PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	A qualitative evaluation of a co-designed faith-based intervention for Muslim women in Scotland to encourage uptake of breast, colorectal and cervical cancer screening.
AUTHORS	Christie-de Jong, Floor; Kotzur, Marie; Amiri, Rana; Ling, Jonathan; Mooney, John; Robb, Kathryn

VERSION 1 – REVIEW

REVIEWER	Padela, Aasim Medical College of Wisconsin, emergency medicine
REVIEW RETURNED	21-Nov-2021

GENERAL COMMENTS	A very well done study and write-up. Some minor quibbles to address, the principal of which relate to an overstep regarding attitudinal/behavioral change, and the sample including too much diversity to draw out conclusion regarding such. This review was completed by myself and a mentee of mine Dr. Sarah AlKhaifi See specific call outs below: Page 3 Line 10: what the online platform was used? Line 16: please add pilot study See comments under page 9 and page 11, and modify the abstract accordingly. Page 5 Line 29: Regular screening has been proven not only screenings, please modify. Line 31 – 33: Convince the reader with some statistics to support low breast, colorectal, and cervical screening among the population of the study compared to while British. Line 32: Refences were listed supported only breast and colorectal screenings uptakes, but not cervical screening. Please support your claim with more refences. Page 6 Line 8: provide more information about the 10 women who co-designed the intervention. Most importantly their age, culture, religion, did they participate in the intervention. It is a qualitative study this information is essential to support the study creditability.

	Line 19-20: Reported separately? Was that published before. If so, provide the reference. Otherwise, explain how BCW supported the intervention. Line 11-14. Please provide some examples on how the team further adopted Padela's work based on 3R model. One or two examples. It is a pilot intervention, it is important to mention how the intervention was adopted/ modified (transferability). Page7 Line 14: described peer educators, ethnicity, education, and age…. Line 15: Glasgow based GP. What is GP general practitioner?? Spell it out What is his/her cultural and religious backgrounds, gender. The same comment for Alimah add some description, ….. It is a qualitative study this describing the personals who participated in the intervention/study are essential to support the study creditability and internal validity. Line 33: spell out Q & A Line 48 -57: Your main study problem was low breast, cervical, and colorectal cancer uptakes among Muslim women Scottish Muslim women, and the in the sample, women's age ranged from 25 to 54 ???? some of the women are too young , 25, for breast cancer and colorectal screenings, unless in Scotland the screenings are recommended at such a young age???, and they are at low risk for such conditions. Thus, I don't see the sample as a purposive sample especially for breast and colorectal cancer screening. But, it could be purposive sample for cervical ca screening only. Would you provide a rationale on why did you studied such a young population? If you cannot support your inclusion criteria with good rationales, then the sample is a convenient sample not purposive sample. Line 48 -57: If you cannot rationalize your inclusion criteria, then in the limitation you should mentioned. Line 55: What was the percentage of each group age group. There is a big gap between 25 to 54. You need to be very transparent bout sample characteristics. Even if the sample was mostly young, mention that. Then you discuss that as a study limitation. Line 53-75: Provide more descriptions about the sample characteristics. How many Arabs /Asian. If you are concerned about word counts, tabulate the results. If you cannot provide detailed sample description, that would affect the result credibility and study transferability (potential applicability on similar population). it should be mentioned in the limitation if sample characteristics were not fully described. Page 8 Line 11 to 14: No need to mention "To enhance confidentiality… participants" It is known already. Please, remove that part, use the space for other needed details. Line 7-9: please provide example about the questions used in (topic guide) during the focus group. The aim of the study is to

	evaluate the acceptability of the interventions, thus providing some example from the (topic guide) will exclude any biases during data collection and enhance the study trustworthiness and credibility especially if the investigators share same culture and religion with the participants. Also, the peer educator developed the intervention, so you need to convince the reader there is no biases by providing examples from the topic guide Line 4 to 7: How the thematic analysis was conducted, what was the process? how the final consensus was reached among the investigators even if the data were analyzed (jointly). All these information are needed for method transparently and study credibility. Line: describe the two researchers, their background, profession, education, gender…. Not providing this information will weaken the internal validity and the credibility of the study Line 17 to 22: Shorten that part and use the word counts/space wisely. Line 24-26: No need to be mentioned here. “community participatory research” can be added under the method. You can delete this entire section. Page 9 Line 41: change felt/ seemed to reported, shared…throughout the result. Change the abstract accordingly. Line: In general avoid words like very, clearly… throughout the entire result. Change the abstract accordingly. Line 39 -40: “Seemed engaged”, this is based on your observation as a researcher or peer educator. In qualitative studies, It is recommended to triangulate results (findings) from the preachers observations (field observation) with participants’ quotations. Data triangulation, in fact, would strength the confirmability and credibility of the finding/study. If you want to triangulate results, then this should be mentioned in the method section. Otherwise, you report what women said, reported, shared, not how they felt like or look like. Change the abstract accordingly. Line 57-59: I think result related to the video, it would fit more under Acceptability of delivery not Acceptability of the content. Page 10 Line: 7-12: you may consider shorten this quotation. Line 4, 17, 18, 28, 45, 47: change felt, enjoyed to reported or shared….see previous comments Line 17: avoid using words like very, clearly …. Page11 Line 12: I am not sure if Attitudinal and behavior change can be considered as a theme. There is no enough data to support the theme. I am also concerned about this theme because young women were included in the sample. Which screening did the women talk about, and What were their age? I believe this theme

