Reviewer's report

Title: The Application of Virtual Reality and Augmented Reality in Oral & Maxillofacial Surgery

Version: 0 Date: 24 Apr 2019

Reviewer: Carlo Mangano

Reviewer's report:

the topic is of interest but the article must be re-organized in its structure, in order to give the readers who are not aware of this technology, the possibility to clearly understand the topic, the basic differences between virtual and augmented reality, as well as the present and future dental applications. what is the definition of virtual reality? what is the definition of augmented reality? what are the differences? what do you mean for "immersive"? what are the present and future clinical applications? these are the questions the article should reply to, in a logical order. in this article you give this information, but in a manner that is not easy to understand for the reader: not in a logical order.
i give you here a few suggestions to improve the quality of this paper, basically by changing the order of the paragraphs.

moreover, the manuscript must be modified also in order to meet the standard requirements of BMC Oral Health- please read the instructions to the authors before to resubmit the paper. please number your pages.

please revise the BMC Oral Health instructions for the authors because the references should be written accordingly and the citations in the body of the manuscript should be inserted accordingly.

---- overall article structure. please structure your paper as follows:
background in which you immediately define virtual and augmented reality, their differences, the concepts of "immersive" reality and "haptic". please report on the different commercially available products and shortly describe their features.
in the methods, you talk about your literature search giving proper details, even if it is a narrative review you need to report on your searching methods.
in the results, report on the number of articles found and then, the dental applications of VR and AR in the different fields (for example dental education, restorative and prosthodontics, oral and maxillofacial surgery, etc.). here you can describe the results obtained in the most important studies.
in the conclusion, please summarize the present applications, their clinical relevance, the future perspectives (note that this section is missing in the present paper) this is how your study should be.

----- details. please revise all the details here:

--title: there is a typing error at the end. please check it and erase it.
abstract. the abstract should be rewritten according to the logical order suggested above and hence structured into aims/methods/results/conclusions even if this is a narrative review. i honestly feel this section does not contain sufficient information on what we can do (and what we cannot still do) with virtual and/or augmented reality. in addition in the title you mention also augmented reality but it is not clear from the abstract the difference between virtual and augmented reality. i think you should cover in the abstract (as well as in your text) both the topics. i would recommend giving proper definition of both of these: virtual and augmented, describing in what they differ. then the applications, present and future.
please describe the methods of your narrative review, and please report on the number of important articles found in the literature, and their conclusions.

----background. the title for this section is missing. please insert it.
in the background you should provide a clear definition of what virtual reality is and what augmented reality is, in what they differ, etc. - this must be done immediately, and not after the 3d data acquisition section.
this mandatory part is missing. the 3d data acquisition part is not essential here at least not like reported here. what kind of structure do you want to give to this paper? i think definitions and differences should come first, and later (in the result section) you should talk about how these can be used, in the different field of dentistry, according to the literature, with the different devices that are currently in the market.

all the first sections of the background do not have references and this is not acceptable.
in the beginning of your section you immediately focus on 3d data acquisition. this part can be included only after the definition of VR and AR and their differences. however all these sections should be enriched and should include pertinent references that are missing. in your text after the 3d acquisition section, you finally include the definitions of virtual reality, and augmented reality. i believe these definitions should be at the beginning of the text. however these paragraphs must be expanded.
i do not understand why you dedicate a paragraph to Oculus Rift and not to the other devices that are currently available in the market. you should mention properly all of them but in the proper paragraphs, and describe them and their uses and applications.
i also do not understand the meaning of the paragraph of the haptic technology. shouldn't you describe it properly within the previous ones?
i would not distinguish between clinical and dental applications. just focus on dental applications and expand them. but you need to list them in a logical order: per applications x example dental education, restorative and prosthodontics, oral and maxillofacial surgery, etc. the revision of the literature is adequate in quality but more papers should be added.

finally i suggest to remove the section on dynamic guided surgery and particularly the one dedicated to the different available systems. this section should be reduced and inserted in the proper applications, in the result section.
please write a conclusion section that summarize the findings of the present study.

the reference list is incomplete and written not in accordance with the BMC Oral Health guidelines, please rewrite.

the figures are interesting but maybe you can compose them in multipanel??

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

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