Author’s response to reviews

Title: Barriers and Facilitators to Implementing Cancer Prevention Clinical Decision Support in Primary Care: A Qualitative Study

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Author’s response to reviews:

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Francesco Barbabella, Linnaeus University, Sweden
Associate Editor, BMC Health Services Research

Dear Dr Barbabella,

We are pleased to resubmit our manuscript, entitled “Barriers and Facilitators to Implementing Cancer Prevention Clinical Decision Support in Primary Care: A Qualitative Study,” for your exclusive consideration and publication in BMC Health Services Research. We have responded to and addressed each reviewer recommendation in our revision, which we believe has strengthened our manuscript.

Thank you for your time and consideration. We look forward to your feedback on our manuscript.

Sincerely,

Daniel M. Saman, DrPH, MPH, CPH
Technical Comments:

Editor Comments:

Please read carefully the comments and issues highlighted by reviewers and address them in your revision.

BMC Health Services Research operates a policy of open peer review, which means that you will be able to see the names of the reviewers who provided the reports via the online peer review system. We encourage you to also view the reports there, via the action links on the left-hand side of the page, to see the names of the reviewers.

Reviewer reports:

Dorte Gilså Hansen, Ph.D. (Reviewer 1): Please include all comments for the authors in this box rather than uploading your report as an attachment. Please only upload as attachments annotated versions of manuscripts, graphs, supporting materials or other aspects of your report which cannot be included in a text format.

Please overwrite this text when adding your comments to the authors.

BMC Health Serv Res

Barriers and Facilitators to Implementing Cancer Prevention Clinical Decision Support in Primary Care: A Qualitative Study This study aimed to identify pre-implementation barriers and facilitators for the cancer prevention components of the integrated CDS system. The authors did so by interviewing healthcare system leadership and cardiovascular CDS intervention clinic key informants prior to the implementation of the cancer prevention and screening CDS.

Studies that aims to add to the existing knowledge about implementation of clinical decision support tools may have potential for an international, scientific audience.

The study should be reported in line with international reporting guidelines https://www.equator-network.org/reporting-guidelines/, i.e. the SRQR: Standards for reporting qualitative research: a synthesis of recommendations.

Response: We revised our paper to following the international Standards for Reporting Qualitative Research (O’Brien et al., 2014).
I highly recommend a professional language-editor for proofreading of the manuscript. A substantial number of sentences are too long and difficult to understand.

Response: We shortened sentences in our revision. We also followed this advice by engaging the professional assistance of a copy editor.

The analytical process is unclear. The different steps of the data analysis should be explained in detail and be transparent to the reader through the result section.

Response: We revised the data analysis section to be clearer and more informative (Methods section, lines 234-253, page 12).

The presentation of main results in the beginning of the Discussion Section says that "Five overarching themes were identified in the data, including barriers and facilitators related to the EHR, the CDS system, CDS users, training, and the organization. These influential factors are not new and are likely found in relation to most primary care-focused interventions. However, they do need to be addressed for the CDS to be successfully adopted by rooming staff, PCPs, and ultimately patients." It does not become clear what this study adds to the existing literature. The usefulness of study results outside the specific study setting remains unclear.

Response: These sentences have been deleted in our revision. We instead focus on how our findings on intervention adoption barriers and facilitators identified pre-implementation relate to the CFIR, providing a model that other researchers in healthcare systems could emulate (Discussion section, lines 485-493, page 23).

Minors:

Several contextual components are unknown to the readers, as for example "Annual Wellness Visits performed by RNs"

Response: We added definitions of contextual components into our revision (Medicare and Medicare annual wellness visits: Results section, lines 352-354, page 17).

Please add to the title of Table 1, that "n" (=28) refer to number of informants, not number of barriers and facilitators.

Response: Change made as requested to Table 1 (pages 34-35).
Reference: Not all are useful, for example reference 5 "Manuscript under review. n.d.", reference 18 HyperRESEARCH 4.0.1. 1988-2018.

Response: We removed these references from the paper.

Mark Harris (Reviewer 2): This qualitative study of 28 participants (including 13 leaders, 23 primary care provider and 2 "rooming" staff) aimed to identify barriers and facilitators to use of clinical decision support in primary care. It largely succeeds. There are however some issues:

There is insufficient information on the informants - notably age and/or year's in practice which have been shown to be important in the adoption of information technology.

Response: Unfortunately, we did not collect age or years in practice demographic information from our key informant interviewees. This is a limitation of this study and has been added to the limitations section of our paper (Discussion section, lines 554-556, page 26). As we now note in our limitations section (lines 556-558, page 26), we will ensure we collect this information from our CDS users going forward post-implementation, where CDS adoption can be assessed.

