PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Health literacy among pregnant women in a lifestyle intervention trial: Protocol for an explorative study on the role of health literacy in the perinatal health service setting
AUTHORS	Nawabi, Farah; Alayli, Adrienne; Krebs, Franziska; Lorenz, Laura; Shukri, Arim; Bau, Anne-Madeleine; Stock, Stephanie

VERSION 1 – REVIEW

REVIEWER	Creedy, Debra Griffith University, School of Nursing & Midwifery
REVIEW RETURNED	12-Feb-2021

GENERAL COMMENTS	Health literacy in pregnancy has been neglected as an important driver of health and health service use, so the proposed study is timely. The protocol provides considerable detail but some additional information and clarification are required. Please mention that this is a protocol in the title Keywords could be revised. Please consider inclusion of the sample (pregnant women) and design. It is not immediately clear why "multi-professional collaboration" would be included as a keyword. Suggested revisions to the abstract 1. There are multiple abbreviations in the abstract which need to be presented in full and/or removed (SMART; HLS-EU-16; BHLS & GWG). The full German title for GeMuKi appears on page 7- is it possible to include an English-equivalent phrase in the abstract? 2. Gynaecologist involved in routine check-up – is this equivalent to visiting a general practitioner to confirm pregnancy? 3. How many staff were involved? 4. How were staff trained? 5. Please specify the two time points for data collection. 6. Dissemination could also include mechanisms to (1) inform the general public and in particular pregnant women about the outcomes of the study; or health messages: and (2) changing antenatal practices to assess and promote maternal health literacy. 7. Strengths and limitations – Although the authors correctly identify that 'Women not proficient in German language are not included, which might result in exclusion of migrants' – I think the recruitment strategy of attending a gynaecological appointment before 12 weeks gestation would likely preclude other vulnerable groups who are less likely to engage in early antenatal care (young; those living in rural areas; drug or alcohol users etc). Research questions (RQ)

	RQ2 is unclear. The GeMuKi seeks to strengthen HL therefore it could be hoped that HL levels would increase from baseline to post-intervention. RQ2 asks if health literacy levels affect the effectiveness of the GeMuKi lifestyle intervention – but shouldn't it be the other way – whereby the GeMuKi lifestyle intervention aims to improve health literacy? Are you perhaps asking if outcomes differ for women with high vs low health literacy? Methods 1. Hybrid effectiveness-implementation designs are relatively new and the protocol would be strengthened by citing authors in this space and giving a more detailed description of type 2 designs. 2. Please specify if the intervention is in addition to usual care or instead of? 3. In maternity care it is more usual to refer to antenatal appointments rather than 'check-ups' and 'pregnant women' rather than 'expecting' mothers. 4. In many countries it is unusual for antenatal care to be provided by gynaecologists. It may be useful to describe this role; the nature 'of preventive examinations'; and approach to maternity care in Germany for the international audience. These descriptors suggest a traditional medical model approach to maternity care rather than a wellness approach. 5. 'Preventive' counselling doesn't make sense when the aim is to promote healthy lifestyle choices and health literacy. Perhaps it could be described as 'lifestyle counselling' or 'health promotion counselling'. 6. This section refers to the practitioner being 'sensitive' to the health literacy level of the woman. However, there is no mention of the counsellor assessing maternal health literacy. Researchers have consistently identified that many clinicians over-estimate clients' health literacy (e.g. Mackley et al 2016). Although the BHLS and HLS-EU-16 (Health Literacy Survey 16 items) will be administered, could the authors please explain if the counsellors receive that information to inform their counselling. 7. In addition to assessing health literacy, clinicians should also determine the woman's understanding of an issue/topic to prevent the unnecessary provision of information that is already known. 8. Please provide detail on training and support offered to clinicians delivering the intervention. Were they assessed for competency? 9. What fidelity checks will be implemented to ensure the intervention is offered in consistent and quality ways? Other recommended changes In the following suggested revisions, page numbers were taken from the top corners of each page the submission. The protocol would benefit from careful editing for clarity of expression, removal of repeated information, insertion of missing words, and minor grammatical errors. Page 2 line 51 – amend to read 'drug' use. Page 3 line 35 should 'insurances' be 'insurers'? (this mistake occurs in other places as well) Page 6 line 9 perhaps this is better expressed as "A population-based study in 2014" Page 6 line13-14 delete repetition of health literacy in the same sentence; could read … "National Action Plan (NAP) to improve health literacy in Germany." Page 7 line 18 could be better expressed as "little is known about the role of health literacy during pregnancy".

