Author’s response to reviews

Title: Experiences of interactive ultrasound examination among women at risk of preterm birth: a qualitative study.

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Author’s response to reviews:
Tovah Honor Aronin/Cecilia Pennica
Editor

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Dear Dr. Tovah Honor Aronin/Cecilia Pennica and Reviewers Matthew Hoffman and S.C. Kane

Thank you for the positive and constructive criticism concerning our manuscript. The Editor’s and Reviewers’ comments have been valuable and have helped us to improve the manuscript. All changes have been made by using track-changes-mode and are marked with red font.

We wish that you could find the revised paper suitable and interesting for publication Hereby we again state, that this is original work, has not been published previously and is not under consideration for publication elsewhere. If accepted for publication, it will not be published elsewhere including electronically in the same form, in English or in any other language, without the written consent of the copyright-holder. All authors also have approved the final version of the manuscript. All authors declare that they have no conflicting interest to disclose.
Responses to the Editor-in-Chief and the Reviewers

Editor Comments:

Thank you for your submission to BMC Pregnancy and Childbirth.

In addition to addressing the reviewers' comments below, please address the following editorial points:

1. Please add a case number to your ethics approval
   - We want thank you for pointing out the inconsistencies in our manuscript. Case number of the ethics approval has been added

2. Please format the Authors' contributions statement according to our guidelines, including the individual contributions of each author: https://bmcpregnancychildbirth.biomedcentral.com/submission-guidelines/preparing-your-manuscript/research-article
   - Author’s contributions statement has been edited and individual contributions of each author have been specified.

3. Please have your manuscript edited for English usage by a colleague who is fluent in English or by a professional editing service. Please see below for more information.
   - A native English speaker has edited and revised the paper.

4. Please specify in the Methods section at what stage of the analysis or manuscript writing process the interviews were translated to English and by whom.
   - The analysis process was performed in Finnish with the original data and the direct quotes were translated in English by native Finnish-American person.

5. Please include a copy of your interview guide, both in Finnish and in English translation, as additional files. Please see the guidelines for additional files here: https://bmcpregnancychildbirth.biomedcentral.com/submission-guidelines/preparing-your-manuscript#preparing+additional+files
• Interview guide has been added both in Finnish and in English as additional files. Interview guide in English was added to the paper in section “Sample and data collection”.

6. Please format all numbers as 3.5 (not 3,5) for three and a half.
• All the numbers are now formatted correctly.

Reviewer reports:

Matthew Hoffman, MD (Reviewer 1): This qualitative study of patient guided ultrasound and its impact on maternal stress is generally well written and well conducted. The sample sizes limited at 12 patient's and the meaningfulness of the outcomes are limited because of this. Nonetheless, this study is somewhat unique. The presentation is occasionally lengthy and there opportunities for further focusing the paper.

• Thank you for the positive comments and encouraging feedback. We have summarized the expression and improved the discussion. We have rationalized in the paper why sample size is limited to 12 patients.

S. C. Kane (Reviewer 2): Thank you for the opportunity to review this paper, which reports on a qualitative study of the experiences of interactive ultrasound examinations among women at risk of pre-term birth.

The paper is well written and interesting overall, and the rationale for this study is appropriately detailed in the introduction.

My comments regarding potential improvements to the paper follow:

- Line 37: depressive symptoms would actually have a positive association with poor prenatal attachment. Suggest rewording as 'depressive symptoms have an association with poor prenatal attachment . . .'.

• Thank you for your positive and critical comments. We have improved the paper based on your feedback. This line was reworded as suggested.
- Some attention could be paid to the English expression (although it is very good overall). For example, the commas in lines 128 and 130 are redundant, and the third comment under point 2 in table 1 doesn't make sense.

• This paper was edited and revised by a native English speaker and mistakes in English grammar should be now corrected.

