Title: A rapid review of barriers and facilitators to cancer screening uptake (breast, cervical and bowel) in underserved populations

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Abstract: In the United Kingdom (UK), the National Health Service (NHS) provides population-based screening programmes for breast, bowel, and cervical cancer. These programmes were temporarily paused in March 2020, due to the COVID-19 pandemic, resulting in large numbers of the eligible population having their invitations delayed. This disruption may have had a disproportionate impact on underserved populations for whom there was a lower uptake prior to the pandemic. Some people may also be less willing to attend screening after the pandemic. Interventions and campaigns designed to encourage people to take part in cancer screening may need to be adapted after the pandemic, in particular those targeting underserved populations.

This rapid review aimed to identify the barriers and facilitators to breast, bowel, and cervical screening uptake in underserved populations (e.g. clinically vulnerable, shielding, multi-morbidities, ethnic minorities, social deprivation, gender, age) during and since the onset of the pandemic, using evidence from the UK and other countries with similar cancer screening programmes (such as Australia and Netherlands), and to compare with the pre-pandemic literature. The pre-pandemic literature was identified using a supplementary scoping search for published systematic reviews.

Three primary studies (two published and one ongoing trial) conducted during the pandemic were identified. Five systematic reviews of pre-pandemic evidence were also included. Two qualitative studies conducted during the pandemic were appraised as high quality but both included sample populations with limited representation.

No primary studies specifically exploring the impact of the pandemic on barriers and facilitators to screening uptake among underserved groups were identified. The findings did not show marked differences in the barriers and facilitators for screening uptake before and during the COVID-19 pandemic in underserved populations. However, it is unclear whether this is because these genuinely remain unchanged or reflects the lack of available evidence. The findings may only be transferable to the population groups studied.

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Wales COVID-19 Evidence Centre (WCEC)
Rapid Review

Barriers and facilitators to cancer screening uptake (breast, cervical and bowel) in underserved populations

Report number – RR00035, June 2022

Rapid Review Details

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TOPLINE SUMMARY

What is a Rapid Review?

Our rapid reviews use a variation of the systematic review approach, abbreviating or omitting some components to generate the evidence to inform stakeholders promptly whilst maintaining attention to bias. They follow the methodological recommendations and minimum standards for conducting and reporting rapid reviews, including a structured protocol, systematic search, screening, data extraction, critical appraisal, and evidence synthesis to answer a specific question and identify key research gaps. They take 1- 2 months, depending on the breadth and complexity of the research topic/ question(s), extent of the evidence base, and type of analysis required for synthesis.

Who is this summary for?

Screening Division of Public Health Wales

Background / Aim of Rapid Review

In the United Kingdom (UK), the National Health Service (NHS) provides **population-based screening programmes for breast, bowel, and cervical cancer**. These programmes were temporarily **paused in March 2020**, due to the COVID-19 pandemic, resulting in large numbers of the eligible population having their invitations delayed. This disruption may have had a **disproportionate impact on underserved populations** for whom there was a lower uptake prior to the pandemic. Some people may also be **less willing to attend screening after the pandemic**. Interventions and campaigns designed to encourage people to take part in cancer screening may need to be adapted after the pandemic, in particular those targeting underserved populations. This rapid review aimed to **identify the barriers and facilitators to breast, bowel, and cervical screening uptake in underserved populations** (e.g. clinically vulnerable, shielding, multi-morbidities, ethnic minorities, social deprivation, gender, age) **during and since the onset of the pandemic**, using evidence from the **UK and other countries with similar cancer screening programmes (such as Australia and Netherlands)**, and to **compare with the pre-pandemic literature**. The pre-pandemic literature was identified using a supplementary scoping search for published systematic reviews.

Key Findings

Three primary studies (two published and one ongoing trial) conducted during the pandemic were identified. Five systematic reviews of pre-pandemic evidence were also included.

Extent of the evidence base

- One **qualitative study** assessed the **perceived barriers** for attending **breast cancer screening among Irish Traveller women in the Republic of Ireland**.
- One **qualitative study** explored **barriers and facilitators to breast, colorectal and cervical screening uptake among Muslim women in Scotland**.
- One UK ongoing randomised controlled trial (RCT) of a behaviour change intervention to increase cervical cancer uptake in deprived and non-deprived populations (implemented during the pandemic) includes data collection on pre-specified barriers.

- **Five systematic reviews reporting pre-pandemic** evidence on barriers and facilitators to breast, bowel, and cervical screening uptake in various underserved populations were identified. The reviews reported **barriers and facilitators among Black, Asian and minority ethnic (BAME) groups, low-uptake sociodemographic groups, people with mental illness or learning disabilities, people with physical disabilities, Lesbian, Gay, Bisexual and Trans (LGBT) people and underserved women**.

Recency of the evidence base

- The data for the qualitative studies were collected in early 2021 (March) and 2022

Evidence of effectiveness

- Despite being conducted during the COVID-19 pandemic, neither qualitative study focused specifically on the impact of the pandemic on perceptions towards cancer screening among underserved groups.
- Barriers identified during the pandemic included**: fear of negative outcome; fear of procedure; embarrassment and health care professional; lack of family and community support; lack of education and awareness; literacy; social stigma surrounding cancers; cultural and language barriers; appointment suitability**.
- Pre-pandemic barriers included: fear and anxiety; shame and embarrassment; lack of knowledge and awareness; perceived stigma associated with cancer; language and communication barriers; lack of support from family and community; religious and cultural beliefs; logistical barriers; gender of practitioner; medical mistrust; threat to masculinity; discrimination and racism; misgendering; negative past experiences.
- **Facilitators identified during the pandemic included**: **trust; offering language support; use of personal testimonies/stories of cancer screening and survival during focus group meetings.**
- Pre-pandemic facilitators included: positive past experiences; encouragement from healthcare professionals; supportive family members and communities; transport provision; offering language support; friendly and approachable healthcare staff; practitioner endorsement; educational support.

Best quality evidence

- The two qualitative studies conducted during the pandemic were appraised as high quality but both included sample populations with limited representation.

Policy Implications

- **No primary studies specifically exploring the impact of the pandemic on barriers and facilitators to screening uptake among underserved groups were identified.**
- The findings did not show **marked differences in the barriers and facilitators for screening uptake before and during the COVID-19 pandemic in underserved populations**. However, it is unclear whether this is because these genuinely remain unchanged or reflects the lack of available evidence.
- The **findings may only be transferable to the population groups studied**.

Strength of Evidence

The evidence is limited to two qualitative studies conducted during the pandemic. Both studies were good quality but only had limited information and partial relevance to address the review question.

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Abbreviations

Acronym	Full Description
AMSTAR	A Measurement Tool to Assess Systematic Reviews
BAME	Black, Asian and Minority Ethnic
CASP	Critical Appraisal Skills Programme
CCGs	Clinical Commissioning Groups
COVID-19	Coronavirus disease 2019
CRC	Colorectal Cancer
FSS	Flexible Sigmoidoscopy Screening
GPs	General Practitioners
LGBT	Lesbian, Gay, Bisexual and Trans
NHS	National Health Service
RCT	Randomised Control Trial
RES	Rapid Evidence Summary
SES	Socioeconomic Status
UK	United Kingdom
USA	United States of America
WCEC	Welsh Covid-19 Evidence Centre
WHO	World Health Organisation

1. BACKGROUND

This Rapid Review is being conducted as part of the Wales COVID-19 Evidence Centre Work Programme. A number of research question on cancer screening participation were submitted during the Prioritisation process by multiple stakeholders. A preliminary meeting between interested parties was used to clarify what would be the most useful focus to influence policy. It was decided that this review would address the research question 'Have the barriers and facilitators to cancer screening uptake (breast, cervical and bowel) in underserved populations (e.g. clinically vulnerable, shielding, multi-morbidities, ethnic minorities, social deprivation, gender, age), changed due to the COVID-19 pandemic?'

1.1 Purpose of this review

Cancer is a leading cause of death worldwide, accounting for approximately 10 million deaths in 2020 (World Health Organization, 2022). Population cancer screening services are used to reduce cancer mortality by offering asymptomatic people screening to detect precancerous lesions or cancers at an early stage. In the United Kingdom (UK), the National Health Service (NHS) provides population-based screening programmes for breast, bowel, and cervical cancer (NHS, 2021). Currently in Wales, breast screening is offered every three years to women aged 50 to 70 years; bowel cancer screening is offered every two years to people aged 58 to 74 years, and cervical screening is offered every five years to women aged 25 to 64 years (Public Health Wales, 2022). Due to the COVID-19 pandemic, these programmes were temporarily paused in March 2020, leaving large numbers of participants without access to these routine services.

Prior research has reported low uptake of cancer screening programmes by individuals from socioeconomically deprived communities and among ethnic minority and underserved populations (Nardi et al., 2016, Ni et al., 2020, Szczepura et al., 2008). Higher rates of non-attendance in cancer screening programmes within these population groups are therefore likely to result in more cancer diagnoses and cancer related deaths within these already disadvantaged communities (Wearn and Shepherd, 2022). Underserved population groups have also been disproportionately impacted by the COVID-19 pandemic, which may lead to even wider inequalities in cancer screening uptake within these groups.

