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Are community-delivered patient navigation interventions the answer for targeting colorectal cancer screening inequalities? Findings from Lancashire's "Call for a KIT" intervention

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Background: The 'Call for a Kit (CFAK)' initiative offers consultations for colorectal cancer (CRC) screening non-responders through person-centered, community-delivered patient navigation strategies. This study investigated CFAK's impact on tackling inequalities in CRC screening participation since the new fecal immunochemical test (FIT) implementation.

Methods: 2,360 bowel cancer screening non-responders were contacted via telephone and offered in-person or telephone consultations as part of the CFAK intervention between July 2022 and February 2023. Outcomes included uptake of the consultation offer and subsequent completion/return of a FIT kit. The intervention's effectiveness in reducing inequalities was assessed using multivariate logistic regression.

Results: Of 2.360 individuals calls, 333 attended a consultation, requested a test kit and completed a test, equating to a 14.1% completion rate across the sample. FIT kit return was higher among individuals with Indian (22.0 vs. 13.6%; adjusted odds ratio (aOR): 2.26, 95% confidence interval (CI): 1.52–3.34; 0.001), Black, mixed, or other ethnic backgrounds than white adults. Importantly, people with disabilities (33.7 vs. 12.7%; aOR: 3.58, 95% CI: 2.49–5.14; 0.001) were more likely to return a test kit compared to people without a disability.

Conclusion: The findings show that CFAK is more effective among marginalized groups, such as ethnic minority groups and people with learning disabilities, who are less likely to participate in bowel cancer screening when routinely invited.

KEYWORDS
cancer screening, fecal immunochemical test, health promotion, inequalities, intervention, non-attenders

Introduction

Colorectal cancer (CRC, also known as bowel cancer) is the fourth most common cancer in England and when diagnosed at an early stage, almost all patients can survive for ten years or longer (1). Since 2006, the National Bowel Cancer Screening Programme (BCSP) offers all adults aged 60–74 (extended to 50 years old in 2021) the opportunity to complete a home-based stool sampling test that aims to detect bowel cancer at an early stage when no symptoms are experienced. The majority of CRC detected through screening is at early stage when treatment options are more effective. The success of screening largely depends on uptake of the test among the invited population.

Since the introduction of the easy-to-complete kit called the fecal immunochemical test (FIT), almost 7 out of 10 people participate in screening (2). FIT has demonstrated an increase in uptake across all deprivation quintiles (3). However, despite the significant efforts that have been made to target screening non-responders that inequalities in CRC screening participation have been persistent between the most deprived and the least deprived with over 20 percentage points difference in uptake (2, 4). This highlighted that population-based interventions have yet to make a significant impact on individuals who are still less inclined to take part and the structural barriers to screening are remaining. Evidence further demonstrates that people from non-white ethnic communities, do not use English as their first language, people with learning disabilities, sensory impairments (5) and severe mental illness (6) are disadvantaged across all cancer screening programmes, primarily in BCSP (7).

A range of modifiable barriers contribute to these disparities. Previous systematic reviews have reported limited awareness of the test and its benefits, unclear or insufficient information in screening invitations, and practical difficulties such as uncertainty about how to complete the test or challenges receiving and returning kits (8, 9). These issues are often compounded for disadvantaged groups, including migrants, people with low English proficiency, and those with disabilities, who may also face additional communication, cultural and structural barriers that further hinder engagement with screening (8, 10).

Thus, it is important to test, develop and evaluate interventions which will improve outcomes from those who are likely to be facing health inequalities in line with the NHS England's national framework for reducing inequalities: the 'CORE20Plus5' framework (11).