	Page 7 line 58 – please specify 'antenatal' appointments rather than 'check-ups' Page 9 line 37 may be better expressed as … lifestyle-related risk factors in women and their infants References Mackley A, Winter M, Guillen U, Paul DA, Locke R. Health literacy among parents of newborn infants. Adv Neonatal Care 2016; 16(4): 283-8

REVIEWER	Murugesu, Laxsini Amsterdam UMC Locatie AMC, Public and Occupational Health
REVIEW RETURNED	29-Apr-2021

GENERAL COMMENTS	Thank you for the opportunity to review this protocol. The authors use a hybrid effectiveness-implementation design to assess the ability of the GeMuKi lifestyle intervention to positively affect health literacy levels and explore associations between health literacy, health outcomes, health services use and effectiveness of the intervention. The authors hypothesise that health literacy levels are positively affected by the GeMuKi intervention and health literacy has an impact on further variables, including health outcomes, health behaviour as well as health service use during pregnancy. This is an interesting study and worthy of publication as behaviour change remains challenging especially for low health literate populations. The GeMuKi intervention could provide insights to further optimise health literacy sensitive interventions for pregnant women. I would like to offer a few comments for improvements: Abstract 1. Line 25-27: "It will assess the ability of the GeMuKi lifestyle intervention to positively affect health literacy levels and…" The GeMuKi intervention consists of preventive counselling and a digital intervention component. The overall aim of both strategies seems to be to strengthen pregnant women to be actively involved in the decision-making process, to develop SMART goals and adhere to their goals using the GeMuKi app. The aim of the study can be phrased more elaborately by specifying the health literacy skills the authors aim to address through their intervention, e.g. enhance active participation (improve interactive health literacy skills), improve goal setting, and apply lifestyle recommendations. 2. It is unclear from the abstract in which country the study is conducted. 3. In the methods section is stated that "Healthcare providers carry out counselling using Motivational Interviewing techniques to positively affect health literacy and lifestyle-related risk factors". Health literacy is portrayed as a general concept, whereas health literacy consists of several components considering the definition used. As stated in the protocol, Motivational Interviewing is used to support people to autonomously change their behaviour. This specific health literacy skill (altering behaviour) can be added to clarify the aim of Motivational Interviewing. 4. A limitation of this study is that women who are not proficient in German language are excluded, which might result in exclusion of migrants. Where illiterate women also excluded? This group could also consist of native Germans.

	5. Another limitation of this study can be that women with low digital health literacy skills might not participate in this study, since they are not able to use the GeMuKi app. Introduction 6. Line 50: “Health literacy describes a persons’ ability to access, understand, appraise and apply health information to make informed decisions regarding their health (1).” A person’s or persons’ without ‘a’ not “a persons’”. 7. The authors state that little is known about the role of health literacy in pregnancy. However, a summary of previous literature on maternal health literacy and interventions in maternity care can provide more context to this particular study. This systematic review on the effect of health literacy interventions on pregnancy outcomes might be useful: https://www.sciencedirect.com/science/article/pii/S1871519219308546. 8. “The action plan points out that measures to strengthen health literacy should focus on various user groups in the healthcare system, particularly vulnerable groups.” Could you please give a description of vulnerable groups? 9. A theoretical framework would help to describe the different layers of health literacy and put the objectives of the GeMuKi intervention into context. A framework can also aid as a starting point for the separate in depth analysis. 10. “health literacy levels are positively affected” “health literacy has an impact on further variables” Can you be more specific in what changes you expect to find in the health literacy skills and what impact you expect to observe? For example: more active participation, better adherence to lifestyle goals or increased knowledge. 11. The research questions can be rephrased as open questions. The data could provide more detailed information. Also, the first research question can be more specified as to the outcomes of the GeMuKi intervention. Methods 12. A more detailed description of a hybrid effectiveness-implementation design (Type II) is needed. What is meant by type II? 13. The rationale for using EPDS is missing. Why are women who score high on this scale excluded? 14. The rationale for using HLS-EU-16 and BHLS is missing. Why are these instruments selected to assess general health literacy as opposed to other health literacy screening instruments? 15. Who fills in the questionnaires about maternal health behaviour? Women might overestimate their physical activity. 16. A more detailed description of the process evaluation is required. How is the interview structured? Also, the process evaluation is not described in the paragraph about study design (line 16-44). 17. The statistical data analysis is explained in detail. A similar level of detail is missing for the interview data. Discussion 18. Health literacy is seen as a general concept throughout the Discussion. The different layers of health literacy, especially the health literacy skills that are important to improve women’s lifestyle are not distinguished. The effect of the GeMuKi intervention on the different components of health literacy can be better described and understood, when the different layers of health literacy are clear.