- The sample size is really quite small. This is one of the study's primary limitations, as noted. Given that all women approached agreed to participate, this would suggest that there were only 12 eligible patients over a 9 month period - is that correct? In line 288, it is indicated that 'data saturation was reached' - what does this mean?

• The small sample size is a limitation, although data saturation, indicated by repetitive responses in the interview was reached. In addition, the data provided a coherent understanding about the topic. Women with breaking of water and body mass index over 30 were excluded. Availability of 3/4D-ultrasound device had an impact on patient selection, because interactive ultrasound examinations were done in prearranged times.

- Some further detail on the intervention would be helpful. Who performed the study scans - sonographers or obstetricians? If obstetricians, what extra training had they undertaken to perform ultrasound (e.g. MFM)? Who would normally perform routine ultrasound scans in pregnancy? How soon after the ultrasound examination did the psychologist undertake the interview? Could the interview questions be included in a table, or does table 1 describe all the questions that were asked?

• An obstetrician, special in maternal-fetal medicine, performed the study scans. In normal pregnancies the routine scans are performed by midwives. The psychologist interviewed the patients right after the ultrasound session except for one woman, who was interviewed the next day. Questions are added in the paper (Table 2) and as additional files both in English and in Finnish.

- It would seem that the intervention differed from standard care in providing both a 3D/4D image of the baby, and in enhanced interaction with the mother. It is therefore difficult to determine which aspect of the intervention was of particular value to the participants, and as noted in lines 286-287, the same result may be achievable with 2D ultrasound. Is this an intervention that could be deployed in clinical practice? Would it be easier simply to train sonographers/obstetricians to interact with patients while scanning them? Should this approach be limited to patients at risk of preterm birth, or would it be of benefit more broadly?
This is important aspect and we have tried to answer to these questions in discussing. We agree that it is difficult to determine whether the advantages of the interactive ultrasound examination are due to improved communication or the method itself. 3/4D- images give more realistic view of the fetus, but this method may also be applied within the 2D-technique by focusing on observation of fetus’ actions. Psychological influence of 3/4D ultrasound should be further investigated in risk groups, because there is increasing evidence that prenatal distress may be detrimental to the cognitive, psychomotor and behavioral development of the infant and.

active and non-pharmacological prenatal interventions are needed.

- It would be interesting to extend the study to the postnatal/neonatal period, to determine whether the enhanced bonding was maintained and manifested itself in an appreciably different fashion once the baby was born.

- We are planning a new intervention on risk pregnancies where the intervention is extended to postnatal/neonatal period

- Overall, I wonder whether this study highlights the need for improved communication (e.g. with patients regarding the reasons for hospital admission and their management therein, and by sonographers/obstetricians during fetal ultrasound scans), rather than justifying the specific intervention. I acknowledge that this is a pilot study; ideally, future studies would focus on interventions that can be applied broadly, and with a 'control' arm to determine the degree of improvement in patient satisfaction when compared to 'standard' care. More detailed and specific discussions regarding further research directions would enhance the 'discussion' section of the paper.

- We have highlighted the importance of communication in the paper. This was a pilot study and based on the results. Interactive ultrasound is a potentially new way to awaken maternal mental images, increase maternal attachment to the infant and reduce worry during pregnancy. The method is relatively easy to implement into public healthcare and may be a promising clinical practice in treatment of women with risk pregnancy.

- Were any potential harms arising from the intervention considered?

- We have added a chapter about potential disadvantages to discussion. was added. The image of the 3/4D ultrasound may affect negatively on the pregnant woman’s developing mental images about her baby, but there is not enough knowledge available about diverse effects on the 3/4D-images on parental representations. A strengthened emotional bond to the unborn infant after interactive ultrasound could also be considered a potential risk in the case of a woman
losing the fetus or newborn infant. The interactive ultrasound can be seen as an opportunity for a pregnant woman to create memories of the unborn infant.

Thank you for your consideration and time.

Yours sincerely,

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