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BMJ Open

A mixed-methods evaluation of a peer-led, co-produced, asset-based intervention for early diagnosis of prostate cancer for Black men: the PROCAN-B study

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To cite: Christie-de Jong F, Eberhardt J, Oyeniyi OS, *et al.* A mixed-methods evaluation of a peer-led, co-produced, asset-based intervention for early diagnosis of prostate cancer for Black men: the PROCAN-B study. *BMJ Open* 2025;**15**:e105803. doi:10.1136/bmjopen-2025-105803

► Prepublication history for this paper is available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2025-105803).

Received 28 May 2025
Accepted 08 October 2025

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ABSTRACT

Objective To pilot a culturally tailored, peer-led, co-produced asset-based intervention workshop to encourage early diagnosis of prostate cancer for Black men.

Design Mixed-methods pilot study.

Setting Community centres in the North-East of England and Scotland.

Participants The intervention was delivered in November 2023 with Black African and Caribbean men (n=21), and again in February 2024 (n=41). Participants were highly educated and aged between 42 and 63 years. The intervention was qualitatively evaluated with 40 of the intervention participants.

Intervention Underpinned by the Integrated Screening Action Model (I-SAM), we co-produced a culturally tailored, peer-led 2-hour workshop consisting of multiple components, including small group discussions about barriers to accessing prostate cancer care, general practitioner (GP) health education, activities to facilitate effective communication with the GP and reception staff and videos with testimonials from survivors, women and religious leaders.

Primary outcomes Knowledge, attitudes and intention to engage in prostate cancer testing were examined through a pre- and post-survey design. Intervention acceptability was qualitatively explored through focus groups.

Results Participants (n=41) reported that the workshop increased their confidence in engaging with healthcare providers to discuss prostate cancer testing (I-SAM component: psychological capability). Knowledge (I-SAM component: psychological capability: Z=4.939, p<0.001) and intention to undergo prostate cancer testing (I-SAM component: decided to act): Z=3.975, p<0.001) significantly increased post-intervention. Focus group data showed participants enjoyed the workshop and found it acceptable and informative. They particularly liked that the workshop was delivered exclusively by people who shared participants' cultural and racial backgrounds. Culturally tailored and faith-based messages made the intervention relevant to participants and facilitated trust-building.

Conclusion Asset-based strategies, focusing on community strengths, including faith-based health promotion, can promote health behaviours in a culturally and spiritually meaningful way. The PROCAN-B intervention effectively targeted components within the I-SAM and shows potential to increase prostate cancer awareness and build confidence to engage in behaviours conducive to early diagnosis. However, the sample was small, and more robust effectiveness testing is needed.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study used a peer-led, co-produced intervention, ensuring cultural appropriateness and relevance.
- ⇒ The study employed an asset-based approach, utilising faith-based messages and the collectivist characteristic of the community, where close social bonds are highly valued, to support the health promotion message.
- ⇒ The qualitative and quantitative components of the mixed-methods design allowed exploration of intervention acceptability, as well as pilot effectiveness testing.
- ⇒ This pilot study included a small and relatively homogenous sample of highly educated Black African men, which limits the generalisability of the findings.
- ⇒ Intervention effectiveness testing must be conducted in a larger and more diverse sample and include process evaluation.

BACKGROUND

Prostate cancer is the most commonly diagnosed cancer in the United Kingdom (UK), accounting for 27% of all cancers in men, with approximately 52 000 new prostate cancer cases every year.[1,2] Prostate cancer is also the UK's third most common cause of cancer death,[2] accounting for 14% of all deaths from cancer.[2,3] Early diagnosis of prostate cancer can lead to better outcomes.[4,5]

Enhancing awareness of risk factors could promote timely help-seeking behaviours and lead to earlier detection.[6]

Inequalities exist in the prevalence and outcomes of prostate cancer for Black men,[1,3,7,8] which are under-researched and unjust. Research suggests that only one-quarter of Black men are aware of their heightened risk.[9] Black men should be informed about the disease and their increased susceptibility. The UK National Screening Committee currently does not recommend prostate screening. However, all men aged 50+ are entitled to request a prostate-specific antigen (PSA) test; Black men aged 45+ are encouraged by the National Health Service (NHS) to talk about their risk with their doctor.[4] International literature shows complex barriers to early diagnosis of prostate cancer among Black men,[10] while a knowledge gap exists regarding barriers to early diagnosis of prostate cancer for Black men in the UK. Community-centred and asset-based approaches, which draw on community strengths such as social networks and cohesion, can be effective in overcoming barriers and promoting health by empowering communities and strengthening social capital.[11,12] These approaches often involve participatory methods and close collaboration with the community, including the use of peer support and the provision of practical and culturally relevant tools.[11,13]

The aim of this study was to pilot a culturally tailored, peer-led, co-produced workshop intervention to encourage early diagnosis of prostate cancer for Black men. With increasing pressure in the UK to roll out a national prostate cancer screening programme, Black men, who face a higher risk, need to be meaningfully engaged to prevent avoidable inequities in prostate cancer screening uptake and prostate cancer outcomes. Our work is positioned to ensure that any future potential screening programme can be equitable by targeting groups who are at higher risk and who experience barriers to accessing prostate healthcare. Here, we present the mixed-methods evaluation of the intervention.

