PEER REVIEW COMMENTS

**Article ID: 2021-0266**

**Title:** Determinants of guideline concordant care by family physicians for breast cancer screening in women age 40–49: a qualitative analysis

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**Reviewer 1:** Dr. Dawn Stacey / University of Ottawa, Ottawa Hospital Research Institute

**Reviewer comments and author response**

Thank you for the opportunity to review this manuscript. I participated in the peer-review of the preventive task force guidelines for mammography and the 2 systematic reviews underpinning the guidelines. Hence, I was very interested to hear how they were being used in primary care. I have some more major and more minor feedback for strengthening the manuscript.

MAJOR REVISIONS

1. The manuscript needs to be revised to be consistent with conducting qualitative research.

a. There were several items that were not consistent and the authors need to identify the study design used - currently it just indicates qualitative but just like quantitative, there are many different approaches for conducting research that is qualitative.

b. The objectives need to be written to align with qualitative research. Determinants is more linked with quantitative research questions.

c. Sampling should be conducting according to qualitative research methods approaches (purposeful) rather than quantitative (stratified).

d. Quality of the methods should be described as strengths rather than limitations.

**Thank you for these important points. We hope that we have addressed points (a) and (b) above within the editors overall comments.**

**Regarding point (c), sampling was purposeful and stratified, consistent with a type of purposeful sampling (Patton 2002, Qualitative Designs and Data Collection, page 240). We elaborated on our sampling strategy and included this citation on page 4. Regarding point (d), it was previously suggested to change the "discussion" section to**

**“interpretation”. We would ask the editors for further clarity on whether an additional subheading is required.**

2. The background starts with a well-written introduction on the Canadian Preventive Task Force Guidelines for breast cancer screening.

a. But then referral to genetics and high-risk screening were added but these are not included in the CMAJ 2018 publications of the breast screening guidelines.

b. How does referral for genetic testing fit and what are the Canadian Guidelines for breast cancer genetic testing? And most of the methods were placed into appendices given word length restrictions. I suggest you split this into 2 different manuscripts and keep this one focused on the guidelines. [Editor’s note: This can be kept in one manuscript.]

**The reviewers correctly pointed out that referral to genetics and high-risk screening and not specifically part of the guidelines. However, the guidelines are written for women at average lifetime risk of breast cancer, suggesting that physicians ought to be able to discern which women are at or above average risk of breast cancer (ie by taking a family history and referring for genetic testing if necessary). During our background literature search, we found that a common barrier to guideline implementation was related to taking a family history and difficulty / frustration accessing genetic testing. In Ontario, eligibility criteria exist for free access to genetic testing if the chance of harboring a genetic mutation is > 10%. Since these are so closely intertwined, our team felt it would be comprehensive to include these behaviours. We have clarified this distinction in our introduction on page 3.**

**We have included the methods from the appendix into the body of the manuscript as suggested by this reviewer and the editor.**

MINOR REVISONS

Abstract

1. Study purpose should be aligned with qualitative research

**We have clarified that determinants is suggesting of barriers and facilitator to make it more clear that the purpose of the study is aligned with qualitative research.**

2. Missing the study design

**Study design was elaborated on in the methods as much as possible given word count constraint.**

3. Missing the total number of participants

**The number of participants (n=18) and key demographic variables have now been included in the abstract.**

4. Discussion includes benefits and harms and this is new information that should have been presented in the results section if it is key discussion/conclusion statements.

**Benefits and harms of screening is included in the results section under knowledge as well as when we refer to the 'beliefs about consequences' of screening. We have added 'benefits and harms' in parenthesis in the results section for additional clarity.**

Introduction

1. missing description of the harms and benefits of the mammography based on the previous literature

**We agree with the reviewer that an overview of mammography harms and benefits are missing from the introduction. Given the limited word count, the harms were only briefly listed in the first paragraph of the introduction (psychological, false-positives, and overdiagnosis). We did not list the benefits due to limitations in word count and controversy over some of the screening benefits in this age group (mortality, stage-shift). We did not want to distract from the overall goal of the research – that is to assess the barriers/facilitators to guideline adherence. We would appreciate direction from the editors on this matter – including whether these benefits should be briefly listed and how much detail on mammography benefits & harms given the word count.**

2. What about "clinicians are encouraged to engage in shared decision making" – this is in the guidelines but not discussed in the paper; Why was shared decision making not explored as one of the behaviours necessary for discussing breast cancer screening?

