**ARTICLE DETAILS**

<table>
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<tr>
<th>TITLE (PROVISIONAL)</th>
<th>How digital health translational research is prioritised: A qualitative stakeholder-driven approach to decision support evaluation</th>
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<tbody>
<tr>
<td>AUTHORS</td>
<td>Bamgboje-Ayodele, Adeola; McPhail, Steven; Brain, David; Taggart, Richard; Burger, Mitchell; Bruce, Lenert; Holtby, Caroline; Pradhan, Malcolm; Simpson, Mark; Shaw, Tim; Baysari, Melissa</td>
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**GENERAL COMMENTS**

Thank-you for the opportunity to review this paper. The authors present a qualitative review of stakeholder prioritisation of digital health research, specifically related to decision support evaluation. Given the ongoing implementation of digital systems globally in the healthcare setting, understanding the key focus areas for digital health translational research is of utmost importance. The manuscript offers a valuable contribution to the literature in this regard.

Several comments/suggestions for consideration are as follows:

**INTRODUCTION:**
Pg 3, line 53-55 “This was particularly topical as the COVID-19 pandemic…and DS systems were being applied in ways not previously planned for prior to the pandemic”. Perhaps suggest adding an example so the readers understand what the authors are referring to here.

**METHODS:**
Procedure:
First paragraph (Pg 5, lines 106-112). Given this research was examining the criteria used for prioritising clinician-facing technologies, I would think it would be relevant to understand how many key stakeholders consisted of clinicians? It is currently unclear the demographics of the key stakeholders involved, other than which sector they were representing. For example, were the researchers, clinician researchers? Were the health service reps from a clinical background, if so, which areas were they representing e.g., medical, nursing, pharmacy, allied health etc. Pg 6, lines 122-127. Just unclear, were the follow-up consultations with different stakeholders to those involved in the initial prioritisation workshop? It looks as though this was the case given total stakeholder numbers increase but it’s not clearly worded and would be worth clarifying.

**RESULTS:**
Pg 13, Figure 1 – again relating back to the point made above, I think initial use cases identified would relate to the key stakeholder backgrounds which are currently unclear within the paper. For
example, was a NICU nurse one of the key stakeholders given two use cases surround this clinical area?

DISCUSSION:
Pg 14, lines 312-324 – Discussion mentions absence of suitable governance frameworks. This is a huge issue in digital health research, but perhaps extends past organisational policy and procedures to also encompass legislative requirements predating the digital era. This might be worth mentioning.
Pg 15, line 343 – typo needs correcting “technology during COVID-19 to other our use cases”

LIMITATIONS:
I would consider the small number of stakeholder perspectives would also limit the generalisability of the results?
These points above have been offered for consideration. Otherwise, the manuscript is well-written and explores important, topical subject matter.
Thank-you for the opportunity to review.

REVIEWER
Gagnon, Marie-Pierre
University of Laval

REVIEW RETURNED
03-Aug-2023

GENERAL COMMENTS
Thank you for the opportunity to review this paper that reports a qualitative study of the prioritization process of digital health research. This is a very relevant contribution as not many papers provide an in-depth analysis of the decision-making process of digital health integration.
The interpretive listening model used as the methodology is innovative and will provide a useful reference for other implementation research teams worldwide. The authors have applied a rigorous approach, their findings are sound and the rich description of the context in which the research was conducted enables their transferability.
There are only minor points that the authors are invited to clarify.
1. In the Results section, a distinction is made between criteria for prioritizing traditional health research and digital health research. Why is this distinction made? Was is a suggestion of the stakeholders’ panel or was it proposed by the researchers?
2. The final DS use cases for research that were selected are presented at the end of the Results section, but no information is provided regarding the selection of these three use cases in particular. It would be interesting to briefly summarize the rationale for selecting these use cases, highlighting which criteria were decisive in the decision. This could be presented in a table were the main criteria for selecting the use case would be summarized.
3. There are some limitations related to the sample. The stakeholders consulted included only one industry representative and no patients nor members of the public were involved. This could be added in the Limitations section.

VERSION 1 – AUTHOR RESPONSE
Reviewer 1
1. Thank-you for the opportunity to review this paper.
The authors present a qualitative review of stakeholder prioritisation of digital health research, specifically related to decision support evaluation. Given the ongoing implementation of digital systems globally in the healthcare setting, understanding the key focus areas for digital health translational research is of upmost importance. The manuscript offers a valuable contribution to the literature in this regard. Thank you to the reviewer for the positive comment.

2. Several comments/suggestions for consideration are as follows:

INTRODUCTION:
Pg 3, line 53-55 "This was particularly topical as the COVID-19 pandemic…and DS systems were being applied in ways not previously planned for prior to the pandemic". Perhaps suggest adding an example so the readers understand what the authors are referring to here.

Thank you, we have now added an example. Please see added text in bold below:

For example, a DS system developed during the pandemic used machine learning to forecast key parameters such as the emergency rooms attendances, and regional medical supplies, to facilitate health service organisations monitoring, management and prediction of medical equipment logistic needs. [6]

3. METHODS:

Procedure:
First paragraph (Pg 5, lines 106-112). Given this research was examining the criteria used for prioritising clinician-facing technologies, I would think it would be relevant to understand how many key stakeholders consisted of clinicians? It is currently unclear the demographics of the key stakeholders involved, other than which sector they were representing. For example, were the researchers, clinician researchers? Were the health service reps from a clinical background, if so, which areas were they representing e.g., medical, nursing, pharmacy, allied health etc.