There is insufficient information in the findings of the issues of adoption of information technology vs CDS itself the and integration between CDS and the EMR (both in sucking data out to populate CDS without the need for further input and in recording in the EMR information derived from analysis in the CDS (eg risk).

Response: Due to the complex nature of the CDS, which has multiple varying algorithms, and technical aspects on its interaction with the EHR being outside the scope of this paper, this information is being reported separately in another paper. However, we have added more information on how the CDS and EHR interact within our revision (Background section, lines 106-108, page 6).

The use of percentages is inappropriate in qualitative research and because participants were heterogenous in type (eg leaders vs PCPs), non representative of a larger population and no evidence is provided of the response rate at recruitment.

Response: We removed percentages from our Results sections (pages 12-22) and Table 1 (pages 34-35).

Response: The articles we cited on CDS in our discussion were international papers (e.g., Medlock et al., 2016; Roshanov et al., 2013; Van de Velde, Kunnamo et al., 2018). In our revision, we integrated the suggested review by Fraccaro et al. (2015) on multimorbidity into our limitations, as our paper focuses on cancer prevention and screening, rather than multimorbidity (Discussion section, lines 560-567, page 26). We also added another recent international systematic review by Van de Velde, Heselmans, and colleagues (2018) on trials that evaluated factors influencing the success of computerized CDS and how they relate to the integrated cancer prevention and cardiovascular risk management CDS (Discussion section, lines 495-498, page 23). However, the recommended systematic review by Vargheses et al. (2018) focuses on inpatient CDS systems rather than those used in outpatient primary care/internal medicine. Inpatient and outpatient care are different healthcare delivery models. The inpatient outcomes assessed by Vargheses et al. also do not include cancer prevention, making this reference less relevant for the present paper.


Response: While we considered applying the socio-technical model by Sittig et al. (2015), we instead revised our paper to include greater emphasis on the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009), as the CFIR was the framework that guided our interviews. We have a manuscript under development relating to technical aspects of the CDS for which Sittig and colleague’s socio-technical model may be more directly relevant. Of note, the socio-technical model concepts appear to fall within CFIR domains.

Danielle Hitch (Reviewer 3): Thank you very much for the opportunity to review this study, which provides an interesting perspective on the implementation of CDS from the perspective of the CFIR. I think the study is of interest to the readership, however I would like to make the following suggestions to ensure it meets the required standards for publication in this journal. I'm looking forward to seeing a revised copy of the manuscript in future.
Abstract

* Please mention that your key informants were drawn from both leadership and direct provision clinician groups.

Response: Change made as requested (Abstract, line 38, page 2).

Background

* You observe that positive impacts from patient outcomes are recorded if the systems were developed by the study authors - could this be influenced by positive publication bias?

Response: We added this point about publication bias to the revised paper (Background section, line 84, page 5).

* Final sentence - do you mean that CDS also focus on tobacco cessation and obesity management?

Response: That was our intended meaning. We clarified this section to make this clear (Background section, lines 103-105, page 6).

Methods

* This is the section that I believe requires the most work, as it currently doesn't have sufficient information to describe your method in appropriate detail

Response: We added more detail into our Methods section (pages 7-12) by following the Standards for Reporting Qualitative Research (SRQR) (O’Brien et al., 2014), the use of which was recommended by another reviewer.
* Please provide a rationale for seeking the perspective of leaders - will they be using the system day to day? Also, how do you define 'leadership'?

Response: We added that leaders “have input into and oversite over clinic operations. This includes approval for adopting new interventions system-wide, such as the cancer prevention CDS. Leadership can also be champions for interventions.” (Methods section, lines 185-188, pages 9-10). Some hold dual roles where they also practice in primary care clinics. However, we do not disclose the positions key informant leaders had or currently have in the healthcare system, as that could easily lead to their identification.

* How long prior to implementation did you do these interviews? Had they had a chance to trial it, or is it based solely on previous experience of other systems?

Response: Interviews were conducted between 6 and 12 months before the cancer prevention CDS intervention was implemented, as we note on page 10 line 210 (Methods section). Interviewees did not have a chance to trial it as it had not been completed at the time of our interviews. This paper reports on pre-implementation key informant interviews only, where previous experience is limited to the cardiovascular CDS, current healthcare system electronic health record, and any past experience the interviewee might have had with CDS in other healthcare systems.

* The workflow print offs could be provided as a supplementary file for the readers further information

Response: The CDS print outs have changed since the pre-implementation key informant interviews were conducted.

* International readers won't be familiar with the term 'rooming staff' - this needs to be defined and differentiated from PCPs. Also, why did you combine these two groups in terms of your analysis?