METHODS

Intervention

Together with Black men (n=13) in North-East England and Scotland, we explored in three focus groups, challenges to early diagnosis of prostate cancer.[14,15] Barriers were mapped onto the Integrated Screening Action Model (I-SAM),[16] which integrates three key components: (1) the stages of behaviour change from the Precaution Adoption Process Model,[17] (2) targets for behaviour change from the Capability, Opportunity, Motivation-Behaviour (COM-B) model[18] and (3) the interrelationships between individual, social and environmental factors of the socio-ecological model.[19] Aligned with the I-SAM, barriers included participant influences, such as not knowing about the elevated prostate cancer risk (Capability), difficulty discussing sensitive issues (Motivation) and environmental influences (Opportunity) such as challenging experiences with healthcare, institutional racism, not trusting healthcare providers and not feeling heard, as well as cultural and religious factors (Social). Faith and support from religious leaders were suggested as approaches to help overcome some of these barriers. Our findings, discussed elsewhere,[20] align with existing literature, predominantly from the USA.[8,10]

We then collaborated with the same Black men (n=13) to develop an intervention aimed at addressing some of these barriers, increasing awareness of prostate cancer risk and encouraging help-seeking (figure 1).[14] The resulting co-produced intervention, a 2-hour workshop underpinned by the I-SAM,[16] which ensured barriers at all levels were addressed where possible, consisted of multiple components, including peer-led discussions about barriers to early diagnosis of prostate cancer, health education by a Black general practitioner (GP), activities to facilitate effective communication with the GP and reception staff, and video testimonials from survivors, women and religious leaders. The workshop completed

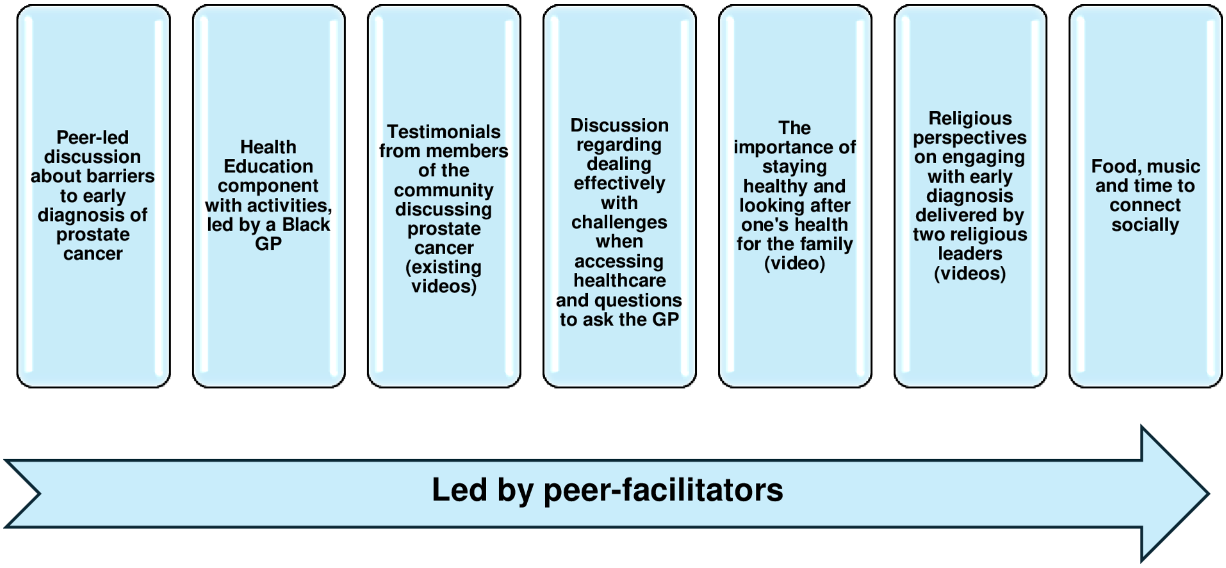

Figure 1 The PROCAN-B co-produced and peer-led intervention. GP, general practitioner.

with time to connect socially, accompanied by African and Caribbean food.

One GP was recruited in each region through social networks; both were Black men aged over 45, consistent with the target population. The GPs agreed to take part voluntarily and were not paid, although a gift voucher was offered to thank the men for their time and effort. We trained community members as 'peer-facilitators' to ensure the intervention was delivered 'by Black men, for Black men'. Peer facilitators were also recruited through social networks and mostly part of the Public Involvement Community Engagement (PICE) group. These men were from both regions and, consistent with the target population, were Black, aged over 45 with no personal history of prostate cancer. More details regarding their characteristics are reported elsewhere.[20] Peer facilitators were offered £25 per hour retail gift vouchers to thank them for their time and effort.

Design

This mixed-methods study aimed to evaluate and refine the co-produced intervention through a multi-step process (figure 2). This involved delivering the intervention, collecting feedback through focus groups, refining the workshop based on this feedback, delivering the intervention again and piloting the refined intervention using a cross-sectional pre- and post-survey design, followed by further qualitative evaluation through two additional focus groups. The aim of the qualitative component was to evaluate participants' experiences of the intervention