Thank you for this comment. Based on the ethical requirements and to protect anonymity, all identifiable information was removed from the data to ensure selected quotes could not be directly linked to stakeholders. However, to address the reviewer’s concerns we have included the following information in lines 127 to 130:

This resulted in a total of 15 stakeholders engaged in the process, and included clinicians (n=4), clinician researchers (n=2), managers (n=2), policy maker (n=1) and researchers (n=6) with expertise spanning one or more areas across medicine, nursing, pharmacy, psychology, health economics, and information technology.

4. Pg 6, lines 122-127. Just unclear, were the follow-up consultations with different stakeholders to those involved in the initial prioritisation workshop? It looks as though this was the case given total stakeholder numbers increase but it’s not clearly worded and would be worth clarifying.

Thank you to the reviewer for this comment. Yes, the follow-up consultations were with additional stakeholders.

We have now clarified this as shown in bold below.
In allowing for the fast pace at which technology implementation was moving during the pandemic, a follow-up consultation was held several weeks (December 2021) following the prioritization exercise with additional health service representatives (n=4) within the same services originally involved to reflect on the ongoing value and relevance of the DS use cases.

5. RESULTS:

Pg 13, Figure 1 – again relating back to the point made above, I think initial use cases identified would relate to the key stakeholder backgrounds which are currently unclear within the paper. For example, was a NICU nurse one of the key stakeholders given two use cases surround this clinical area?

Thank you to the reviewer for this comment. Please see our response above (#3).

6. DISCUSSION:

Pg 14, lines 312-324 – Discussion mentions absence of suitable governance frameworks. This is a huge issue in digital health research, but perhaps extends past organisational policy and procedures to also encompass legislative requirements predating the digital era. This might be worth mentioning.

We have now highlighted this important perspective on governance frameworks as shown in bold text below:

Suitable governance frameworks guiding system integration through a standardised language that clearly define the parameters for accomplishing a health system process or digital health strategy, (35) and evolve from legislative requirements predating the digital era, have been recognised as one of the requirements for successful digital health implementation (36).

7. Pg 15, line 343 – typo needs correcting “technology during COVID-19 to other our use cases”.

Thank you to the reviewer for spotting this typo which has now been fixed.

8. LIMITATIONS:

I would consider the small number of stakeholder perspectives would also limit the generalisability of the results?

Thank you to the reviewer for this comment, we have now acknowledged this as a limitation of the study as shown in bold below:

Also, we acknowledge the limited number of participants, and make-up of the group as there was only one industry representative and no patients nor members of the public were involved.

9. These points above have been offered for consideration. Otherwise, the manuscript is well-written and explores important, topical subject matter.

Thank-you for the opportunity to review.

Thank you to the reviewer for the kind words.

Reviewer 2

1. Thank you for the opportunity to review this paper that reports a qualitative study of the prioritization process of digital health research. This is a very relevant contribution as not many papers provide an in-depth analysis of the decision-making process of digital health integration.

Thank you to the reviewer for the positive comment.
2. The interpretive listening model used as the methodology is innovative and will provide a useful reference for other implementation research teams worldwide. The authors have applied a rigorous approach, their findings are sound and the rich description of the context in which the research was conducted enables their transferability.

Thank you to the reviewer for the positive comment.

3. There are only minor points that the authors are invited to clarify.

In the Results section, a distinction is made between criteria for prioritizing traditional health research and digital health research. Why is this distinction made? Was it a suggestion of the stakeholders’ panel or was it proposed by the researchers?

Thank you to the reviewer for this comment. The distinction was proposed by the researchers based on the gap in the literature which led to the research aim. Prior to the conduct of the study, we noted that significant research exists on how traditional health research is prioritised (1-6), and realised that there is limited research on how to prioritise, and what criteria are used when prioritising digital health research particularly following the exponential increase in use of digital health technology during COVID-19 (7, 8). This led to the first aim of the study which was to identify the criteria for prioritising digital health research and examine how these differ from criteria for prioritising traditional health research. This justification is included in the last two paragraphs of the introduction section.

4. The final DS use cases for research that were selected are presented at the end of the Results section, but no information is provided regarding the selection of these three use cases in particular. It would be interesting to briefly summarize the rationale for selecting these use cases, highlighting which criteria were decisive in the decision. This could be presented in a table where the main criteria for selecting the use case would be summarized.

Thank you to the reviewer for this comment. We have now provided information regarding the selection of the three use cases as shown below:

The three selected use cases generally fulfilled the majority of the 13 criteria highlighted in Table 1. However, the prioritisation decision was largely driven by practical elements such as time to implementation, time and effort currently expended on the problem, alignment to broader technologies and the learnings from other sites.

5. There are some limitations related to the sample. The stakeholders consulted included only one industry representative and no patients nor members of the public were involved. This could be added in the Limitations section.

Thank you to the reviewer for this comment. We have now acknowledged this limitation as shown by the text in bold below:

Also, we acknowledge the limited number of participants, and make-up of the group as there was only one industry representative and no patients nor members of the public were involved.
References
4. CDC. Gaining Consensus Among Stakeholders Through the Nominal Group Technique. Centre for Disease Control; 2018.