There is increasing concern regarding the effect of the coronavirus pandemic on cancer mortality, particularly among underserved populations. Given the perceived need to address health inequalities in these groups, understanding the barriers and facilitators to participation in screening programmes is important. The purpose of this rapid review is to identify the barriers and facilitators to breast, bowel, and cervical screening uptake in underserved populations during and since the onset of the pandemic, using evidence from the UK and other countries with similar cancer screening programmes (such as Australia and Netherlands), and to compare with the pre-pandemic literature.

2. RESULTS

2.1 Overview of the Evidence Base

2.1.1 Pandemic-related evidence

Three primary studies were identified for inclusion in this rapid review. These included two published qualitative studies (Christie-de Jong et al., 2022, Keane et al., 2022) and one ongoing randomised controlled trial (RCT) (Wilding, 2022).

The two published qualitative studies targeted specific underserved or deprived population groups. One study (Christie-de Jong et al., 2022), which was conducted in the UK, focused on Muslim women and participation in breast, bowel and cervical cancer screening. The second study (Keane et al., 2022), which was conducted in the Republic of Ireland, focused on Irish Traveller women and participation in breast cancer screening.

Both published studies explored factors affecting the uptake of cancer screening programmes. One study investigated barriers to screening uptake while the other investigated both barriers and facilitators to uptake. Despite being conducted during the COVID-19 pandemic, neither study focused specifically on the impact of the pandemic on perceptions towards cancer screening among underserved groups.

The methodological quality of the two published primary studies were assessed using the 10-item Critical Appraisal Skills Programme (CASP) tool for qualitative research (Critical Appraisal Skills Programme, 2018). Both studies were deemed to be of high quality as they met the majority of the CASP tool criteria (see Appendix 3). However, it is worth noting the limitations of both studies including: study participants in Keane et al (2022) were working as Traveller Primary Health Care workers at time of interview, and participants in Christie-de Jong et al (2022) were self-selected, educated and English-speaking, with possibly fairly positive attitudes to screening already.

A summary of the two qualitative studies is provided in Tables 1, and a narrative summary of their findings are presented in Section 2.2.

The ongoing RCT focuses on cervical screening uptake among both deprived and non-deprived groups in the UK. A summary of the trial is provided in Table 2. No results have yet been reported for this study.

2.1.2 Pre-pandemic evidence

This rapid review aimed to identify studies conducted during and since the onset of the pandemic. The pre-pandemic literature used here for comparison was identified using a supplementary scoping search for published systematic reviews (see Section 5). Five systematic reviews (Baird et al., 2021, Travis et al., 2020, Wearn and Shepherd, 2022, Wessex Voices, 2021, Young et al., 2018) reporting pre-pandemic evidence on barriers and facilitators to breast, bowel, and cervical screening uptake in various underserved populations were identified. These reviews sought the barriers and facilitators among Black, Asian and minority ethnic (BAME) groups, low-uptake sociodemographic groups, people with mental illness or learning disabilities, people with physical disabilities, Lesbian, Gay, Bisexual and Trans (LGBT) people and underserved women. Two reviews focused on breast screening, one on bowel screening, one on cervical screening, and one on breast, bowel, and cervical screening. Primary studies included in the systematic reviews were mostly qualitative and conducted in the UK.

The methodological quality of the five pre-pandemic systematic reviews were assessed using the AMSTAR 2 critical appraisal tool (Shea et al., 2017). Four reviews were rated as being of critically low quality, while one review was rated as low quality.

A summary of included evidence is provided in Table 3. Narrative summaries of the evidence are presented below.

2.2 Barriers and facilitators to cancer screening uptake

2.2.1 Pandemic-related evidence

Keane et al. (2022) conducted a study to assess the perceptions of Irish Traveller women towards breast screening and the perceived barriers and enablers to attendance. Findings identified influences creating barriers to breast screening for this group including **inequality and family or community support, fear of a negative outcome, literacy and education, embarrassment and the health care professional, and stress and appointment suitability**.

Christie-de Jong et al. (2022) conducted a pilot qualitative study aimed at evaluating the acceptability of a co-designed faith-based intervention to encourage uptake of breast, colorectal and cervical cancer screening in Scottish Muslim women. While participants accepted the content and delivery of the intervention, they also highlighted barriers to cancer screening including **embarrassment/shyness, fear of the procedure/outcome, lack of awareness, social stigma surrounding colorectal, breast, and cervical cancers, and cultural and language barriers**. Participants were also eager to explain that cultural barriers to screening or lack of awareness impeded screening uptake, rather than religious barriers.

Facilitators to breast, colorectal and cervical screening uptake included the **use of faith-based interventions delivered by people from the community who are trusted, the use of multiple languages both in interventions and in health education materials and the sharing of personal testimonies and stories of cancer screening or survival during focus group meetings**.

2.2.2 Pre-pandemic evidence

Baird et al. (2021) conducted a systematic review to identify barriers and facilitators to breast screening attendance in UK BAME women. The main barriers identified included knowledge-related factors such as, **lack of knowledge surrounding breast cancer and screening, and language barriers**; Cultural-related factors such as, **stigma associated with cancer, fear of mastectomy and its marital consequences, deficient support from family and community, gender of healthcare professionals, faith and under-appreciation of preventative medicine, and cultural beliefs related to modesty**; and Access-related factors such as, **logistical (distance, inconvenience and cost) and emotional barriers.**

Facilitators included educational facilitators such as, **incorporation of religious leaders into educational interventions, improving knowledge, offering language support, forming interpersonal relationships between healthcare workers and BAME women, encouragement from healthcare professionals, and supportive family members and communities**; and Logistic facilitators such as, **transport provision, positive health messages from health services, and use of information leaflets in different languages.**

Travis et al. (2020) conducted a systematic review on barriers and facilitators of flexible sigmoidoscopy screening (FSS) intention and uptake within low socio-demographic uptake groups (women, lower socioeconomic status (SES), and Asian minority ethnicity). Barriers included **procedural anxieties, 'medical fear' of doctors, hospitals, and tests, shame and embarrassment, masculinity-associated procrastination/machismo, anxiety surrounding test results, perceived susceptibility to colorectal cancer (CRC), lack of knowledge and awareness about CRC, and religious and cultural-influenced health beliefs**.

Facilitators included **sense of responsibility to use public funding and resources, presence of a professional throughout the procedure, family support and encouragement, doctor/physician screening recommendation, and personalised invitations from medical professionals**.

Wearn and Shepherd (2022) conducted a qualitative systematic review on the determinants of routine cervical screening participation in underserved women. Barriers to participation included **embarrassment, fear of the test and potential outcome, risk beliefs, religious beliefs, prioritising competing demands, perceived stigma, lack of knowledge, peer and family influence, communication barriers, unfamiliarity with screening, negative past experiences of healthcare and screening, gender of practitioner, interpersonal skills of practitioner, medical mistrust, service accessibility, and cultural differences.**

Facilitators to participation included **perceived severity of cancer, anticipated relief of receiving a positive outcome, strong social networks, close family members, friendly and approachable healthcare staff, practitioner endorsement, service accessibility, and media influence on raising awareness**.

Wessex Voices (2021) conducted a systematic review on people's experiences of breast screening. The main barriers to breast screening uptake in ethnic minorities identified were **lack of knowledge, language difficulties, use of incomprehensible terminology on NHS materials, lack of confidence and expectation anxiety, fear, stigma associated with cancer, embarrassment, religious beliefs**.
Barriers for people with mental illness or learning disabilities included **negative past experiences, and fear and anxiety**. Barriers for people with physical disabilities included **lack of disability access and inaccessibility of equipment.** Barriers for LGBT people included **discrimination, misgendering, and lack of provider awareness.**

Young et al. (2017) conducted a review aimed at understanding the factors influencing the decision to attend screening. Barriers to breast cancer-screening uptake in ethnic minority and/or socioeconomically diverse groups included **language barriers, cultural beliefs, apathy, low risk perception, competing time demands, and religious beliefs.**
Barriers to cervical cancer screening included **lack of knowledge/awareness, language difficulties, fear of the test, fear of cancer, embarrassment and shame, negative past experiences, male practitioners, cultural beliefs, and racism**.
Barriers to colorectal cancer screening included **lack of knowledge/awareness, invasiveness of the test, fear, language difficulties, threat to masculinity, stigma, embarrassment, and religious beliefs.**
Barriers to breast, cervical, and bowel screening uptake in people with mental illness included **stigma of mental illness, transport difficulties, fear of bad news, and not knowing what to expect**.
Facilitators to breast, bowel, and cervical screening uptake by people with mental illness included **staff being understanding, good relationship with practice staff, familiar locations, understanding the benefits of screening, and positive past experience.**

2.2.3 Bottom line results for barriers and facilitators to breast, bowel, and colorectal cancer screening uptake

2.2.3.1 Pandemic-period

Evidence around the barriers and facilitators to cancer screening uptake in underserved populations during the pandemic is limited. However, from the limited evidence available, barriers among Scottish Muslim women and Irish Traveller women include **lack of support from family and community, fear of the procedure/negative outcome, embarrassment, gender of healthcare professional, lack of education, lack of awareness, appointment suitably, social stigma surrounding colorectal, breast, and cervical cancers, and cultural and language barriers.** Certain barriers may be specific to each underserved population, with others common across the underserved groups. Conversely, facilitators to uptake appear to include **trust, offering language support, and use of personal testimonies**.