	19. The authors state that "pregnant women are confronted with a variety of health information during pregnancy, it is difficult to differentiate between the quality of information and which one is important". Other challenges, besides finding and appraising information, that low health literate pregnant women encounter in for example decision-making are not addressed. 20. The authors mention that there is little research on health literacy in pregnant women and interventions to improve health literacy in this population. A summary of these studies are not given in the introduction or the discussion. 21. The authors do not discuss the impact of digital health literacy on their study results.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

1. Please mention that this is a protocol in the title

Reply: We have added this in the title.

2. Keywords could be revised. Please consider inclusion of the sample (pregnant women) and design. It is not immediately clear why "multi-professional collaboration" would be included as a keyword.

Reply: Thank you for this suggestion, we have added ‚pregnant women' and changed the key word ‚intervention' into ‚lifestyle intervention' and have deleted 'multi-professional collaboration'.

Suggested revisions to the abstract

1. There are multiple abbreviations in the abstract which need to be presented in full and/or removed (SMART; HLS-EU-16; BHLS & GWG). The full German title for GeMuKi appears on page 7- is it possible to include an English-equivalent phrase in the abstract?

Reply: We now present ‚SMART' goals in full (line, 47-48) and have removed questionnaire abbreviations (lines 50-51). The project name is now presented both in German and English in the abstract, lines 40-42.

2. Gynaecologist involved in routine check-up – is this equivalent to visiting a general practitioner to confirm pregnancy?

Reply: Thank you for making us aware of this ambiguity. In Germany, women usually see a gyneacologist to confirm the pregnancy, who then continues to carry out regular antenatal screenings. Because this approach might indeed be unclear to the international audience, we have added s short description in the methods section, lines 155-158.

3. How many staff were involved?

Reply: Antenatal appointments can be either conducted by only gyneacologists or in combination with a midwife. Women cannot only see a midwife and because general practicionairs do not perform antenatal care, they are not included in the study. No changes were made in the text because line 155 mentions that only gyneacologists and midwives take part.

4. How were staff trained?

Reply: Since there is a word limit for the abstract, we have only mentioned that the counseling is conducted by trained health care providers (line 44). A more detailed description of the training, which we have complemented, can be found in the methods section under ‚Preventive counselling to strengthen health literacy', lines 205-207.

5. Please specify the two time points for data collection.

Reply: We have added this in the abstract, line 49.

6. Dissemination could also include mechanisms to (1) inform the general public and in particular pregnant women about the outcomes of the study; or health messages: and (2) changing antenatal practices to assess and promote maternal health literacy.

Reply: Thank you for making us aware of these ways to dissemniate the results. There are indeed press releases, which we have added, line 61 and 366-367. Additionally, we have changed the last sentence in the dissemination section including that the closing event offers a plattform to discuss potential implementation of GeMuKi into regular care, lines 367-369. We will discuss further possibilities to inform the general public and policy makers in our research team.

7. Strengths and limitations – Although the authors correctly identify that 'Women not proficient in German language are not included, which might result in exclusion of migrants' – I think the recruitment strategy of attending a gynaecological appointment before 12 weeks gestation would likely preclude other vulnerable groups who are less likely to engage in early antenatal care (young; those living in rural areas; drug or alcohol users etc).

Reply: Thank you for this suggestion, which is indeed a limitation. We have added this under the strengths and limitation section, lines 74-76.

Research questions (RQ)

RQ2 is unclear. The GeMuKi seeks to strengthen HL therefore it could be hoped that HL levels would increase from baseline to post-intervention. RQ2 asks if health literacy levels affect the effectiveness of the GeMuKi lifestyle intervention – but shouldn't it be the other way – whereby the GeMuKi lifestyle intervention aims to improve health literacy? Are you perhaps asking if outcomes differ for women with high vs low health literacy?

Reply: Thank you for this suggestion, which we have incorporated in RQ2, lines 137-139.

Methods

1. Hybrid effectiveness-implementation designs are relatively new and the protocol would be strengthened by citing authors in this space and giving a more detailed description of type 2 designs.

