

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

## ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	How Patient Acceptability Affects Access to Breast Reconstruction: A Qualitative Study
<b>AUTHORS</b>	Retrouvey, Helene; Zhong, Toni; Gagliardi, Anna; Baxter, Nancy; Webster, Fiona

## VERSION 1 – REVIEW

<b>REVIEWER</b>	Shelley Potter University of Bristol, UK
<b>REVIEW RETURNED</b>	24-Feb-2019

<b>GENERAL COMMENTS</b>	<p>This is a potentially interesting qualitative study exploring the acceptability of breast reconstruction to patients and how this affects access to care.</p> <p>Although this is an interesting topic, I am not sure whether it can be fully addressed in the current study. It appears that not all of the patients included in the study had been informed that breast reconstruction was an option at the time of their diagnosis. It seems very much that the overriding factor in determining acceptability was if and how breast reconstruction was discussed with the patient. No details are provided about the stage of breast cancer and any adjuvant treatments required which make some of the quotes difficult to interpret. In addition, no information is provided about the types of breast reconstruction patients went on to receive and this is important in terms of the wider picture and allowing the reader to interpret the findings. There is also a need for some information about the health setting – do the surgeons performing mastectomy also perform BR (e.g. UK) or is this performed by different surgeons in Canada (e.g US). Do the centres sampled had on site access to plastic surgeons? This would frame the context. This is given in the discussion but would be better in the background section.</p> <p>The methods are not completely clear. It appears that the authors used purposive sampling with regard to mastectomy only (no reconstruction); immediate and delayed reconstruction and also regarding sociodemographic backgrounds and location. There appears to be some convenience sampling from breast cancer organisations. It is not clear how plastic surgeons sampled the patients or how they were approached to participate – in person; by letter etc. The authors state that of the 31 women approached, 28 women agreed to participate in the interviews. Further details are needed.</p> <p>Although I agree 28 is a very large sample for a qualitative study, I have concerns about the sampling and the claims that saturation</p>
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	<p>was achieved. Almost 60% of participants had mastectomy only without reconstruction (n=17). The numbers of patients having IBR (n=5) and DBR (n=6) are small. It is likely that saturation was achieved for no BR group, but given potential diversity of the procedures the patients undergoing BR may have experienced, these groups seem underrepresented. As a minimum, I would have anticipated approximately equal numbers of no BR/IBR/DBR patients. It could be hypothesised that given the experiences of so many women who did not have reconstruction (because they weren't informed about it as an option or for other reasons), patients electing to have IBR in particular would almost represent 'negative' cases and as such represent a very rich source of data – what went 'well' in the care of these women? Why did they have BR? The DBR group would be similarly informative. Furthermore, as no information is provided about the types of reconstruction (implant vs autologous) it is very difficult to know if all types of reconstruction were represented and if there were any specific challenges in any specific area. This is a significant weakness as it makes interpretation difficult.</p> <p>Aside from the initial preliminary interviews, it is unclear whether the sampling, data collection and analysis were conducted iteratively and concurrently or whether the analysis was performed after all interviews had been conducted. The latter seems to be the case as the authors do not seem to have looked for negative cases to prove/disprove emerging themes or to have iteratively modified their interview schedule/topic guide as the study progressed to allow any emerging themes to be explored.</p> <p>In the results section, it would be helpful to have the full quotes in the text as it is difficult to judge from the very brief comments that are currently provided as to whether these quotes support the interpretation.</p> <p>The themes do not seem to directly relate or link to the patients' acceptability of breast reconstruction which could be improved.</p> <p>For theme 1 'cancer survival before breast reconstruction' for example, there are no quotes from patients who did elect to have an IBR who must have had differing opinions/experiences from those presented. I do not feel that the breadth of views is presented. The data seems to be quite superficially handled. There is no reference here regarding the acceptability of BR. I suspect that patients may have accepted BR had it been offered.</p> <p>For theme 2, this, for me is the most significant finding of the study. There is a wealth of experiences but they linked together without any interpretation or meaningful analyses. This section should be expanded with more consideration of the contrasting experiences and how this impacts on patient acceptability for IBR and DBR and thus how it impacts on choice.</p> <p>For theme 3, I am not convinced that the patients' acceptance of breast reconstruction has changed and theme 4 – women's need to justify BR does not clearly link to its acceptability. The reasons for these views do not seem to have been explored and this is a shame. There is a need for the inclusion of more data to help the reader determine the degree to which the statements support the interpretation given.</p> <p>The discussion section includes some quite rich analyses e.g. 'social values around gender roles informed participants</p>
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	<p>experience in our study and created tension for women considering BR. ....“vain creatures’ which are not fully supported by the data presented in the results section.</p> <p>The authors state ‘Practically, our findings suggest that the pathway to accessing BR can be improved through enhanced acceptability of BR.’ This may be true, but predominantly it is healthcare providers’ attitudes (rather than patients) that need to be addressed. I do not feel that on the basis of the data presented that the conclusion ‘acceptability of BR by patients strongly influenced access to this surgical procedure’ is supported. What the authors have not discussed really is why patients have these attitudes. This does come out slightly in the earlier part of the discussion, but the manuscript would benefit greatly by having more quotes in the results are greater consideration of the context of the study.</p> <p>Smaller points It would be helpful in table 2 to have details of the whether or not patients had had breast reconstruction in addition to their ID numbers to help the reader interpret the findings without having to return to table 1.</p> <p>There are spelling mistakes ‘STRENGHT AND LIMITATIONS’ and in table 1 (Breast reconstruction REVEIVED’.</p>
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<b>REVIEWER</b>	Dr Fiona Holland University of Derby, UK
<b>REVIEW RETURNED</b>	12-Mar-2019