In 2015, the National Health Service (NHS) England North West commissioned a local community-engagement intervention, called: "Call for A Kit" (CFAK) in attempt to improve CRC screening uptake among GP practices with less than 60% uptake (12). The CFAK is delivered by a person-centered, non-clinical health promotion team with cultural competence training within the Lancashire BCSP and parallels the key components of patient navigation interventions (13). Recent systematic reviews have shown that such interventions can increase CRC screening rates, particularly among minority groups and economically disadvantaged populations (14, 15). CFAK involves GP practices identifying individuals who are not up to date with CRC screening. All potential individuals receive a text-message informing them that they would soon receive a phone call from the health promotion team and they can opt-out if they do not wish to receive this phone call. During the call, the health promotion team offers individuals the choice of a 15-min in-person or telephone consultation to discuss CRC screening. During the in-person consultation, barriers to CRC screening are identified and discussed. Participants are shown the screening kit and a video on how to use it. They are also offered a replacement kit if needed. Similarly, during the telephone consultation, barriers were identified and discussed, with a new replacement kit offered if needed. At the end of the consultation, the individuals are encouraged to decide if they would like to a new test kit to be requested from BCSP on their behalf. Previous evaluation of CFAK during the use of fecal occult blood test (FOBt) in 2019 found that approximately 15% of those contacted by the health promotion team ordered and returned a test kit with positive impact on those from ethnic minority backgrounds and with the majority (71.5%) opting for in-person consultations (16). In 2020–2021, the intervention was paused due to the pandemic and changes within the BCSP.

The present project aimed to evaluate to what extent CFAK's intervention model continues to be effective reducing inequalities among underserved communities (e.g. those with social deprivation, disabilities and ethnic minorities) within the FIT-based CRC screening participation among previous screening non-responders. Furthermore, we assessed whether CFAK is an equitable intervention i.e. are there differences in the characteristics of individuals likely to engage with CFAK.

Methods

Study design

This is a service evaluation study using observational anonymised data collected as part of CFAK. We evaluated the call logs of the CFAK intervention across 27 GP practices in Lancashire, between July 2022 and February 2023.

Participants

Data included men and women registered with one of the 27 participating practices who had not returned their CRC screening FIT kit within 18 weeks of their most recent invitation and had not opted out of the CFAK intervention. CFAK eligible individuals were identified by GP practices using data available from their clinical systems.

Data collection

The health promotion team kept a call log for every participant included in the study. The log was more detailed than the one used in the previous evaluation (8) and had two sections: one for collecting demographic information from the clinical system and another for tasks and outcomes.

In the first section, the log recorded the GP practice's postcode, used to calculate the Index of Multiple Deprivation (17), and the first three elements of the individual's postcode to determine their region. It also included the individual's gender, ethnicity (White, Indian, Pakistani, Black, mixed, or other), disabilities (learning, physical, mental health, sensory disabilities, or long-term illnesses), and age range (60–64, 65–69, and 70–74).

The second section recorded the day and time of each attempted call, whether the call attempt was successful (i.e., telephone answered by the participant), and whether the participant agreed to participate in CFAK. For those who agreed to participate, their preference for an in-person or telephone consultation was documented. Additionally, the log recorded whether they subsequently attended a consultation and whether a test kit was ordered, completed, and returned, with the latter being checked 13 weeks after issuing the replacement. Finally, those who answered the telephone were asked why they did not return their kit for the most recent screening round.

Outcomes

The primary outcome was the proportion of participants who returned a test kit following their CFAK consultation. Secondary outcomes included the proportion of participants who answered the phone, accepted the CFAK invitation, opted for an in-person or telephone consultation, and the main reasons given for not participating in the previous screening round.

Statistical analysis

No formal sample size calculation was done. This exploratory evaluation aimed to understand the impact of the CFAK intervention after FIT was implemented. The sample size was based on the number of GP practices participating during the study period using this particular call log. Multivariate logistic regression was used to assess the effectiveness of CFAK to facilitate FIT kit return among participants from marginalized groups, compared with respective counterparts. The effectiveness of the intervention was assessed on an intention-to-treat basis, as well as a per protocol basis. In the intention-to-treat model, all participants the health promotion team attempted to contact were included. In the per protocol model, only those the team were successfully able to contact, and agreed to participate in CFAK, were included.

Multivariate logistic regression models were also used to assess variation for secondary outcomes, i.e. the proportion of individuals from marginalized groups, and respective counterparts, who were successfully contacted, agree to participate in CFAK, opted for a telephone consultation, opted for a face-to-face consultation, attended a telephone consultation, attended a face-to-face consultation, and requested a test kit. The regression models included gender, age, ethnicity, disability, IMD quintile, and the region where the individual lived as covariates. Descriptive statistics were used to report the frequency of reasons for non-completion of previous FIT screening round, overall sample, and by ethnic group, and disability status. All statistical analyses were conducted using Stata/IC version 16.0 (StataCorp LP, College Station, TX, USA).

TABLE 1 Description of the study sample ($N = 2,360$).