2.2.3.2 Pre-pandemic period

Evidence from the pre-pandemic period appears to be much more abundant and indicated that barriers to cancer screening uptake in underserved populations (such as people with mental illness, ethnic minorities, underserved women, low-uptake sociodemographic groups) included a **lack of knowledge and awareness; language and communication barriers; perceived stigma associated with cancer; lack of support from family and community; religious and cultural beliefs; logistical barriers; fear and anxiety; shame and embarrassment; gender of practitioner; medical mistrust; machismo/threat to masculinity; discrimination and racism; misgendering; and negative past experience**.

Facilitators to cancer screening uptake identified from the literature included **positive past experience, encouragement from healthcare professionals, supportive family members and communities, transport provision, offering language support, friendly and approachable healthcare staff, practitioner endorsement, and educational support.**

Table 1. Summary of included pandemic-period primary studies

Citation (Country)	Study Details	Participants & setting	Key findings	Observations/notes
Christie-de Jong et al (2022). Qualitative evaluation of a codesigned faith-based intervention for Muslim women in Scotland to encourage uptake of breast, colorectal and cervical cancer screening. *BMJ open*, *12*(5), p.e058739. UK	**Study Design:** Qualitative pilot study **Type of intervention [*exposure*]:** Culturally tailored, faith-based online intervention **Data collection methods:** Focus groups	**Sample size:** 18 **Participants:** Muslim women residing in Scotland **Setting:** Online **Dates of data collection:** March 2021	**Primary Findings:** The overarching themes included (1) acceptability of content, (2) acceptability of delivery and (3) improvement of the intervention. 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. **Additional Findings:** Participants highlighted that their faith could help them to overcome some **screening barriers like embarrassment or shyness**. They said that their faith prioritises their health and so would be supportive of screening. **Participants were eager to explain that cultural barriers to screening or lack of awareness impeded screening uptake, rather than religious barriers**. Using faith alone to encourage screening was not perceived as a solution to overcoming screening barriers, and they argued that the impact of religious encouragement would vary between different people, possibly depending on how religious they were. One participant stated that **fear of the procedure had prevented her from attending screening.** Participants described that the intervention would encourage screening uptake and expressed positive attitudes towards screening after attending the intervention. **Some participants stated that the intervention had increased their intention to engage in screening and inspired them not to 'ignore their health'.** Women in the current study shared **it was important for the intervention to be delivered by people from the community**	Although conducted during the COVID-19 pandemic there is no focus specifically on the impact of COVID-19. The participants in this pilot study were mostly self-selected, educated and English-speaking, and possibly already had fairly positive attitudes towards screening. The main focus of this paper is the codesigned faith-based intervention. One of the four elements of the intervention is the peer-led discussion of barriers to screening.

Citation (Country)	Study Details	Participants & setting	Key findings	Observations/notes
			who are trusted. Participants appreciated the role of respected and trusted persons like the general practitioners (GPs) and the alimah (female religious scholar) in the intervention. They shared that the alimah would encourage women who feel anxious about attending screening or reassure women who experience fear of hearing the outcome of a screening test. **Participants reported that learning about screening through discussion with other women and hearing from a healthcare professional was easier to understand and much more beneficial than researching topics online**. They discussed feeling comfortable in the group setting, although some reported initial shyness. A few said that **language barriers** made them feel somewhat nervous at the start of the meeting. Although participants were positive about the intervention, several methods were discussed to improve the process of encouraging screening uptake in this community and the intervention delivery. Participants stated **they would like more of these meetings to gain additional understanding of cancer and screening.** They also suggested having monthly 'drop-in' sessions which would allow them to ask any questions about screening, or other health issues. Participants emphasised that **using multiple languages, both in the intervention and in health education materials, would be important to ensure accessibility to all women and that information in one's native language is more effective.** **Using personal testimonies and sharing stories of cancer screening or survival** was an important focus group finding, as participants were able to relate to these messages. **Implications:** Interventions must address generic barriers that are shared with other women, such as fear of the outcome or fear of the procedure.	

Citation (Country)	Study Details	Participants & setting	Key findings	Observations/notes
			Interventions and health education materials need to address language barriers. Including men separately in community-centred approaches may help tackle screening barriers for women. Intervention needs to be complex, tackle multifactorial barriers to screening and work at multiple levels.	
Keane et al (2022). Identifying barriers to Irish traveller women attending breast screening. *Radiography*, *28*(2), pp.348-352. Ireland	**Study Design:** Qualitative **Exposure:** Breast screening mammography **Data collection methods:** Interviews	**Sample size:** Eight **Participants:** Three Irish Traveller women and five Healthcare professionals **Setting:** Not stated **Dates of data collection:** 2022	**Primary Findings:** Influences that create barriers to breast screening for Irish Traveller women include: 1. Inequality and family/community support 2. Fear 3. Literacy and education 4. Embarrassment and the health care professional 5. Stress and appointment suitability. **Additional Findings:** Sub themes identified that can create barriers included: - Support (‘to bring a friend with you as well’). - Societal attitudes (‘discrimination plays a role in non-attendance’). - Gender issues (‘if they have to wait around, the men wouldn't want to wait around to pick up’ the female for health appointments in some cases and ‘discrimination or lack of knowledge of their culture can be a big barrier, especially where a family member or friend would have had a bad experience’). - Access issues (‘if an abnormality is detected and you live in Limerick you would have to travel to Cork for a follow-up and they don't like this').	Although conducted during the COVID-19 pandemic there is no focus specifically on the impact of COVID-19. Not always clear from text and quotes provided whether there were differences in perceptions among Irish Traveller women and the healthcare professionals. All the Irish Traveller women were working as Traveller Primary Health Care workers at time of interview.

Table 2 Ongoing trials

Ongoing trials

Citation (Country)	Trial details	Inclusion/exclusion criteria	Observations/notes
Wilding (2022). Increasing cervical cancer screening uptake in Yorkshire: testing the effectiveness of a behaviour change intervention in deprived and non-deprived populations WHO ICTRP UK	**Trial type:** Randomised controlled trial **Trial period:** Trial ended 6th April 2022 **Purpose:** The aim of this research is to test a low-cost behaviour change intervention in the North of England. A randomised controlled trial will test two interventions individually and combined: (a) Implementation intention based intervention, (b) a motivational based intervention, (c) both these interventions combined, and (d) usual care control, to see if they increase the number of women going for cervical cancer screening. Intervention details: The implementation intervention will use a Volitional Help Sheet (VHS) which enables participants to form 'if-then' plans by connecting barriers associated with screening with potential solutions that could be applied if the barriers are encountered. To ensure the intervention is tailored to each participant given they will choose the situation and solutions that match their own needs, thereby, accounting for differences in terms of age and deprivation	**Inclusion criteria:** 1. Participants eligible for cervical cancer screening 2. Aged 24.5 - 65 years 3. From Clinical Commissioning Groups (CCGs) based in Yorkshire, Humber and North East regions **Exclusion criteria:** 1. Individuals not eligible for cervical cancer screening 2. Individuals outside of the 24.5 - 65 year age limits 3. Located outside of the eligible CCGs 4. Those opting out of their data being used for research (national data opt-out)	The trial seems relevant to our research topic. The barriers were identified using pre-pandemic evidence however the interventions aimed to increase uptake were carried out during the pandemic and participants were able to select barriers that applied to them. The study authors were contacted on 01/06/2022 to enquire on study progress, and responded stating that the trial data had been received and was currently being analysed.

