

## Peer Review File

Article information: <https://dx.doi.org/10.21037/jtd-22-461>

### Reviewer A

Comment 1: The investigation of non-pharmacologic techniques to reduce anxiety during medical procedure is timely and worthy of research. This is a pilot study with 20 participants and no control group. The lack of a control group greatly weakens the significance of the study. The study demonstrates a reduction of anxiety levels from 9/10 before procedure to 4/10 during the procedure, but we have no control to show what the normal reduction in anxiety is during the procedure. The high level of patient satisfaction is encouraging and significant. The study shows that the VRH procedure is viable, it can be delivered to bronchoscopy patients practically and the patients are satisfied.

The text on lines 83-84 is vague. Did the patients rate their pre-procedure pain levels before the procedure? Or did they rate it afterwards, retrospectively. The text suggests the latter, which is less reliable.

Reply 1: Many thanks for this comment.

The pre-procedure and per-procedure anxiety were rated just after the procedure (before leaving the bronchoscopy suite); as well as the patient's satisfaction rating. Changes in the text: page 5 line (81-86) : "(...) Just after the procedure, before the patient leaves the bronchoscopy suite, physicians and nurses filled a standardized satisfaction form with items related to patient characteristics, duration of the bronchoscopy procedure, type and duration of the scenario chosen, and satisfaction with VRH (on a scale of 0 to 10). In the same time, before leaving the bronchoscopy suite, patients also filled the satisfaction form and in addition reported their anxiety level before the procedure and during the procedure using a numeric scale from 0 to 10.

Comment 2: There is a lack of precision in the overall report, perhaps a language factor. Another example is the summary of the only study using hypnosis during bronchoscopy (lines 130-134). The text does not stipulate when the various measures were taken relative to the bronchoscopy, and therefore we are not clear on what decrease and increase refers to.

Reply 2: many thanks for this comment. We modified the text in order to be more specific.

Changes in the text: page 6 line 130-134: "(...) Patients filled a standardized form to assess levels of anxiety, cough, dyspnea and pain before and after the procedure, with a numeric scale from 0 to 10. In the hypnosis group, levels of anxiety, cough, and

dyspnea decreased, whereas they all increased in the standard group, which more often required the addition of local anesthesia. (...)

Comment 3:

Recommendation:

1. This study is worthy of publication if the authors can be more specific and exact on the sequence in their study of when the pre-procedure anxiety was rated, and when the during procedure anxiety is rated. Finally, how long after the procedure was the patient satisfaction rated.

Reply: many thanks for this comment:

The pre-procedure and per-procedure anxiety were rated just after the procedure (before leaving the bronchoscopy suite); as well as the patient's satisfaction rating  
Change in the text: page 5 line (86-89) : “(...) Just after the procedure, before the patient leaves the bronchoscopy suite, physicians and nurses filled a standardized satisfaction form with items related to patient characteristics, duration of the bronchoscopy procedure, type and duration of the scenario chosen, and satisfaction with VRH (on a scale of 0 to 10). In the same time, before leaving the bronchoscopy suite, patients also filled the satisfaction form and in addition reported their anxiety level before the procedure and during the procedure using a numeric scale from 0 to 10.

2. The authors should also discuss at greater length that a control group would be valuable to verify that the anxiety reduction was due to the hypnosis and not to the passage of time.

Reply: Many thanks for this comment. we added this comment in the discussion section of the manuscript:

Change in the text: page 8 line 154-156: “(...) A study with a control group should be performed in order to verify that the anxiety reduction was due to the hypnosis and not to the passage of time (...)”

## **Reviewer B**

This paper proposes to use VRH technique to stress the patients' attention during bronchoscopy and carried survey to show its performance on decreasing anxiety. This technique uses VR device to.

Comment 1: The authors claimed no study before their work, however, I found several works describing the similar research [1-2]. So, I am wondering if the authors really did the survey.

[1] Jansen, E. M. M. (2017). Effects of nature on stress and anxiety during invasive

diagnostic procedures: using virtual reality environments (Bachelor's thesis, University of Twente).

[2] Thomasson, N. W. (2020). Stress reduction during bronchoscopy using a virtual reality head mounted display with nature stimuli (Bachelor's thesis, University of Twente).

Reply 1: Many thanks for this comment. We read with a lot of interest these 2 theses and discussed their results in the new version of the manuscript.

Change in the text : page 7-8 line 143 to 146: “(...) A team reported the use of VR, displaying nature stimuli(21), during bronchoscopy in 37 patients and showed an improvement of level of anxiety with VR. However, in this work, comparing to our study, no narrative hypnosis was added. (...)”

Comment 2: The samples in the paper are not big enough, as the authors said in the discussion. I would be appreciated if more cases are researched

Reply 2: Thank you for this comment. After this pilot study, assessing retrospectively the satisfaction of VRH during bronchoscopy, we are currently planning a controlled study.