Variable	*N*	(%)
Gender		
Female	989	(41.9)
Male	1,371	(58.1)
Age		
60–64	1,223	(51.8)
65–69	766	(32.5)
70–74	371	(15.7)
Ethnicity		
White	1,392	(59.0)
Indian	277	(11.7)
Pakistani	412	(17.5)
Black, mixed or others	43	(1.8)
Unknown	236	(10.0)
Disability		
No	2,197	(93.1)
Yes	163	(6.9)
Area level deprivation		
IMD quintile 5 [3–698]	636	(26.9)
IMD quintile 4 [1,236–1,940]	361	(15.3)
IMD quintile 3 [1,987–4,071]	465	(19.7)
IMD quintile 2 [5,521–7,612]	532	(22.5)
IMD quintile 1 [10,382–13,575]	366	(15.5)
Region where patient lives		
Blackburn	975	(41.3)
Blackpool	618	(26.2)
Preston	45	(1.9)
Liverpool	641	(27.2)
Wigan	81	(3.4)

IMD quintiles are calculated based on the rank of the GP practice which ranges from 1 (the most deprived area) to 32,844 (the least deprived area).

Results

Sample characteristics

Table 1 shows that most non-responders targeted by CFAK in July 2022–February 2023 were male (58.1%), aged between 60 and 64 (51.8%), lived in Blackburn (41.3%), had a White ethnic background (59.0%), and had no disabilities (93.1%). Indian (11.7%) and Pakistani (17.5%) individuals constituted the most frequent ethnic minorities.

