Author's response to reviews

**Title:** Evaluation of maxillary anterior teeth and their relation to the golden proportion and golden standard in malaysian population

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Dear Sir/Madame

I am pleased to submit the manuscript entitled, “evaluation of maxillary anterior teeth and their relation to the golden proportion and golden standard in malaysian population” for your consideration.

This study is a cross sectional study conducted to investigate the occurrence of the golden proportion between the perceived widths of the maxillary anterior teeth. A second purpose was to evaluate whether consistent relationships exist between tooth width and height of the clinical crown dimensions. The study also aimed to compare these proportions among the 3 majority ethnic groups in Malaysia: Malay, Chinese and Indian.

The clinical significance of the study is to determine a mathematical or geometrical relationship between teeth in order to achieve an esthetic restorative result. It would be helpful if statistically reliable relationships existed to support existing relationships theories. This can simplify the diagnosis of facial and dental disharmonies and will help to restore optimal facial esthetics.

I hereby warrant the following to be true:
1. The manuscript has been approved for submission to the BioMedCentral (BMC) Oral Health by all authors.
2. The text and images in the manuscript submitted are the original work of the author(s).
3. The manuscript has not been published or being under consideration by another journal.

Dear Sir/Madame

The following changes has been done to the original manuscript as required from the journal editorial office before starting the peer review process.
Here I describe these changes made point-by-point:
1) We added this paragraph in the Methods:
   “Ethical approval obtained from the Ethics Committee of the Faculty of Dentistry, MAHSA University College. All volunteers participated in the research signed informed consent prior to their participation which included the nature of the project and declared the confidentiality of all information.”
   This is added to discuss our efforts to comply with Helsinki Declaration.
2) We added this paragraph after the conclusions:
The authors declare that they have no competing interests

3) We added the authors’ contribution part to the manuscript.
MI AL-MARZOK took part in making the study conception and design, supervision of
the research group, analysis and interpretation of data, involved in drafting the
manuscript.
KR ABDUL-MAJEED participated in the design of the study and involved in drafting
the manuscript.
IK IBRAHIM involved in drafting the manuscript.
Authors read and approved the final manuscript.

4) We added the acknowledgment part to the manuscript.
We would like to express our gratitude to Ms. Agnetha Tan Tjin, Mr. Ong Wui Liam and
Mr. Lee Yen Yao; the dental students at MAHSA University College for their efforts in
getting volunteers’ consent, data collection and taking photographs. This study was
supported by Faculty of Dentistry, MAHSA University College which approved the study
proposal and offered all the instruments and materials.

5) We added an acknowledgment to the volunteers especially to the volunteer who accepted
to publish her picture in the study.
Our thanks to everyone who has helped as a volunteer especially to Ms. Aimi Khadijah
Binti Abdul Razak for approval of publishing her picture. A written consent was obtained
for publication of study.

After the peer review process and in light of the reviewers’ comments, this is a point-by-point
description of the changes made.

1) We re-worded the methods part of the abstract- MAHSA University College students
whom met the inclusion criteria. Who instead of whom.
2) We stated the research hypothesis in the manuscript’s background.
The null hypotheses were that there is no difference between the proportions of maxillary
anterior teeth of Malaysian population and the golden proportion or the golden standard
values.
3) We stated how the ethnicity was determined in the study. This paragraph was added to
the methods:
Participants were asked to identify their ethnicity by selecting an answer using pre-fixed
ethnicity categories (e.g. Malay, Chinese, Indian, Indigenous people, Mixed and Others).
Then participants were also asked to identify their father’s and mother’s ethnicity using
the same pre-fixed categories.
4) We referred to the figures in the main text. The following paragraphs was amended or
added accordingly.
- Making an alginate impression for the maxillary arch of a volunteer is shown in (Figure 1).
- Evaluations regarding the occurrence of the golden proportion were conducted by
drawing of grids that obtained by placing the casts on a flat surface and drawing
vertical lines representing the perceived mesiodistal widths of the teeth. The golden proportion grid is shown in (Figure 2).

- Measurements were done for the spaces in the grids using the digital caliper as shown in (Figure 3).
- Ratios for maxillary lateral to central incisors and canine to lateral incisor based on the golden proportion are shown in (Figure 4).
- One-way ANOVA was used to analyze the comparison between ethnics of the lateral to central incisor ratio is demonstrated in Table 1; and of the canine to lateral incisor ratio is demonstrated in Table 2.
- The means for the widths and heights of the maxillary central incisors are shown in (Figure 5).
- Table 3 represents the one-way ANOVA that was used to analyze the comparison between ethnics of the width-to-height ratio of maxillary incisors.

5) We added these two paragraphs for clarifying why we group together all three ethnicities in the statistical analysis of the data.
   - The results of this study displayed no specific effect of ethnicity on golden proportion and golden standard among the three major Malaysian ethnic groups.
   - The general Malaysian data can be used in the current study to compare with other populations as the golden proportion and golden standard was not found in all ethnic groups.

6) We added more references in order to compare our results with other populations regarding the existence of golden proportion.
   - Rosenstiel and others found that golden proportion was preferred only when viewing very tall teeth and less desirable for normal height or shorter teeth.
   - The current study found poor correlation between teeth dimensions and the golden proportion which is similar to the findings of (Preston in 1993, Gillen et al in 1994, Mahshid et al in 2004, Hasanresioglu et al in 2005, Fayyad et al in 2006, Murthi and Ramani in 2008 and Petricevic et al in 2008). The results for Malaysian population were comparable to the results reported in similar studies of other populations, including Turkish, Iranians, Jordanians, Americans, Indians and Caucasians.

7) We added this paragraph for a recent study conducted in Korea for supporting our results regarding the golden standard.
   - Recent study conducted in Korea showed similar results for the non-celebrities group.

8) We added this paragraph regarding the possible limitations placed on the study by the sample size
   - The sample size was small due to time constraints and the exclusion criteria restricted the number of volunteers who could be recruited into the study. Additional research on a greater sample size selected more systematically is needed before extrapolating the results to the Malaysian population.

9) We added four more references.


After the second review process and in light of the second reviewer’s comments, this is a point-by-point description of the changes made.

1. Power analysis was made (Post hoc or retrospective) as the second reviewer requested. Accordingly, this paragraph was added to the methods part:
   “Post hoc power analysis was made using PS power and sample size program as suggested by Dupont and Plummer (1998)”.
   These paragraphs were added to the discussion part:
   “Power analysis was used to find how much power for this cross-sectional study if we had a specified number of volunteers. The power analysis of 65% indicates that there is a 65% chance of rejecting the null hypothesis when it’s false while 80% is generally considered to be good power. With small sample size, the sample mean tends to be noticeably larger than when the null hypothesis is rejected with the larger sample size. Literatures reveal small difference in means between current study and studies with larger sample sizes.”

2. This reference was added:

3. The first paragraph in the Background is changed:
   “Dental esthetics is a primary consideration for patients. New dental materials and techniques were introduced maximizing the likelihood of an attractive outcome. The size and form of the maxillary anterior teeth are important not only to dental esthetics, but also to facial esthetics”.

4. Two paragraphs changed in the Discussion part:
   - “Many dental and facial characteristics differ following the geographical location and historical background. Therefore, information regarding tooth norms in a group of population is useful to dentists when restoring teeth”.
“Determination of a mathematical or geometrical relation between anterior teeth is important to achieve an esthetic result. It would be helpful if statistically reliable results existed to support existing theories.”

Thank you for considering this manuscript.

Sincerely,
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