Author’s response to reviews

Title: The impact of ICDAS on occlusal caries treatment recommendations for high caries risk patients: an in vitro study

Authors:
Muawia Qudeimat (mqudeimat@hsc.edu.kw)
Yacoub Altarakemah (yacoub@hsc.edu.kw)
Qasem Alomari (qalomari@hsc.edu.kw)
Nour Alshawaf (nour@umaryland.edu)
Eino Honkala (eho072@post.uit.no)

Version: 2 Date: 30 Dec 2018

Author’s response to reviews:

Dear Professor Rechmann,

Thank you very much for considering our manuscript for publication in the journal of BMC Oral Health.

We would like to thank the reviewers for their expert and valuable comments and suggestions. We think the quality and clarity of the manuscript have improved. In this report (below), we respond to all points raised by the reviewers. We also uploaded a word document of this report as a supplement material.

Best Wishes and Happy New Year
Muawia Qudeimat

Reviewer reports:

Michele Diniz (Reviewer 1): *This manuscript aimed to assess in vitro the impact of ICDAS on dentists’ caries management decisions for patients at high risk for caries.

COMMENT: The authors point out that the influence of using ICDAS on caries management decision-making has not been investigated before. However, this is not true. See other references
in literature that evaluated caries lesions by ICDAS visual criteria and combined the radiographic examination for treatment decision:


Response:

It was not our intention to ignore important work that was carried out in this area. However, when we stated that “The influence of using ICDAS on caries management decision-making has not been investigated before” we meant changes in treatment decisions before and after ICDAS training. The objectives and methodologies of the above studies were different and investigated the direct association between the use of ICDAS as a detection tool and treatment decisions. Saying that, we agree with the reviewer that the studies are relevant to this study, and that our results should be compared to those from the above studies. We have now modified the text to show the work that was done in this area previously.

COMMENT: ICCMS should be better presented and discussed, since the authors used the combined scores for ICDAS (1-2, 3-4 and 5-6), according to the ICCMS recommendations.

In fact, I do believe that the scores proposed for caries management decisions are not adequate: (1) no action, (2) nonoperative care (fluoride toothpaste, regular recall visits, and/or professional topical fluoride and fissure sealants), and (3) operative care (minimally invasive restorations, restorations, pulp therapy, and extraction). Different caries management are presented as the same score, especially as operative care, and this is not correct (i.e., it's not possible to compare minimally invasive restorations to extraction).

Response: We are now describing the ICCMSTM in the introduction section. There was a typo in option (3) of the treatment options. What was stated on the study capture form was “preventive resin restoration (PRR)” and not “minimally invasive restorations”. Also, both therapeutic and preventive fissure sealants were considered under “fissure sealants”. This has been corrected in the material and methods section.

COMMENT: More information about the examiners (age, clinical practice or faculty) and their clinical experience and area of actuation/expertise should be discussed, since this information
might have influenced the results. Why two examiners were more invasive after ICDAS training than the others?

Response:

We provided more information about the clinical experience and specialty in dentistry for each examiner.

“Five examiners participated in this study. Three examiners worked in the department of restorative sciences department (examiner one: a scholarship dentist with more than five years of clinical experience; examiner four: a clinical associate professor with 19 years of clinical and academic experiences; and examiner five: a clinical assistant professor with 10 years clinical and academic experiences). The other two examiners worked in the department of developmental and preventive sciences (examiner two: a clinical associate professor with 20 years clinical and academic experiences; and examiner three: a clinical professor with 38 years of clinical and academic experiences). In addition, all the examiners were regularly involved in treating patients and training undergraduate students on caries detection and treatment.”

We speculated in our discussion section (second paragraph page 12 and first paragraph of page 13) why we think examiners 1 and 2 were more influenced by the ICDAS system.

COMMENT: Moreover, ICDAS e-learning program is not available anymore. So, how dentists can assess this information for clinical practice?

Response:

We believe that the ICDAS e-learning that we used is now equivalent to day one of the didactic training and lab course provided by the International Caries Classification and Management System (ICCMS)TM (https://www.iccms-web.com/course/1). We’ve now stated this in the methodology section and updated the references.

COMMENT: All these queries and suggestions would improve the manuscript for a better understanding by the readers.

Sophie Doméjean, DDS, PhD (Reviewer 2): Review for BMC Oral Health

Manuscript number OHEA-D-18-00391R1

Title The impact of ICDAS on occlusal caries management recommendations for high caries risk patients
Overall appreciation

COMMENTS: Terminology and typography

The authors must refer to the current international terminology related to Cariology.

- The distinction between "caries" and "carious" as well as has to be made as well as the distinction between treating the caries disease and managing a carious lesion to match the current international terminology related to Cariology.