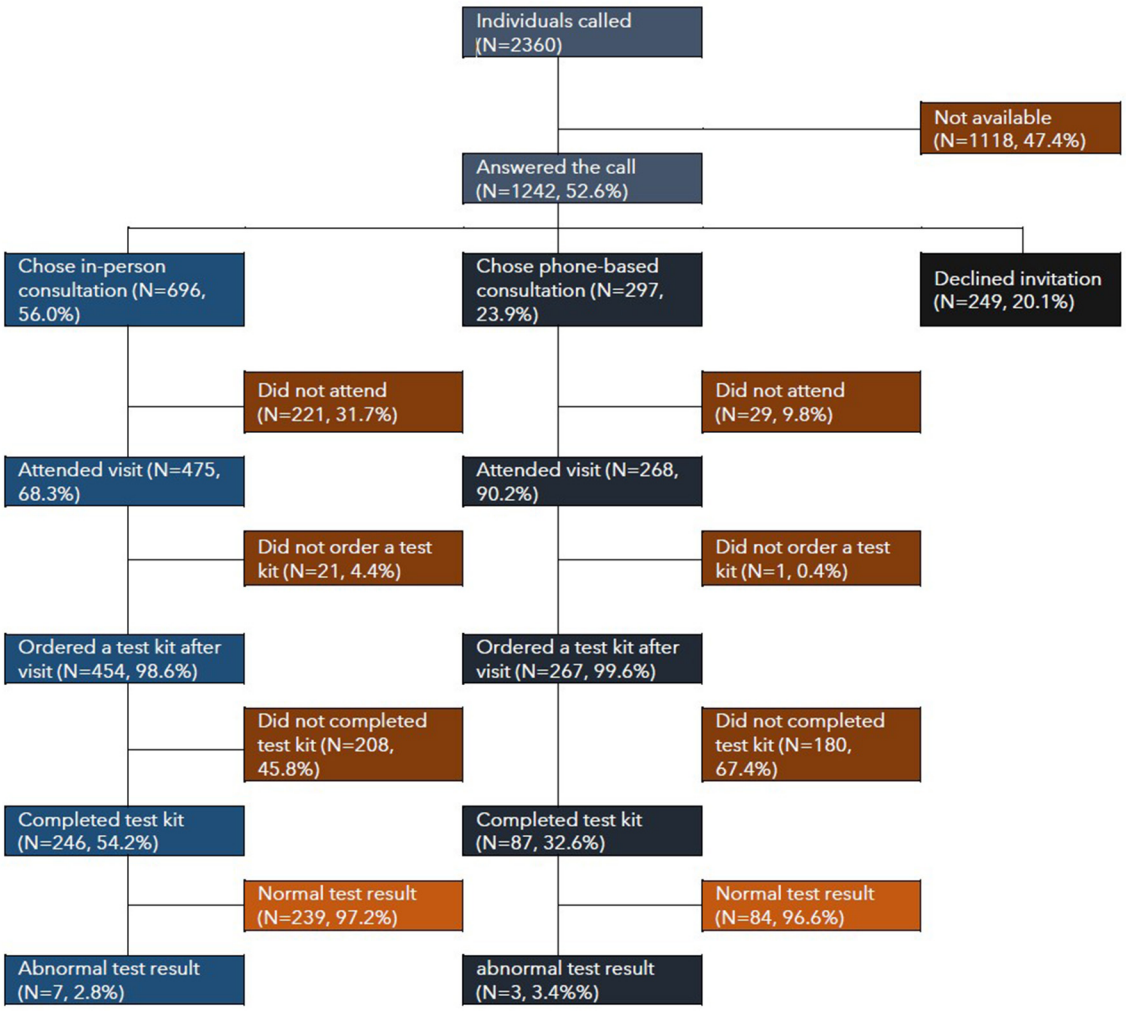

FIGURE 1
Flow chart describing the study participants from 27 GP practices in Lancashire, between July 2022 and February 2023.

Participant flow

Figure 1 shows that, of the 2,360 non-responders who were called, 1,242 (52.6%) were contacted successfully (answered the call). Of these, 249 (20.1%) declined the invitation to participate in CFAK, 696 (56.0%) accepted an in-person consultation, and 297 (23.9%) opted for a telephone-based consultation. Of the in-person consultations, 475 (68.3%) attended. Approximately half of those who attended an in-person consultation ordered and returned a test kit (239/475, 50.3%). Phone-based consultations contributed an additional 84 completed test kits (84/267, 31.5%).

Answering the phone call and preference for consultation (REACH)

The adjusted regression results in Table 1 indicate that individuals aged 70–74 were more likely to answer the phone than individuals aged 60–64 (59.7 vs. 50.9%; adjusted odds ratio (aOR) 1.40, 95% confidence interval (CI) 1.08–1.82; $p = 0.011$). Similarly, those of Indian ethnic background were more likely to answer than those of White British background (64.3 vs. 56.7%; aOR 1.60, 95% CI 1.18–2.17; $p = 0.003$), as were individuals with a disability compared with individuals without a disability (96.3 vs. 50.6%; aOR 23.18, 95% CI 10.16–52.86; $p < 0.001$). Conversely, individuals from less deprived areas were less likely to answer the phone (quintile 1: 48.1 vs. quintile 5: 55.7%; aOR 0.46, 95% CI 0.31–0.69; $p < 0.001$ and quintile 2: 49.1 vs. quintile 5: 55.7%; aOR 0.57, 95% CI 0.38–0.86; $p = 0.007$).

Supplementary Table S2 in the online supplementary file shows that individuals with Indian or Pakistani ethnic backgrounds, or those with disabilities, were more likely to accept the invitation to participate in CFAK compared with those of White ethnicity or no disability (Indian: 88.2 vs. 76.3%; aOR: 2.50, 95% CI: 1.45–4.31; $p = 0.001$; Pakistani: 87.7 vs. 76.3%; aOR: 2.21, 95% CI: 1.35–3.62; $p = 0.002$; disability: 90.5 vs. 78.4%; aOR: 3.77, 95% CI: 2.11–6.76; $p < 0.001$). In contrast, individuals aged 70–74 were less likely to

accept an invitation compared to those aged 60–64 (68.3 vs. 82.5%; aOR: 0.42, 95% CI: 0.29–0.62; $p < 0.001$), as were participants from Liverpool compared with those from Blackburn (71.4 vs. 84.3%; aOR: 0.41, 95% CI: 0.25–0.67; $p < 0.001$).

Regarding consultation type preferences, Supplementary Table S3 in the online supplementary file shows that individuals with Indian or Pakistani ethnic backgrounds were more likely to prefer an in-person consultation compared with those of a White background (77.1 vs. 66.0%; aOR: 2.38, 95% CI: 1.46–3.89; $p = 0.001$ and 74.9 vs. 66.0%; aOR: 2.10, 95% CI: 1.35–3.27; $p = 0.001$). Similarly, those with disabilities were more likely to prefer in-person consultations compared with those without disabilities (78.2 vs. 68.7%; aOR: 1.80, 95% CI: 1.16–2.80; $p = 0.009$), and those living in Liverpool were more likely to prefer in-person consultations compared with those living in Blackburn (77.1 vs. 68.0%; aOR: 2.28, 95% CI: 1.31–3.95; $p = 0.003$).

