Reviewer’s report

Title: A positioning pillow to improve lumbar puncture in paediatric haematology-oncology patients: A randomized controlled trial.

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Reviewer: Jacqueline Ellis

Reviewer’s report:

1. Is the question posed by the authors well defined?
   The question for the study is simple and well defined: does the pillow increase the likelihood of achieving a successful LP outcome. The justification for the study needs to be better described. It is not clear why a pillow is needed and why sedation is not used in France. The standard for LP performance is conscious sedation with local analgesia. The authors need to make a case for why this is not done in France and why it is then useful to have some sort of restraining or comfort device to aide in the performance of the LP. Since the outcome of the study was largely negative and there was no significant difference between the control and the intervention group it is not clear why you are trying to publish the results. Is this a pillow that is used widely in France but has never been tested? Is this something that the authors developed or have used in the past and found helpful. The basic premise for the study needs to be better developed in the introduction.

   The authors state that ‘evidence-based pain management remains insufficient’ I agree that the practice has not kept pace with the evidence but the evidence is there. State-of-the art is a child that is properly sedated with propofol given by an anesthetist or nurse-anesthetist in a comfortable side lying position. It is organizational barriers and system issues that prevent this from happening. There is evidence to show that the LP accuracy increases when the child is properly sedated.

2. Are the methods appropriate and well described?
   For the most part, the methods seem appropriate to answer the research questions. It is not clear what the ‘usual procedure’ is for the LP. The control group needs to better described with respect to how their LPs were performed? Were they sitting or lying down? Restrained in any way?

   Can you include a section on measures so that we know the psychometrics of the measures that you used and the justification for choosing those measures. What is the LeBaron score, Lansky score, why did you use a VAS instead of numerical or facial pain scale (for the 2-6 year olds)?

3. Are the data sound?
   The data seem to be sound and the protocol was well defined and well reported.
4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
Yes.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   The discussion needs to be restructured as I could not really get a sense of the data, what was statistically or clinically significant. I do not get a sense from the authors of whether or not they think this pillow has potential. It is as if they were trying to show that the pillow does not work and so we need to find better methods for pain control in France. Is this is so then more needs to be done in the introduction so the reader is aware of how this pillow is used in practice.
   The authors report no statistically significant difference between the control and intervention group with the exception of LP success over age 6. Since this is there only positive finding it should perhaps be better described and discussed.
   In the conclusion the authors do not suggest using the pillow with the exception of children over 6? This was a significant portion of their participants so this needs clarification.

6. Are limitations of the work clearly stated?
Yes.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
No

8. Do the title and abstract accurately convey what has been found?
The title could be more specific as to what you are trying to improve with LP. The accuracy and comfort might be added to the title.

9. Is the writing acceptable?
No, the writing needs some fine tuning and editing.

Note: The picture of the pillow is important for the readers understanding and interpretation of the paper. However, the picture is misleading as it looks like the person behind the patient is actually performing the LP. I am assuming that she was posed for the picture and not actually performing an LP. She has no mask, hat, gloves or gown and has hair falling in her eyes. You would not want your readers to think that this is how you do your LPs on cancer patients.

**Level of interest:** An article of insufficient interest to warrant publication in a scientific/medical journal

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a
statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.