Reply: Thank you for this suggestion. We have added information on the study design in the methods section and added the reference, lines 146-149.

2. Please specify if the intervention is in addition to usual care or instead of?

Reply: GeMuKi takes place in addition to regular care. We have added this information in the methods section, line 151.

3. In maternity care it is more usual to refer to antenatal appointments rather than 'check-ups' and 'pregnant women' rather than 'expecting' mothers.

Reply: Thank you for this suggestions. We have changed the terms ‚expecting mothers' into ‚pregnant women'. Regarding the term ‚check-ups', we have added a short explanation in lines 124. We have discussed this in the research team and because a general study protocol has been published already, using this terminology, we have decided to stick with ‚check-ups' to make it more consistent and reduce confusion.

4. In many countries it is unusual for antenatal care to be provided by gynaecologists. It may be useful to describe this role; the nature 'of preventive examinations'; and approach to maternity care in Germany for the international audience. These descriptors suggest a traditional medical model approach to maternity care rather than a wellness approach.

Reply: We have added an explanation in the methods section, lines 155-158. Healthcare provision in Germany follows an ambulatory approach, which means that women visit the gyneacologist to confirm pregnancy and from then onward visit the gyneacologist for antenatal care.

5. 'Preventive' counselling doesn't make sense when the aim is to promote healthy lifestyle choices and health literacy. Perhaps it could be described as 'lifestyle counselling' or 'health promotion counselling'.

Reply: Thank you for this input. The GeMuKi project indeed aims to promote a healthy lifestyle, however, the primary aim of the prioject is the prevention of overweight and obesity in pregnant women, which is why we speak of a preventive counselling. As we are writing this procotol in line with the general protocol, we would like to stick to the same wording.

6. This section refers to the practitioner being ‘sensitive’ to the health literacy level of the woman. However, there is no mention of the counsellor assessing maternal health literacy. Researchers have consistently identified that many clinicians over-estimate clients’ health literacy (e.g. Mackley et al 2016). Although the BHLS and HLS-EU-16 (Health Literacy Survey 16 items) will be administered, could the authors please explain if the counsellors receive that information to inform their counselling.

Reply: Thank you for this suggestion,which is indeed relevant in the improvement of health literacy of patients. The healthcare providers do not assess the health literacy levels of the pregnant women prior to the counselling. The aim of motivational interviewing in the GeMuKi trial is that the healthcare provider has less share of the conversation but instead lets the pregnant women talk. This way, the healthcare provider is able to assess and adapt the counselling according to the level of knowledge / health literacy. Because health literacy was not a major component of the training (compared to the primary outcome which is GWG) we have added this issue as a limitation, lines 426-428.

7. In addition to assessing health literacy, clinicians should also determine the woman’s understanding of an issue/topic to prevent the unnecessary provision of information that is already known.

Reply: The apporach in GeMuKi is that women select the topic they want to talk about in every single counselling session (described in lines 193-195). This way, women reveal themselves were they need further counselling/information. It is also possible for the women to select a topic several times, if she feels the need. To clarify this procedure, we have added a sentence in lines 195-196.

8. Please provide detail on training and support offered to clinicians delivering the intervention. Were they assessed for competency?

Reply: We have added information on the training in lines 205-207 and added information on the support the healthcare provider receive in lines 238-242. We have not assessed the clinicians for competency. This was considered at the beginning of the project, however it did not seem feasible because it would have hindered healthcare providers from participation in the study and hence hampered recruitment of participants to reach the required sample size. Moreover, GeMuKi is supposed to take place in real-world conditions, in case it gets implemented as part of the regular care, which is why it is not feasable to check for competency. However, this point needs indeed discussion when the results are there since some healthcare providers might not be qualified enough to conduct the counselling, even though all healthcare providers received the same training and support during the trial.

9. What fidelity checks will be implemented to ensure the intervention is offered in consistent and quality ways?

Reply: We can check if the appointments took place as healthcare providers enter data into the GeMuKi-Assist tool. If data are missing, a study coordinator will contact the according healthcare provider. Fidelity checks will be conducted as part of the process evaluation with qualitative interviews with participants, midwives, gyneacologists and their teams. This issue is already included in the discussions section (lines 424-426) of this paper and needs to be considered in the evalaution of the project. No changes where made to the text.

Other recommended changes

Page 2 line 51 – amend to read ‘drug’ use.