<b>GENERAL COMMENTS</b>	<p>Overall an interesting paper that gives insight into women’s experiences of breast cancer and attitudes towards BR. It is a cross sectional interview design with an appropriate sample of women. More detail is needed in areas to allow the positioning of the research to be clearer, and the experiences across the sample to be acknowledged. It would be ideal to have a more critical debate around the acceptability of BR as it is presented in a rather simplistic manner, and the critical literature is absent from the introduction. Some key studies in the area are recommended for the authors to consider including as they are relevant to the paper, albeit from a UK and USA setting. Including this would add more of a balanced perspective. Clarifying the theme title around acceptance is needed. Whose acceptance and of what?</p> <p>In detail: Should it read ‘the acceptability’ rather than acceptability? –see throughout Page 5 11 patients’ (see apostrophe use with this word throughout) 27. participants- what age were the women who were recruited? Add more about your inclusion criteria please. 32 intervention- interviews- how analysed could also be added here. Inductive thematic analysis? 35 – The telephone interview can’t discuss (anthropomorphism)- perhaps ‘in the telephone interviews, participants discussed their experience of breast cancer and the acceptability of BR as a surgical option post-mastectomy’ 40- grammar. Of the 28 participants 11 had undergone BR at the time of the interview; 5 at the time of mastectomy, and 6 at a later date- delayed BR (DBR).</p>
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	<p>54 Shift to acceptance (of what? BR or their bodies- I think this theme title needs to be clearer- see comments about how the themes are only seeming to reflect the views of women who have undergone BR)</p> <p>Page 6 conclusion</p> <p>What about the women who did not elect to have BR? Line 17 infers that all were in receipt of it in the end, where your participant info doesn't suggest this. The non BR women are currently reported in such a way that we understand that their physicians did not give them information, or did not encourage them to consider it (yet). Is there any consideration that some of the women might not opt for BR even if it were considered acceptable, and accessible (but just not for them?). Their experiences of not pursuing BR are not discussed much in your themes...</p> <p>Page 9 background</p> <p>It would be helpful to have the paper be positioned clearly within the Canadian Context, with a brief overview of the breast cancer treatment process within the health care system, e.g. what is covered by insurance for women. As an international journal, it would be helpful to readers from other cultures to understand the provision of care. Also, having an overview of BR rates nationally and in Ontario would also be helpful, along with any Canada-specific literature that has been conducted to date in this area. There are several papers suggested below from other cultural contexts that are recommended for the authors to consider, which would add a greater level of balance to the work, and situate in more clearly within the other qualitative work in this field done to date.</p> <p>There is no mention in the manuscript of women who opt to not elect BR (and in your later statements this appears to reflect the majority of women in Ontario). Previous research has suggested that the option to not undertake BR is a viable choice for women with similar long –term satisfaction outcomes. This paper appears to have a pro BR bias, suggesting that the optimal would be that BR rates should increase if it is positioned as more acceptable to women ('despite its benefits (line 19)). The literature suggests that there are benefits for many women, but not all women and this should be recognised in the paper. This paper appears to position BR as optimal and although previous studies have reported the psychosocial benefits of reconstruction (see for example Wilkins et al., 2000; Ananian et al., 2004) particularly in terms of immediate versus delayed (Al Ghazal et al., 2000), there is a complexity involved when pre-existing characteristics such as mental health, body image etc are taken into account ( see Rubino et al., 2007; Krauss, 1999; Figuerido et al., 2004). These should be acknowledged.</p> <p>The complexity of the decision to reconstruct be reflected in the rates of reconstruction is acknowledged and, as in the case in Ontario, uptake remains below 50% when taken across all epidemiological studies (Alderman et al., 2003) so despite the assumed psychological benefits of reconstruction (Abu-Nab and Grunfeld, 2007), the majority of breast cancer patients who have a mastectomy opt not to reconstruct. Some critical research (Harcourt and Rumsey, 2004) suggests that health professionals accept, somewhat unquestioningly, the psychological benefits of reconstructive surgery for women post-mastectomy. However, the differences in body satisfaction measures between women choosing reconstruction/non-reconstruction are shown to be non-significant (Rowland et al., 2000). Harcourt et al. (2003) examined the psychological implications of reconstruction versus</p>
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	<p>mastectomy alone, finding no differences in satisfaction with decision-making at six and twelve months post-mastectomy but with all participants reporting psychological benefits. The researchers could position their paper to articulate their work within this debate, discussing the literature around access (is it a question of access? Acceptability? Informed choice to pursue or not pursue?).</p> <p>There is a lack of appraisal of other qualitative papers within the field that have employed interviews to understand the experiences of women reflecting on BR/non BR e.g. Rubin and Tanenbaum (2011) (how the personal and social contexts of a group of sexual minority women informed their reconstruction decisions). Rubin et al., (2013) (a grounded theory approach to better understand why African American women were less likely to pursue BR than the wider population). Truelsen (2003) reported the decision-making of eight women (seven Scottish and one Irish) following mastectomy; Holland, Montague and Archer (2016) interviewed younger women who had not pursued BR post-mastectomy. These should be acknowledged.</p> <p>Page 10</p> <p>14 What us a preference sensitivity procedure?</p> <p>P13 line 25 – this seems to be incomplete</p> <p>Page 14</p> <p>Line 39 –what does it mean that the women had some level of interest in BR? This isn't clear. Many had not pursued it. What does 'rethink BR' mean in your table of participants- not included in the key.</p> <p>Page 17 Line 17- the physicians views are reported views and opinions as recalled by the women, we can't know these are their views in person as they were not asked. Did patient age or stage of cancer appear to have any influence on the discussions around BR with the patients you interviewed?</p> <p>The quotes are mostly from women who did opt to have BR, yet you also recruited women who didn't opt for this. Their views are not acknowledged in your analysis as much. While others defended BR, did the non BR they defend their choice too? Your theme on acceptance- please clarify whose acceptance and of what?</p> <p>p.22 I would argue that the findings are not novel as other have qualitatively explored BR (see Rubin and Tanenbaum's work; Holland, Archer and Montague for non BR). It could be positioned as novel within the Canadian context.</p> <p>P 22. Line 14-20 the women should be understood to be preparing for a future BR (if they are described as no BR) – or are they talking about their mastectomy here? This is confusing- clarify which 'surgery' is being discussed here.</p> <p>Page 23 line 30- no need for quote mark.</p> <p>Other work has also discussed the role of physicians in decision making (see Holland, Montague and Archer et al, 2016) and the defending of decision-making (Archer, Holland &amp; Montague)</p> <p>Page 24 line 14 participants' (check apostrophe use throughout)</p> <p>Page 25</p> <p>Have the authors seen the BRECONDA tool that has been developed to support patients considering BR? (see Sherman, K., Harcourt, D., Lam, T., Shaw, L.-K. and Boyages, J. (2014) <a href="http://eprints.uwe.ac.uk/22676">http://eprints.uwe.ac.uk/22676</a>). This is a tool that was developed in the UK to support patients considering BR and to give informed options, it would be worth reviewing and considering to include this in your recommendations section.</p>
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## VERSION 1 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:

Reviewer: 1

Reviewer Name: Shelley Potter

Institution and Country: University of Bristol, UK

Please state any competing interests or state 'None declared': None declared

We have modified our competing interest statement to "None declared".

Please leave your comments for the authors below

This is a potentially interesting qualitative study exploring the acceptability of breast reconstruction to patients and how this affects access to care.

Thank you for your interest.

Although this is an interesting topic, I am not sure whether it can be fully addressed in the current study. It appears that not all of the patients included in the study had been informed that breast reconstruction was an option at the time of their diagnosis. It seems very much that the overriding factor in determining acceptability was if and how breast reconstruction was discussed with the patient.

We agree that there are numerous barriers to access to BR, one of which is patient awareness of this procedure. We acknowledged these barriers in the background: "These factors act as barriers in the six access to care domains presented by Penchansky and Thomas, specifically availability, accessibility, awareness, affordability, accommodation, and acceptability."

In our study, although we focused on acceptability, we first explored the different barriers to BR including awareness of this procedure. Through this process, we found that the acceptability of BR by patients surfaced as the most important barrier to BR for our participants. We thus focused on the acceptability of BR in our manuscript. We agree that not all patients are informed of the option of BR at the time of breast cancer diagnosis, but in our study, we found that all participants eventually became aware of the option of BR, reporting learning about this option through discussion with friends, online research, and advocacy group. In our interviews, awareness was therefore not as significant of a barrier as compared to acceptability.

The introduction has been reworded to emphasize our focus on acceptability in this study:

"Acceptability has been poorly evaluated in the context of access to BR, a preference sensitivity procedure. A "preference sensitivity" procedure is a treatment where multiple options exist with heterogenous trade-offs.<sup>30</sup> The published literature on BR acceptability only evaluates the association between patient factors, physician view and rates of BR.<sup>31-33</sup><sup>22 26 34 35</sup><sup>27</sup> Certain patient characteristics have been associated with increased likelihood of BR discussion/referral by physicians; these included younger, more educated, English speaking, Caucasian patients with higher income<sup>26-28 34-39</sup>. In Canada, immigrant women and women who live in neighborhoods with lower median income have significantly lower odds of BR.<sup>3</sup> These highlight barriers to BR access despite universal health care coverage where all patients should have equal access to BR.<sup>3 20 40</sup> These studies denote potential acceptability barriers to BR access but fail to capture patient's opinions of the acceptability of this surgical procedure and how these may impact access to BR. Furthermore, the published literature does not evaluate the impact of gender on acceptability; women may feel hesitant to accept an additional surgery which would temporarily remove their ability to partake in activities.<sup>41-</sup>



44 Given that the acceptability of BR by patients has not yet been examined, the purpose of our study was to conduct qualitative interviews with women to explore their experiences with BR and improve our understanding of this phenomenon. Qualitative research allowed for in depth exploration of patient level barriers and had the potential to increase our understanding of the role of patient acceptability in women's access to BR."

In addition, our study evaluated BR as a whole, and did not focus on immediate versus delayed BR. We acknowledge this as a limitation of our study. If we had focused on immediate BR, we likely would have found that awareness at the time of breast cancer diagnosis was a major issue as you highlighted. We plan to further research this important issue and evaluate the different barriers between immediate and delayed BR, as we anticipate that different barriers will emerge.

Our discussion has been modified:

"This study is limited by the lack of detailed review of specific barriers to IBR versus DBR and of autologous versus prosthetic-based BR. However, our focus in this exploratory study was to increase the understanding of broad barriers to BR access, acknowledging that these may not be applicable to all subtypes of BR. Future research should aim to refine the understanding of barriers to specific types of BR."

No details are provided about the stage of breast cancer and any adjuvant treatments required which make some of the quotes difficult to interpret. In addition, no information is provided about the types of breast reconstruction patients went on to receive and this is important in terms of the wider picture and allowing the reader to interpret the findings.

Thank you for your suggestions. We have added information on previous breast cancer treatments, current breast cancer treatments as well as breast reconstruction type in Table 1. We have also added this information to the results section and to the quotes to facilitate interpretation.