	should be removed. There is inconsistency between the study findings and the method, and that affect the study dependability and credibility (especially the sample characteristic was not fully described). This theme is too thin and problematic, so please consider removing it! Please change the abstract accordingly. Even in the table mentioned in Page 25 findings pertained to Attitudinal and behavior change were insufficient for a theme. Page 12 Line 41 and 44: I am not sure about the effectiveness of the program… see the previous comment. This statement cannot be supported by finding from this study. Page 14 Line 13 – 17: Yes, include them in your next intervention please! Line 34: Ok, but we had no clue about the sample level of education. Please add it under sample characteristics. Line 31- 42: There are a lot to be added under limitation if you could not provide the required description as mentioned previously.

REVIEWER	Brain, Kate Cardiff University, Cochrane Institute of Primary Care and Public Health
REVIEW RETURNED	23-Nov-2021

GENERAL COMMENTS	Thank you for the opportunity to review this paper, which reports findings of a qualitative study of the acceptability of a culturally sensitive intervention designed to encourage cancer screening participation in Muslim women. The study addresses an important and under-researched area, and the intervention that the authors have co-developed is novel and thoughtfully designed. This is timely research in view of the need to mitigate cancer health inequities, likely to be exacerbated by the pandemic. I hope my comments are helpful to the authors in strengthening this well-prepared and important paper. Abstract: 1. Design – please state the theoretical framework underpinning intervention development. How many women took part in the two focus groups? 2. Conclusion – I suggest rephrasing the second sentence as “Potential attitudinal and behaviour changes…” and nuancing or possibly removing the reference to “establishing effectiveness in more depth”. The reason I suggest removing this is because I think it’s quite a methodological leap from a small-scale (albeit very insightful) study of acceptability to testing effectiveness. As per the recently updated MRC Framework, it would seem appropriate to consider feasibility testing as a suitable next step. The final concluding statement about application to other populations and health issues is also a bit problematic because this is not evidenced in the research findings as currently presented, so I suggest toning this down. Background:

	3. Please provide supporting references for the sentence about cancer outcomes in Muslim women (lines 34-35) and the impact of COVID screening delays on health inequalities (line 36). 4. Repetition of “co-designed” on lines 57 and 58. Methods: 5. Please provide more details about the 10 Scottish Muslim women who were involved in intervention co-design, for example how were they identified and involved. 6. Please provide a reference if possible for the details of co-design process (line 19). 7. It could be helpful to know the number and reach of “gatekeeper” organisations who essentially provided access to participants. Please expand lines 53-54 in this regard. 8. Was there any information available on focus group participants’ cancer screening history? This would help to inform the generalisability of findings to women who may be unreceptive to different forms of cancer screening and/or find the intervention less acceptable. PPI: 9. The authors provide a brief PPI statement. It is unclear whether the members of the public referred to on lines 24-25 were the research participants, or whether there was a separate PPI group who informed the research design and conduct – please can the authors clarify this. Analysis: 10. I could not see a section describing the analytic approach – please include this, detailing the qualitative techniques used and any procedures undertaken to reduce researcher subjectivity. Results: 11. I don’t understand the sentence on line 31 that “overarching themes were largely guided by the topic guide”. This would seem to suggest that Framework analysis was used, but I’m not sure. Discussion: 12. I think the discussion could be further strengthened by some reflections on intervention implementation, for example whether it would be sustainable for GPs to deliver the intervention in practice, who the community ambassadors might be, how they would be trained etc. 13. I also wondered about the generalisability of these findings to women with lower levels of health and/or digital literacy, and to those who have not engaged in cancer screening. Can the authors comment on this?

REVIEWER	Al-Azri, Mohammed Sultan Qaboos University, Family Medicine and Public Health
REVIEW RETURNED	03-Jan-2022

GENERAL COMMENTS	Thank you for the opportunity to review this interesting manuscript. The manuscript is important, relevant to Muslim women, and well written. I have the following comments: Abstract: 1.The result of the abstract should include the main findings – brief.