FIT order and return

Intention-to-treat analysis

Tables 2 and 3 shows the results of the primary analysis. Ordering a test kit was positively associated with being of Indian (45.5 vs. 30.1%; aOR: 2.49, 95% CI: 1.81–3.41; $p < 0.001$) or Pakistani background (37.6 vs. 30.1%; aOR: 1.62, 95% CI: 1.22–2.16; $p = 0.001$) compared to White, or having a disability (73.0 vs. 27.4%; aOR: 7.40, 95% CI: 5.10–10.74; $p < 0.001$). Conversely, individuals with unknown ethnic backgrounds (1.7 vs. 30.1%; aOR: 0.04, 95% CI: 0.02–0.12; $p < 0.001$), or those living in Liverpool instead of Blackburn (23.7 vs. 36.2%; aOR: 0.69, 95% CI: 0.49–0.99; $p = 0.042$), were less likely to order a test kit. A similar pattern was observed for returning test kits. Individuals with Indian (22.0 vs. 13.6%; aOR: 2.26, 95% CI: 1.52–3.34; $p < 0.001$), Black, mixed, or other ethnic backgrounds (27.9 vs. 13.6%; aOR: 2.65, 95% CI: 1.29–5.43; $p = 0.008$), or those with disabilities (33.7 vs. 12.7%; aOR: 3.58, 95% CI: 2.49–5.14; $p < 0.001$) were more likely to return a test kit than those with White ethnicity or no disability. In contrast, those with unknown ethnic backgrounds (0.9 vs. 13.6%; aOR: 0.06, 95% CI: 0.02–0.26; $p < 0.001$) or living in Liverpool (13.6 vs. 17.0%; aOR: 0.52, 95% CI: 0.33–0.82; $p = 0.005$) instead of Blackburn were less likely to return a test kit.

Per protocol analysis

Out of the 743 individuals who received either an in-person or phone consultation, 721 (97.0%) ordered a test kit, and 333 (46.2%) returned it (see Supplementary Table S4 in the online supplementary file). Ordering a test kit was less likely for those who attended an in-person consultation compared to a phone consultation (95.6 vs. 99.6%; aOR: 0.06, 95% CI: 0.01–0.53; $p = 0.011$) and for those with unknown ethnic backgrounds compared to White ethnic backgrounds (80.0 vs. 97.7%; aOR: 0.02, 95% CI: 0.01–0.65; $p = 0.027$). Returning a test kit was more likely for those who attended in-person instead of a phone consultation (54.2 vs. 32.6%; aOR: 2.46, 95% CI: 1.76–3.43; $p < 0.001$; see Supplementary Table S5 in the online supplementary file).

Main reason mentioned for not participating in the previous screening round

Supplementary Table S5 in the online supplementary file shows that out of the 1,265 people who answered the phone, 960 (75.9%) provided the main reason for not participating previously. The three most frequently mentioned reasons were indifference toward cancer screening (196/960; 20.4%), missing the test kit, either because they did not receive it or misplaced it (161/960; 16.8%), and not knowing how to use the test kit (151/960; 15.8%). Overall, the majority of respondents (525/960; 54.7%) cited practical barriers such as missing the test kit, lack of information, mental or physical health issues, being busy, or being unavailable as their main reasons for not participating. Supplementary Tables S6, S7 in the supplementary file indicate that among respondents of Indian, Pakistani, Black, mixed, or other ethnic backgrounds, the primary reasons for initial non-participation were past issues such as missing test kits (83/333; 24.9%), indifference toward screening (67/333; 20.1%), and information gaps (59/333; 17.7%). For respondents with disabilities, the main reasons cited were health issues (28/147; 19.0%), lack of information (27/147; 18.4%), and missing test kits (24/147; 16.3%).

Discussion

Summary of main findings

This study evaluated whether CFAK as a non-clinical health promotion intervention has continued to address inequalities in CRC screening participation. The findings from this latest evaluation showed that CFAK acceptability is higher among ethnically diverse communities (i.e. Indian, Black, mixed, or other ethnic backgrounds) and those with disabilities which further parallels the proportion of test orders as well as their returns from these marginalized communities. These findings demonstrate that CFAK continues to be effective at addressing inequalities in cancer screening with impact on specific underserved communities in Lancashire, in the Northwest of England.