There is also a need for some information about the health setting – do the surgeons performing mastectomy also perform BR (e.g. UK) or is this performed by different surgeons in Canada (e.g US). Do the centres sampled had on site access to plastic surgeons? This would frame the context. This is given in the discussion but would be better in the background section.

Thank you for your question. In Canada, plastic surgeons perform the reconstructive procedure, while general surgeons perform the cancer resection surgery (in our case, the mastectomy). BR thus required collaboration between two surgical teams. Availability of plastic surgeons can be a barrier to BR and has been described in the literature. In our study, as we wanted to evaluate patient level barriers to BR, all sites recruiting patients had plastic surgeons available to perform reconstructive surgery.

The background has been modified to reflect this:

"In Canada, general surgeons perform the mastectomy while plastic surgeons perform the reconstruction."

The methods were also modified:

"Plastic surgeons working at six centers across the province of Ontario (Toronto, Ottawa, Hamilton, London, Thunder Bay, and Windsor) also recruited breast cancer patients to participate."

The methods are not completely clear. It appears that the authors used purposive sampling with regard to mastectomy only (no reconstruction); immediate and delayed reconstruction and also regarding sociodemographic backgrounds and location. There appears to be some convenience sampling from breast cancer organisations. It is not clear how plastic surgeons sampled the patients or how they were approached to participate – in person; by letter etc.

Thank you for this feedback. We have updated our Methods section to reflect your questions.

The “Sampling and Recruitment” section has been modified to:

“Institutional ethics board approval was obtained from the University of Toronto. Women with a diagnosis of breast cancer planning to undergo or having undergone a mastectomy were sampled purposively. We recruited patients from three groups: 1) not having undergone BR (No BR), 2) having undergone immediate BR (IBR) or 3) delayed BR (DBR). Plastic surgeons working at six centers across the province of Ontario (Toronto, Ottawa, Hamilton, London, Thunder Bay, and Windsor) recruited information rich breast cancer patients via telephone to participate. Convenience sampling was also used; poster advertisement was used to sample breast cancer patients involved with breast cancer organizations from across Ontario (ReThink Breast Cancer, Wellspring Cancer Support Network, Willow Breast Cancer Support Canada, and the Canadian Breast Cancer Foundation). Through these diverse recruitment strategies, we aimed to include women of varying sociodemographic backgrounds (age and income quintile) and geographical locations within the province of Ontario, Canada. Breast cancer patients who agreed to participate were then enrolled.”

The authors state that of the 31 women approached, 28 women agreed to participate in the interviews. Further details are needed.

We have added information on the 3 patients who elected not to participate.

“Three women selected not to participate because of the one-hour time commitment required.”

Although I agree 28 is a very large sample for a qualitative study, I have concerns about the sampling and the claims that saturation was achieved. Almost 60% of participants had mastectomy only without reconstruction (n=17). The numbers of patients having IBR (n=5) and DBR (n=6) are small. It is likely that saturation was achieved for no BR group, but given potential diversity of the procedures the patients undergoing BR may have experienced, these groups seem underrepresented. As a minimum, I would have anticipated approximately equal numbers of no BR/IBR/DBR patients. It could be hypothesised that given the experiences of so many women who did not have reconstruction (because they weren't informed about it as an option or for other reasons), patients electing to have IBR in particular would almost represent ‘negative’ cases and as such represent a very rich source of data – what went ‘well’ in the care of these women? Why did they have BR? The DBR group would be similarly informative. Furthermore, as no information is provided about the types of reconstruction (implant vs autologous) it is very difficult to know if all types of reconstruction were represented and if there were any specific challenges in any specific area. This is a significant weakness as it makes interpretation difficult.

Thank you for your questions. These are all very interesting and we hope to answer them in future research.

We have added information on type of reconstruction in Table 1. This information will facilitate the interpretation of the data.

In response to your questions, I would like to provide information to clarify our 3 groups. Patients in the “no BR” group could be considering undergoing autologous or prosthetic BR in a delayed or immediate fashion or could have decided not to undergo BR. Patients in the IBR group could have debated undergoing BR at the time of their breast cancer surgery and also debated the type of BR they selected. Patients in the DBR could have chosen not to undergo BR or may not have been provide with the opportunity to undergo IBR. Although we divided our participants into 3 groups for reporting, all participants could share their experiences and views with accessing BR. Thus, in my



opinion. we reached saturation on barriers to BR as a whole by including participants at varying stages of their breast cancer pathway.

Our goal in this exploratory study was to evaluate barriers to any type of BR, regardless of IBR/DBR or of autologous/prosthetic BR. As such, we reached thematic saturation on barriers to access to BR as a whole in our study. We acknowledge that we did not evaluate in detail barriers to specific types of BR. We have added this as a study limitation – and a topic for future research based on our results.

“This study is limited by the lack of detailed review of specific barriers to IBR versus DBR and of autologous versus prosthetic-based BR. However, our focus in this exploratory study was to increase the understanding of broad barriers to BR access, acknowledging that these may not be applicable to all subtypes of BR. Future research should aim to refine the understanding of barriers to specific types of BR.”

Despite this limitation, the novel barrier identified in this study is likely applicable to most subtypes of BR. Lack of acceptability of BR impacts access to most subtypes of BR, and interventions targeted towards this barrier may facilitate BR access for most BC patients.

Aside from the initial preliminary interviews, it is unclear whether the sampling, data collection and analysis were conducted iteratively and concurrently or whether the analysis was performed after all interviews had been conducted. The latter seems to be the case as the authors do not seem to have looked for negative cases to prove/disprove emerging themes or to have iteratively modified their interview schedule/topic guide as the study progressed to allow any emerging themes to be explored.

Thank you for your question. Our sampling, data collection and analysis were all performed iteratively. We have modified the methods section based on your feedback.

### Sampling

During the interviewing process, we noted that most participants had considered BR. The research team felt that this sample lacked negative cases, specifically breast cancer patients without interest in BR. As such, the research team subsequently searched for “negative cases”. Specifically, we asked plastic surgeons to recruit patients without interest in BR. We also asked members of the care team (eg. Clinic nurses) to help recruit patients who may not have considered BR as an option. We also encouraged breast cancer organizations to display our poster advertisement in a variety of locations and to encourage all women (regardless of BR status) to participate in the study. Despite a broader recruitment strategy and efforts to find women without interest in BR, all participants who accepted to participate had some interest in BR (ie. had considered the option of BR).

For Data Collection, the interview guide was pilot tested and refined iteratively. Although the overall structure of the interview guide remained similar for most interviews, prompts were added iteratively to explore emerging themes.

“The interview guide was pilot tested and iteratively refined by HR to improve interview flow and add prompts. The guide was then consistently used during the interviews.”

### For Approach to Data Analysis,

“Our analysis was performed in a stepwise iterative fashion as described by Saldana, from the development of codes to the generation of themes. The first five interviews were independently reviewed and two authors (HR and FW) which performed initial coding. These two investigators then met to compare codes, thus enabling the process to be reflexive as each author discussed their own perspectives and assumptions. Through a series of meetings and discussions, a coding framework was developed and HR applied second cycle coding to interviews as they were performed. The coding framework was revised as necessary based on new findings. Coding software was used to

organize the data (NVivo, 12.0 QSR International, Melbourne, Australia). This process allowed for the development of preliminary categories and themes. These were shared with all members of the research team which independently reviewed the themes and, through discussion, refined them. All authors provided methodological and content expertise to ensure trustworthiness of the study. All authors critically reviewed the data and its interpretation to ensure confirmability as well as the analytical process to ensure rigour and congruence. We interpreted the meaning of the data through thematic analysis.”

In the results section, it would be helpful to have the full quotes in the text as it is difficult to judge from the very brief comments that are currently provided as to whether these quotes support the interpretation.

Thank you for this suggestion. We have added quotes to facilitate interpretation:

#### Theme 1 – Cancer survival before breast reconstruction

Women in the study described their experience with breast cancer diagnosis and most reported significant distress upon learning about their initial diagnosis. During this distressing period, women often could not consider BR as they were overwhelmed by their new diagnosis. Women were often shaken and traumatized by this information and described being surprised, shocked and angered with this unexpected and life changing diagnosis. One woman stated, “Having cancer, it’s like one day you’re walking along and you think you’re living your life and you’re living it the best you can and you feel like you just get run over by a Mack truck, right? It’s a pretty scary and daunting kind of event that transpires.” (ID 113 – M, IBR).”