Table 3. Summary of included pre-pandemic secondary studies

Citation	Review details	Included studies	Quality	Findings and observations/notes
Baird et al (2021). What can be done to encourage women from Black, Asian and minority ethnic backgrounds to	**Review period:** Up to December 2017 **Review purpose:** To identify the barriers to UK Black, Asian, and Minority Ethnic women attending breast screening, and	**Number of included studies:** 8 **Key characteristics:** All included qualitative studies were UK-based and concerned Black, Asian, and Minority Ethnic women	Critically low	**Knowledge-related factors**: • Lack of knowledge on: what is breast cancer, how to identify it, what is the screening programme, who is at risk and the treatments available. **Cultural-related factors:** • Cultural values

Citation	Review details	Included studies	Quality	Findings and observations/notes
attend breast screening? A qualitative synthesis of barriers and facilitators. Public Health: DOI: 10.1016/j.puhe.2020.10.013	solutions to the public health problem of ethnic variation within screening attendance. **Included study designs:** Qualitative **Included outcome measures:** Barriers and facilitators to breast cancer screening	participants. The majority of studies were based in London.		• Religious beliefs (associations between faith and decreased appreciation of preventative medicine, with women describing the development of breast cancer as 'up to God') • Influence of family and friends • Stigma associated with cancer • Fear of mastectomy and its marital consequences • Deficient support from family and community • Gender of healthcare professionals (male radiographer made some women reluctant to partake) • Previous negative experiences with healthcare professionals (exacerbated in situations where women felt disrespected) **Access-related factors:** • Distance • Inconvenience • Cost **Facilitators:** • Educational facilitators – improve knowledge • Incorporation of religious leaders into educational interventions • Offering language support • Forming interpersonal relationships between healthcare workers and BAME • Female radiographer (unanimously preferred across all ethnicities) • Encouragement from healthcare professionals • Supportive families and communities • Transport provision • Positive health messages from health services • Information leaflets in different languages
Travis et al (2020). Barriers to flexible sigmoidoscopy	**Review period:** From database inception to January 2020 **Review purpose:** To synthesise qualitative evidence related to	**Number of included studies:** 10 **Key characteristics:**	Low	**Barriers**: • Procedural anxieties - anxieties regarding test invasiveness (Women and UK Asian communities) • Shame and embarrassment (UK Asian groups)

Citation	Review details	Included studies	Quality	Findings and observations/notes
colorectal cancer screening in low uptake socio-demographic groups: A systematic review. Psychooncology. doi: 10.1002/pon.5443.	barriers and facilitators of flexible sigmoidoscopy screening (FSS) intention and uptake, particularly within low socio-demographic uptake groups. **Included study designs:** Qualitative **Included outcome measures:** Barriers and facilitators of FSS intention and uptake	Of the ten included studies, six were from the UK, three from USA, and one study from Canada. Qualitative data collection methods included focus groups (n = 3), telephone semi-structured interviews (n = 2), and face-to-face semi-structured interviews (n = 5). The method of analysis carried out by many of the included studies was thematic framework analysis.		• Masculinity-associated procrastination/machismo. FSS considered as a threat to masculinity (Afro-Caribbean men) • Reduced perceived personal susceptibility to CRC (Residents in deprived area) • Medical fear of doctors, hospitals, and tests in general • Anxiety surrounding test results • Avoidance due to underlying fatalism • Belief that treatment alone caused cancer to advance (Pakistani women) • Anticipation of fear and anxiety (Gujarati Indian men) • Perceived susceptibility to CRC (Gujarati Indian men) • Lack of awareness of prevalence (Gujarati Indian men) and lack of knowledge about CRC (Pakistani women) • Procedural pain and discomfort anticipated and experienced from FSS • Women's experience of painful mammograms heightened nervousness to attend the FSS test • Peer pressure, a lack of family support or encouragement were found to both promote and inhibit screening intention and uptake • Religious and cultural-influenced health beliefs • Competing priorities **Facilitators**: • Peer pressure, a lack of family support or encouragement were found to both promote and inhibit screening intention and uptake • Doctor/physician screening recommendation, in which personalised invitations from medical professionals promoted screening • Sense of responsibility to use public funding and resources • Presence of a professional throughout the procedure
Wearn and Shepherd (2022). Determinants of	**Review period:** Searches were conducted in June 2018 and repeated in January 2021	**Number of included studies:** 24 **Key characteristics:**	Critically low	**Barriers**: • Embarrassment - procedure is physically and emotionally invasive

Citation	Review details	Included studies	Quality	Findings and observations/notes
routine cervical screening participation in underserved women: a qualitative systematic review. Psychology & Health. DOI: 10.1080/08870446.2022.2050230	**Review purpose:** To synthesise qualitative literature which explore determinants of cervical screening participation within the context of population wide call-recall screening programmes. Specifically, this review aims to synthesise the views of ethnic minority women and women living in socioeconomically deprived communities, identifying key commonalities across these underserved groups **Included study designs:** Qualitative **Included outcome measures:** Determinants of cervical screening participation	Of the 24 included studies, 10 were from the UK, seven from Australia, three from the Netherlands, two from Norway, and one each from Finland and Sweden. The majority of studies (n = 16) were focused upon migrant women. Two further studies grouped women as a minority based upon their religious beliefs, three studies classified participants as an ethnic minority if they self-defined as an ethnic group other than the country's majority population and one study described participants as an ethnic minority in relation to their language group. Two studies classified participants as low socioeconomic status as they lived within areas of high deprivation		• Religious beliefs - aspect of shame associated with 'exposing' oneself, belief that God would keep them safe from cancer, perceived as God's will • Fear of the test and potential outcome • Risk beliefs (perceived low risk) • Religious beliefs • Prioritising competing demands • Perceived stigma – judgements, perceived as sexually active, perceived as a cause of promiscuity (religious concerns) • Lack of knowledge of purpose of screening • Peer and family influence – negative stories, partners views • Barriers to communication • Unfamiliarity with screening, differences to home country, not mandatory therefore maybe seemed unimportant • Negative past experiences of healthcare and screening • Sex of practitioner, preference for female • Interpersonal skills of practitioner • Continuity of care, see a practitioner they had built rapport with • Medical mistrust • Practitioner endorsement (by a known practitioner) • Service accessibility, time, travel, childcare • Cultural differences, preventive health perceived as searching for disease which may trigger ill-health, female circumcision and fear of judgement **Facilitators**: • Receipt of invitation letter • Practitioner endorsement • Free-of-charge test • Media promotion, e.g., human interest stories, raising awareness and encouragement

Citation	Review details	Included studies	Quality	Findings and observations/notes
				• Strong social networks and close family members • Perceived severity of cancer • Relief of receiving positive outcome • Friendly and approachable healthcare staff
Wessex Voices (2021). A systematic review of people's experiences of breast screening - A rich and diverse picture.	**Review period:** 2000 to 2021 **Review purpose:** To understand the views of people eligible for breast screening and identify gaps in knowledge and areas where further insight is needed **Included study designs:** Not stated **Included outcome measures:** Experiences of screening, barriers and facilitators/solutions	**Number of included studies:** 105 **Key characteristics:** Not stated	Critically low	**Ethnic minorities:** **Barriers**: • Difficulties accessing information and the breast screening programme • Culturally appropriated information • Screening in native country viewed as superior (more regular) • Information doesn't address specific concerns of ethnic minority groups • Past negative experience • Language difficulties • Lack of awareness of system in UK • Lack of knowledge, who's at risk, how do you get it • Lack of access to information • Use of incomprehensible terminology on NHS materials • Not comfortable exposing breasts to a stranger • Religious beliefs, e.g., cancer was a retribution for past actions and that illness was a means of forgiveness - hence not seeking treatment. Screening non-diagnostic, rules allowing exposure of sensitive areas do not apply • Embarrassment • Don't want a male practitioner • Lack of support from family and community • Fear of diagnosis • GPs able to exclude people with mental illness from being invited to screening • Locations, e.g., supermarket car parks, can be embarrassing **Facilitators**:

Citation	Review details	Included studies	Quality	Findings and observations/notes
				• Knowledge around breast screening • Translated screening materials & letter **For people with mental illness or learning disabilities:** **Barriers**: • Negative past experiences • Sensory overload • Fear and anxiety • Need to convince carers who may make decisions for patients **Physical disabilities:** **Barriers**: • Access, steps, stairs, small screening rooms, lifts, distance from parking location • Physical limitations using screening equipment **Lesbian, Gay, Bisexual and Trans**: **Barriers**: • No automated call-recall system because the system is still defined by binary genders – male or female • Overt gendering or 'pinking' of breast and gynae cancers can be a barrier for LGBT people seeking information
Young et al (2017). Factors influencing the decision to attend screening for cancer in the UK: a meta-ethnography of qualitative research. Journal	**Review period:** Database inception to October 2016 **Review purpose:** To better understand experiences of being invited to cancer screening and associated decision-making **Included study designs:** Qualitative	**Number of included studies:** 34 **Key characteristics:** All included studies were from the UK. Twenty-one papers had cancer screening uptake as the main focus of the reports. The primary focus of other reports included wider knowledge and attitudes to cancer and prevention, responses to	Critically low	**Findings in ethnic minority and/or socioeconomically diverse population groups:** **Breast cancer screening barriers**: • Time, travel, competing time demands • Language barrier • Cultural beliefs • Lack of confidence in screening and outcome • Relationship with health professionals

Citation	Review details	Included studies	Quality	Findings and observations/notes
of Public Health. doi: 10.1093/pubmed/fdx026	**Included outcome measures:** Factors influencing cancer screening attendance	information about screening, experiences of screening test results and risk management options which included screening. Cervical, breast and colorectal cancer accounted for 29 of the 34 studies. Two related to prostate cancer, two to ovarian and one to lung cancer.		• Religious beliefs • Service provision issues • The test itself • Apathy • Low-risk perceptions **Facilitators**: • Invitation letter • Belief that screening is effective and beneficial **Cervical cancer screening barriers**: • Lack of knowledge (about cervical cancer, its risk factors, causes and screening) • Lack of awareness of rights to healthcare in Britain • Language difficulties • Fear of the test or pain • Fear of cancer • Embarrassment • Shame • Negative past experiences • Male practitioners • Practical difficulties, location/travel, time, childcare • Absence of symptoms / perceived risk • Perceived as an inconvenience • Lack of confidence in NHS health professionals • 'Fractured living' in two countries (lack of acculturation) • Cultural beliefs e.g. cervical cancer associated with promiscuity, inflicted as a punishment from God, a disease of the West, nothing could be done to avoid cervical cancer • Racism (treated coldly because of race, being treated like a piece of meat, being too intimidated to ask questions) **Colorectal cancer**: • Lack of knowledge / awareness