**'Shared decision making' was the second behaviour of interest in this study. We called it 'discussion of benefits, harms, and preferences'. This has been clarified on page 5 when the five screening behaviours are listed. Within the introduction first paragraph we state that the decision to undergo screening in this age should be individualized, based on benefits, harms, and a woman's values which reflects shared decision making.**

3. Missing what is already known about physicians' approach or facilitators/barriers to breast cancer screening.

**We have included some information about this in the introduction on page 3.**
**"…Regarding overall breast cancer screening, providers report lack of support, time, absence of reminder services, and confusion regarding conflicting evidence about screening as barriers. Many providers have never referred a woman to genetics and/or to high-risk screening…"**

Methods

1. How were physicians selected? The methods for sampling & recruitment are better described in the appendix and these details are important to understand how they were selected – this needs to be added into the manuscript.

**Further details on participants and recruitment were moved from the appendix to the manuscript and further details on sampling were added and clarified on pages 4-5.**

2. Who conducted the interviews? What were their qualifications?

**The primary study author (MBN), a medical oncologist, conducted the interviews. This has been included on pages 5-6.**

**"…The interviewer (MBN) is a breast medical oncologist with moderate interview experience. She was motivated to understand the problem of provider variability in guideline concordance after seeing women experiencing harms at both end of the spectrum: women who should have been offered earlier / additional screening due to high lifetime breast cancer risk as well as women who were over-diagnosed due to screening despite low lifetime breast cancer risk. Interviews were conducted with a neutral, openended, non-judgemental tone without any intonation about was "correct". There were no prior relationships, knowledge about practice, or other goals (other than to understand practice, barriers, and facilitators) between interviewer and interviewees and no interviewer characteristics were disclosed…"**

Results

1. Knowledge was identified as a barrier but I think you are indicating that lack of knowledge should have been the barrier.

**Within the TDF, the determinant 'knowledge' is typically applied when there is a lack of knowledge. We have chosen to keep it this way to follow rigorously the definitions set in place by the authors of this framework. We feel we have described carefully and succinctly what is meant by this domain and how it affected physicians in practice.**

2. Subsection titled "Facilitators to guideline concordant screening decisions"

a. why are physicians discussing that screening is not recommended when the Canadian Guidelines state "the decision to undergo screening is conditional on the relative value a woman places on possible benefits and harms from screening"

**Thank you for this interesting question. Physicians' overall goals are to 'first do no harm';**

**therefore, typically a physician ought to recommend against a test, procedure, or medical intervention if it is more likely to cause harm than benefit a patient. To apply this principal to the guidelines, our operational definition of screening concordance is that the physician ought to still make a screening recommendation based on relative benefits and harms (and therefore should make a recommendation against screening if it is more likely to cause harm); however, if despite this recommendation a woman places high value on screening and has an informed discussion (where both potential benefits and harms are discussed), then the physician should still provide a screening referral and this would be guideline concordant. This has been clarified in our operational definition of guideline concordance on page 4.**

Discussion

1. "Barriers to risk assessment include knowledge of risk factors and risk assessment tools, skills to synthesize risk and beliefs about consequences"

a. shouldn't this be limited knowledge and skills?

**Yes, we have kept the domain names consistent with the TDF and elaborated on them. We hope it is clear from the results and discussion that physicians lack the knowledge and skills.**

2. There is strong evidence that physicians have limited shared decision making skills and given this is relevant to providing concordant use of breast cancer screening.

a. can you discuss your findings within the shared decision making literature?

b. Do they need training in shared decision making?