#### Theme 2: The Influence of physicians on BR acceptability

Women relied significantly on their physician to guide them through their breast cancer diagnosis and provide advice regarding the most appropriate treatment plan. A women stated, “I let him guide it, I let him guide it. Because at that point, when someone tells you, you have cancer, the person’s voice all of a sudden turns into Charlie Brown’s teacher, you know waa, waa, waa.” (ID 122 – M, C, no BR). The physician’s guidance regarding BR could influence the patient’s acceptability of this surgical procedure.

#### Theme 3 – Patient’s Shift to Acceptance

In addition to “repairing the damage” of breast cancer, BR often helped women feel better after a period of difficult treatments. BR was an opportunity for women to “[get] back” what they had lost from their breast cancer. A participant valued BR because, “having the opportunity to have, I think for it to give you back something that cancer has taken from you, I think there’s value to that” (ID 119 – M, CR, no BR). Another women stated, “But to me, having the reconstruction was, and that’s hard to explain to everybody when people were asking me, I would say, that’s the last step, that’s the final step, is the repair of all the damage that has been done over the last two years. It’s like, let’s repair this and then I can move on with my life.” She added, “It’s like, okay, well, now it’s time to make me completely healthy. It’s almost like closing a door. You can close your door, and then get on with the rest of your life.” (ID 111, DBR) BR helped women transition from the breast cancer chapter of their lives to their survivorship period. As one woman stated, “But I also looked upon it as sort of a way to move forward past the cancer diagnosis and further into my life after cancer in a hopeful way” (ID 128 – M, C, no BR). Thus, women who viewed BR as offering the opportunity for closure had an increased acceptability of this surgical procedure.

#### Theme 4: Women’s need to justify BR

Many women did not seem to be able to state that breasts were important to them and that they could undergo, without judgement, a reconstructive surgery to recreate them. A participant stated, “It took

me a while, but then I finally decided ... I needed it for me" (ID 111 – M, DBR). Women were constantly justifying to themselves and to their surroundings that they "needed" or "deserved" BR. A participant reported that she found it difficult to express the desire for BR, stating "I'm having a hard time saying this, but I came to the realization that by having a reconstruction that I deserved it. I guess that's my sort of thing, that I deserved to have breasts and to feel more feminine". She added, "There's also the barrier in terms of, and I've sort of had to deal with this a little bit, there may be perceptions out there that this is sort of an undeserving use of healthcare resources" (ID 107 – DBR). Women thought the choice to undergo BR was a "very personal decision"; a choice that only they, as breast cancer patients, could fully understand. A participant said, "I know everybody thinks, well, just, why is it a big deal. It's like, well, for me, it is a big deal because that's what makes me ... to me, that's what makes a woman a woman, in a way." (ID 111, M, DBR) The constant need for justification of women's choice to undergo BR highlighted the tension that some patients experienced when considering BR, which may be related to perceived external disapproval and/or lack of acceptance of a procedure aimed at recreating breasts.

The themes do not seem to directly relate or link to the patients' acceptability of breast reconstruction which could be improved.

Based on your feedback, we have modified the explanations within the themes. Hopefully this facilitates the understanding of the link between the themes and patient acceptability of BR.

For theme 1 'cancer survival before breast reconstruction' for example, there are no quotes from patients who did elect to have an IBR who must have had differing opinions/experiences from those presented. I do not feel that the breadth of views is presented. The data seems to be quite superficially handled. There is no reference here regarding the acceptability of BR. I suspect that patients may have accepted BR had it been offered.

No BR/IBR and DBR patients had similar experiences with their life changing cancer diagnosis.

We have added a quote from a patient with IBR.

One woman stated, "Having cancer, it's like one day you're walking along and you think you're living your life and you're living it the best you can and you feel like you just get run over by a Mack truck, right? It's a pretty scary and daunting kind of event that transpires." (ID 113 – M, IBR).

The focus of women on breast cancer specific treatments was mostly discussed by no BR and DBR patients as you highlighted. We have modified Theme 1 accordingly:

"During this process, many women focussed only on treatments aimed at curing their breast cancer, avoiding thinking of other treatments such as BR that did not improve survival. Women reported not thinking about BR at that time, as only concern was to "get the cancer out" (ID 115 – M, C, no BR). Some women chose not to undergo BR at the time of their breast cancer surgery because it was seen as an optional surgery and was not perceived as an essential component of their oncological treatment plan. One participant noted, "In order to get rid of the cancer, the chemo, the radiation, the surgery was needed, and the breast reconstruction is an option" (ID 110 – M, CR, no BR). Therefore, early in the journey of breast cancer, some patients focused on their cancer diagnosis and associated curative treatments, avoiding thinking of BR. The acceptability of BR only came to play once patients considered the option of BR."

Lastly, as we did not focus on barriers to IBR versus DBR, we cannot further contrast BR barriers by timing. Patients' responses to the option of BR at the time of their first breast cancer diagnosis requires further investigation as you suggest.

For theme 2, this, for me is the most significant finding of the study. There is a wealth of experiences but they linked together without any interpretation or meaningful analyses. This section should be expanded with more consideration of the contrasting experiences and how this impacts on patient acceptability for IBR and DBR and thus how it impacts on choice.

Thank you for your interest in Theme 2. We have expended this section as per your recommendations.

#### “Theme 2: The Influence of physicians on BR acceptability

Women relied significantly on their physician to guide them through their breast cancer diagnosis and provide advice regarding the most appropriate treatment plan. A woman stated, “I let him guide it, I let him guide it. Because at that point, when someone tells you, you have cancer, the person’s voice all of a sudden turn into Charlie Brown’s teacher, you know waa, waa, waa.” (ID 122 – M, C, no BR). The physician’s guidance regarding BR could influence the patient’s acceptability of this surgical procedure.

The options presented by the physicians to the patients impacted their ability to consider BR. In the interviews, we noted a wide variation in how physicians communicated treatment options to patients. Some women reported that their physician “laid out all kinds of options for [them]” (ID 107 – M, DBR) and “explaining everything in detail” (ID 130 – M, IBR). A patient stated, “I was given a choice, you can either go this path with the lumpectomy with radiation or you can go this path with the mastectomy and no radiation. And it was totally up to me, there was no pressure to make a decision at the time.” (ID 108, M, IBR) Other patients were not offered the options of BR by their surgeon. A participant reported, “I wasn’t given that option, okay, and I wasn’t given that option. [...] I accepted that she, [the surgeon], said that, no, this is the process that will ... I didn’t fight for ... I didn’t say, no, I want reconstruction at the same time. I accepted, I accepted that her recommendation and the process for me to follow was the process for me to follow.” (ID 110, M, CR) Another added, “If that would have been an option for me, I would have done it then. But, that was not even mentioned.” (ID 115 – M, C, no BR) Hence, if BR was not discussed or recommended by physicians, patients did not consider it as an option in their treatment plan.”

Our study examined BR as a whole and did not evaluate the challenges of IBR versus DBR. We have added this as a study limitation. In light of your feedback, we plan to perform an additional study to evaluate the distinct barriers between these patients.

For theme 3, I am not convinced that the patients’ acceptance of breast reconstruction has changed and theme 4 – women’s need to justify BR does not clearly link to its acceptability. The reasons for these views do not seem to have been explored and this is a shame. There is a need for the inclusion of more data to help the reader determine the degree to which the statements support the interpretation given.

Theme 3 depicts how women progress from doubt about BR to seeing it as a valuable procedure. Theme 3 illustrates the progression of some women from doubting the benefits of BR to seeing it as regaining control and as closure and thus as a more acceptable procedure.

We have reworded theme 3 and added data to facilitate interpretation.

#### “Theme 3 – Patient’s Shift to Acceptance

##### BR as regaining control

While each patient had a unique experience with cancer, women were similar in that they perceived that they had no control over their breast cancer. Women could not predict their diagnosis and had limited influence on the most appropriate curative treatments offered, but they had control on the

receipt of BR. One woman stated, “I had some measure of control in a situation that I really had no control over” (ID 113 – M, IBR). She added, “Whereas sometimes if you make a decision, it feels like you’ve got some measure of control for some people. But that’s good, right? You don’t feel like everything is spiralling on you.” If BR was seen positively as offering control, it could be perceived to be an acceptable option by patients.