- "Detection" and "diagnosis" that are not synonyms; please refer to the current international terminology related to Cariology.

- "Cavities" is a term to be used with patients but not in a scientific article.

- ICCMS should be ICCSTM.

- ICDAS 0 versus 1,2 versus 3,4, 5,6 is called "merger-ICDAS scores" and not 4-level- ICDAS scores.

Response:

We’ve reviewed the terminology we used in the manuscript with that of the current international terminology. A list of recent publications that we took into consideration when reviewing the terminology is found below. However, as we were researching the definitions and use of the terms “caries diagnosis”, “caries detection”, “caries treatment” and “caries management” in the recently published literature it became clear that the terms were used interchangeably among clinicians, researchers, and cariologist. We hope we managed to correct the terminology and typography found in our manuscript.


COMMENT: - The term "heuristic maximum kappa of <0.8" is difficult to understand.
Response: This was replaced with maximum kappa $< 0.8$

COMMENT: All numbers below 10 should be in full e.g "5 different examiners" should be "five different examiners".

Response: Corrected.

Some formatting is necessary in the text: for an example, [7, 8, 9, 10, 11, 12] should be [7-12].

Response: We’ve reviewed the Journal’s information to the authors section and checked the most recent publications from BMC Oral Health. The citation system within the text for this journal is [7, 8, 9, 10, 11, 12] and not like other journals [7-12]. If this is not the case, we are happy to change it to the suggested format.

Title

COMMENT: The in vitro nature of the study design as to be mentioned: a title as to be informative.


Background

COMMENT: ICCMSTM is not only a standardized method for caries classification and management, it is also and above all evidence-based" - this must be stipulated.

Response: we defined ICCMSTM and replaced “standardized” with “evidence-based”.

COMMENT: The authors wrote: "Little is known about the mechanisms or criteria dentists use for making caries management decisions [14]. If it was the case in 1997 when Bader et al published the cited article, many questionnaire surveys have been undertaken around the globe and many narrative articles described the fact the factors influencing treatment decisions and potential practice changes.

Response: we agree with the reviewer, using “little is known” does not describe the current knowledge about this subject. However, we think that the work by Bader et al is still relevant today. Also, we’ve read the studies that were suggested by the reviewer. Abreu-Placeres et al 2018 is in agreement with Bader et al and states that: “…To respond to the clinicians and clinical-practice educators’ need of practical guidance, ICCMSTM was created to provide an evidence-informed comprehensive system aimed at producing tooth-preserving caries prevention and personalized care plans. Despite efforts such as these, however, current best-practice
recommendations have not been adopted as expected by practitioners. As a result, questionnaires have been developed to evaluate the caries practices and treatment decisions of clinician and educator dentists, but these have mainly provided a descriptive framework that has lacked an understanding of the antecedent variables that may explain dentists’ behaviours or possible avenues for achieving change”.

We modified the paragraph to read as follows: “Even with the increasing use of methods and tools that are more accurate for caries detection among dental practitioners and researchers [13], the mechanisms or criteria dentists use for making caries treatment decisions are still not fully understood [14, 15, 16].

Methods

COMMENT: Please give a proper description of the five examiners and be more descriptive than "Five examiners with a minimum of five-year experience in clinical practice participated in this study. All of the examiners were regularly involved in treating patients and training undergraduate students on caries diagnosis and management." Age? Clinical experience of each? Selection modality?

Response:

We’ve included more information about the examiners “Five examiners participated in this study. Three examiners worked in the department of restorative sciences department (examiner one: a scholarship dentist with more than five years of clinical experience; examiner four: a clinical associate professor with 19 years of clinical and academic experiences; and examiner five: a clinical assistant professor with 10 years clinical and academic experiences). The other two examiners worked in the department of developmental and preventive sciences (examiner two: a clinical associate professor with 20 years clinical and academic experiences; and examiner three: a clinical professor with 38 years of clinical and academic experiences). In addition, all the examiners were regularly involved in treating patients and training undergraduate students on caries detection and treatment”

COMMENT: The authors should mention when the study has been done. They mention that none of the examiners had any information about the ICCMSTM. ICCMSTM has developed and disseminated in 2014; has be study been done before 2014?

Response:

The ICCMSTM were first published after December 2014. When we conducted this part of the study none of the examiners had a prior information about the ICCMSTM guidelines. We’ve added the following statement: “This study was conducted between October 2013- September 2016 and at the time of carrying out the visual detection and treatment decision component of this study, none of the examiners had any information about the ICCMS™ caries management system.”
COMMENT: The authors mention that the examiners were asked to evaluate the occlusal surfaces of the teeth. They must mention what has been asked to the examiners: presence/absence of a carious lesion? Lesion severity stages? Lesion activity?