	2.The last implication (last sentence) is not applicable? How can you apply something within the Muslim faith with someone with a Buddhist's or Christian's faith? There are differences in faiths and beliefs. For example, Muslim women might be reluctant to expose or give stories /symptoms about their breast to a male physician but that could be possible with a Christian woman and so on. Also, you have used different methods of intervention with Muslims which might be not relevant or cannot be sued with another faith's group. Strengths and Limitations to the study 3.The second point: tackling health inequalities related to beliefs or faiths. 4.The third point again- already covered – please see the second comment. Introduction 5.Some more information about breast, colorectal and cervical screening programs in the UK. 6.Data on the number of the Muslim population in the UK should be presented to international readers. 7.How many Scottish Muslim women did not involve with breast, colorectal, and cervical cancer screening before? Are there any data available? If yes, then please include. Methods 8.More details on how many women of Asian and Arabs ethnicity were involved in the study. 9.More detail of thematic analysis and how it was applied in this study. 10.Please give some more detail about the contents in each session of the intervention. 11.How the topic guide of focus groups was developed? What was the base of the development? Results 12. Please provide more information on the socio-demographic characteristics of the participants including their ethnicity (Please see comment number 8). 13.Although the faith of Muslims' are the same for the main five pillars such as the declaration of faith (shahada), prayer (salah), alms-giving (zakat), fasting (sawm), and pilgrimage (hajj), there are some cultural influences that based on the originality of Muslims which could affect their perceptions, attitudes, and behaviors. For example, Arabs' Muslims might have some more conservation than Muslims of Asian origin (Pakistan, Bangladesh, Indian, etc) or vices versa. Did the authors consider such variations when conducting qualitative data analysis? If yes, what were the findings? If not, can this be looked at from the collected data? Indeed, this point should be considered as one of the study's limitations that might influence the participants in the perception toward the uptake of cancer screening in the UK. 14.Did the authors find any influences of the education on the women's response? Has this been dichotomized when conducting thematic analysis? Could this be looked at from data? Discussion 15. Well written and presented. Although it is clear from the title that this study has been conducted in Scotland, UK, still the findings might be not applicable to other women Muslims' ethnicity

	in other world countries because of differences in the healthcare systems. 16.Although data collection was conducted online, there is still an absence of the natural setting including the interactions of participants to each other and with the moderator. 17.This study has been conducted during the COVID-19 pandemic. Are there any influences of COVID-19 pandemic on the women perception for the uptake of cancer screen than if the study was conducted at a different time? If yes, then this is should be also stated as one of the study's limitations.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Aasim Padela, Medical College of Wisconsin

Comments to the Author:

A very well done study and write-up. Some minor quibbles to address, the principal of which relate to an overstep regarding attitudinal/behavioral change, and the sample including too much diversity to draw out conclusion regarding such. This review was completed by myself and a mentee of mine Dr. Sarah AlKhaifi
Dear Professor Padela and Dr AlKhaifi,

Many thanks for your positive and constructive comments. We have addressed your comments below.

See specific call outs below:

Page 3

Line 10: what the online platform was used?
Zoom has been added
Line 16: please add pilot study
Pilot study has been added
See comments under page 9 and page 11, and modify the abstract accordingly.
You stated you thought there was not sufficient data for the third theme 'Attitudinal and behaviour change'. We have removed the theme from the results section and adjusted the abstract accordingly.

Page 5

Line 29: Regular screening has been proven not only screenings, please modify.
'Regular' has been added

Line 31 – 33: Convince the reader with some statistics to support low breast, colorectal, and cervical screening among the population of the study compared to whole British.
Thank you, although limited data in the UK are available, some statistics have now been added to illustrate the issue in the introduction section. The following section has been added: "Data on 1.7 million individuals in two rounds of the Scottish Bowel Cancer Screening Programme (2007-2013) demonstrated lower uptake of bowel screening among South Asian groups, particularly Pakistani (55.5 (95% CI 52.5 to 58.8)) compared to the White Scottish population and Other White British (110.9 (95% CO 110.2)). Investigating uptake by religion, lowest uptake was recorded across Muslim females (57.8 (95% CI 55.2 to 60.5)) compared to the reference population (Church of Scotland)"

Line 32: Refences were listed supported only breast and colorectal screenings uptakes, but not cervical screening. Please support your claim with more refences.
Yes, you are right, thank you for noting this. Due to limited available data, we have now separated this into some statements about uptake amongst ethnic minorities in the UK for which there is support from the literature regarding all three cancer screening programmes, but only available evidence was found regarding low uptake for Muslim women in relation to breast and colorectal screening in the UK. So this has been presented/corrected as such in the introduction section it is stated: "Although there is a dearth of studies investigating cancer screening by religion in the UK, and these data are not routinely collected, evidence indicates British Muslim women use breast and colorectal screening less often than white British women"

Page 6

Line 8: provide more information about the 10 women who co-designed the intervention. Most importantly their age, culture, religion, did they participate in the intervention. It is a qualitative study this information is essential to support the study creditability.
We have now provided some more information on the co-design group. At the start of the methods section we state: "The intervention was co-designed with 10 Scottish Muslim women. Two of the women were 25-34 years old, six women were 35-44 years old, one between 45-54 years, and one women was older than 65 years. Nine women were of Asian origin and one Arab. This was an educated sample with eight women having a degree".

We have kept this description to a minimum as we believe it is important to report the co-design phase in full separate from the evaluation of the intervention, as presented in this manuscript. We are currently preparing a manuscript to disseminate that phase of our work.
Line 19-20: Reported separately? Was that published before. If so, provide the reference. Otherwise, explain how BCW supported the intervention.
As above, we will be reporting the co-design phase in a different manuscript. We have changed the wording to: "Details of the co-design process and the use of the BCW, are reported elsewhere (in preparation)", to make this clearer but we believe it is difficult to explain in full, and within the limited word count, how BCW supported the intervention
Line 11-14. Please provide some examples on how the team further adopted Padela's work based on 3R model. One or two examples. It is a pilot intervention, it is important to mention how the intervention was adopted/ modified (transferability).
More clarity and an example have been provided. We will also describe this in more detail in the co-design phase report. We now state in the methods section: "Messages used in Padela's work were further developed and adapted in the co-design phase by the Muslim women. For example, women voted on which barriers to screening to include and the language of the messages was decided by

them. As Padela's work was focused on breast screening only, specific barriers in relation to colorectal screening were included"