Citation	Review details	Included studies	Quality	Findings and observations/notes
				• Invasiveness of the test and the area of the body under investigation • Psychosocial barriers to bowel preparation at home (enema) • Fear of test results • Lack of symptoms • Biomedical view of healthcare system • Language difficulty • Threat to masculinity • Knowing a close family member or friend who had died of cancer • Feeling susceptible • Stigma of cancer • Embarrassment • Belief that God would help them • The word 'occult' having demonic connotations • Attitudes of staff to religious beliefs e.g., female endoscopist necessary **Barriers to faecal occult blood test completion:** • Everyday pressures • Faecal sample • Misunderstanding of instructions • Planning test completion • Risks that collecting, storing, and posting samples of faeces posed to hygiene • Preference to attend a health setting • Risk perception • Participants preferred not to be in possession of this information (screening results) **Findings in people with mental illness (breast, cervical and bowel screening)**: **Barriers**:

Citation	Review details	Included studies	Quality	Findings and observations/notes
				• Not knowing what to expect or what to do; unsure of need for screening; difficult to process information • Lack of understanding of mental illness in screening professionals; made to feel like a burden on health service; stigma of mental illness • Screening environment aggravates mental health symptoms; staff can be rushed; staff can be rough; exclusion from GP registers • Additional burden; mental health symptoms reduce motivation for self-care; past negative experience; embarrassment; traumatizing; fear of bad news; poor relationship with GP; diagnostic overshadowing • Appointment booking; transport difficulties; difficulty remembering appointments; difficulty leaving the house due to mental health problems; taking time off **Facilitators**: • Wanting to be informed; understanding the benefits of screening; encouragement • Staff being understanding; staff knowledge of mental illness • Continuity of care • Feeling health conscious; being anxious to avoid further health problems; physical symptoms (e.g. finding a lump); past positive experience; good relationship with GP; good relationship with practice nurse • Familiar location; reminders

3. DISCUSSION

3.1 Summary of the findings

A comparison of evidence on barriers and facilitators to breast, bowel and cervical cancer screening uptake in underserved populations, identified before and during the COVID-19 pandemic does not appear to show any marked differences. However, variation in the population groups as well as the type of screening undertaken, could impact on the generalisability of these findings.

Our rapid review has identified several barriers and facilitators to breast, bowel and cervical screening uptake. It is possible some may be unique to the individual population groups examined, but some, such as 'fear' (of procedure or outcome) appear to be a common barrier across most underserved populations. The barriers and facilitators highlighted appear similar across the different screening programmes investigated. In light of this, the findings may only be generalisable to the populations groups they were identified in, and possibly the type of cancer screening.

It is important to note that our rapid review focused on research undertaken in a few select countries (Australia, Netherlands, Republic of Ireland and UK)as these are comparable with UK cancer screening programmes. We however identified one study conducted in The Republic of Ireland which has similar screening criteria to the UK. It is likely we have missed several factors influencing uptake of cancer screening, and those identified are in no way an exhaustive list.

The ongoing UK trial identified in our searches reports an intention to investigate the barriers associated with cervical cancer screening uptake in order to test the effectiveness of a behaviour change intervention. Although we are unsure when the findings from this trial will be published (*study authors stated in recent correspondence that trial data is currently being analysed*), this trial may be relevant to this review topic and could likely contribute to the current body of evidence.

3.2 Limitations of the available evidence

There appears to be a paucity of UK (and countries with similar screening programmes) research evidence on cancer screening uptake in underserved groups conducted during the COVID-19 pandemic period. We identified some UK primary studies published during the pandemic, however, participant data were collected prior to the pandemic and therefore did not meet the inclusion criteria for this rapid review. In addition, we identified numerous studies from other countries, particularly USA, where data collection occurred during 2020 and 2021. These were not eligible for inclusion in this rapid review owing to differences in healthcare provision and screening criteria.

Various underserved population groups were identified in this rapid review, and it is highly possible barriers and facilitators may be unique to the different population groups. This is likely to impact on the generalisability of findings between population groups.

Although conducted during the COVID-19 pandemic, none of the primary studies identified specifically explored the impact of the pandemic on barriers and facilitators to screening uptake among underserved groups.

Likewise, some studies identified focused on the impact of the COVID-19 pandemic on people's participation in cancer screening programmes. However, these were not targeted at underserved populations and therefore did not meet our inclusion criteria.

Although our findings show that barriers and facilitators to screening appear to remain unchanged before and during the pandemic, it is unclear whether these findings were due to the paucity of UK research evidence identified or the limited number of studies targeted at underserved populations.

3.3 Implications for policy and practice

It is likely that the evidence base around the impact of the pandemic on cancer screening uptake will continue to evolve as more studies publish results of their research. However, the findings from this review can serve as a useful baseline for future research to build on. They also serve as an evidence-based foundation for work to increase uptake and reduce inequity in uptake within the Screening Division of Public Health Wales.

Interventions designed to encourage uptake of cancer screening in underserved populations need to take into consideration the varied and complex nature of these groups. The evidence also indicates that as the barriers and facilitators to cancer screening are potentially different among each of the underserved groups, interventions may need to be tailored to individual population groups.

In light of the paucity of evidence identified, further well-designed higher quality research from the UK and similar countries is needed to better understand the factors affecting uptake of breast, bowel and cervical screening in underserved populations.

3.4 Strengths and limitations of this Rapid Review

The studies included in this rapid review were identified through an extensive search of electronic databases, trial registries, grey literature, as well as consultation of content experts in the field. Full text screening was conducted by one independent reviewer and any decision to include was checked for accuracy by a second reviewer. The data extraction was performed by one reviewer and two independent reviewers carried out consistency checking.

Rigorous review methods were used in this rapid review. Despite making every effort to capture all relevant publications and reduce the risk of bias, it is possible that additional eligible publications from may have been missed or we may have introduced some biases to this review.

Our decision to only include studies from countries where cancer screening programmes are closely comparable to UK (Australia, Netherlands, Republic of Ireland), means our findings are highly generalisable to the Welsh context. However, had we broadened our inclusion criteria to include other countries, it is likely we would have identified more barriers and facilitators. Whilst this may have increased our certainty of the evidence, it would have compromised our ability to generalise findings to the Welsh context.

Pre-pandemic evidence on barriers and facilitators to screening uptake were derived from secondary sources (systematic reviews) while evidence relating to the pandemic were derived from primary studies. This approach was chosen because our earlier Rapid Evidence Summary (RES) did not identify any relevant good quality pandemic-related secondary research. However, it should be noted that direct comparison of the evidence between systematic reviews and primary studies may not be appropriate as evidence from systematic reviews are normally ranked higher than that derived from primary studies.

The AMSTAR 2 tool was used to assess the quality of included pre-pandemic systematic reviews. This checklist, although validated, was designed specifically to assess the methodological quality of systematic reviews that include randomised or non-randomised studies of healthcare interventions. As such, it may not be the most suitable for appraising systematic reviews of qualitative studies.

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5. RAPID REVIEW METHODS

5.1 Eligibility criteria

We searched for primary sources to answer the review question "Have the barriers and facilitators to cancer screening uptake (breast, cervical and bowel) in underserved populations, changed due to the COVID-19 pandemic?"

The following eligibility criteria were used to identify studies for inclusion in the rapid review:

Review question	Have the barriers and facilitators to cancer screening uptake (breast, cervical and bowel) in underserved populations, changed due to the COVID-19 pandemic?	
	Inclusion criteria	**Exclusion criteria**
Population	Underserved populations (e.g. clinically vulnerable, shielding, multi-morbidities, ethnic minorities, social deprivation, gender, age) offered breast, bowel and cervical screening General population if sub-group analyses includes an examination of underserved populations	
Exposure	Breast, bowel and cervical screening programmes relevant to the UK context, during the COVID-19 pandemic	Other screening programmes Screening programmes pre-pandemic
Outcomes	Barriers and facilitators to screening uptake	Screening uptake generally during the pandemic
Settings	Community and Hospital settings	
Studies	Primary studies and grey literature. COVID literature (2020-22)	
Language of publication	English	
Publication type	Published and preprint, protocols	
Other factors *Any other key points to note*	**Only include studies conducted in the UK or other countries that have comparable cancer screening programmes to the UK (such as Australia and Netherlands)** Limit search dates to 2020 onwards to capture COVID-19 relevance	

5.2 Literature search

COVID-19 specific and general repositories of evidence noted in our resource list were searched between 25th and 26th May 2022. An audit trail of the search process is provided within the resource list (Appendix). Searches were limited to English-language publications and limited to records published during the pandemic period (2020-2022). Search hits were screened for relevance by a single reviewer.