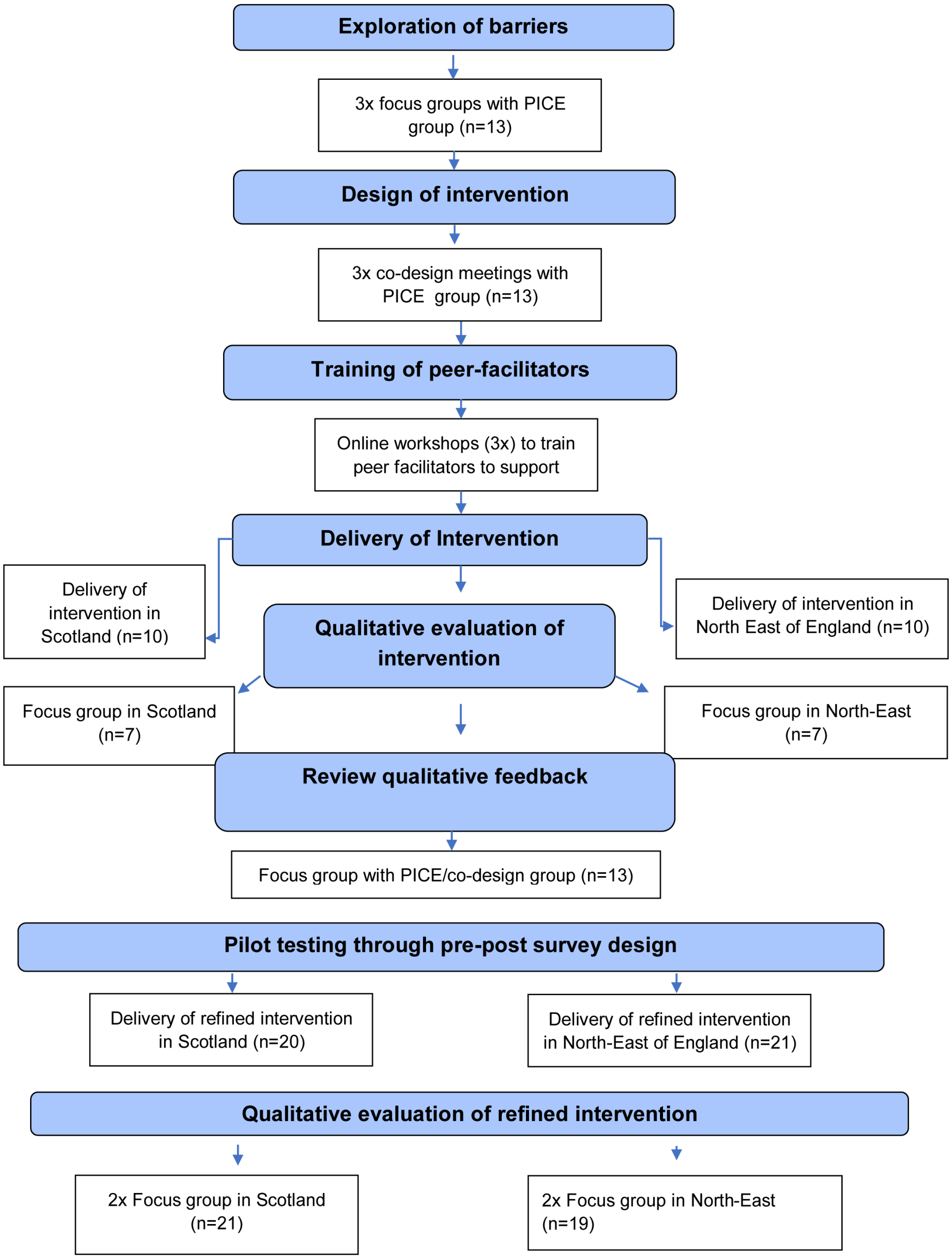

Figure 2 Study flow chart. PICE, Public Involvement Community Engagement.

through focus groups and refine the workshop accordingly. The aim of the quantitative component was to pilot the refined intervention using a pre- and post-survey design to assess changes in knowledge, attitudes and intention to engage with prostate cancer testing. The study combined elements of an Exploratory Sequential Mixed-Methods Design with those of an Iterative Embedded Design.[21 22] The exploratory sequential approach was evident in the initial collection of qualitative data to inform intervention development, followed by a quantitative evaluation. A follow-up qualitative phase after the pilot reflected the embedded and iterative process aimed at refining the intervention based on participant feedback. The PROCAN-B study was a pilot study, designed to generate preliminary evidence on the acceptability and potential impact of the co-produced intervention, to inform the development of a more robust evaluation.

Setting

This mixed-methods study was conducted in two socioeconomically deprived areas with poor cancer outcomes: Scotland and North-East England, which lack inclusion in UK research. Including Black men from less ethnically diverse settings is important to ensure their voices are heard. By 'less ethnically diverse settings' we refer to regions such as the North East of England and Scotland, where census data show that the proportion of residents from Black and minority ethnic groups is substantially lower than the national average.[23]

Sample and sampling approach

The target population for the study participants comprised Black men aged 45 and over, living in the North-East of England or Scotland, without a clinical diagnosis of prostate cancer. A total of 62 Black men, aged 42–63, were recruited. This is considered an acceptable sample size for a pilot study.[24] Purposive sampling was initially employed to ensure a diverse sample in terms of key characteristics: age and Black ethnic background. However, as recruitment was conducted through community networks, achieving diversity proved difficult. Snowball sampling was therefore used to invite Black men to participate in the intervention. Subsequently, convenience sampling was used to invite all intervention participants to take part in focus groups. Those who agreed were recruited.

Data collection

The first two workshops were delivered in November 2023 (Intervention 1, n=21), one in the North-East, one in Scotland, followed by two focus groups (n=14). Following the initial qualitative evaluation, the only modification made was to move the social element and food from the middle to the end of the workshop.

The revised workshop was delivered in February 2024 (Intervention 2, n=41), again one in the North-East, one in Scotland, followed by two additional focus groups (n=26). To assess its preliminary impact and to inform future research, a pre-post survey design was applied to the data from the second delivery (n=41), focusing on changes to knowledge, attitudes and intention to engage in prostate cancer testing (figure 2).