Page7

Line 14: described peer educators, ethnicity, education, and age….
the characteristic of peer educators and women from our co-design who helped us for focus group discussions have been provided and underneath table 1 we state: "Five of the ten co-design participants facilitated intervention delivery. Three of them acted as peer educators, and one woman prepared a short video of her experience with cervical, bowel and breast cancer screening in the UK. The fifth women was the Alimah. These women were aged between 25 and 65 years and with Asian (Pakistani/ Bangladeshi) and Arab ethnicity. Three of the women were highly educated (Masters or PhD). One was British born, and the others lived in the UK between 3 to 20 years.
Line 15: Glasgow based GP. What is GP general practitioner?? Spell it out What is his/her cultural and religious backgrounds, gender. The same comment for Alimah add some description, ….. It is a qualitative study this describing the personals who participated in the intervention/study are essential to support the study creditability and internal validity.
More detail has been provided. W state:
"The intervention was also supported by two female, white, non-Muslim, Glasgow-based General Practitioners (GP)". We have also provided details of the women included in the intervention delivery (as described above), including the Alimah. We have not
provided the Alimah's individual characteristics to ensure her confidentiality.
Line 33: spell out Q & A
Done
Line 48 -57: Your main study problem was low breast, cervical, and colorectal cancer uptakes among Muslim women Scottish Muslim women, and the in the sample, women's age ranged from 25 to 54 ???? some of the women are too young , 25, for breast cancer and colorectal screenings, unless in Scotland the screenings are recommended at such a young age???, and they are at low risk for such conditions. Thus, I don't see the sample as a purposive sample especially for breast and colorectal cancer screening. But, it could be purposive sample for cervical ca screening only. Would you provide a rationale on why did you studied such a young population? If you cannot support your inclusion criteria with good rationales, then the sample is a convenient sample not purposive sample.
In collaboration with the co-design participants we decided to focus on all screening programmes as many barriers to screening overlap for this population. We believe this is purposive sampling as we aimed to recruit Muslim women, from central Scotland, of different ethnicities, and between the ages of 25-75. A stronger rationale has been provided in the sample and sampling approach section, where we now state:
'Although each cancer type presents unique barriers to screening, literature suggests there is also considerable overlap (25). Therefore, and in collaboration with the co-design group, it was decided to focus on all three types of screening which meant we aimed to include women between the ages of 25-75.'
Line 48 -57: If you cannot rationalize your inclusion criteria, then in the limitation you should mentioned.
A stronger rationale has been provided as detailed above.
Line 55: What was the percentage of each group age group. There is a big gap between 25 to 54. You need to be very transparent bout sample characteristics. Even if the sample was mostly young, mention that. Then you discuss that as a study limitation.

Table 3 has been added which present participant characteristics, including percentage of each age group. The limitation of this being a young and educated sample, mostly not eligible for breast or colorectal screening has been added to the Discussion/limitation section.
Line 53-75: Provide more descriptions about the sample characteristics. How many Arabs /Asian. If you are concerned about word counts, tabulate the results. If you cannot provide detailed sample description, that would affect the result credibility and study transferability (potential applicability on similar population). it should be mentioned in the limitation if sample characteristics were not fully described.
Table 3 has now been added, which includes sociodemographic characteristics for age groups, marital status, education level, employment status, ethnicity, and length of time in the UK.

Page 8

Line 11 to 14: No need to mention “To enhance confidentiality… participants” It is known already. Please, remove that part, use the space for other needed details.
We believe this sentence provides context to why we have not provided individual details of participants in the quotations nor have we compared or contrasted the data between participants, for example more educated vs lower educated, as we were not able to do this. Therefore it may be best to leave that sentence in. This is illustrated by Dr Al-Azri, reviewer 3, comment number 14, asking if we analysed data by demographic characteristics, which we were not able to do because of the reason explained in this sentence.

Line 7-9: please provide example about the questions used in (topic guide) during the focus group. The aim of the study is to evaluate the acceptability of the interventions, thus providing some example from the (topic guide) will exclude any biases during data collection and enhance the study trustworthiness and credibility especially if the investigators share same culture and religion with the participants. Also, the peer educator developed the intervention, so you need to convince the reader there is no biases by providing examples from the topic guide
Some examples have been provided illustrating how women were asked about their experiences of the workshop and the different components and if they wanted anything changed. We now state in the ‘evaluation’ section: “To this aim MK developed the topic guide in discussion with RA and FC to explore participants’ experiences of the intervention, acceptability of intervention content and delivery. For example, women were asked how they felt about the workshop, the different components, like the videos, the GP session and the faith-based component, and if there was anything that should be changed. Women were also asked their views on cancer screening after the workshop”. We have also submitted the topic guide as supplement

