Author’s response to reviews

Title: Comparison of diagnostic methods for early interproximal caries detection with nearinfrared light transillumination: An in vivo study

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Author’s response to reviews:

The following are the changes made in the revision of the manuscript;

Reviewers' comments:

Reviewer#1

(Reviewer 1): The introduction is pertinent to the topic addressed. The methodology can be described more clearly to respond to what the study proposes.

We’d like to thank and express our deep gratitude to the reviewer for his/her kind concern and effort for reviewing our manuscript. We agree with the reviewer completely. Several changes were made according to reviewers’ suggestions. A Consort Flow Chart was added both this and other reviewers’ suggestions to better explain the methodology.

Reviewer#2

In their study, the authors compared near-infrared light trans illumination (NILT) and bitewing radiographs with digital phosphor plates (PSP) for the detection of interproximal lesions in-a clinical setting. Based on their results the authors conclude that NILT reaches the level of sensitivity and accuracy to reveal early interproximal caries. Although the topic of detection of early interproximal caries is of high clinical relevance there are several issues that need to be solved before the study meets the high standard of BMC Oral Health.
We’d like to thank and express our deep gratitude to the reviewer for his/her kind concern and effort for reviewing our manuscript. Several changes were made according to reviewers’ suggestions, which can be found below.

Major issues:

1) Overall the authors did not convincingly show the novelty of their study. Given the fact that the authors discuss some of the available studies which evaluate the feasibility of NILT for interproximal lesions it remains unclear why the authors have not provided this information in the introduction and background. As this literature is available the authors should provide the information in the introduction and clarify the rational of their study.

We agree with the reviewer completely. We added paragraphs according to NILT application for early caries diagnosis. A new paragraph was written according to NILT and the rationale of our study was added in the introduction part. We added new references and reference list was corrected.

2) The authors also aim to reveal the interobserver difference. Why were the number of observers limited to two with different training and experience level? What does an average of 8 years of experience for two observers mean? This is very unclear as hypothetically one of the two observers could also have no experience if the other has 16 years.

The methodology regarding the inter-observer difference was explained in detail. We would like to compare the performance of two different specialist esp. working on caries detection. Both radiologists and restorative dentists compared and try to figure out for any differences. This issue was corrected and explained din detail in the methods section as;

“An oral and maxillofacial radiologist (KO) and a restorative dentistry consultant (IHB) evaluated the images twice. The radiologist consultant has 16 years of experience in diagnosing and evaluation of caries lesions using all radiographic modalities. The restorative dentistry consultant has 8 years of experience in diagnosing caries lesions both clinically and radiographically. The observers were selected from different specialties dealing with caries detection as a daily routine activity in their clinical environments. Hence, it was considered worthwhile to compare between these two specialists for early caries detection in the daily clinical practice”.

The methodology is not clearly described: I strongly would suggest a flow chart for the study design. Furthermore, inclusion, exclusion, and drop out of patients for the study should be presented in a flow chart like the concept of the consort flow chart.
According to the reviewer’s suggestion, a consort flow chart was prepared and implemented in the methods section. The chart was prepared as new figure (Figure 1).

The authors should provide a section on the limits of the study and provide a paragraph on future perspectives. It is unclear what the authors mean with "However, it should be indicated that the of bias cannot be excluded from any in vivo diagnostic study for ethical reasons as in this study."

According to reviewer suggestion, the limitation of the study was re-written in a separate paragraph at the end of the discussion. Future perspectives were also added to this paragraph as;

“Limitation of the study

There are several limitations in this study. Because of not clinically validating the teeth that were scored as (4) probably no caries and (5) definitely no caries, there may still be missing caries lesions in these patients. However, because of ethical reasons, one cannot clinically validate these lesions because of unnecessary interventional possibility to the patients. Another limitation is that only two observers were included in the study, a consultant of maxillofacial radiology and a restorative dentistry consultant. More number of consultants or even a general dentist with a difference experience level should have been included in this study. In addition, since various radiographic and several NILT images were used in this study by the observers, a nonbiased investigation of the intraobserver and interobserver reproducibility was not possible”

Minor issues:

1) Abstract: The authors provide only the aim of the study in the background but do not present the rational of the study.

According to reviewer suggestion, the rationale in this study was added both in the abstract and in the introduction part of the manuscript.

2) The authors should be consistent with the use of terms and abbreviations. E.G. "Observer 1" vs "Obs1", "p values" vs. "level of significance".

According to reviewer suggestion, the mistakes in terms of spelling, punctuation etc. were corrected accordingly.
3) The authors should double check the manuscript for formatting. Although this is revision 1 (R1) there are still several issues such as color (page 4, line 58) and typos ("…", page 6, line 106, "didnit" page 6, line 111) and more. The authors also used several different formats for numbers e.g. 28.1 vs. 28,1. The authors should use "." Instead of "," when reporting numbers in the manuscript and the tables.

The mistakes in terms of spelling, punctuation etc. were corrected accordingly. Reference list was corrected. The entire manuscript was proofread by a profession language editing service (Enago-Crimson). The English in this document has been checked by a professional editor, native speakers of English. The mistakes in terms of spelling, punctuation etc were corrected accordingly.

4) Page 7, line 121 "The decision for cavity preparation (validation phase) was mainly based on combined clinical and radiographical evaluation." If the authors used mainly these two issues for their decisions, what other criteria were used? Maybe the authors want to rephrase this sentence?

We agree with the reviewer completely. The decision made by just only the modalities. Thus, the sentence was re-phrased and “mainly” was omitted from the text.

5) The authors should re-evaluate their usage of the term "gold standard".

According to reviewer’s suggestion. The term gold standard was omitted from the text.

6) Discussion: Page 11, line 226: What do the authors mean with "This may due to experience of the examiners." The authors should provide further information on this issue in the manuscript.

According to reviewer’s suggestion. The sentence was changed as;” The results showed that the second readings were better than the first readings, with higher kappa values. This may be explained by the fact that both observers obtained more experience in evaluating the NILT images and improved in the second readings.

7) Author’s contributions: Line 263 "IHB, MEK, and KO designed the study and helped to draft the manuscript." Who did IHB, MEK, and KO help to draft the manuscript? Who were the two observers mentioned in the abstract and method section? Please include this information.

According to reviewer’s suggestion. This section as re-written. MEK was mentioned in the Acknowledgments section.
8) The authors should provide the data following the guidelines of the BMC Oral Health journal.

According to reviewer’s suggestion, the entire manuscript was re-organized according to BMC oral health guidelines.

9) Table 1: What is SE. The authors should define the abbreviations also in the table legends.

SE mean standard error which correct in the text.

10) I suggest that the authors should consult a scientific trained native speaker for help with the manuscript.

The mistakes in terms of spelling, punctuation etc. were corrected accordingly. Reference list was corrected. The entire manuscript was proofread by a profession language editing service (Crimson –ENAGO). The English in this document has been checked by a professional editor, native speakers of English. The mistakes in terms of spelling, punctuation etc were corrected accordingly.