Comment 3: In the questionnaire, physician and nurse satisfaction with VRH were investigated. I wonder two questions about this option: (1) the meaningfulness of this option, since they are same people (1 physician 2 nurses?) (2) its contribution to the further study.

Reply 3: Thank you for this comment. We think that it is important to have the satisfaction evaluation of the VRH mask from the medical team (1 physician and 2 nurses). The team was really satisfied with the patient's calm during the procedure, but also with the ease to use the device (setting and use during bronchoscopy). The point was also to identify potentials pitfalls for the medical staff, including obstruction for the bronchoscopy procedure for example.

Comment 4: Do these patients have enough scenario to select? For example, some patients may prefer not to select if none of the scenario is in their favorite list.

Reply 4: Thank you for this comment. It is a commercially standard VRH device, with pre-recorded scenarios. All of the patients chose one of the four scenario, and no patient refused the VRH because of the scenario selection.

Comment 5: Does a previous bronchoscopy have influence on the next bronchoscopy?

Reply 5: Thank you for this comment. Regarding the influence of a previous bronchoscopy on the level of anxiety, the literature reports contradictory results (citer les 2 études). In the future, a controlled study could also analyze the effect of a previous bronchoscopy, with or without VRH, on anxiety.

Change in the text : page 7 Line 136 to 134 : “ (...) In our study, 8 out of the 20

patients did have a previous bronchoscopy. The influence of a previous bronchoscopy on the level of anxiety is debated in the literature, with contradictory results. In the future, a controlled study could also analyze the effect of a previous bronchoscopy, with or without VRH, on anxiety. (...)”

Comment 6: Some other parts on format.

The format of referring to literature are quite different. For example, in Introduction line 58 and 72 they are in normal format and size, however, in Discussion they are in superscript.

L.203: the format of author’s name is different from others.

L.211: I suppose the text in bold in other references is volume.

L. 215: in some literature, authors’ name are replaced by et al, and in some others, all authors are listed. Which one is correct?

Reply 6: Thank you for this comment. We modified the references as required (Vancouver system of referencing + adding, et al if more than 3 authors)

## **Reviewer C**

Comment: The current study investigated the hypnotic effect of virtual reality software to reduce anxiety during bronchoscopy. Bronchoscopy was performed under local anesthesia without any sedative drugs. Patients retrospectively graded their anxiety before and during bronchoscopy procedure. The questionnaires were filled after the procedure. The median level of anxiety decreased 9/10 too 4/10. The authors concluded virtual reality was useful to reduce patient’s anxiety.

This report is unique because virtual reality was introduced during bronchoscopy to release patient’s anxiety. To reduce anxiety, virtual reality seems to be effective during bronchoscopy if bronchoscopy is performed without sedation.

However, the data were described only by questionnaires measured objectively. There are no comparative data and the outcomes seem to be susceptible bias. Therefore, the conclusions are lacking of scientific evidences. As the authors mentioned this was a preliminary study, to strengthen the current study, the authors should compare the conventional standard method without virtual reality with this novel method.

Reply: Thank you for this comment. This is a pilot study assessing retrospectively the satisfaction of the VRH for bronchoscopy, both for patients and the medical staff. After these encouraging preliminary results, we are indeed planning a controlled study.

## **Reviewer D**

Comment 1: VRH mask is not known to the readers. Could you describe the VRH mask in more detail? For example, its size, its cost, etc.

Reply 1: Thank you for this comment, we added this information to the manuscript.

Change in the text page 5 line 72 to 80: (...) VRH was performed using a PICO G2 4K, (PICO, San Francisco, CA) which presents as LCD goggles (LCD 4K 3840 x 2160 pixels). The device weighs 298g. The content used was created by HypnoVR (HypnoVR®, Strasbourg, France) (figure 1). It displays a slow-motion movie from different scenarios (mountain, forest, tropical beach, space or deep-sea diving) (figure 2) It also incorporates headphones that transmit the narrative hypnosis, which follows a classic medical hypnosis session (induction, suggestion and return), and integrates sequences of controlled breathing, cardiac coherence and hypnotic suggestions. The hypnosis narration has been developed by specialists in hypnosis. The duration of VRH was adapted to the expected duration of the procedure (10 minutes or 20 minutes).(...)

And page 8 line 151 to 152.: (...) Moreover, this device (hardware + software) is not expensive (about 3000 euros). (...)

Comment 2: Did the patients experience adverse events related to the VRH mask?

Reply 2: Thank you for this comment. No patients experience adverse events related to the VRH mask

Change in the text : page 6 line 100 to 101: “(...) No patients experienced adverse events related to the VRH mask (...)