Women felt they could actively participate in the process of BR, being able to voice their opinion on when to undergo BR. One woman commented that it was the element of decision that made her feel in control. Women viewed positively this feeling of control as it allowed them to feel empowered. A participant stated, “I’m not going to look in the mirror every day and see what I see, which is cancer took that from me. So part of it is, you know, a bit of a mental thing that I’m not going to let cancer deform my body, I’m not going to look in the mirror and see what used to be is no longer there because of cancer. [...] Just kind of regaining control and having my body back.” (ID 119 – M, CR, no BR). Therefore, during the process of BR, women felt they were in control and felt empowered with the ability to choose to undergo a surgery which could bring their pre-breast cancer “body back”. As women realized that BR was a way of regaining control, this surgical procedure gained acceptability.

#### Closure through BR

BR not only allowed women to feel in control, it was often seen as the final step in their breast cancer journey. A participant noted, “I had the surgery, I had the cancer removed, I had the treatments to make sure it won’t come back and then now, I have the reconstruction” (ID 105 – M, C, DBR). As the final step in the breast cancer path, BR was an option that could “repair [the] damage” caused by the various breast cancer treatments.

In addition to “repairing the damage” of breast cancer, BR often helped women feel better after a period of difficult treatments. BR was an opportunity for women to “[get] back” what they had lost from their breast cancer. A participant valued BR because, “having the opportunity to have, I think for it to give you back something that cancer has taken from you, I think there’s value to that” (ID 119 – M, CR, no BR). Another women stated, “But to me, having the reconstruction was, and that’s hard to explain to everybody when people were asking me, I would say, that’s the last step, that’s the final step, is the repair of all the damage that has been done over the last two years. It’s like, let’s repair this and then I can move on with my life.” She added, “It’s like, okay, well, now it’s time to make me completely healthy. It’s almost like closing a door. You can close your door, and then get on with the rest of your life.” (ID 111, M, DBR) BR helped women transition from the breast cancer chapter of their lives to their survivorship period. As one woman stated, “But I also looked upon it as sort of a way to move forward past the cancer diagnosis and further into my life after cancer in a hopeful way” (ID 128 – M, C, no BR). Thus, women who viewed BR as offering the opportunity for closure had an increased acceptability of this surgical procedure.”

Theme 4 has been modified to more clearly depict the link between women’s need to justify BR and acceptability of BR.

#### “Theme 4: Women’s need to justify BR

One pervasive theme that spanned throughout the interview was women’s need to justify BR. Women’s need to repeatedly justify their desire to undergo BR highlighted a lack of BR acceptability. In their justification, women discussed the need for breasts and the role of a surgery to recreate them. A participant stated, “Having or not having a breast is [a matter of debate] ... I could live either way and then the whole aspect around vanity.” (ID 107 – M, DBR) Women worried that choosing BR was vain, “I’m not looking for reconstructive to ... so I can strut around topless, you know what I mean, that’s not it... it’s not for vain reasons.” (ID 122 – M, C, no BR) Therefore, the acceptability of BR was affected by the worries women experienced when considering a surgery perceived to promote vanity.



Women used vivid metaphors and comparisons in their justification of BR. Women compared the loss of breast to the loss of another body part, debating the need for breasts, their function in the female body, and the role of a surgery to recreate them. A woman compared the option BR to options available after the loss of a limb, “It would be like removing a leg, I guess. You need to have that leg. How do you feel if that leg wasn’t there and you put a prosthesis there? Probably that’s more extreme, but you know, that leg mean anything to you?” (ID 114 – C, PM, no BR) The vivid metaphors depicted women’s need to justify BR and highlighted that women sometimes felt misunderstood in their rationale for wanting the surgery. Women’s need to continually justify BR suggested poor acceptability of this procedure by patients themselves and their surroundings.

Many women did not seem to be able to state that breasts were important to them and that they could undergo, without judgement, a reconstructive surgery to recreate them. A participant stated, “It took me a while, but then I finally decided ... I needed it for me” (ID 111 – M, DBR). Women were constantly justifying to themselves and to their surroundings that they “needed” or “deserved” BR. A participant reported that she found it difficult to express the desire for BR, stating “I’m having a hard time saying this, but I came to the realization that by having a reconstruction that I deserved it. I guess that’s my sort of thing, that I deserved to have breasts and to feel more feminine”. She added, “There’s also the barrier in terms of, and I’ve sort of had to deal with this a little bit, there may be perceptions out there that this is sort of an undeserving use of healthcare resources” (ID 107 – M, DBR). Women thought the choice to undergo BR was a “very personal decision”; a choice that only they, as breast cancer patients, could fully understand. A participant said, “I know everybody thinks, well, just, why is it a big deal. It’s like, well, for me, it is a big deal because that’s what makes me ... to me, that’s what makes a woman a woman, in a way.” (ID 111, M, DBR) The constant need for justification of women’s choice to undergo BR highlighted the tension that some patients experienced when considering BR, which may be related to perceived external disapproval and/or lack of acceptance of a procedure aimed at recreating breasts.

Women were also conflicted when considering undergoing an additional “optional” “cosmetic” surgery to recreate their breasts, a procedure which would temporarily make them unable to perform their usual roles (ID 118 – No BR). Women worried that the well-being of their surroundings would be compromised during their absence. Another women, who the main caregiver in the house, had to offload this responsibility onto others prior to undergoing surgery; she stated that there had to be a “reversal of roles” (ID 112 – No BR). Specifically, she reported, “You know how it is, the mothers are always in charge of the house. Now I’m not in charge of the house, they’re in charge”. Women thus faced challenges when thinking of undergoing BR, a procedure which would render them incapable of performing their usual roles. Therefore, the acceptability of BR was affected by the worries women experienced when considering a surgery perceived to promote vanity while also impairing women’s ability to perform their traditional roles.”

Theme 1-3 show the progression of women from breast cancer diagnosis, to being heavily influenced by their physician and finally thinking of BR as an acceptable procedure for them. Throughout these 3 themes, women feel they need to justify this decision both to themselves (do they “deserve” BR) and to their surroundings as described in theme 4.

The discussion section includes some quite rich analyses e.g. ‘social values around gender roles informed participants experience in our study and created tension for women considering BR. ....“vain creatures’ which are not fully supported by the data presented in the results section.

We have modified the language used in the discussion to reflect our data presented in the results. We hope you will agree that our discussion is now more supported by our results.



“In relation to this need to justify BR, social values around female gender roles may have informed participants’ experience in our study and created tension for women considering BR. Many women in our interviews accepted gender roles of being responsible for the well-being of their surroundings, rather than caring solely for themselves.<sup>41-44 74-76</sup> Women reported feeling a sense of discomfort when thinking about taking time to care for oneself. Similarly, in other fields, women report this feeling of guilt when deciding to undergo a procedure which may take time away from their traditional household duties.<sup>41 77 78</sup> The repeated justification of our participants towards their decision to pursue BR may highlight the gendered nature of acceptability. Furthermore, in our interviews, many women believed that valuing breasts and having surgery to improve their feminine identity reflected a superficial female vanity and was therefore not necessary or “optional”.<sup>79</sup> At the same time, many women described not feeling “whole” or feminine without breasts. Perhaps as reflective of this tension, women who opted for BR felt they needed to justify their rationale for wanting this procedure. Other authors have described the benefits of BR for some women, allowing them to feel “normal”, whole or feminine again, but have not previously reported acceptability concerns.<sup>33 80 81</sup> Societal gender roles may therefore have influenced women’s views of the acceptability of BR, a surgical procedure aimed at recreating breasts.<sup>81</sup> These findings suggest that gender may play a role in access to certain procedures.”

The authors state ‘Practically, our findings suggest that the pathway to accessing BR can be improved through enhanced acceptability of BR.’ This may be true, but predominantly it is healthcare providers’ attitudes (rather than patients) that need to be addressed.

Thank you for this suggestion. We have added a sentence to the paragraph:

“Healthcare providers should present BR as a valuable option in the breast cancer pathway.”

I do not feel that on the basis of the data presented that the conclusion ‘acceptability of BR by patients strongly influenced access to this surgical procedure’ is supported. What the authors have not discussed really is why patients have these attitudes. This does come out slightly in the earlier part of the discussion, but the manuscript would benefit greatly by having more quotes in the results are greater consideration of the context of the study.

Based on your insightful feedback, we have revised the manuscript.

- We have modified the background, methods and discussion to ensure that the study context is clear to readers.
  - We have added quotes to Theme 1 – 4 to facilitate interpretation of findings.
  - We have expanded the results section to provide additional data for interpretation.
  - We have modified the language in the discussion to ensure that it is fully supported by our results.
- We hope you agree that our modifications have strengthened the manuscript.