The quantitative data collection tool was informed by the I-SAM and constructed by adapting questions from several validated measures: (1) Weinrich *et al.*'s Knowledge of Prostate Cancer Questionnaire,[25] (2) Attitudes and Beliefs-Thomas Jefferson University Prostate Cancer Screening Survey,[26] (3) Attitudes toward help-seeking, based on the Cancer Awareness Measure 2020[27] and (4) General health questions were asked using the EuroQol 5-Dimension 5-Level (EQ-5D-5L) health questionnaire.[28] Pre- and post-questionnaires were administered online using Qualtrics. The pre-questionnaire was completed at home prior to attending the workshop. The post-questionnaire was completed either immediately following the workshop or for the majority of participants, at home within 2 weeks following the workshop.

For the qualitative component, an interview schedule was developed using open-ended questions to explore intervention acceptability through focus groups, gathering insights on workshop content, delivery and perceived impact, and probing for facilitators, barriers and suggestions for intervention improvement.

Data analysis

Qualitative data were analysed by two researchers (FC-dJ, ER) using thematic analysis[29 30] and intervention acceptability was explored using the Theoretical Framework of Acceptability as it provides a structured approach to understanding how participants perceive and respond to an intervention across key domains such as affective attitude, burden and perceived effectiveness.[31] Quantitative data were analysed using Wilcoxon Signed Rank Tests to assess and compare pre- and post-intervention scores.

As the quantitative and qualitative components addressed distinct objectives, the qualitative and quantitative findings are presented separately rather than integrated, as is preferred in mixed-methods studies.[32 33]

Patient and public involvement

The PROCAN-B study was built on strong community partnerships from the outset, shaping the project from its initial proposal development. A PICE) group (n=13) was a key part of the study. They were regularly engaged throughout all stages of the research, including intervention development, data collection preparation, training for intervention delivery, data analysis, meaning making and dissemination. We also recruited two community members as 'Recruitment Leads', who were crucial members of the research team. They conducted participant recruitment in collaboration with one of the researchers (OSO), who is also a member of the community.

Positionality

The study team, led by the principal investigator, a White female academic, included both Black and White researchers as well as Black community members. All data collection was undertaken by the Black male researchers, as was preferred by the PICE group, while all researchers contributed to design and analysis.

Quantitative results

A total of 62 Black men, aged 42–63, were recruited as Intervention participants, 21 in Intervention 1, 41 in Intervention 2. Participants' sociodemographic characteristics can be found in table 1. These are presented separately for Interventions 1 and 2, as the pre-post survey design was only conducted with the participants of Intervention 2. Focus group participants were a subset of all intervention participants.

Comparison of pre- and post-intervention scores

There was a significant increase in participants' worries and concerns about prostate cancer and screening-related risks after the intervention, rising from a mean of 2.07 pre-intervention to 2.68 post-intervention (table 2; Z=2.799, p=0.005). Additionally, participants' perceived susceptibility to prostate cancer increased significantly, from 2.10 to 2.68 (Z=2.908, p=0.004). Participants' intention to have a prostate health check significantly increased following the intervention, from 1.66 to 2.49 (Z=3.975, p<0.001). Intention to discuss prostate health checks with a doctor in the next 6 months also increased significantly, from 2.10 to 3.32 (Z=3.567, p<0.001).

The belief that prostate cancer can be cured if found early improved significantly, from 3.38 to 3.66 (Z=2.502, p=0.012). Conversely, significantly fewer men believed that prostate cancer cannot be cured if one gets it, with scores falling from 3.17 to 1.63 (Z=−4.437, p<0.001). Furthermore, significantly fewer men agreed that there are more important things to do than go for prostate health checks (2.90–1.63, Z=−5.455, p<0.001 and that one does not need to be tested for prostate cancer if there are no prostate problems (2.88–1.49, Z=−5.047, p<0.001).

Significantly more participants agreed that men with a family history of prostate cancer are more likely to develop it, with scores rising from 3.05 to 3.71 (Z=3.690, p<0.001). Intention to discuss prostate health checks with a doctor in the next 6 months increased from 2.10 to 3.32 (Z=3.567, p<0.001). Lastly, participants' overall knowledge about prostate cancer significantly increased, from 0.63 to 6.07 (Z=4.939, p<0.001).

There were no significant changes in participants' salience (the perceived importance of having a prostate health check) and coherence (the extent to which attending a prostate health check made sense to participants) of prostate health checks (Z=1.440, p=0.150). Similarly, the belief that scheduling a prostate health check is easy did not change significantly (Z=1.854, p=0.064), although this result approached significance. The belief that one's family is likely to encourage a prostate health check also did not show a significant change (Z=1.622, p=0.105).

Qualitative evaluation of the intervention

Qualitative data from all four focus groups combined (n=40) were analysed according to three Theoretical Framework of Acceptability themes: (1) affective attitude towards the intervention, (2) burden of the intervention and (3) perceived effectiveness of the intervention, including recommendations for improvement. 'S' refers to Scottish and 'NE' to North-East participants.

Affective attitudes

This theme describes how participants felt about the workshop's content and delivery.

Workshop content

Participants stated they liked the workshop's comprehensiveness and that it contained different elements, which they all found important, such as the GP's health education, the faith element and input from women. All participants shared that hearing from prostate cancer survivors' lived experiences made the subject real. Stories of lived experiences were described as 'powerful'" (S13). Some participants highlighted that this could help people to take prostate cancer more seriously. Hearing survivors discuss their illness and experiences of treatment provided hope and reduced anxiety. Participants particularly liked survivors discussing aspects they were worried about, such as the procedure of prostate cancer testing and side effects from treatment options.