Comparisons with previous literature

Our findings are comparable with the previous evaluation testing the effectiveness of the CFAK intervention with the gFOBt (16) which reported an overall return rate of 15.3% ($n = 1{,}651/10{,}772$), which is slightly higher than the rate seen in this study (i.e., 14.1%, $n = 333/2{,}360$). This difference may have emerged from the positive impact of the FIT implementation which resulted with most GP practices to have an uptake over 60%. Thus, those which are now being targeted by CFAK are potentially from areas with wider health inequalities and this

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TABLE 2 Binary logistic regression on answering phone call ($N = 2,360$).

Variable	*N*	*N*	(%)	Unadjusted model		Adjusted model	
				OR	95% CI	aOR	95% CI
Overall	2,360	1,242	(52.9)	–	–	–	–
Gender							
Female	989	535	(54.1)	Ref.		Ref.	
Male	1,371	707	(51.6)	0.904	0.767–1.064	0.900	0.749–1.081
Age							
60–64	1,223	622	(50.9)	Ref.		Ref.	
65–69	766	399	(52.1)	1.050	0.877–1.259	1.033	0.846–1.261
70–74	371	221	(59.7)	1.424	1.125–1.802**	1.403	1.081–1.822*
Ethnicity							
White	1,392	790	(56.7)	Ref.		Ref.	
Indian	277	178	(64.3)	1.370	1.048–1.791*	1.599	1.178–2.172**
Pakistani	412	227	(55.1)	0.935	0.749–1.167	1.097	0.841–1.432
Black, mixed or others	43	20	(46.5)	0.663	0.361–1.218	0.755	0.403–1.412
Unknown	236	27	(11.4)	0.098	0.065–0.149**	0.092	0.060–0.142**
Disability							
No	2,197	1,112	(50.6)	Ref.		Ref.	
Yes	163	157	(96.3)	26.818	11.816–60.864**	23.178	10.164–52.856**
Area level deprivation							
IMD quintile 5 [3–698]	636	354	(55.7)	Ref.		Ref.	
IMD quintile 4 [1,236–1,940]	361	187	(51.8)	0.856	0.661–1.109	0.622	0.440–0.878**
IMD quintile 3 [1,987–4,071]	465	264	(56.8)	1.046	0.822–1.332	0.897	0.678–1.187
IMD quintile 2 [5,521–7,612]	532	261	(49.1)	0.767	0.609–0.967*	0.568	0.376–0.859**
IMD quintile 1 [10,382–13,575]	366	176	(48.1)	0.738	0.570–0.955*	0.459	0.306–0.688**
Region where patient lives							
Blackburn	975	530	(54.4)	Ref.		Ref.	
Blackpool	618	332	(53.7)	0.975	0.796–1.193	1.156	0.839–1.591
Preston	45	20	(44.4)	0.672	0.368–1.226	0.949	0.472–1.907
Liverpool	641	318	(49.6)	0.827	0.677–1.009	1.267	0.925–1.735
Wigan	81	42	(51.8)	0.904	0.574–1.423	1.620	0.938–2.797
N	–	–	–	2,360	–	2,360	–

*$p < 0.05$; **$p < 0.01$.

CI, confidence interval; IMD, index of multiple deprivation; OR, odds ratio.

IMD quintiles are calculated based on the rank of the GP practice which ranges from 1 (the most deprived area) to 32,844 (the least deprived area).

potentially explains the different compositions of the two CFAK samples. For instance, the non-responders in this study are more ethnically diverse and economically deprived. Additionally, similar to the previous evaluation, we found that in-person consultations were more effective, as test kits were more likely to be returned by those who attended in-person rather than over the phone consultation. While the analysis showed that individuals with Indian or Pakistani ethnic backgrounds and/or disabilities were more likely to choose in-person consultations, the call log did not capture reasons for their preferences. Future studies could explore these preferences to improve the intervention.