Search concepts and keywords around breast, bowel, and cervical cancer screening programmes, underserved populations, and barriers and facilitators were utilised. The searches combined free text words and descriptors when available. Resources searched during the rapid review are outlined in Appendix 1 and the search strategy used to search MEDLINE is available in Appendix 2.

A scoping search was also conducted to identify secondary sources relating to the pre-pandemic period, which are included in table 3. No date limits were applied, however, searches were limited to English-language publications and to secondary sources published before the pandemic period.

5.3 Study selection process

The searches conducted to retrieve pandemic-period evidence yielded a total of 5,549 records, one additional record was identified through personal communication, resulting in a total of 5,550 records. Records were imported into an Endnote database library and duplicates were removed. After deduplication, a total of 5,165 records remained. The title and abstract of the 5,165 records were screened by one reviewer and if relevant, the full text was also screened using the eligibility criteria from section 5.1. A second reviewer consistency checked all the studies selected for inclusion. If disagreements arose, these were discussed, and a third reviewer was consulted to make a final inclusion decision. In relation to the pandemic period, three records met the inclusion criteria for this rapid review (two qualitative papers and one ongoing trial of interventions).

For the pre-pandemic period literature, two independent reviewers screened title and abstracts. If relevant, the full text was reviewed by two independent reviewers for inclusion. If disagreements arose, these were discussed, and a third reviewer was consulted to make a final inclusion decision.

5.4 Data extraction

5.4.1 Pandemic-related data extraction

One researcher performed the data extraction and a second researcher carried out consistency checks. The following information was extracted when reported:

- Citation
- Country
- Study design
- Data collection methods
- Sample size
- Population
- Setting
- Dates of data collection
- Key findings

A comments column was added to report key information that was not captured above and to record any limitations of the included primary sources.

5.4.2 Pre-pandemic data extraction

One researcher performed the data extraction and a second researcher carried out consistency checks. The following information was extracted when reported:

- Citation
- Review period
- Review purpose
- Included study designs
- Quality rating
- Included outcome measures
- Number of included studies
- Key characteristics
- Findings and observations/notes

5.5 Quality appraisal

Quality assessment was undertaken by a single reviewer, with verification of all judgements by a second reviewer. Any discrepancies were discussed and resolved amongst the review team. Critical appraisal of pandemic period primary studies was conducted using the Critical Appraisal Skills Programme (CASP) tool for qualitative research (Critical Appraisal Skills Programme, 2018).

Critical appraisal of pre-pandemic systematic reviews was conducted using the AMSTAR 2 tool (Shea et al., 2017). The results of the quality appraisal for pre-pandemic studies can be seen in table 3. The reviewers agreed to give prominence to five critical domains on the AMSTAR 2 tool (see below) that could affect the validity of a review and its conclusions.

Critical domains:

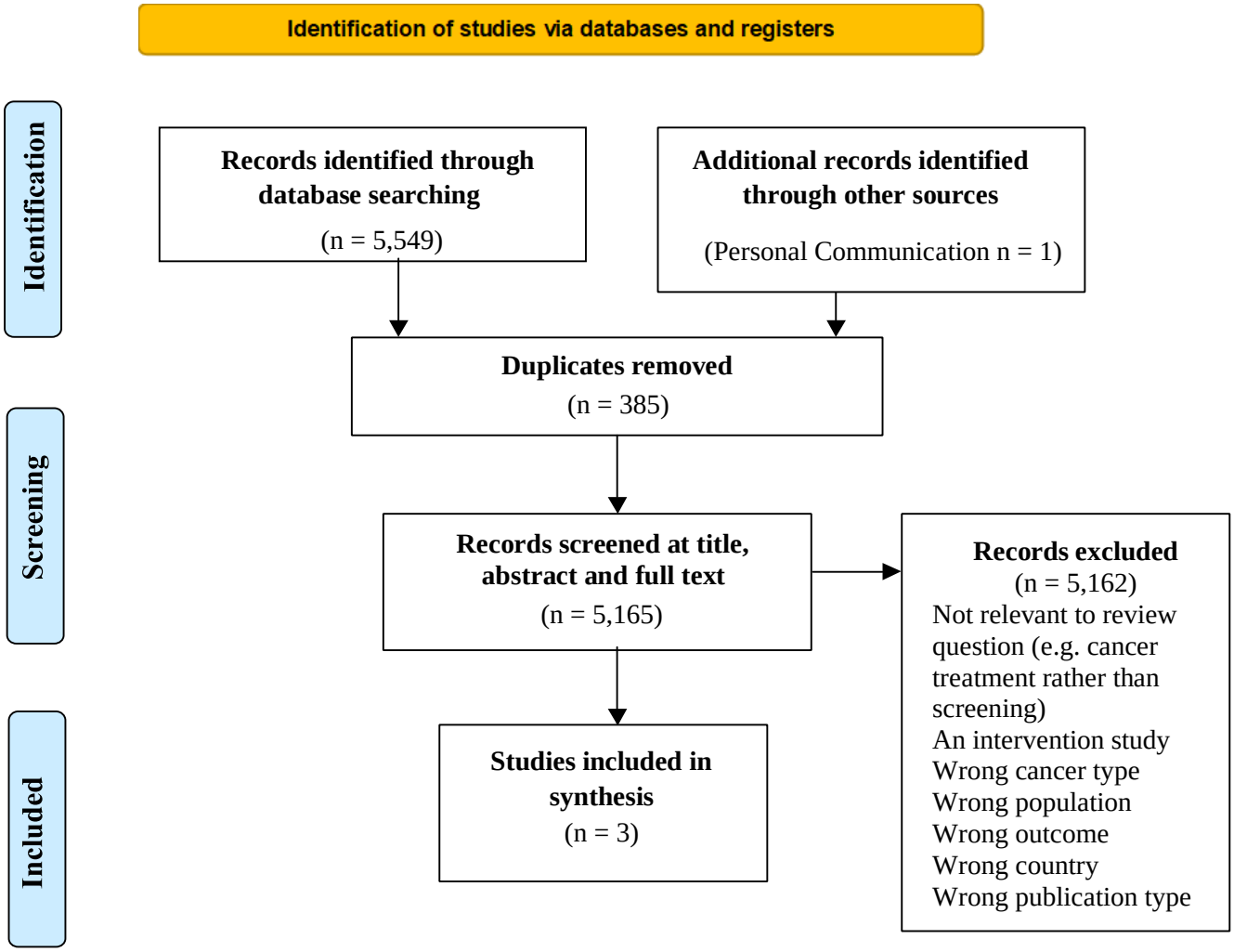
- Protocol registered before commencement of the review (item 2)
- Adequacy of the literature search (item 4)
- Justification for excluding individual studies (item 7)
- Risk of bias from individual studies being included in the review (item 9)
- Consideration of risk of bias when interpreting the results of the review (item 13)

5.6 Synthesis

Barriers and facilitators to screening uptake identified relating to the COVID-19 pandemic period were compared against the barriers and facilitators identified before the pandemic. Where possible these were examined according to cancer type and population type. Data was synthesised narratively to provide a collective interpretation of the evidence.

6. EVIDENCE

6.1 Study selection flow chart for pandemic literature



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

7. ADDITIONAL INFORMATION

7.1 Conflicts of interest

The review team declares no conflicts of interest

7.2 Acknowledgements

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8. ABOUT THE WALES COVID-19 EVIDENCE CENTRE (WCEC)

The WCEC integrates with worldwide efforts to synthesise and mobilise knowledge from research.

We operate with a core team as part of Health and Care Research Wales, are hosted in the Wales Centre for Primary and Emergency Care Research (PRIME), and are led by Professor Adrian Edwards of Cardiff University.

The core team of the centre works closely with collaborating partners in Health Technology Wales, Wales Centre for Evidence-Based Care, Specialist Unit for Review Evidence centre, SAIL Databank, Bangor Institute for Health & Medical Research/ Health and Care Economics Cymru, and the Public Health Wales Observatory.

Together we aim to provide around 50 reviews per year, answering the priority questions for policy and practice in Wales as we meet the demands of the pandemic and its impacts.

Director:
Professor Adrian Edwards

Contact Email:
WC19EC@cardiff.ac.uk

Website:
https://healthandcareresearchwales.org/about-research-community/wales-covid-19-evidence-centre

9. APPENDIX

APPENDIX 1: Resources searched during Rapid Review Searching

A single list of resources has been developed for guiding and documenting the sources searched as part of a Rapid Review. All 'core' resources should be searched, but other resources may be considered if appropriate to the topic, or time allows.

For those resources used, record the search strategies used below the table.