> When somebody shares lived experience, it goes a long way to give you the impetus and say, "I should go and get tested, if he had the courage to do it. And they talked about the challenges of men, the fear, whereby to talk about the treatment led to impotence, and some of the things they worried even to share with fellow men. So, they really gave us the hopes and fears around the whole thing. (S16)

All participants emphasised the importance of incorporating faith, with religious leaders encouraging early diagnosis and prostate cancer health behaviour. Participants described their community as religious, and one in which '*faith plays a vital role in society*' (S14). They stated that engaging with religious leaders is key, as these leaders are regarded with '*trust, authority, influence and being closer to God'* (NE1). One participant also highlighted that, regardless of religion (eg, Islam or Christianity), God wanted them to take responsibility and look after their health. Two participants (NE26, NE33) highlighted that faith can also be a barrier to healthcare. Participants thought the workshop's faith element, supported by religious leaders, would be particularly helpful for people who rely on prayers instead of going to the doctor.

> Actually, the video was a great one. And, you know, people […]believing, "My God will save me. There is no need to go to the doctor," and so on and so on. So, inviting the religious leaders, it's a great exposure for people to really know that even if you are a Christian or Muslim, that doesn't mean or deprive you from

Table 1 Sociodemographic characteristics of participants Interventions 1 and 2

Variable	Categories	Intervention 1 (n=21) frequency (percentage)	Intervention 2 (n=41) frequency (percentage)
Site	North-East of England	10	21
	Scotland	11	20
Age	Range	44–59	42–63
	Mean	49.1	49.11
	SD	4.2	4.62
Marital status	Married or in a domestic partnership	18	35
	Divorced/separated	2	3
	Single	1	3
Employment status	Employed full-time (40 or more hours per week)	11	23
	Employed part-time (up to 39 hours per week)	5	10
	Unemployed	1	3
	Student	4	5
Disability status	Yes	0	2
	No	21	39
Main language spoken at home	English	16	29
	Igbo	1	4
	Akan	1	1
	Luganda	2	1
	Shona	1	0
	Oshiwambo	0	1
	Other languages	0	4
	Prefer not to say	0	1
Religion	Christian (Catholic)	5	7
	Christian (Non-Catholic)	16	28
	Muslim	0	2
	None	0	2
	Other (Jehovah's Witnesses, Seventh-Day Adventist)	0	2
Ethnicity	Black African	19	40
	Black Caribbean	1	0
	Other Black background	1	1
Highest educational qualification	Degree or higher degree	19	33
	Higher education below degree level	2	3
	A-levels or higher	0	2
	No formal qualifications	0	1
	Other	0	1
	Prefer not to say	0	1
Highest income earner's job	Higher managerial/professional/administrator	5	9
	Intermediate managerial/professional/administrative	8	17
	Supervisory/clerical/junior managerial/professional/administrative	3	6

Continued

Table 1 Continued

Variable	Categories	Intervention 1 (n=21) frequency (percentage)	Intervention 2 (n=41) frequency (percentage)
	Skilled manual worker	2	2
	Semi-skilled and unskilled manual worker	0	2
	Casual labourer/pensioner/student/unemployed	0	2
	Prefer not to say	3	3

> taking care of yourself or taking tests when it's needed, or visiting your surgery when it's needed. (NE26).

Participants shared that they liked the use of videos. They believed that including visual information in the workshops is powerful, noting that some people learn better through visual information. One participant (NE5) suggested that the workshop would benefit from more videos, as he believed these to be a particularly useful tool. Videos featuring celebrities, such as Morgan Freeman, were used in the intervention to raise awareness of prostate cancer risk and were welcomed by some participants. They shared that these celebrities are respected and held in high esteem and therefore if health promotion messages are delivered by them, this might enable people to take the message seriously. Some Scottish participants, however, were less certain about using celebrities in health promotion as they were unsure of the message's authenticity. They wondered if celebrities were expressing views they were paid for, rather than what they truly believed. These participants preferred to hear from someone with lived experience.

> I'm quite cynical about celebrity endorsements because- and I think, at certain times, it doesn't- Because you will look at somebody- The guy next door tells you something, you're most likely to believe them. But because the celebrity has endorsed so many things, you start assuming it's just for the sake of they were paid some to sit and try to arouse something in me. (S16)

Table 2 Comparison of pre- and post-intervention scores (n=41), mapped onto the I-SAM

Variable	Pre-Mean	Post- Mean	Standardised test statistic (Z)	P value
Significant findings				
Worries and concerns about prostate cancer and screening-related risks (automatic motivation)	2.07	2.68	2.799	0.005
Perceived susceptibility to prostate cancer (reflective motivation)	2.10	2.68	2.908	0.004
Intention to have a prostate health check (decided to act)	1.66	2.49	3.975	<0.001
Belief that prostate cancer can be cured if found early (reflective motivation)	3.38	3.66	2.502	0.012
Belief that prostate cancer cannot be cured if one gets it (reflective motivation)	3.17	1.63	−4.437	<0.001
Belief that there are more important things to do than go for prostate health checks (reflective motivation)	2.90	1.63	−5.455	<0.001
Belief that one does not need to be tested for prostate cancer if there are no prostate problems (reflective motivation)	2.88	1.49	−5.047	<0.001
Belief that men with a family history of prostate cancer are more likely to develop it (reflective motivation)	3.05	3.71	3.690	<0.001
Intention to discuss prostate health checks with a doctor in the next 6 months (decided to act)	2.10	3.32	3.567	<0.001
Level of prostate cancer knowledge (psychological capability)	0.63	6.07	4.939	<0.001
Non-significant findings				
Salience and coherence of prostate health checks (reflective motivation)	1.88	2.20	1.440	0.150
Belief that scheduling a prostate health check is easy (psychological capability)	3.34	3.71	1.854	0.064
Belief that one's family is likely to encourage a prostate health check (social opportunity)	3.68	3.85	1.622	0.105

I-SAM, Integrated Screening Action Model.