Smaller points

It would be helpful in table 2 to have details of the whether or not patients had had breast reconstruction in addition to their ID numbers to help the reader interpret the findings without having to return to table 1.

We have added information to table 2 to facilitate interpretation.

There are spelling mistakes ‘STRENGHT AND LIMITATIONS’ and in table 1 (Breast reconstruction REVEIVED’.

Thank you for noting these. We have corrected these mistakes.

Reviewer: 2

Reviewer Name: Dr Fiona Holland

Institution and Country: University of Derby, UK

Please state any competing interests or state 'None declared'

We have modified our competing interest statement to "None declared".

Please leave your comments for the authors below

Overall an interesting paper that gives insight into women's experiences of breast cancer and attitudes towards BR. It is a cross sectional interview design with an appropriate sample of women. More detail is needed in areas to allow the positioning of the research to be clearer, and the experiences across the sample to be acknowledged. It would be ideal to have a more critical debate around the acceptability of BR as it is presented in a rather simplistic manner, and the critical literature is absent from the introduction. Some key studies in the area are recommended for the authors to consider including as they are relevant to the paper, albeit from a UK and USA setting. Including this would add more of a balanced perspective. Clarifying the theme title around acceptance is needed. Whose acceptance and of what?

We have significantly modified the manuscript in response to your feedback. We hope these changes will improve the clarity of our findings.

The context of the study has been improved by modifications in the background. More critical discussion of acceptability in the Canadian context has also been added.

"Many women require mastectomy or the removal of the entire breast to treat breast cancer.<sup>1 2</sup> Breast reconstruction (BR) aims to surgically restore the shape of the breasts after tumour removal and can be performed at the same time (immediate BR) or after mastectomy (delayed BR).<sup>2</sup> In Canada, general surgeons perform the mastectomy while plastic surgeons perform the reconstruction.<sup>3</sup> BR can provide long-term quality of life and psychosocial benefits, improving the physical and psychological damage from mastectomy for women who chose this procedure.<sup>3-10</sup> Despite its benefits for some women, studies have found that BR is not consistently integrated into treatment of breast cancer patients.<sup>3 11-16</sup> In Canada, BR rates are low, reported as 16% in 2012.<sup>3</sup> Rates are similarly low in Ontario, quoted at 7.6% between 2004-2010.<sup>3</sup> While it is difficult to ascertain if these low rates are appropriate (i.e. if they reflect the fact do not want BR), they certainly do not reflect the finding by Ananian et al. that 81% of mastectomy patients would want BR if offered the choice.<sup>17</sup>

[...]

Acceptability has been poorly evaluated in the context of access to BR, a preference sensitivity procedure. A "preference sensitivity" procedure is a treatment where multiple options exist with heterogenous trade-offs.<sup>30</sup> The published literature on BR acceptability only evaluates the association between patient factors, physician view and rates of BR.<sup>31-33</sup><sup>22 26 34 35</sup><sup>27</sup> Certain patient characteristics have been associated with increased likelihood of BR discussion/referral by physicians; these included younger, more educated, English speaking, Caucasian patients with higher income<sup>26-28 34-39</sup>. In Canada, immigrant women and women who live in neighborhoods with lower median income have significantly lower odds of BR.<sup>3</sup> These highlight barriers to BR access despite universal health care coverage where all patients should have equal access to BR.<sup>3 20 40</sup> These studies denote potential acceptability barriers to BR access but fail to capture patient's opinions of the acceptability of this surgical procedure and how these may impact access to BR. Furthermore, the published literature does not evaluate the impact of gender on acceptability; women may feel hesitant

to accept an additional surgery which would temporarily remove their ability to partake in activities.<sup>41-44</sup> Given that the acceptability of BR by patients has not yet been examined, the purpose of our study was to conduct qualitative interviews with women to explore their experiences with BR and improve our understanding of this phenomenon. Qualitative research allowed for in depth exploration of patient level barriers and had the potential to increase our understanding of the role of patient acceptability in women's access to BR."

Theme 3 name has been changed to "Theme 3 – Patient's Shift to BR Acceptance"

In detail:

Should it read 'the acceptability' rather than acceptability? –see throughout

Thank you for your suggestion. We have added "the" in front of acceptability where appropriate.

Page 5

11 patients' (see apostrophe use with this word throughout)

This has been changed.

27. participants- what age were the women who were recruited? Add more about your inclusion criteria please.

Our inclusion criteria were broad; women of any age with a diagnosis of breast cancer eligible for or have undergone a mastectomy were recruited.

This has been added to the abstract.

32 intervention- interviews- how analysed could also be added here. Inductive thematic analysis?

Intervention has been refined.

It now reads: "Sixty-minute semi-structured interviews were analysed using qualitative descriptive methodology that draws on inductive thematic analysis"

35 – The telephone interview can't discuss (anthropomorphism)- perhaps 'in the telephone interviews, participants discussed their experience of breast cancer and the acceptability of BR as a surgical option post-mastectomy'

Thank you for the great suggestion. Outcome has been revised to:

"In the telephone interviews, participants discussed their experience with breast cancer and accessing BR, focusing on the acceptability of BR as a surgical option post-mastectomy."

40- grammar. Of the 28 participants 11 had undergone BR at the time of the interview; 5 at the time of mastectomy, and 6 at a later date- delayed BR (DBR).

Thank you for the great suggestion. Results has been revised to: "Of the 28 participants, 11 had undergone BR at the time of the interview; 5 at the time of mastectomy and 6 at a later date."

54 Shift to acceptance (of what? BR or their bodies- I think this theme title needs to be clearer- see comments about how the themes are only seeming to reflect the views of women who have undergone BR)

This theme discusses the shift for some women in their views of BR, transitioning from seeing BR as non-acceptable to an acceptable procedure. The theme name has been changed to "patient's shift to BR acceptance".

Page 6 conclusion

What about the women who did not elect to have BR? Line 17 infers that all were in receipt of it in the end, where your participant info doesn't suggest this.

Thank you for your comment. We have clarified line 17. Our sample included women that did and did not undergo BR.

The non BR women are currently reported in such a way that we understand that their physicians did not give them information, or did not encourage them to consider it (yet). Is there any consideration that some of the women might not opt for BR even if it were considered acceptable, and accessible (but just not for them?). Their experiences of not pursuing BR are not discussed much in your themes...

We have added information on the breast cancer history of our participants throughout the manuscript. The themes presented within the manuscript and in table 2 represent the experiences of a diverse group of women (with and without BR) reporting acceptability barriers to BR access.

We agree that the decision to pursue BR is complex and depends on a number of factors, including physician recommendation, personal acceptability of the procedure and accessibility. Prior to making an informed decision about the procedure, patients must have access to it. In our study, we find that for most participants (with and without BR), poor acceptability of BR rendered access to this surgery challenging, thereby negatively influencing their ability to make an informed decision about BR.

We have created a new figure (Figure 2) to facilitate understanding and added it to the results section to make this clearer.

"The poor acceptability of BR by patients was found to be the main barriers affecting women's decision-making, and ultimately negatively impacted BR access (Figure 2)."

Page 9 background

It would be helpful to have the paper be positioned clearly within the Canadian Context, with a brief overview of the breast cancer treatment process within the health care system, e.g. what is covered by insurance for women. As an international journal, it would be helpful to readers from other cultures to understand the provision of care. Also, having an overview of BR rates nationally and in Ontario would also be helpful, along with any Canada-specific literature that has been conducted to date in this area. There are several papers suggested below from other cultural contexts that are recommended for the authors to consider, which would add a greater level of balance to the work, and situate in more clearly within the other qualitative work in this field done to date.

We have added to the background to situate the work in the Canadian context.

"In Canada, BR rates are low, reported as 16% in 2012.<sup>3</sup> Rates are similarly low in Ontario, quoted at 7.6% between 2004-2010.<sup>3</sup> While it is difficult to ascertain if these low rates are appropriate (i.e. if they reflect the fact do not want BR), they certainly do not reflect the finding by Ananian et al. that 81% of mastectomy patients would want BR if offered the choice."

"In Canada, immigrant women and women who lived in neighborhoods with lower median income also had significantly lower odds of BR. These highlight barriers to BR access despite universal health care coverage where all patients should have equal access to BR."