Line 4 to 7: How the thematic analysis was conducted, what was the process? how the final consensus was reached among the investigators even if the data were analyzed (jointly). All these information are needed for method transparently and study credibility.
More detail has been provided regarding how the analysis was conducted and in the ‘data analysis’ section we state: “Two female, white, non-British, non-Muslim researchers, who are experienced in public health and health psychology qualitative research (FC and MK), analysed the data by thematic analysis (43). Each researcher independently coded one transcript in qualitative data analysis software NVivo 12 (44). The researchers generated themes and sub-themes inductively by comparing

and combining the two independent" sets of codes. The framework of themes and sub-themes was then discussed with the wider research team (RA, KR, JL). One researcher in the team is a Muslim female"

Line: describe the two researchers, their background, profession, education, gender…. Not providing this information will weaken the internal validity and the credibility of the study
More detail has been provided on the researchers, as described above (data analysis)

Line 17 to 22: Shorten that part and use the word counts/space wisely.
Essential information regarding ethical approval and the reimbursement for participants has been left in, however the sentence regarding consent and the participant sheet has been removed.

Line 24-26: No need to be mentioned here. "community participatory research" can be added under the method. You can delete this entire section.
This is a requirement of the BMJ Open and we were asked by the editor to include this.

Page 9

Line 41: change felt/ seemed to reported, shared…throughout the result. Change the abstract accordingly.
We have removed 'felt' or 'seemed to' throughout

Line: In general avoid words like very, clearly… throughout the entire result. Change the abstract accordingly.
These have been removed unless these were part of the quotations

Line 39 -40: "Seemed engaged", this is based on your observation as a researcher or peer educator. In qualitative studies, It is recommended to triangulate results (findings) from the preachers observations (field observation) with participants' quotations. Data triangulation, in fact, would strength the confirmability and credibility of the finding/study. If you want to triangulate results, then this should be mentioned in the method section. Otherwise, you report what women said, reported, shared, not how they felt like or look like. Change the abstract accordingly.
As above, this has been changed and we have removed 'felt' or 'seemed to' throughout
Line 57-59: I think result related to the video, it would fit more under Acceptability of delivery not Acceptability of the content.
Thank you for this comment. Although we understand this comment, we believe that particular section is about the personal stories of the women in the videos that participants reported finding beneficial, not the mode of delivery and therefore we believe this is more about content and we have not changed this
Page 10

Line: 7-12: you may consider shorten this quotation.
This quotation has been shortened to read: “You don’t have to change anything, because it was very interesting. The videos you showed, the doctor invited, and everything was so awesome and nice, and I really loved it”.

Line 4, 17, 18, 28, 45, 47: change felt, enjoyed to reported or shared….see previous comments
This has been changed throughout

Line 17: avoid using words like very, clearly ….
This has been changed throughout

Page11

Line 12: I am not sure if Attitudinal and behavior change can be considered as a theme. There is no enough data to support the theme. I am also concerned about this theme because young women were included in the sample. Which screening did the women talk about, and What were their age? I believe this theme should be removed. There is inconsistency between the study findings and the method, and that affect the study dependability and credibility (especially the sample characteristic was not fully described). This theme is too thin and problematic, so please consider removing it! Please change the abstract accordingly. Even in the table mentioned in Page 25 findings pertained to Attitudinal and behavior change were insufficient for a theme.
We have removed this theme however, we do believe it is important to report the positive views and actions related to cancer screening women reported following the intervention. Therefore we have moved the section previously placed in the ‘attitudinal and behaviour change’ theme, to ‘acceptability of content’. We have emphasised the limitation of the sample in the limitation section and have now provided more detail describing the sample (Table 3).
Page 12

Line 41 and 44: I am not sure about the effectiveness of the program… see the previous comment. This statement cannot be supported by finding from this study.
We have changed the language to ensure we present this more from the perspectives of participants, however we did not intend to make claims about effectiveness. Women did report increased knowledge and positive attitudes towards screening and we do believe it is important to share this. At the start of the discussion we state: “Participants reported they found the intervention informative and enjoyable, and they shared that the intervention had a positive impact on their intention and attitudes towards screening. Some participants even reported immediate action to arrange cervical screening after the intervention”

In the limitations section we state:
“Future research could use quantitative methods to assess attitudes and behavioural intent to screening pre- and post- intervention, including longer follow-up to establish behaviour change per cancer screening type. Further research is required with a more representative sample, eligible for all screening programmes. A feasibility trial is the next step on the pathway to investigate effectiveness on a larger scale in a full trial. Including Muslim women who are not up to date with their screening and with diverse levels of health and digital literacy, will be essential”.

Page 14

Line 13 – 17: Yes, include them in your next intervention please!
Thank you.

Line 34: Ok, but we had no clue about the sample level of education. Please add it under sample characteristics.
Yes, thank you, this has now been added (Table 3).

