In order to increase the readability, I believe the 3rd paragraph should be the 1st one of the Background section.

Response: We have moved the 3rd paragraph to the beginning of the Introduction section and have made few minor changes to improve the flow of the contents.

* I miss the objective of the present study.

Response: We have made few changes in the flow of the introduction and included aim of the study as follows:

“Hence, this study aimed to test the applicability of southern Han Chinese dental reference dataset on three distinct populations in East Asia: Filipino, Thai, and Japanese.”

Methods

* Table 1 and Figure 1 are repetitive. Although the map is an interesting way to illustrate the sample distribution, the Table may illustrates this matter more appropriately.

Response: We understand the Reviewer’s concern. Thailand shares a huge landmass and similarly, Japan and Philippines are composed of several islands. A figure would be able to
clearly represent the geographical location within these countries from where the samples were obtained. The map would also help readers who are unfamiliar with Asian countries to know the distance between those locations.

* The calibration process, per se, must be explained in details. Moreover, it is not clear what the interexaminer reproducibility is. Was the examiner (JJ) calibrated with a standard examiner?

Response: A separate section to brief the examiner reliability has been included in the Methods and Results section.

Methods

“A single examiner (JJ) scored all the radiographs. The intra- and inter-examiner reliability scores were tested based on the 8-stage tooth development system described by Demirjian and colleagues [17]. The reliability examination was conducted using Kappa analysis at statistical significance level of p<0.05.”

Results - Examiner Reliability scores

“Fifty radiographs were randomly chosen to test the reliability of the examiner. For inter-examiner reliability, the radiographs were scored by the main examiner (JJ) and the second examiner (HMW) at the beginning of the study. For intra-examiner reliability, the same radiographs were scored by the main examiner (JJ) at two-time intervals, beginning of the study and after a period of 3 weeks. The Kappa scores were 0.81 and 0.85 for intra- and inter-examiner reliability and these scores correspond to “almost perfect” observations.”

* For each individual, was the dental age estimation attributed only once? How the reference dataset was used in the present study, when attributing the age estimation? The whole process of dental age estimation need further clarification.

Response: Yes, the dental age estimation was conducted only once for each subject. The scores were obtained from the reference dataset to estimate the age of subjects included in this study. This has been already elaborated in the Methods section:

“Excel spread sheets were prepared and the details including newly assigned ID number, date of birth, date of radiograph, sex and ethnicity were entered (Microsoft Excel, Microsoft Corp, US). For each subject, sex specific scores were identified and the mean Ages of Attainment (AoA) and the associated standard deviations were obtained from the southern Han Chinese reference dataset. A total of six dental age estimation methods were employed; one simple average method (SAM) and five weighted average method (WAM) calculation based on the parameters associated with tooth development stages (TDS).”
ADDITIONAL REQUESTS/SUGGESTIONS:

None.