Response: We provided a description of “rooming staff” (Methods section, lines 118-121, pages 6-7).
* How did you select the parts of the CFIR you chose to focus on? You're identified all five domains, but I'm assuming you didn't address every single construct within them. The framework is mentioned just in this section, but ideally its terms and concepts should be embedded throughout the paper.

Response: To assist with answering our guiding research questions based on the CFIR (Methods section, lines 127-135, page 7), we selected some qualitative research questions from the CFIR website when developing our interview guides (Methods section, lines 218-230, page 11). We also revised our paper to include coding identified barriers and facilitators to the CFIR.

* The waiver of documentation of informed consent seems unusual given this research was being completed on human subjects. Please provide more information regarding this decision and how it relates to national research ethics guidelines

Response: As we note (Methods section, lines 196-201, page 10), we received a waiver of documentation of informed consent, rather than a complete waiver of informed consent. As we now explain, this waiver was granted by the Institutional Review Board because the care recommendations in the cancer prevention CDS intervention were limited to evidence-based care already recommended in current national and regional clinical guidelines and involved no more than minimal risk to interviewees (healthcare system employees only). We did receive verbal consent from all interviewees prior to the interviews.

* Your description of method is a little confused - you say you used open coding adapted from grounded theory, but this is clearly a content analysis. How did you adapt these techniques from grounded theory to make them appropriate to content analysis?

Response: We revised our data analysis section to more clearly state the methods used (Methods section, lines 234-253, page 12).

* How much did the coding by MH and AT differ prior to consensus being achieved?

Response: We did not keep track of consensus during code comparisons, as MH and AT compared coding on small batches of interviews in an iterative process. KW was added as a new second coder in the current revision as a coding quality check for the coding MH and AT completed. In keeping with our consensus approach, KW coded 6 interviews in an iterative fashion. This quality check allowed for additional collapsing of a few similar codes to improve readability. KW and MH then coded the barriers and facilitators to the CFIR and compared their coding, again using a consensus approach to achieve 100% agreement.
Results

* Please include a statement of the total sample before enumerating the characteristics of sub groups

Response: Change made as requested (Results section, line 255, page 12).

* How does difficulty finding both outside records and in-house colonoscopy reports impact on the use of CDS - this seems to assume greater knowledge of your systems than the average reader is likely to have.

Response: We added more detail about these two items and how they could impact the CDS (Results section, lines 367-372, pages 17-18).

* Why do the workflows need to be in colour?

Response: Some key informants just said that the printouts looked better in color, rather than black and white. This is feedback that the CDS team has repeatedly heard for the cardiovascular CDS system as well. The CDS is available in color in the EHR within intervention clinics and can be printed in color by those clinics that have color printers.

* Which other team members were recommended to go through the CDS printouts with patients - they then become users of the system too.

Response: Currently PCPs (physicians, advanced practitioners [physician assistants, nurse practitioners], or registered nurses conducting Medicare Annual Wellness visits for those on Medicare) are the only individuals recommended to go through the CDS printouts in both intervention arms. Rooming staff only prints and distributes the CDS printouts to patients.

* Am amazed and disappointed that health professionals were expressing doubts about the efficacy of the HPV vaccine!!! Is the point you're making that people won't implement CDS if they doubt the validity of the information it provides - if so you need to make this stronger

Response: While only 2 key informants expressed doubts about the HPV vaccine, we added more detail on the broader implications of this into our revision (Discussion, lines 543-546, pages 25-25).
* It strikes me that many of the barriers and facilitators are flipsides of the same theme - this could perhaps be used to arrange your results more concisely, as they are slightly repetitive in their current format.

Response: We revised Table 1 (pages 34-35) and our results section (pages 12-22) to reflect new coding to CFIR domains and constructs.

Discussion

* Some good links to existing literature, but I would like to see more discussion of the role of users in the design of CDS going forward. You've mentioned the guidelines / models and working with the design firm, but where were users in all this? Were they consulted directly? How much change could they influence given the system was well down the design track by the time this study occurred?

Response: End users at the healthcare system were not directly involved in the initial process with the design firm. However, we updated our paper to note that the research team has since taken over the design of the CDS and has made changes to the CDS printouts that were recommended by PCPs during pilot testing and as needed after the intervention went live based on PCP feedback (Discussion section, lines 534-537, page 25).

* Well done on describing the actions you are taking as a result of these findings ... this is great to see / hear along with your plans of further evaluation.

* Your limitations paragraph is far to brief. Please show a more critical response to the limitations of your study.

Response: We added additional limitations, including by taking a more critical view of our study (Discussion section, lines 552-570, pages 26-27).
Conclusion

* Your conclusion may need to be reworded slightly after you've responded to the reviewer recommendations, particularly in regards to presentation of the results.

Response: We revised our conclusion based on our revised results section (Discussion section, lines 572-583, page 27).