**We explored 'shared decision making' in the second behaviour of 'discussion regarding benefits and harms'. In our study, physicians told us they were quite comfortable and had skills to engage in shared decision making, especially with screening decisions as they often do this for PSA screening as well. Another quote to highlight this has been added to Table 4. The issue was that some physicians did not have accurate information (or knowledge) to provide to patients within that discussion, so although there is evidence of shared decision making, unfortunately, decisions are being made with incomplete knowledge / information. We do not feel our results suggest the need for training in shared decision making.**

**"I guess I'm kind of used to having wishy washy conversations because you know PSAs are kind of like that too right? And like when people are deciding whether to go for FITT testing versus a colonoscopy like there's no black and white answer there. It's just sort of explaining what the risks and benefits are of all the different options" -P010**

3. the concern about radiology departments is that they should be accepting referrals for mammography based on the relative value a woman places on possible benefits and harms from screening. The radiology referral forms need to reflect the Canadian Task Force Guidelines

**We want to reiterate that we agree that it is of utmost important to follow a woman's values. However, it appears that women are making decisions and expressing their values based on incomplete information (since the media often reflects the benefits of screening, and physicians seemed more knowledgeable about the benefits of screening, the information missing is often related to the harms of screening). As discussed on page 12 (citation 37), women often change their opinions in regard to screening intentions when given more complete information. We agree that the radiology referral forms ought to reflect the Task Force and be standardized across the provide. This would lead to increased behavioural regulation and consistency on the part of family physicians. This is reflected in our sentence that states that "risk assessment and discussion have been performed" and we have clarified that we mean a shared-decision making discussion on page 14.**

**This suggests that an intervention standardizing practice or referral forms for physicians to communicate that risk assessment and informed shared-decision making discussion have been performed could help to reinforce guideline concordant behaviour.**

4. What needs to be done to address the barriers and promote the facilitators? A paragraph related to future directions (which was initially in the conclusion) has now been moved to the discussion section on page 14.

**Reviewer 2:** Dr. Doris Howell / Princess Margaret Cancer Centre

This is a clearly written article that has followed a rigorous qualitative methodology and methods and the use of the theoretical domain's framework was a strength for the content directed analysis. There are only minor revisions required as follows:

1. Abstract: in the abstract it states data were inductively analyzed and then in next sentence states deductively. This is confusing.

**Thank you to this reviewer for their positive comments. We wonder if the reviewer mis-read the word "iteratively" (ie cyclically) rather than inductively**.

2. Methods: saturation. The author states theoretical saturation was achieved based on the Information power and guidance documents. Can it be stated what these were specific and how they applied to determination of saturation in this study and sourced, so reviewers do not need to go to source to determine rigor.

**Theory-based interviews suggest at least 6-10 interviews, however given the multiple behaviours of interest and four physician categories we estimated a lower limit of 10-12 interviews. We increased from this lower limit based on some aspects of lower information power and to try to reach less well represented physician groups (men, low resourced areas). We have added this information on page 6.**

**"Saturation was determined considering the concept of 'information-power' (26) and guidance for achieving data saturation for theory-based interview studies (27). Theory-based interviews suggest at least 6-10 interviews, with a stopping criterion of 3 interviews with no new information (27). Given the multiple behaviours of interest and four physician categories we estimated a lower limit of 10-12 interviews. We increased from this lower limit to increase our information power due average distribution of dialogue quality, initial inexperience of the interviewer, and trying to reach less well represented physician groups (men, low resourced areas). Recruitment, data collection, transcription, and analysis continued until saturation was reached in all relevant TDFdomains."**

3. Limitations: in this section the author should address the generalizeabilty of the sample i.e. predominance of female physicians Thank you for this important point. Please see our response in regards to this to the editor's comment above and note that we have included more information regarding this limitation and generalizability in the limitations section on page 14. Specifically related to predominance of female physicians, we have added:

**The literature suggests that female physicians are more likely to order more screening tests (mammography, pap smears) (48), but further research and analysis (forthcoming) is required to understand if women experience different barriers / facilitators than men.**

4. Minor: Spelling error in discussion line 33, categorization.

**Thank you for pointing this out. The spelling error has been corrected on page 12**