Line 31- 42: There are a lot to be added under limitation if you could not provide the required description as mentioned previously.
The limitation section has now been expanded and states:
“A limitation to the study was that this was a small, self-selected, educated and English-speaking sample, who possibly had fairly positive attitudes to screening already. The sample was young and most women were not yet eligible to take part in breast or colorectal screening. Pre-or post-intervention cancer screening measures were not collected. Therefore, from this pilot study conclusions cannot be drawn regarding the impact or effectiveness of the intervention on attitudinal and behaviour change or uptake of screening. Muslim women are a heterogenous group and although they share their faith, different groups could experience different barriers. Examining other factors, such as ethnicity, will help inform future research. Including women who have different perspectives towards religion and levels of religiosity would be important too”

Reviewer: 2

Dr. Kate Brain, Cardiff University

Comments to the Author:

Thank you for the opportunity to review this paper, which reports findings of a qualitative study of the acceptability of a culturally sensitive intervention designed to encourage cancer screening participation in Muslim women. The study addresses an important and under-researched area, and the intervention that the authors have co-developed is novel and thoughtfully designed. This is timely research in view of the need to mitigate cancer health inequities, likely to be exacerbated by the pandemic. I hope my comments are helpful to the authors in strengthening this well-prepared and important paper.
Dear Professor Brain,
Many thanks for your constructive and helpful comments. We have aimed to address these as outlined below.

Abstract:

1. Design – please state the theoretical framework underpinning intervention development. How many women took part in the two focus groups?
The Reframe, Reprioritize, and Reform model and Behaviour Change Wheel frameworks underpinned the intervention design, which has been added to the abstract. Eighteen women participated in the intervention, and subsequently in the focus groups.

To make it clearer that these were the same women, we have changed the participants section in the abstract to: “Participants (n=18) taking part in both the intervention and subsequently in its evaluation, were Muslim women residing in Scotland, recruited through purposive and snowball sampling from a mosque and community organisations”.

And in the abstract’s ‘design’ section we have stated: “The intervention was delivered twice online in March 2021, followed one week later by two focus groups, consisting of the same participants respectively, to discuss participants’ experiences of the intervention”.

2. Conclusion – I suggest rephrasing the second sentence as “Potential attitudinal and behaviour changes…” and nuancing or possibly removing the reference to “establishing effectiveness in more depth”. The reason I suggest removing this is because I think it’s quite a methodological leap from a small-scale (albeit very insightful) study of acceptability to testing effectiveness. As per the recently updated MRC Framework, it would seem appropriate to consider feasibility testing as a suitable next step. The final concluding statement about application to other populations and health issues is also a bit problematic because this is not evidenced in the research findings as currently presented, so I suggest toning this down.
Thank you for this helpful suggestion. The conclusion has been changed to reflect the findings better. Yes, we agree that a feasibility study would be the next step and this is the route we are currently pursuing. The conclusion now reads:
“Participatory and community-centred approaches can play an important role in tackling health inequalities in cancer and its screening. Despite limitations, the intervention showed potential and was positively received by participants. Feasibility testing is needed to investigate effectiveness on a larger scale in a full trial”.

Background:

3. Please provide supporting references for the sentence about cancer outcomes in Muslim women (lines 34-35) and the impact of COVID screening delays on health inequalities (line 36).
References to both elements have been added. We now state:

“Moreover, women from ethnic minority backgrounds attend breast, bowel, and cervical screening less often than white-British women (11–15). Although there is a dearth of studies investigating cancer screening by religion in the UK, and these data are not routinely collected, evidence indicates British Muslim women use breast and colorectal screening less often than white British women (13,14,16)”.

And added:

“COVID-19 has caused a delay in cancer screening that may exacerbate current health inequalities (17,18)”.

References 12 (Massat et al, 15 (Nelson et al, 17 (Puricelli at et al), and 18 (Campbell et al), have been newly added.

4. Repetition of “co-designed” on lines 57 and 58.
Thank you. This has been removed.

Methods:

5. Please provide more details about the 10 Scottish Muslim women who were involved in intervention co-design, for example how were they identified and involved.
We have now provided some more information on the co-design group. At the start of the methods section we state: “The intervention was co-designed with 10 Scottish Muslim women. Two of the women were 25-34 years old, six women were 35-44 years old, one between 45-54 years, and one women was older than 65 years. Nine women were of Asian origin and one Arab. This was an educated sample with eight women having a degree”.

We have kept this description to a minimum as we believe it is important to report the co-design phase in full separate from the evaluation of the intervention, as presented in this manuscript. We are currently preparing a manuscript to disseminate that phase of our work.
6. Please provide a reference if possible for the details of co-design process (line 19).
This manuscript/reference is unfortunately not available yet and still in development. We have changed the wording to read: “Details of the co-design process and the use of the BCW, are reported elsewhere (in preparation)”,
7. It could be helpful to know the number and reach of “gatekeeper” organisations who essentially provided access to participants. Please expand lines 53-54 in this regard.
In the ‘sample and sampling approach’ section we state: “Recruitment took place between November 2020 and January 2021 through advertisement of the study with seven local community groups or mosques. Five women were recruited through the support of the Imam from the same mosque as the Alimah, and three women were recruited through three other mosques. Recruitment was challenging and snowball sampling provided the remaining participants’.
8. Was there any information available on focus group participants’ cancer screening history? This would help to inform the generalisability of findings to women who may be unreceptive to different forms of cancer screening and/or find the intervention less acceptable.
Unfortunately, we did not formally record this. Data did suggest mixed screening histories. We aim to record this in a feasibility trial. We did therefore add a sentence in the limitation section stating: “Pre-or post-intervention cancer screening measures were not collected”.