Response:

We modified the paragraph to read as follow: “In the first part of this study, the examiners were asked to independently evaluate the occlusal surfaces of the teeth and apply the appropriate score from the ICDAS scoring system and choose their treatment recommendation for each tooth from a list of options. No attempts were made to detect lesion activity.”

COMMENT: Statistical analysis: this is very strange to me that merged-ICDAS was the standard for inter-examiner reproducibility assessment (0 versus 1,2 versus 3,4 5,6) when later in the text other thresholds have been used (ICDAS D1 threshold (code 0 as sound/enamel caries and codes 1-6 as dentin caries); ICDAS D2 threshold (codes 0-2 as sound/enamel caries and codes 3-6 as dentin caries), and ICDAS; D3 threshold (codes 0-3 as sound/enamel caries and codes 4-6 as dentin caries). Indeed, in ICDAS 2 threshold, code 3 refers to dentin carious lesions and in ICDAS 3 threshold to an enamel carious lesion.

Response:

In order to investigate the agreement between the ICDAS and the histology of the lesions a threshold limit was used. The visual and histologic diagnostic thresholds we used in this study were proposed and used by:


And other studies

To compare our results with those from the literature who used a similar visual classification system, an ICDAS D1, D2 and D3 diagnostic threshold and the Ekstrand et al. (1997) histology at the 2 and 3 threshold were used. In addition, we tried to use this analysis to postulate the reasons for the treatment decisions made by some dentists in this study.

Results and Tables

COMMENT: The reviewer is sorry but does not understand the link between Table 2 and the related text section.

Response:

In the results text we stated that “The scores for inter-examiner reproducibility were not always comparable (Table 2). The linear weighted kappa statistics for the inter-examiner reproducibility ranged between 0.50-0.68.” In the table we have reported on the observed agreements, linear weighted kappa and maximum kappa. Since linear weighted kappa (LWK) indicates the scores for reproducibility (b) between examiners, we reported that the lowest LWK was 0.50 (between examiners 1 and 3 and 1 and 5) and the highest LWK was 0.68 (between examiners 4 and 5). We have added more information to this statement in the text and we hope we were able to clarify what we meant.

COMMENT: The authors wrote: "ICDAS training statistically significantly increased the percentages of operative recommendations for two examiners." Significantly? P-values?

- Same comments for numbers presented in table 6: significantly?

Response:

The p-value was added to the results and tables sections for tables 4 and 5 and to the tables section for tables 6 and 7.

COMMENT: Table 5: would it be possible to have the results codes by codes and not all teeth together.

Response:

We fully understand what the reviewer is asking us to do and we agree that such table would very interesting and valuable. However, the interpretation and discussion for the results from such table would be complicated and is not specifically within the objectives of this study.
COMMENT: The authors must describe the treatment options that have been indicated as non-operative strategies. Were therapeutic sealants an option?

Response: This has now been clarified and typos corrected.

COMMENT: Table 6: "under": under what? Undertreatment? In reference to ICCMSTM?

Response: This is now corrected.

Discussion

COMMENT: The authors wrote: "we investigated the impact of ICDAS training on the decision-making for the management of cavitated and non-cavitated lesions in patients at high risk for caries." That is a different objective than the one expressed in the introduction. Moreover, ICDA code 4 refers to non-cavitated lesions but I am not sure if this point is clear in the present work.

Response: This was corrected to “In this study, we investigated the impact of ICDAS on dentists' caries treatment decisions.”

COMMENT: The discussion should be shortened and more straight to the point.

- References that have been considered are not the most recent in the domain.


- And other guidelines/recommendations related to caries management in adolescents

Response: We have revised the background and discussion sections and added more relevant and recent studies/data to our discussion.

Following is a list of the studies that were added:


References

COMMENT: The reference related to ICCMSTM is missing in the introduction.
Response: The reference has been cited in the text.

COMMENT: Please, update ICDAS and ICCMSTM website
Response: ICDAS, ICCMSTM and the other online/electronic references were updated.

COMMENT: The references need some reformatting; e.g. capital letters in the middle of the title.
Response:

In citing references, we followed the instructions to authors’ section. We reviewed the references section and checked with pubmed and scopus. The referencing style we used follows the journals suggested format. The example given in the instructions to authors is as follows: “Roberts LD, Hassall DG, Winegar DA, Haselden JN, Nicholls AW, Griffin JL: Increased hepatic oxidative metabolism distinguishes the action of Peroxisome Proliferator-Activated Receptor delta from

If there is a more recent link to the referencing style of this journal, we are happy to make the required referencing format.

COMMENT: The pages of reference 35 are not cited appropriately.

Response:
Dental Update has many advertisement pages within their issues. Dental Update’s publishers assign these advertisements a page number. Therefore, there is discontinuity in the page numbering. We also checked pubmed and scopus and both cite this reference in this form.