There is no mention in the manuscript of women who opt to not elect BR (and in your later statements this appears to reflect the majority of women in Ontario). Previous research has suggested that the option to not undertake BR is a viable choice for women with similar long-term satisfaction

outcomes. This paper appears to have a pro BR bias, suggesting that the optimal would be that BR rates should increase if it is positioned as more acceptable to women ('despite its benefits (line 19)). The literature suggests that there are benefits for many women, but not all women and this should be recognised in the paper. This paper appears to position BR as optimal and although previous studies have reported the psychosocial benefits of reconstruction (see for example Wilkins et al., 2000; Ananian et al., 2004) particularly in terms of immediate versus delayed (Al Ghazal et al., 2000), there is a complexity involved when pre-existing characteristics such as mental health, body image etc are taken into account ( see Rubino et al., 2007; Krauss, 1999; Figuerido et al., 2004). These should be acknowledged.

The complexity of the decision to reconstruct be reflected in the rates of reconstruction is acknowledged and, as in the case in Ontario, uptake remains below 50% when taken across all epidemiological studies (Alderman et al., 2003) so despite the assumed psychological benefits of reconstruction (Abu-Nab and Grunfeld, 2007), the majority of breast cancer patients who have a mastectomy opt not to reconstruct. Some critical research (Harcourt and Rumsey, 2004) suggests that health professionals accept, somewhat unquestioningly, the psychological benefits of reconstructive surgery for women post-mastectomy. However, the differences in body satisfaction measures between women choosing reconstruction/non-reconstruction are shown to be non-significant (Rowland et al., 2000). Harcourt et al. (2003) examined the psychological implications of reconstruction versus mastectomy alone, finding no differences in satisfaction with decision-making at six and twelve months post-mastectomy but with all participants reporting psychological benefits. The researchers could position their paper to articulate their work within this debate, discussing the literature around access (is it a question of access? Acceptability? Informed choice to pursue or not pursue?).

We have significantly modified the paper to remove bias, including our response to the question above regarding the low percentage of women seeking BR. Our manuscript encourages informed decision making by breast cancer patients rather than the utilisation of BR by all breast cancer patients. Our goal is to ensure that all women consider BR as an acceptable option in the treatment of breast cancer and can decide in an informed manner whether or not this is a surgery they personally wish to undergo. We have also added a figure to reinforce this. We hope our revised manuscript reflects this.

Here are some of our changes:

Results:

"The poor acceptability of BR by patients was found to be the main barriers affecting women's decision-making, and ultimately negatively impacted BR access (Figure 2)."

Discussion:

"Practically, our findings suggest that the pathway to accessing BR can be improved through enhancing the acceptability of BR by patients. From the moment of the initial breast cancer diagnosis, patients could benefit from support to mitigate the distress they experience.<sup>88 89</sup> This support system should ensure that women are given the opportunity to access all treatment options for breast cancer including IBR and DBR, as appropriate based on their pathology. Tools such as the BRECONDA could be effective in providing decisional support during this process.<sup>90</sup> Healthcare providers should also present BR as a valuable option in the breast cancer pathway.<sup>88</sup> Women should be encouraged to explore their physical, emotional and spiritual well-being and the role BR may play for them.<sup>89</sup> Throughout this process, by optimizing the acceptability of the option of BR, women could select in an informed manner a treatment plan which may or may not include BR that best fits their desires and needs.<sup>89 91</sup> Ensuring that patients and providers consider BR as an acceptable part of care for women with breast cancer will likely improve access to BR; future research is needed to evaluate this hypothesis."

## Conclusion:

"In conclusion, our interviews with breast cancer patients revealed that the acceptability of BR by patients influenced access to this surgical procedure. The acceptability of BR was dynamic as it evolved over time, from cancer diagnosis to consideration of BR."

Thank you for also sharing these insightful publications. We have modified the background to incorporate these references. The articles discuss the variability of benefits based on different factors such as the timing of reconstruction and patient demographics. Because of the word constraint and the focus of our manuscript on access/acceptability, we could not expand on these nuances. We hope that the addition of references to these stimulating articles will encourage readers interested in this topic to further explore these.

## Background:

"Many women require mastectomy or the removal of the entire breast to treat breast cancer.<sup>1 2</sup> Breast reconstruction (BR) aims to surgically restore the shape of the breasts after tumour removal and can be performed at the same time (immediate BR) or after mastectomy (delayed BR).<sup>2</sup> In Canada, general surgeons perform the mastectomy while plastic surgeons perform the reconstruction.<sup>3</sup> BR can provide long-term quality of life and psychosocial benefits, improving the physical and psychological damage from mastectomy for women who chose this procedure.<sup>3-10</sup> Despite its benefits for some women, studies have found that BR is not consistently integrated into treatment of breast cancer patients.<sup>3 11-16</sup> In Canada, BR rates are low, reported as 16% in 2012.<sup>3</sup> Rates are similarly low in Ontario, quoted at 7.6% between 2004-2010.<sup>3</sup> While it is difficult to ascertain if these low rates are appropriate (i.e. if they reflect the fact do not want BR), they certainly do not reflect the finding by Ananian et al. that 81% of mastectomy patients would want BR if offered the choice.<sup>17</sup>"

There is a lack of appraisal of other qualitative papers within the field that have employed interviews to understand the experiences of women reflecting on BR/non BR e.g. Rubin and Tanenbaum (2011) (how the personal and social contexts of a group of sexual minority women informed their reconstruction decisions). Rubin et al., (2013) (a grounded theory approach to better understand why African American women were less likely to pursue BR than the wider population). Truelsen (2003) reported the decision-making of eight women (seven Scottish and one Irish) following mastectomy; Holland, Montague and Archer (2016) interviewed younger women who had not pursued BR post-mastectomy. These should be acknowledged.

Thank you for sharing these qualitative papers. I thoroughly enjoyed reviewing them and agree that they should be acknowledged in the manuscript.

We have added these to the discussion:

"In relation to this need to justify BR, social values around female gender roles may have informed participants' experience in our study and created tension for women considering BR. Many women in our interviews accepted gender roles of being responsible for the well-being of their surroundings, rather than caring solely for themselves. Women reported feeling a sense of discomfort when thinking about taking time to care for oneself. Similarly, in other fields, women report this feeling of guilt when deciding to undergo a procedure which may take time away from their traditional household duties. The repeated justification of our participants towards their decision to pursue BR may highlight the gendered nature of acceptability. Furthermore, in our interviews, many women believed that valuing breasts and having surgery to improve their feminine identity reflected a superficial female vanity and was therefore not necessary or "optional". At the same time, many women described not feeling



“whole” or feminine without breasts. Perhaps as reflective of this tension, women who opted for BR felt they needed to justify their rationale for wanting this procedure. Other authors have described the benefits of BR for some women, allowing them to feel “normal”, whole or feminine again, but have not previously reported acceptability concerns. Societal gender roles may therefore have influenced women’s views of the acceptability of BR, a surgical procedure aimed at recreating breasts. These findings suggest that gender may play a role in access to certain procedures.”

“Practically, our findings suggest that the pathway to accessing BR can be improved through enhancing the acceptability of BR by patients. From the moment of the initial breast cancer diagnosis, patients could benefit from support to mitigate the distress they experience. This support system should ensure that women are given the opportunity to access all treatment options for breast cancer including IBR and DBR, as appropriate based on their pathology. Tools such as the BRECONDA could be effective in providing decisional support during this process. Healthcare providers should also present BR as a valuable option in the breast cancer pathway. Women should be encouraged to explore their physical, emotional and spiritual well-being and the role BR may play for them. Throughout this process, by optimizing the acceptability of the option of BR, women could select in an informed manner a treatment plan which may or may not include BR that best fits their desires and needs. Ensuring that patients and providers consider BR as an acceptable part of care for women with breast cancer will likely improve access to BR; future research is needed to evaluate this hypothesis.”

Page 10

14 What is a preference sensitivity procedure?

We have added a definition for “preference sensitivity procedure”.

“A “preference sensitivity” procedure is a treatment where multiple options exist with heterogeneous trade-offs.”

P13 line 25 – this seems to be incomplete

The breast cancer organization names have been modified and hyperlinks have been added for completeness.

“ReThink Breast Cancer, Wellspring Cancer Support Network, Willow Breast Cancer Support Canada, and the Canadian Breast Cancer Foundation.”

Page 14

Line 39 –what does it mean that the women had some level of interest in BR? This isn’t clear. Many had not pursued it.