Participants also liked the videos of women who encouraged them to stay healthy for the family's benefit. They valued the emphasis on family and kinship networks and made them realise that looking after their health was not just for them, but for their wives and children too, and emphasised the importance of prostate cancer testing. Some participants also shared that including women in the promotion of early diagnosis of prostate cancer was important, as they believed women play a vital role in men's health, not only by encouraging men, but also by reminding them to go for check-ups. One participant (S14) described this as '*the women pushing men to go for testing*'. A few participants believed that including women in the workshop would be beneficial, although most participants believed that it was more comfortable for men to be among themselves to discuss intimate topics (eg, impotence). Therefore, videos were preferred.

> Yeah, talking about it for the women who spoke, it was also a masterstroke strategy as well. You know, for those of you who are Christians, if you want to convert a family, the first thing you do is you go and engage the women. (Male 25 S)

Workshop delivery

Participants shared that having multiple sources of information and a combination of speakers was beneficial. For many participants, the GP's health education component was their favourite part of the workshop.

Participants described the GPs (one in each region) as professional, calm and responsive, making information accessible and easy to understand, explaining information accessibly, which was perceived as helpful and allowed them to relate to the information. Participants noted the GPs also '*debunking*' (NE1) misinformation, with their status as a medical doctor providing them with the credibility to do so. This credibility was important to participants, leading them to consider the information reliable, '*based on research evidence and fact-based' (S25*), something they valued and missed with online information. They found the opportunity to ask questions valuable and the GPs made them feel at ease to ask questions, no matter how '*naïve or silly*' these questions felt (S16).

Although participants thought that having Black GPs was not essential and that the information shared was what counted most, both GPs being Black made the workshop more '*meaningful*' (S8). It made participants feel comfortable and able to relate to the GP. They shared that they could open up and felt that the GP would understand them, coming '*from their own culture*' (S13), and consequently would have their '*best interest at heart*' (S15). Although participants accepted that their own healthcare professional might not be Black, they believed that community health promotion efforts should be conducted by and for the Black community, by individuals with '*the same characteristics*' (S16).

> For me, I think one of the things that broke down that barrier was the doctor who came to talk to us, being one of us, being one of our own, an African talking to an African. That was, to me, one of the things that made some of us feel at home, to open up and actually speak our minds. (NE1)

Participants commented that the peer-led model was an important part of the workshop, which they particularly liked, and that a workshop run by Black people, for Black people, was important to them. Having only Black people in the room was perceived as comforting by participants and contributed to what they described as a 'free' and comfortable atmosphere, allowing for engaging interaction. One participant shared that he felt somewhat '*detached if White people had presented the workshop*' (NE30). However, being among Black people, they could relate to others in the room and to the materials presented. Participants felt that this made it easier to make sense of the learning. Ensuring cultural understanding and getting the nuances right was seen as important in community health promotion, both for effectively conveying the message and engaging with workshop participants. It was expressed that men, and especially Black men, find it difficult to talk about their health, which further increased the need for this intimate safe space.

> So having someone from our own communities talking about these issues and also having presentations with people from our community makes it relatable. And it helps us to actually understand the enormity of the issue that we are talking about and therefore, you know, it gets us to the place where we need to act, we need to do something about this. (NE30)

Participants shared that the workshop was well organised. Participants were surprised that food was offered and were appreciative of this gesture. Participants also appreciated the gift vouchers, but felt these were unnecessary and would have preferred to forgo them so that additional participants could attend the workshop.

Burden

The theme of burden refers to the perceived amount of effort required to participate in the workshop. Participants were also keen to discuss challenges in engaging in prostate cancer health behaviour in general. While the workshop was viewed as manageable, participants suggested that broader change in prostate cancer health behaviour would not happen overnight and that having patience with the community was essential to effective health promotion. Study elements were also discussed, such as the data collection measures. Overall, participants perceived questionnaires as acceptable in length and content. However, they thought that members of the Black community may not like filling in questionnaires.

> I could see people, not complaining, but not too happy about it. I am one of them. I wasn't impressed

> with the forms that we were filling, too long and some questions repeated. (NE2)

Perceived effectiveness

This theme reflects perceptions of how effectively the intervention achieved its purpose, including recommendations to improve this.

Perceived effectiveness and impact

Participants perceived the workshop to be effective and shared that it impacted positively on them. Participants discussed that it helped to tackle misconceptions surrounding prostate cancer, and they expressed that the workshop's information and interactive activities increased their understanding of prostate cancer risk, which they described as empowering. Participants now understood that early diagnosis is key and that cancer does not have to be a death sentence. Participants indicated they used to think that prostate cancer only happened to older men and, therefore, believed that prostate cancer information did not apply to them. Understanding that Black men are at elevated risk was new and important to them, but also raised anxiety.

Participants also revealed new health behaviour changes and had started sharing the newly learnt information with their friends and family. The workshop gave them confidence to discuss prostate cancer with others. As a result of the workshop, particularly the interactive components, they also felt empowered in dealing with healthcare providers.