Resource	Success or relevanc of the retrieval	Number of hits
Core COVID-19 specific resources *(search for both secondary & primary evidence)*		
Cochrane COVID Review Bank (Browse list of titles) https://covidreviews.cochrane.org/search/site	Searched, nothing found	0
WHO Global Coronavirus Database https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/	Searched, nothing found	0
L*OVE COVID https://app.iloveevidence.com/loves/5e6fdb9669c00e4ac072701d?utm=aile	Searched, results found	4
Cochrane COVID-19 Study Register https://covid-19.cochrane.org/	Searched, results found	3
VA-ESP (Use "search this page" to limit to a concept. A second (or subsequent) concept can be applied to the results list by using "search this page" again.) https://www.covid19reviews.org/index.cfm	Not searched, maybe relevant	
Core non-COVID-19 specific resources *(search for both secondary & primary evidence)*		
Medline/PubMed (Limit to COVID-19 using a suitable filter, in-built or otherwise, if required)	Searched, results found	4,804
Embase (Limit to COVID-19 using a suitable filter, in-built or otherwise, if required)	Not searched, not relevant	
Cochrane Library (Only necessary for non-COVID-19 topics) https://www.cochranelibrary.com/	Searched, results found	42
Ongoing clinical trials (if appropriate for topic)		
clinicaltrials.gov http://clinicaltrials.gov/	Searched, results found	21
WHO ICTRP http://apps.who.int/trialsearch/	Searched, results found	6
Additional COVID-19 resources (if appropriate or timeframe allows) *(Tailor the list according to the topic and potential evidence base. In some cases, it may be preferable to scan the main (generic) source rather than COVID-19 specific product; listed under secondary research)*		

Trip – for guidelines (TripPro can be accessed by an institutional based subscription based via institution, otherwise use Trip) As a COVID-19 resource for guidelines – search for (covid-19 OR covid19 OR sars-cov-2 OR sars-cov2 OR sarscov2) and the topic/concept of interest, then filter by UK guidelines, covers NICE and SIGN. Can also filter for non-UK guidance. https://www.tripdatabase.com/	Searched, results found	100
COVID-END – Evidence summaries (McMaster Health Forum) (Incorporates multiple COVID-19 resources, including many listed here. May be useful for topic specific/focused questions; may not be useful for border questions) https://www.mcmasterforum.org/networks/covid-end	Not searched, not relevant	
COVID-19 Evidence Alerts from McMaster PLUS™ Usefulness dependent on topic; may not be user friendly for broad/complicated questions https://plus.mcmaster.ca/COVID-19/	Not searched, not relevant	
Secondary resources for reviews relevant to local/UK context (if appropriate or timeframe allows)		
United Kingdom Health Security Agency (UKHSA) – COVID-19 Rapid Reviews https://ukhsalibrary.koha-ptfs.co.uk/covid19rapidreviews/	Not searched, not relevant	
NICE resources for COVID reviews https://www.nice.org.uk/guidance/conditions-and-diseases/respiratory-conditions/covid19/products?Status=Published *Any queries regarding ongoing or planned reviews contact Chris Connell: Chris.Connell@nice.org.uk*	Not searched, not relevant	
Healthcare Improvement Scotland – COVID-19: Evidence for Scotland (not a searchable database but a lists Once for Scotland guidance, rapid evidence reviews, NICE rapid guidelines evidence covering diagnostics and treatments) http://www.healthcareimprovementscotland.org/our_work/coronavirus_covid-19/evidence_for_scotland.aspx	Not searched, not relevant	
Ireland, HSE Library, COVID-19 Summaries of Evidence not a searchable database but a list of all summaries of evidence that HIQA have been asked to address) https://hselibrary.ie/covid19-evidence-summaries/	Not searched, not relevant	
HIQA Health Information and Quality Authority (Ireland) – Rapid reviews https://www.hiqa.ie/reports-and-publications/health-technology-assessments?tid_1=All&field_hta_topics_target_id=112	Not searched, not relevant	
Secondary resources for reviews produced by key international organisations (if appropriate or timeframe allows)		
NCCMT COVID-19 rapid reviews (Canada) https://www.nccmt.ca/covid-19/covid-19-rapid-evidence-service	Not searched, not relevant	
ECDC European Centre for Disease Prevention and Control (COVID-19 outputs) https://www.ecdc.europa.eu/en/publications-data	Not searched, not relevant	
CDC centre for Disease Control and Prevention - Guidance for COVID-19 (US) https://www.cdc.gov/coronavirus/2019-ncov/communication/guidance.html	Not searched, not relevant	
AHRQ Agency for Healthcare Research and Quality (US)	Not searched, not relevant	

(Note: only 1 of these covid-19 reviews are actively being kept updated as a living review: "Antibody Response Following SARS-CoV-2 Infection and Implications for Immunity: A Living Rapid Review" https://www.ahrq.gov/coronavirus/health-systems-research.html		
NASEM The National Academy of Sciences Engineering Medicine - Coronavirus Resources Collection (US) https://www.nap.edu/collection/94/coronavirus-resources	Not searched, not relevant	
Australian National COVID-19 Clinical Evidence Task Force - Living Guidelines; mainly treatment https://covid19evidence.net.au/ (*also incorporated in Trip*)	Not searched, not relevant	
Secondary research resources for (non-COVID-19) reviews (if appropriate or timeframe allows) (*Tailor the list according to the topic and potential evidence base, talk to stakeholder before proceeding with this type of search*)		
Trip – for guidelines (TripPro can be accessed by an institutional based subscription based via institution, otherwise use Trip) https://www.tripdatabase.com/	Not searched, not relevant	
Campbell Collaboration https://www.campbellcollaboration.org/better-evidence.html	Not searched, not relevant	
JBI (via OVID) (Subscription based service – WCEBC has a subscription)	Not searched, not relevant	
Epistemonikos https://www.epistemonikos.org/en/advanced_search https://www.epistemonikos.org/ (for the simple search)	Not searched, not relevant	
International HTA database (INAHTA-HTA) (for technology & intervention questions only) https://database.inahta.org/	Not searched, not relevant	
PROSPERO https://www.crd.york.ac.uk/prospero/	Not searched, not relevant	
Additional resources searched (*Add in any additional resources that have been used, e.g. Scopus, HMIC, Social Care Online)*		
Google Advanced Search https://www.google.co.uk/advanced_search	Searched, results found	89
Google Scholar https://scholar.google.com/	Not searched, not relevant	
PsycINFO	Searched, results found	480

Appendix 2. MEDLINE search strategy

Set#	Searched for	Results
S1	((((MESH.EXACT.EXPLODE("Early Detection of Cancer") OR MESH.EXACT.EXPLODE("Mass Screening")))))	165852
S2	((((TI,ab(Screeni* OR "cancer screening" OR "early detection" OR "detection" OR "early diagnosis" OR "diagnosis" OR "cancer screening tests" OR "testing" OR "mass screening")))))	3493216
S3	((((Ti,ab(Mammogra*) OR (colonoscop*) OR (“faecal immunochemical test”) OR (“feacal immunochemical testing”) OR (smear) OR (pap smear) OR (HPV) OR (“human papillomavirus”)))))	202016
S4	S3 OR S2 OR S1	3634559
S5	((((MESH.EXACT.EXPLODE("Breast Neoplasms") OR MESH.EXACT.EXPLODE("Neoplasms") OR MESH.EXACT("Uterine Cervical Neoplasms") OR MESH.EXACT.EXPLODE("Breast Cancer Lymphedema") OR MESH.EXACT.EXPLODE("Colorectal Neoplasms")))))	3692423
S6	(((ti,ab("breast cancer" OR "bowel cancer" OR "cervical cancer" OR "colorectal cancer" OR "cancer" OR "neoplasm"))))	1997371
S7	S6 OR S5	4217020
S8	((((((MESH.EXACT.EXPLODE("Minority Groups") OR MESH.EXACT.EXPLODE("Health Disparity, Minority and Vulnerable Populations") OR MESH.EXACT.EXPLODE("Minority Health") OR MESH.EXACT.EXPLODE("Vulnerable Populations") OR MESH.EXACT.EXPLODE("Sexual and Gender Minorities") OR MESH.EXACT.EXPLODE("Ethnic and Racial Minorities") OR MESH.EXACT.EXPLODE("Risk Factors") OR MESH.EXACT.EXPLODE("Poverty Areas") OR MESH.EXACT.EXPLODE("Poverty") OR MESH.EXACT.EXPLODE("Disabled Persons") MESH.EXACT.EXPLODE("Age Factors"))))))	1071724
S9	(((Ti,ab(minorit* OR vulnerable OR ethnic* OR Black OR Asian OR LGBT* OR homosexual* OR bisexual* OR race OR gender OR ("hard to reach") OR underserved OR age OR ("travelling communit*") OR ("disabled person*") OR disab* OR poverty OR ("working poor") OR emigrant* OR immigrant* OR refugee OR ("asylum seeker") OR gypsy OR Roma OR ("Irish traveller")))))	3488651
S10	((((((MESH.EXACT.EXPLODE("Socioeconomic Factors") OR MESH.EXACT.EXPLODE("Health Status Disparities") OR MESH.EXACT.EXPLODE("Healthcare Disparities") OR MESH.EXACT.EXPLODE("Medically Underserved Area") OR MESH.EXACT.EXPLODE("Gender Equity") OR MESH.EXACT.EXPLODE("Sociological Factors") OR MESH.EXACT("Age Factors") OR MESH.EXACT("Sex Factors") OR MESH.EXACT.EXPLODE("Health Equity"))))))	1572980