Reply: We have corrected this.

Page 3 line 35 should ‘insurances’ be ‘insurers’? (this mistake occurs in other places as well)

Reply: We have checked what the plural of insurance is and the translation says ‚insurances‘.

Page 6 line 9 perhaps this is better expressed as “A population-based study in 2014”

Reply: We have corrected this.

Page 6 line13-14 delete repetition of health literacy in the same sentence; could read … “National Action Plan (NAP) to improve health literacy in Germany.”

Reply: The action plan is called ‚National Action Plan Health Literacy', which is why we have sticked to this expression.
Page 7 line 18 could be better expressed as “little is known about the role of health literacy during pregnancy”.
Reply: We have corrected this.
Page 7 line 58 – please specify ‘antenatal’ appointments rather than ‘check-ups’
Reply: Please see reply of comment 3 for the methods.
Page 9 line 37 may be better expressed as … lifestyle-related risk factors in women and their infants
Reply: We have corrected this.

Reviewer: 2
Abstract

1. Line 25-27: “It will assess the ability of the GeMuKi lifestyle intervention to positively affect health literacy levels and…”

The GeMuKi intervention consists of preventive counselling and a digital intervention component. The overall aim of both strategies seems to be to strengthen pregnant women to be actively involved in the decision-making process, to develop SMART goals and adhere to their goals using the GeMuKi app. The aim of the study can be phrased more elaborately by specifying the health literacy skills the authors aim to address through their intervention, e.g. enhance active participation (improve interactive health literacy skills), improve goal setting, and apply lifestyle recommendations.
Reply: Thank you for this suggestion, which we have included in the abstract in line 37.

2. It is unclear from the abstract in which country the study is conducted.

Reply: We have now added this information.

3. In the methods section is stated that “Healthcare providers carry out counselling using Motivational Interviewing techniques to positively affect health literacy and lifestyle-related risk factors”. Health literacy is portrayed as a general concept, whereas health literacy consists of several components considering the definition used. As stated in the protocol, Motivational Interviewing is used to support people to autonomously change their behaviour. This specific health literacy skill (altering behaviour) can be added to clarify the aim of Motivational Interviewing.

Reply: Thank you for making us aware of this point, which we have added in the methods section line 208.

4. A limitation of this study is that women who are not proficient in German language are excluded, which might result in exclusion of migrants. Where illiterate women also excluded? This group could also consist of native Germans.

Reply: Thank you for this suggestion, which is very true as illiterate people can also be native Germans. To undestand the counselling and fill in the questionnaires, it is necessary that the women have some literacy skills. We have changed the sentence in lines 428-432, which now comprises illiterate women in general and have added this as a limitation in line 73.

5. Another limitation of this study can be that women with low digital health literacy skills might not participate in this study, since they are not able to use the GeMuKi app.

Reply: Thank you for making us aware of this possibility. Digitial health literacy is indeed necessary to use a health app. We hope that we have met the needs of the women, also those that might not have high digital health literacy during the pretest of the app. The pretest was conducted at a university hospital with women that had antenatal appointments there, with different socio-economic backgrounds. We have adjusted the app according to the needs and tried to make it as intuitive as possible. Yet still, this is definitely something that might occur, which we have included in the discussions section of this paper, lines 432-434.

Introduction

6. Line 50: “Health literacy describes a persons’ ability to access, understand, appraise and apply health information to make informed decisions regarding their health (1).”

A person’s or persons’ without ‘a’ not “a persons’”.

Reply: We have corrected this.

7. The authors state that little is known about the role of health literacy in pregnancy. However, a summary of previous literature on maternal health literacy and interventions in maternity care can provide more context to this particular study. This systematic review on the effect of health literacy interventions on pregnancy outcomes might be useful: https://www.sciencedirect.com/science/article/pii/S1871519219308546.

Reply: Thank you very much for making us aware of this review, which unfortunately was not published by the time we submitted the manuscript. We have included this reference now for example in lines 119 and 120.

8. “The action plan points out that measures to strengthen health literacy should focus on various user groups in the healthcare system, particularly vulnerable groups.” Could you please give a description of vulnerable groups?

Reply: We have added this information in lines 94 - 95.

9. A theoretical framework would help to describe the different layers of health literacy and put the objectives of the GeMuKi intervention into context. A framework can also aid as a starting point for the separate in depth analysis.