> For me, it gives me a lot of confidence, and to be honest, to an extent where I cannot wait till the second day before I book for a test for prostate cancer. I've gone to the hospital and then they make the necessary check on me. So this is how confident I am. It's, like, what we used to say that you can be suffering and be smiling, which is what men, most of us, go through to talk about it, to discuss about it. We feel so ashamed, so low esteem to be able to talk about it or afraid for anyone to know or to see it. (NE7)

Several of the men mentioned their intention to go for a prostate health check as a result of attending the workshop, and several men had actually gone for their prostate health check.

> I forgot to add, I've had my test, actually. The following day, I went to my GP straight away. (Laughter). (S25)

> Yes, my feeling has changed, although it triggered a little fear in me. I remember when I went to see my GP last week, I had to raise the question that I would love to do a prostate cancer check. Yes, my family have died from it, but I wasn't really too serious about it, you know? But after the workshop, I am very hungry to do this check. (S14)

Recommendations to improve effectiveness

Participants also provided recommendations to improve the workshop further. Some men believed that common misconceptions could be tackled more directly. For example, at the time of workshop delivery, a YouTube video was circulating that presented the message that Black men were developing prostate cancer due to insufficient sexual activity. Although some men raised this issue in the workshop, they would have preferred the discussion to have been instigated by the workshop. Participants would have also liked to hear more about reasons for the elevated prostate cancer risk for Black men. A focus on prevention and what men could do in their day-to-day lives to lower prostate cancer risk was also noted.

> I personally was trying to draw a link between sex and prostate cancer but I know that was a huge discussion. (NE11)

Participants believed that, as the community lacked awareness of prostate cancer risk, bringing awareness to the community by delivering these types of workshops in churches or mosques would be useful. Participants commented that including religious leaders in prostate health promotion was powerful but also thought that it might be difficult to engage these leaders. Some participants offered their help in making more connections with religious institutions and their leaders.

As a potential means for improving the workshop and lowering barriers to engaging with prostate health checks, a few participants suggested facilitating PSA testing within the workshop, that is, for men to be offered to have the blood test there and then.

Some participants suggested using a hybrid format, or offering online workshops, to facilitate access, although others argued that the face-to-face interaction was important to facilitate connection. Although there were videos of survivors of prostate cancer, participants would have preferred survivors to be physically present at the workshop. Several participants discussed that additional workshops were needed to ensure more men could benefit from them.

DISCUSSION

This study conducted a mixed-methods evaluation of a peer-led, co-produced intervention to encourage early diagnosis of prostate cancer among Black African and Caribbean men in North-East England and Scotland. Quantitative pilot data suggested the intervention had a significant impact on how Black men understood and approached prostate cancer. Awareness increased, with participants exhibiting improved knowledge of the disease and becoming more concerned about their prostate cancer risk after attending. Beliefs also changed, as men felt more strongly that early detection improves outcomes and became more hopeful about survival. Importantly, the workshop increased the men's confidence in accessing healthcare for a prostate health check and encouraged proactive steps, with more participants expressing willingness to check their prostate health and several participants reporting having been to their GP for a PSA test. Participants overwhelmingly liked the workshop and felt positive about its content and delivery. Overall, the study showed that the co-produced workshop has the potential to change how these men thought and felt about prostate cancer risk, increasing awareness and promoting action.

Raising awareness and increasing knowledge through health education was a key component of the PROCAN-B intervention. Prostate cancer presents a significant health inequality for Black men.[3] A community-centred and participatory approach can help raise awareness of prostate cancer risk and encourage Black men to seek early diagnosis.[34–41] Developing a basic understanding, such as what a prostate is, what prostate cancer symptoms are, as well as understanding the advantages and disadvantages of a prostate health check, facilitates informed decision-making. Hence, many prostate cancer interventions targeting Black men are focused on raising awareness and increasing knowledge.[6] In the context of prostate cancer, without a clear understanding of prostate cancer risk, one is unlikely to engage with prostate cancer health checks or seek medical care. However, knowledge alone is not sufficient to prompt action.[42 43] Importantly, for health education to be effective, it must be delivered in a culturally appropriate and meaningful way. Without this, messages may not resonate or may be mistrusted, limiting their impact.[12 44]

The PROCAN-B study highlights the need to embed health education components within culturally sensitive frameworks to ensure messages are both heard, received and acted on. Health literacy is a key component of culturally sensitive frameworks and has been associated with knowledge gain of cancer risk.[45] However, health education should not just deliver information. Effective, health literate, interventions ensure that individuals can make sense of this information, engage with it and act on it.[42 43] For that to happen, the information has to reflect cultural and social contexts and people have to be able to connect with the information offered, and make sense of it. Cultural tailoring ensures that the content of interventions reflects a community's cultural beliefs and values,[44] which can only be achieved by working in partnership with the target communities, allowing them to take control of intervention content and delivery, and ultimately striving for empowerment.[46] Cultural relevance supports empowerment of communities by building trust through using peer-led approaches, using language that participants can connect with, and involving trusted members of the community and community leaders. Empowerment builds confidence, which is what was found in the PROCAN-B study, and is supported in relevant literature.[41 47]