S11	(((((((Ti,ab((“social disparit*”) OR (“social inequ*”) OR (“health disparit*”) OR (“health inequ*”) OR (“healthcare disparit*”) OR (“health status disparit*”) OR (disparit*) OR (inequ*) OR (equali*) OR (“disparities in health”) OR (“socioeconomically disadvantaged”) OR (“economic level”) OR (“social class”) OR (“social determinant”) OR (“social status”) OR (“social background”) OR (“social circumstance”) OR (“socio-economic”) OR (socioeconomic) OR (sociodemographic) OR (socio-demographic))))))))	355366
S12	S11 OR S10 OR S9 OR S8	5076729
S13	(((((Ti,ab (compliance) OR (comply*) OR (adher*) OR (encourage*) OR (promot*) OR (uptake) OR (non-attend*) OR (nonattend*) OR (accept*) OR (attend*) OR (attitude*) OR (utilisation) OR (utilization) OR (refus*) OR (reluctan*) OR (non-respon*) OR (nonrespon*) OR (barriers) OR (facilitators) OR (enabl*) OR (engag*) OR (perception*) OR (experience*) OR (views) OR (intention*))))))	5881849
S14	(((interview* OR (“focus group*”) OR discussion OR survey* OR observation*)))	2915954
S15	(((Qualitative OR (“mixed method*”) OR cohort)))	1176329
S16	S15 OR S14	3733195
S17	(S16 AND S13 AND S12 AND S7 AND S4) and (pd(2020-2029))	4804°

Appendix 3. CASP Checklists

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CASP Checklist: 10 questions to help you make sense of a **Qualitative** research

How to use this appraisal tool: Three broad issues need to be considered when appraising a qualitative study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Qualitative) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference: Christie-de Jong et al, (2022). Qualitative evaluation of a c

Section A: Are the results valid?

1. Was there a clear statement of the aims of the research?

Yes	✔
Can't Tell	
No	

HINT: Consider
- what was the goal of the research
- why it was thought important
- its relevance

Comments: The aim of the research was to evaluate qualitatively the acceptability of a codesigned, faith-based online intervention to increase uptake of breast, colorectal and cervical screening in Scottish Muslim women

2. Is a qualitative methodology appropriate?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal

Comments:

Is it worth continuing?

3. Was the research design appropriate to address the aims of the research?

Yes	✔
Can't Tell	
No	

HINT: Consider
- if the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

Comments:

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4. Was the recruitment strategy appropriate to the aims of the research?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- If there are any discussions around recruitment (e.g. why some people chose not to take part)

Comments: A mix of purposive and snowball sampling was used, to target participants based on age and ethnicity. Research has shown that these sampling techniques are effective for recruiting ethnic minorities in research. Advertisements used in local community groups or mosques, with support from a local imam.

5. Was the data collected in a way that addressed the research issue?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If the setting for the data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
- If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
- If methods were modified during the study. If so, has the researcher explained how and why
- If the form of data is clear (e.g. tape recordings, video material, notes etc.)
- If the researcher has discussed saturation of data

Comments: Data were collected by way of two, 2-hour focus groups conducted online using Zoom. These focus group sessions were audio-recorded and transcribed. Questions aimed to explore participants' experiences of the intervention, and acceptability of content and design.

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6. Has the relationship between researcher and participants been adequately considered?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

Comments: The intervention (and various aspects of the research project) was codesigned i.e. involved the study researchers and 10 Scottish Muslim women. It appears the codesign group are different from the women recruited for the focus groups. A number of the participants were recruited through the support of the imam (i.e. someone well known within the target community). Finally, a female Muslim member of the team (unnamed) appeared to have been involved in analysing and transcribing the data collected.

Section B: What are the results?

7. Have ethical issues been taken into consideration?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

Comments: Ethic approval was sought and approved, and participants were not identified in the recordings, enhancing confidentiality.

The study was approved by the University of Sunderland Research Ethics Committee (008361). The participants gave informed consent to participate in the study before taking part. Each participant received a £20 shopping voucher per meeting.

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8. Was the data analysis sufficiently rigorous?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Comments: Data were analysed by thematic analysis.
Two researchers independently coded the transcripts using NVivo. Themes and sub-themes were then generated by inductively by comparing and combining the two sets of codes.
However, how contradictory data or potential bias was dealt with was not described.

9. Is there a clear statement of findings?

Yes	✔
Can't Tell	
No	

HINT: Consider whether
- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Comments: The overarching themes included (1) acceptability of content, (2) acceptability of delivery and (3) improvement of the intervention.

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Section C: Will the results help locally?

10. How valuable is the research?

HINT: Consider

- If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature
- If they identify new areas where research is necessary
- If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used

Comments: This research provides insight into the acceptability of a co-designed faith-based intervention to encourage Muslim women to attend breast, colorectal and cervical cancer screening in Scotland. The authors state this is the first study of its kind, and that participants found the intervention acceptable, informative and enjoyable, which positively impacted their intention and attitude towards screening. This could be used as a component of health promotion efforts to increase screening uptake amongst this demographic. Limitations included the fact the sample was self-selected, educated and English-speaking, and most participants were too young to currently attend screening. Future research should investigating influence of ethnicity and different perspectives towards religion, and with a more representative sample, eligible for all screening programmes.

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CASP Checklist: 10 questions to help you make sense of a **Qualitative** research

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- Are the results of the study valid? (Section A)
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About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Qualitative) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference: Keane et al, (2022). Identifying barriers to Irish traveller wc

Section A: Are the results valid?

1. Was there a clear statement of the aims of the research?

Yes ✔ | Can't Tell | No

HINT: Consider
- what was the goal of the research
- why it was thought important
- its relevance

Comments: This work aims to address the gap in knowledge of Irish Traveller womens' perceptions of breast screening and the perceived barriers and enablers to attendance.

2. Is a qualitative methodology appropriate?

Yes ✔ | Can't Tell | No

HINT: Consider
- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
- Is qualitative research the right methodology for addressing the research goal

Comments:

Is it worth continuing?

3. Was the research design appropriate to address the aims of the research?

Yes ✔ | Can't Tell | No

HINT: Consider
- if the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

Comments:

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4. Was the recruitment strategy appropriate to the aims of the research?	Yes Can't Tell No	✔ 	HINT: Consider • If the researcher has explained how the participants were selected • If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study • If there are any discussions around recruitment (e.g. why some people chose not to take part)

Comments: Recruitment was gained by emailing employees within the Health Service Executive, BreastCheck, the Cork Traveller VisibilityGroup and Clare Family Resource Centre.

5. Was the data collected in a way that addressed the research issue?	Yes Can't Tell No	✔ 	HINT: Consider • If the setting for the data collection was justified • If it is clear how data were collected (e.g. focus group, semi-structured interview etc.) • If the researcher has justified the methods chosen • If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide) • If methods were modified during the study. If so, has the researcher explained how and why • If the form of data is clear (e.g. tape recordings, video material, notes etc.) • If the researcher has discussed saturation of data

Comments: There was a set of four questions pre-established and approved by the ethics committee. These were on knowledge, experience, barriers and enablers, and opinions. The four questions were asked and explored by the facilitator until answers were repeated, or participants indicated they had nothing further to add (saturation).

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6. Has the relationship between researcher and participants been adequately considered?

Yes	
Can't Tell	
No	✔

HINT: Consider
- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

Comments: The research question, screening questions, and interview questions were all designed by the research team. It is unclear whether there was any involvement by target population in the design of these processes.

Section B: What are the results?

7. Have ethical issues been taken into consideration?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- If approval has been sought from the ethics committee

Comments: Ethical Approval wasobtained from the University College Cork (UCC) Social Research Ethics Committee (SREC) in the early part of 2020 (UCC SREC-CT 2019-221). All participants' received a participant information sheet and once they had an opportunity to ask questions, they signed a consent form prior to the interview.

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8. Was the data analysis sufficiently rigorous?

Yes	✔
Can't Tell	
No	

HINT: Consider
- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
- To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Comments: Thematic analysis method described on pg349

9. Is there a clear statement of findings?

Yes	✔
Can't Tell	
No	

HINT: Consider whether
- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Comments: Influences that create barriers to breast screening for Irish Traveller women include inequality and family/community support, fear, literacy and education, embarrassment and the health care pro fessional, stress and appointment suitability. Findings also demonstrate inadequate data and information is available in Ireland regarding Irish Traveller women attending breast screening.

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Section C: Will the results help locally?	
10. How valuable is the research?	HINT: Consider • If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature • If they identify new areas where research is necessary • If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used
Comments:	The research is valuable. The authors highlight barriers to Irish traveller women attending breast cancer screening and highlight the potential implications of the findings for practice. Limitations include limited numbers at recruitment, especially Irish Traveller women outside of the healthcare profession. There was an inability to recruit Irish Traveller women through community centres due to closures of community centres during the COVID-19 pandemic However, despite these limitations the topic reached overlap in data amongst the majority of interviews. Only one radiographer took part in the study, further work should look at the radiographers perspective on Irish Traveller women's screening.