PPI:

9. The authors provide a brief PPI statement. It is unclear whether the members of the public referred to on lines 24-25 were the research participants, or whether there was a separate PPI group who informed the research design and conduct – please can the authors clarify this.
Thank you. It is a requirement of the journal to have a statement about PPI.The entire study is based on a participatory approach. The PPI group could be described as the ten women in the co-design group, of whom five women also helped to deliver the intervention. We have now rephrased this to make it clearer. It now reads:
“This study used a participatory approach in the intervention development phase and the co-design group were members of the public who were involved in the design, conduct and dissemination of the study”.
The co-design group have also helped in the development of the next phase of the study, and we have with their help, developed a proposal for a feasibility study.

Analysis:

10. I could not see a section describing the analytic approach – please include this, detailing the qualitative techniques used and any procedures undertaken to reduce researcher subjectivity.
More information regarding the analysis has been added and we have created a separate data analysis section:

“Two female, white, non-British, non-Muslim researchers, who are experienced in public health and health psychology qualitative research (FC and MK), analysed the data by thematic analysis (43). Each researcher independently coded one transcript in qualitative data analysis"software NVivo 12 (44). The researchers generated themes and sub-themes inductively by comparing and combining the two independent sets of codes. The framework of themes and sub-themes was then discussed with the wider research team (RA, KR, JL). The team includes a female Muslim researcher”

Results:

11. I don’t understand the sentence on line 31 that “overarching themes were largely guided by the topic guide”. This would seem to suggest that Framework analysis was used, but I’m not sure.
Yes, thank you, this was confusing. We have removed this sentence.

Discussion:

12. I think the discussion could be further strengthened by some reflections on intervention implementation, for example whether it would be sustainable for GPs to deliver the intervention in practice, who the community ambassadors might be, how they would be trained etc.
We have added a section on future implementation at the very end of the discussion (before limitations)

“Peer educators, as trusted people in the community, could be trained as champions of cancer screening or community ambassadors and could play an important in the implementation and sustainability of the intervention and such health promotion efforts in the Muslim community. Further research should include a focus on implementation, which could include a logic model for implementation and a manual for delivery of the intervention to support healthcare providers and community ambassadors to deliver the intervention. Healthcare providers such as GPs do not have the capacity to organise interventions like these, however partnerships between public health and community organisations such as mosques, could make these community-centered interventions sustainable”.
13. I also wondered about the generalisability of these findings to women with lower levels of health and/or digital literacy, and to those who have not engaged in cancer screening. Can the authors comment on this?
Yes, thank you, this is an important point. We have added this in the limitations section:

“A feasibility trial is the next step on the pathway to investigate effectiveness on a larger scale in a full trial. Including Muslim women who are not up to date with their screening and with diverse levels of health and digital literacy, will be essential”.

Reviewer: 3

Dr. Mohammed Al-Azri, Sultan Qaboos University

Comments to the Author:

Thank you for the opportunity to review this interesting manuscript. The manuscript is important, relevant to Muslim women, and well written. I have the following comments:
Dear Dr Al-Azri,
Many thanks for your helpful suggestions. We have addressed these below.

Abstract:

1.The result of the abstract should include the main findings – brief.
We have included the results in the 'results' section of the abstract:
"Participants accepted the content and delivery of the intervention and were positive about their experience of the intervention. Participants reported their knowledge of screening had increased and shared positive views towards cancer screening. They valued the multidimensional delivery of the intervention, appreciated the faith-based perspective and in particular liked the personal stories and input from a healthcare provider".

2.The last implication (last sentence) is not applicable? How can you apply something within the Muslim faith with someone with a Buddhist's or Christian's faith? There are differences in faiths and beliefs. For example, Muslim women might be reluctant to expose or give stories /symptoms about their breast to a male physician but that could be possible with a Christian woman and so on. Also, you have used different methods of intervention with Muslims which might be not relevant or cannot be sued with another faith's group.
We believe that the community-centred approach (rather than the exact intervention) is potentially applicable to different populations and health issues. We have removed the sentence to avoid confusion.

Strengths and Limitations to the study

3.The second point: tackling health inequalities related to beliefs or faiths.
Thanks so much for this suggestion. In this context, we mean that the community-centred, participatory and culturally-tailored approach we used can be utilised in tackling health inequalities in general. These may, or may not, be related to beliefs or faith. Therefore we have left this as it was:

"The study was community-centred, participatory, and culturally tailored which is an important approach to tackling health inequalities".

4.The third point again- already covered – please see the second comment.
Thank you, we have removed this point.

Introduction

5.Some more information about breast, colorectal and cervical screening programs in the UK.

A sentence has been added about which programmes the UK has:

“The UK has programmes for breast, colorectal and cervical screening (2)”.
6.Data on the number of the Muslim population in the UK should be presented to international readers.
Thank you, we have added this:

“There are over 3 million Muslims in the UK, and they form an ethnically diverse population whose shared religion impacts their health beliefs and behaviours (3). Among UK Muslims, 46% live in the most deprived areas based on the Index of Multiple Deprivation (3,4)”.
7.How many Scottish Muslim women did not involve with breast, colorectal, and cervical cancer screening before? Are there any data available? If yes, then please include.
Thank you, we have added data available, which are limited:

Although there is a dearth of studies investigating cancer screening by religion in the UK, and these data are not routinely collected, evidence indicates British Muslim women use breast and colorectal screening less often than white British women (13,14,16). Data on 1.7 million individuals in two rounds of the Scottish Bowel Cancer Screening Programme (2007-2013) demonstrated lower uptake of bowel screening among South Asian groups, particularly Pakistani (55.5 (95% CI 52.5 to 58.8)) compared to the White Scottish population and Other White British (110.9 (95% CO 110.2)). Investigating uptake by religion, lowest uptake was recorded across Muslim females (57.8 (95% CI 55.2 to 60.5)) compared to the reference population (Church of Scotland) (14). Low uptake puts Muslim women at risk of delayed detection and provision of effective treatment of cancer.