The peer-led approach was a powerful element in the PROCAN-B study and participants valued the comfortable and safe atmosphere this provided. Using a peer-led, or lay health advisor, model builds trust[48] and is vital in terms of scalability. The history of systemic racism and discrimination in healthcare has led to a lack of trust in the medical system by many Black men.[10] This distrust can make it challenging for them to seek medical, including prostate cancer, care.[10] A community-centred or participatory approach can help build trust by engaging Black men in the process of tackling barriers to accessing care and empowering them to take charge of their health. This approach puts communities at the heart of intervention development and delivery by strengthening communities, and meaningful community engagement can contribute to tackling health inequalities.[12] Asset-based approaches, utilising the strengths of a community in health promotion, are an important part of this.[11] Black African and Caribbean communities are considered to be collectivist, in which people see themselves foremost as part of a larger social unit, whether that includes family networks, the ethnic group one identifies with, or their faith group.[49] Collectivist components were incorporated in the PROCAN-B intervention, such as the support of women, which participants liked although they preferred women not to be present in the workshop. This finding aligns with a US trial with 262 African-American men randomised to either a men-only or a mixed-gender workshop on decision-making for prostate cancer screening, where including women in the workshops did not have a significant impact on decision-making outcomes.[50]

Faith-based approaches, in which health promotion aligns with principles underpinning one's faith, are another asset-based strategy for communities holding strong religious beliefs. Some US-based studies have utilised faith settings, such as churches, to connect with the Black community and were therefore faith-placed, rather than necessarily faith-based.[47 51 52] In a small randomised controlled trial (n=49) in the USA, workshops regarding prostate cancer screening decision-making that included faith-based messages, compared with non-faith-based workshops, were found to be more effective in increasing knowledge and changing attitudes toward prostate cancer screening.[53] The PROCAN-B intervention was not faith-placed and set in community centres but incorporated faith-based messages, delivered by religious leaders. Faith-based health promotion messages that are framed using religious language and emphasise that the religion encourages health behaviours can promote these health behaviours in a culturally and spiritually meaningful way. Viewing one's body as spiritually sacred, as often encouraged by religious beliefs, can be utilised to nudge people to take responsibility for their health.[54] In the PROCAN-B study, participants valued the inclusion of faith-based messages and stressed this was a useful way of connecting with the Black community and making health promotion relevant, which is supported in the literature.[53 55 56] Participants also valued message delivery by religious leaders. Involving trusted members of the community who have credibility, such as community and religious leaders, has been found to reduce distrust and is another effective method of ensuring cultural relevance, provided they have received training in health promotion messaging.[57] Although the PROCAN-B study was designed as a pilot study, some feasibility-related observations were made. Recruitment of participants was achieved within the study's timeframe, peer facilitators were successfully trained, and the intervention was co-produced and delivered as intended. Questionnaire completion rates and acceptability of the intervention were good. These findings can inform the design of a future definitive evaluation.

Strengths and limitations

This study has several strengths and limitations. The PROCAN-B study was built on strong community partnerships from the outset, shaping the project from its initial proposal development, through all stages of the research cycle. This is a strength and ensured cultural appropriateness of intervention content and delivery. The mixed-methods design was a further strength, as the qualitative and quantitative components allowed both an exploration of intervention acceptability, as well as pilot effectiveness testing. However, true integration of the qualitative and quantitative results, as is ideal in mixed-methods research, was not possible due to the different objectives of each component.[32 33]

A limitation is that this was a pilot study with a small sample size. Data on sexuality were not collected following advice from our PICE group and Recruitment Leads that this might be perceived as intrusive. We aim to revisit this issue in consultation with our PICE group in future work to ensure that potential differences by sexual orientation can be investigated; however, in this study, we prioritised investigating intervention acceptability and building trust.

The sample was highly educated and could have been more diverse in terms of Black ethnicity and age. These limitations reduce the generalisability of our findings. To explore the intervention's effectiveness further, effectiveness testing must be conducted in a more robust manner. However, even if the intervention is found to be effective, a limitation of this type of community-based research is that sustainability beyond the funded study period is difficult to achieve without ongoing investment. To help address this, we are developing a manual that includes all the steps of the research, workshop delivery and materials, as well as the peer-facilitator training programme. The aim is to build local capacity to continue delivering and adapting the intervention.

CONCLUSION

Research on prostate cancer among Black men in the UK remains limited, leaving important gaps in the evidence base. Novel approaches to engaging with target populations in tailored ways, such as the PROCAN-B study, are key to improving prostate health outcomes for Black men, who are at increased risk of prostate cancer. This may ultimately benefit the Black community by increasing the chance of early diagnosis and, in turn, improved outcomes for prostate cancer patients. In conclusion, the community-centred and participatory approach applied in the PROCAN-B study has the potential to contribute to addressing health inequalities, increasing awareness, building trust in healthcare and improving prostate cancer outcomes.

Acknowledgements We would like to thank our PICE group for their fantastic commitment and contribution. We are also very grateful to our participants.

Contributors FC-dJ conceived the study. FC-dJ, JE, JK, MKM and KR contributed to designing the study approach and obtaining the funding. OSO, LN, JK and MK delivered the intervention. OSO, LN and JK collected the data. FC-dJ and ER analysed the qualitative data; JE analysed the quantitative data. OSO, LN, JK and MK conducted the patient and public involvement. KR provided senior academic oversight. All authors supported the study throughout, contributed to editing drafts, and approved the final manuscript for publication. FC-dJ is the author responsible for the overall content as the guarantor.

Funding This study received funding from Prostate Cancer Research (6968). The funders had no role in the design of the study, data collection, analysis, interpretation of data, or writing of the manuscript.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by Ethical approval was obtained from the Research Ethics Committee of the University of Sunderland on the 7th of December 2022 (#015660). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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