“Some level of interest” implies that all women in our study had thought about BR and had considered undergoing BR. To reduce confusion, we have changed the wording to “Although our sampling strategy aimed to recruit a diverse sample of women with breast cancer having or not undergone BR, all women in our study thought about BR and considering undergoing it.” Their awareness and interest in BR could be due to recommendations by their surgeon, to discussion with fellow breast cancer survivors, to readings about BR online, etc. To our surprise, no patient was unaware of the option of BR during the interview. Patients that did not undergo BR in our study either chose not to undergo the procedure or were in the process of considering IBR or DBR.

What does ‘rethink BR’ mean in your table of participants- not included in the key.

We have removed the organization names in Table 1 and instead used “organization” to facilitate interpretation.

Page 17 Line 17- the physicians views are reported views and opinions as recalled by the women, we can't know these are their views in person as they were not asked. Did patient age or stage of cancer appear to have any influence on the discussions around BR with the patients you interviewed?

Thank you for this question. Because of our small sample, we did not comment on associations between participant characteristics and surgeon recommendations. We anecdotally noted that BR was more likely discussed and offered in our younger patients with less advanced disease, but did not include these findings in our study as we have very few patients in these groups and our study was not aimed at exploring these associations. Further research aimed at evaluating the association between patient demographic / tumour characteristics and physician opinions should be performed to test this hypothesis.

The quotes are mostly from women who did opt to have BR, yet you also recruited women who didn't opt for this. Their views are not acknowledged in your analysis as much. While others defended BR, did the non BR they defend their choice too?

I have compiled the ID# as well as the BR status for each theme. Within each theme, we report the perspectives of participants who have and have not undergone BR (no BR, IBR, or DBR). We believe our results and analysis are based on the experience shared by all of our participants, regardless of their BR status.

Theme	BR status	ID #
Theme 1	No BR	ID 117
		ID 125
		ID 115
		ID 110
	IBR	ID 113
	DBR	
Theme 2	No BR	ID 122
		ID 114
		ID 115
		ID 121
	IBR	ID 130
	DBR	ID 111
		ID 107
Theme 3	No BR	ID 119
		ID 128
	IBR	ID 113
	DBR	ID 105
		ID 111
Theme 4	No BR	ID 122
		ID 114
		ID 118
		ID 112
	IBR	
	DBR	ID 107
		ID 111

Your theme on acceptance- please clarify whose acceptance and of what?

Patients defended their personal acceptability of BR. We have clarified this throughout the manuscript.

p.22 I would argue that the findings are not novel as other have qualitatively explored BR (see Rubin and Tanenbaum's work; Holland, Archer and Montague for non BR). It could be positioned as novel within the Canadian context.

Thank you for highlighting these studies. We have modified our discussion sentence to reflect the novelty within our context.

"Our interviews with breast cancer patients highlighted a novel barrier to BR access in the universal Canadian health care system, the acceptability of this surgical procedure."

P 22. Line 14-20 the women should be understood to be preparing for a future BR (if they are described as no BR) – or are they talking about their mastectomy here? This is confusing- clarify which 'surgery' is being discussed here.

We have added "reconstructive" to clarify that we are referring to BR.

Page 23 line 30- no need for quote mark.

This has been removed.

Other work has also discussed the role of physicians in decision making (see Holland, Montague and Archer et al, 2016) and the defending of decision-making (Archer, Holland & Montague)

Thank you for sharing these articles. We have added these references to improve and help support our practical recommendations.

"Healthcare providers should also present BR as a valuable option in the breast cancer pathway.<sup>88</sup> Women should be encouraged to explore their physical, emotional and spiritual well-being and the role BR may play for them.<sup>89</sup> Throughout this process, by optimizing the acceptability of the option of BR, women could select in an informed manner a treatment plan which may or may not include BR that best fits their desires and needs.<sup>89 91</sup>"

Page 24 line 14 participants' (check apostrophe use throughout)

Thank you. We have reviewed the manuscript and corrected the grammar.

Page 25

Have the authors seen the BRECONDA tool that has been developed to support patients considering BR? (see Sherman, K., Harcourt, D., Lam, T., Shaw, L.-K. and Boyages, J. (2014) <http://eprints.uwe.ac.uk/22676>). This is a tool that was developed in the UK to support patients considering BR and to give informed options, it would be worth reviewing and considering to include this in your recommendations section.

This is a very interesting tool. Thank you for sharing the link. We have added this in our recommendations as I agree that women need additional support in making the difficult decision about BR.

"Tools such as the BRECONDA could be effective in providing decisional support during this process.<sup>90</sup>"

## VERSION 2 – REVIEW

<b>REVIEWER</b>	Shelley Potter University of Bristol
<b>REVIEW RETURNED</b>	02-Aug-2019

<b>GENERAL COMMENTS</b>	<p>Many thanks for asking me to re-review this manuscript.</p> <p>It has been much improved by the changes and now has a much clearer message. There are a few mostly minor issues that require additional clarification.</p> <p>Title page: Minor point: On the title page, the authors state: 'Data availability statement: All data relevant to the study are included in the article or uploaded as supplementary information.' This is incorrect as the raw data are the qualitative interview transcripts. This need to be revised.</p> <p>Abstract: The phrase 'breast cancer patients' acceptability' does not really make sense; the acceptability of breast reconstruction to breast cancer patients' would be better.</p> <p>Methods: Minor point – The COREQ checklist is for reporting so technically shouldn't be used to design the study.</p> <p>The term 'information rich' breast cancer patients requires further explanation.</p> <p>The methodology is remains unclear. It reads as if the plastic surgeons rang patients out of the blue to consider participating in the study. The authors report that they received ethical approval for the study but this seems inappropriate. Were the patients given any prior information? More information is required.</p> <p>Discussion: This is much improved. It may be worth re-mentioning that different groups of surgeons are responsible for the cancer surgery and the reconstruction. More buy-in from surgical oncologists is required to help patients consider BR as an option. This is supported by many other published studies.</p>
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## VERSION 2 – AUTHOR RESPONSE

### Reviewer Comments

Many thanks for asking me to re-review this manuscript.

Thank you for re-reviewing our manuscript. Your comments and feedback have helped to significantly improve our manuscript. We truly appreciate your insight.

It has been much improved by the changes and now has a much clearer message. There are a few mostly minor issues that require additional clarification.

Title page: Minor point: On the title page, the authors state: 'Data availability statement: All data relevant to the study are included in the article or uploaded as supplementary information.' This is incorrect as the raw data are the qualitative interview transcripts. This need to be revised.

Thank you for noting this. We have modified the title page to read: "Data are available upon reasonable request."

Abstract: The phrase 'breast cancer patients' acceptability' does not really make sense; the acceptability of breast reconstruction to breast cancer patients' would be better.

We have modified the abstract to read: "There has been limited research on the acceptability of breast reconstruction (BR) to breast cancer patients'. We performed interviews to explore breast cancer patients' acceptability of BR."

Methods: Minor point – The COREQ checklist is for reporting so technically shouldn't be used to design the study.

We have changed the statement based on your feedback. It now reads:

"We use the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist to guide the reporting of this research to optimize rigour."

The term 'information rich' breast cancer patients requires further explanation.

The methodology is remains unclear. It reads as if the plastic surgeons and patients out of the blue to consider participating in the study. The authors report that they received ethical approval for the study but this seems inappropriate. Were the patients given any prior information? More information is required.

Thank you for the feedback. The concept of "information rich data" is commonly used within qualitative research (see for example Rich Data in The SAGE Encyclopedia of Qualitative Research Methods, edited by Lisa M. Given, 2008).

In order to make this clearer, we have changed the section to:

"Plastic surgeons working at six centers across the province of Ontario (Toronto, Ottawa, Hamilton, London, Thunder Bay, and Windsor) recruited, via telephone, breast cancer patients. Plastic surgeons purposively selected breast cancer patients before or after their BR consultation for participation in the study. These patients were selected as they had the potential to generate information rich data; that is, they could provide detailed and meaningful perspectives on barriers to BR access.<sup>50</sup>"

Discussion: This is much improved. It may be worth re-mentioning that different groups of surgeons are responsible for the cancer surgery and the reconstruction. More buy-in from surgical oncologists is required to help patients consider BR as an option. This is supported by many other published studies.

Thank you for the suggestion.

We have added to the discussion:

"Healthcare providers should also present BR as a valuable option in the breast cancer pathway.<sup>88</sup> This could be achieved through enhanced buy-in from oncologists, including surgical oncologists (which usually perform the cancer resection surgery), which would help patients consider BR as an acceptable option,"