Reply: Thank you for this suggestion, which indeed would be helpful. In this study, we have focused on strategies from the ‘National Action Plan Health Literacy’, as described throughout the paper. The strategies resulted from scientific evidence. No changes where made to the text.

10. “health literacy levels are positively affected” “health literacy has an impact on further variables” Can you be more specific in what changes you expect to find in the health literacy skills and what impact you expect to observe? For example: more active participation, better adherence to lifestyle goals or increased knowledge.

Reply: Thank you for this remark which we have added in lines 131-132.

11. The research questions can be rephrased as open questions. The data could provide more detailed information. Also, the first research question can be more specified as to the outcomes of the GeMuKi intervention.

Reply: We have refrased research question 2, lines 137-139. Because this protocol only focusses on health literacy, we have not added the other outcomes of the GeMuKi intervention.

Methods

12. A more detailed description of a hybrid effectiveness-implementation design (Type II) is needed. What is meant by type II?

Reply: We have added this explanation as well as a reference to make this more clear, lines 146-149.

13. The rationale for using EPDS is missing. Why are women who score high on this scale excluded?

Reply: The rational is twofold: in case of high scoring in the EPDS, women need to receive care with regards to their mental health. Additionally, they will be suggested another project which particularly focusses on mental health during pregnancy. This way, the probability of interfering effects / bias with the other project are reduced. We have added this information in lines 170-175.

14. The rationale for using HLS-EU-16 and BHLS is missing. Why are these instruments selected to assess general health literacy as opposed to other health literacy screening instruments?

Reply: We did explain why the HLS-EU is utilized from line 258 onwards. The German version worked very well in Germany with good internal consistency. We hav added that the HLS-EU is used frequently in Germany, enabing the comparison of studies, lines 268-270. Additonally, we were able to add two pregnancy specific questions to the questionnaire to make it more suitable for out population. The instrument was selected to get a detailed baseline health literacy description and on the other hand is not too long. The BHLS was used to assess health literacy at every time point of the survey and to check for a change of health literacy over time.

15. Who fills in the questionnaires about maternal health behaviour? Women might overestimate their physical activity.

Reply: All questionnaires are self-administered. It is indeed a limitation that women might overestimate their physical activity behaviour, which is why we now have inlcuded this in the limitations, lines 434-435.

16. A more detailed description of the process evaluation is required. How is the interview structured? Also, the process evaluation is not described in the paragraph about study design (line 16-44).
17. The statistical data analysis is explained in detail. A similar level of detail is missing for the interview data.

Reply for 16+17: Because this study protocol only focusses on health literacy, we did not describe the process evaluation in detail since it only focusses on the implementation (in terms of fidelity, feasibiliy, adaptation etc.). The process evaluation deals with the implementation of the whole project and did not focus on health literacy. We have only mentioned the process evaluation in this protocol because it was requiered for the patient and public involvement section. However, in the assessment of health literacy within GeMuKi, the process evaluation does not have any influence. A detailed description of the process evaluation can be found in Alayli et al., 2020.

Discussion

18. Health literacy is seen as a general concept throughout the Discussion. The different layers of health literacy, especially the health literacy skills that are important to improve women's lifestyle are not distinguished. The effect of the GeMuKi intervention on the different components of health literacy can be better described and understood, when the different layers of health literacy are clear.

Reply: Thank you for this crucial input, which we have incpororated in the discussion section now, line 395-398 and 404-408.

19. The authors state that "pregnant women are confronted with a variety of health information during pregnancy, it is difficult to differentiate between the quality of information and which one is important". Other challenges, besides finding and appraising information, that low health literate pregnant women encounter in for example decision-making are not addressed.

Reply: Thank you for making us aware of this gap. We have added this issue in the discussion section, lines 376-379.

20. The authors mention that there is little research on health literacy in pregnant women and interventions to improve health literacy in this population. A summary of these studies are not given in the introduction or the discussion.

Reply: We have added two systematic reviews in the discussions section, line 373.

21. The authors do not discuss the impact of digital health literacy on their study results.

Reply: We have added this in the discussion, lines 431-434.

VERSION 2 – REVIEW

REVIEWER	Creedy, Debra Griffith University, School of Nursing & Midwifery
REVIEW RETURNED	03-Jun-2021

GENERAL COMMENTS	Thank you for your revisions of the manuscript. I was unable to locate a 'response to reviewers' file in the submission, but on going through the manuscript I believe most of my earlier concerns have been addressed. The manuscript would benefit from careful editing to improve the standard of written English.