Methods

8.More details on how many women of Asian and Arabs ethnicity were involved in the study.
Thank you, this has been added
9.More detail of thematic analysis and how it was applied in this study.
More information regarding the analysis has been added and we have created a separate data analysis section:

“Two female, white, non-British, non-Muslim researchers, who are experienced in public health and health psychology qualitative research (FC and MK), analysed the data by thematic analysis (43). Each researcher independently coded one transcript in qualitative data analysis"software NVivo 12 (44). The researchers generated themes and sub-themes inductively by comparing and combining the two independent sets of codes. The framework of themes and sub-themes was then discussed with the wider research team (RA, KR, JL). The team includes a female Muslim researcher”

10.Please give some more detail about the contents in each session of the intervention.
In Table 2 we have added some more information regarding the intervention. We are preparing another manuscript which provides detailed content on the intervention which is beyond the scope of the current submission.
11.How the topic guide of focus groups was developed? What was the base of the development?
We have provided further detail on the topic guide in the evaluation section: “To this aim MK developed the topic guide in discussion with RA and FC to explore participants’ experiences of the intervention, acceptability of intervention content and delivery. For example, women were asked how they felt about the workshop, the different components, like the videos, the GP’s session and the faith-based component, and if there was anything that should be changed. Women were also asked their views on cancer screening after the workshop.”

Results

12. Please provide more information on the socio-demographic characteristics of the participants including their ethnicity (Please see comment number 8).
Table 3 has been added to present sociodemographic characteristics of the participants.
13.Although the faith of Muslims' are the same for the main five pillars such as the declaration of faith (shahada), prayer (salah), alms-giving (zakat), fasting (sawm), and pilgrimage (hajj), there are some cultural influences that based on the originality of Muslims which could affect their perceptions, attitudes, and behaviors. For example, Arabs' Muslims might have some more conservation than Muslims of Asian origin (Pakistan, Bangladesh, Indian, etc) or vices versa. Did the authors consider such variations when conducting qualitative data analysis? If yes, what were the findings? If not, can this be looked at from the collected data? Indeed, this point should be considered as one of the study's limitations that might influence the participants in the perception toward the uptake of cancer screening in the UK.
Thank you, this is an important point. We did discuss this with the co-design who believed that the shared faith was sufficient. We did not analyse the data according to faith or ethnicity. This is certainly something we will consider in future work. We have added this as a limitation.
14.Did the authors find any influences of the education on the women's response? Has this been dichotomized when conducting thematic analysis? Could this be looked at from data?
Most of the women were highly educated. Data were not analysed by individual characteristics. Individual participants were not identified in the transcripts to enhance confidentiality. Therefore, data could not be analysed by demographic characteristics

Discussion

15. Well written and presented. Although it is clear from the title that this study has been conducted in Scotland, UK, still the findings might be not applicable to other women Muslims' ethnicity in other world countries because of differences in the healthcare systems.
Thank you. There are limits to the transferability of the data. We have added the following sentence to the limitations: "Transferability of data outside of the UK may also be limited due to differences in healthcare systems".
16.Although data collection was conducted online, there is still an absence of the natural setting including the interactions of participants to each other and with the moderator.
Similar face-to-face interventions have been successful. We plan in our feasibility work to compare the effectiveness of face-to-face and online setting. We aimed to create a comfortable environment.
17.This study has been conducted during the COVID-19 pandemic. Are there any influences of COVID-19 pandemic on the women perception for the uptake of cancer screen than if the study was conducted at a different time? If yes, then this is should be also stated as one of the study's limitations.
This is an important point. We did discuss this with women in the co-design phase. When asked specifically, the women did share that they thought COVID-19 may exacerbate barriers for other women. In addition, challenges in making appointments were mentioned as an impact of the pandemic. However, women did not vote this as a key barrier.
We did not ask the intervention participants in the focus groups about their view of how the pandemic may have affected intervention effectiveness. However, we did ask how the intervention had affected their attitudes and willingness to do cancer screening, so the participants had an opportunity to raise the impact of COVID-19 if they felt it was relevant. None of the intervention participants mentioned it in this context.

As COVID-19 was not raised in the intervention phase, we do not believe we can draw any conclusions regarding influence of COVID-19 on women's views. The co-design and intervention participants thought the intervention may be more effective or more enjoyable in a face-to-face setting, but this couldn't happen due to the COVID-19 pandemic.

VERSION 2 – REVIEW

REVIEWER	Al-Azri, Mohammed Sultan Qaboos University, Family Medicine and Public Health
REVIEW RETURNED	16-Feb-2022

GENERAL COMMENTS	The authors have addressed most of comments for the submitted manuscript. There are no more comments for R1.