Furthermore, this evaluation included factors associated with answering the initial phone call, shedding light on who the intervention is more likely to reach and whether it is equitable. The results showed that 1 in 2 calls are not picked up by the target population with greater difficulties with engaging potential first-time invitees screening at age 60–64. The results also showed while older people are more likely to answer the phone call, their acceptability to attend CFAK is lower in comparison. Future research should explore strategies to improve this, such as optimizing call times or using alternative contact methods, like text messages and automated booking systems to CFAK clinics among people aged 60–64. This would likely reduce

TABLE 3 Binary logistic regression on ordering and returning a test kit (intention-to-treat analysis, $N = 2,360$).

Variable	Ordering a test kit					Returning a test kit				
	Unadjusted model			Adjusted model		Unadjusted model			Adjusted model	
	(%)	OR	95% CI	aOR	95% CI	(%)	OR	95% CI	aOR	95% CI
Overall	(30.6)					(14.1)				
Gender										
Female	(29.5)	Ref.		Ref.		(13.0)	Ref.		Ref.	
Male	(31.3)	1.087	0.910–1.299	1.000	1.000–1.000	(14.9)	1.165	0.919–1.478	1.042	0.808–1.344
Age										
60–64	(30.1)	Ref.		Ref.		(14.2)	Ref.		Ref.	
65–69	(31.7)	1.080	0.888–1.312	1.019	0.823–1.261	(14.1)	0.990	0.764–1.282	0.947	0.722–1.242
70–74	(29.7)	0.979	0.759–1.262	0.906	0.685–1.199	(13.8)	0.961	0.686–1.345	0.901	0.632–1.285
Ethnicity										
White	(30.1)	Ref.		Ref.		(13.6)	Ref.		Ref.	
Indian	(45.5)	1.938	1.490–2.520**	2.487	1.813–3.411**	(22.0)	1.798	1.301–2.483**	2.257	1.524–3.342**
Pakistani	(37.6)	1.401	1.113–1.763**	1.624	1.222–2.159**	(16.8)	1.280	0.948–1.730	1.353	0.937–1.954
Black, mixed or others	(39.5)	1.518	0.815–2.828	1.785	0.937–3.401	(27.9)	2.464	1.244–4.882**	2.651	1.294–5.431**
Unknown	(1.7)	0.040	0.015–0.108**	0.043	0.016–0.117**	(0.9)	0.054	0.013–0.221**	0.063	0.015–0.257**
Disability										
No	(27.4)	Ref.		Ref.		(12.7)	Ref.		Ref.	
Yes	(73.0)	7.166	5.008–10.253**	7.398	5.095–10.740**	(33.7)	3.515	2.482–4.979**	3.576	2.487–5.144**
Area level deprivation										
IMD quintile 5 [3–698]	(34.0)	Ref.		Ref.		(17.0)	Ref.		Ref.	
IMD quintile 4 [1,236–1,940]	(31.9)	0.909	0.690–1.197	0.758	0.529–1.087	(15.5)	0.898	0.631–1.277	0.770	0.492–1.205
IMD quintile 3 [1,987–4,071]	(35.5)	1.069	0.832–1.375	0.887	0.665–1.184	(13.6)	0.766	0.547–1.073	0.618	0.424–0.901*
IMD quintile 2 [5,521–7,612]	(25.0)	0.648	0.502–0.837**	0.751	0.481–1.172	(11.3)	0.621	0.443–0.872**	0.842	0.481–1.476
IMD quintile 1 [1,0382–1,3575]	(25.1)	0.653	0.490–0.870**	0.679	0.442–1.045	(12.6)	0.703	0.484–1.019	0.772	0.456–1.305
Region where patient lives										
Blackburn	(36.2)	Ref.		Ref.		(18.0)	Ref.		Ref.	
Blackpool	(30.7)	0.782	0.631–0.970*	1.197	0.854–1.678	(13.4)	0.709	0.534–0.941*	0.971	0.630–1.496
Preston	(22.2)	0.503	0.246–1.029	0.710	0.315–1.604	(11.1)	0.571	0.222–1.469	0.679	0.243–1.901
Liverpool	(23.7)	0.548	0.438–0.685**	0.694	0.488–0.987*	(9.8)	0.498	0.366–0.677**	0.519	0.329–0.820**
Wigan	(19.8)	0.434	0.247–0.761**	0.700	0.362–1.355	(8.6)	0.432	0.196–0.955*	0.552	0.227–1.341
N	–	2,360	–	2,360	–	–	2,360	–	2,360	

*$p < 0.05$; **$p < 0.01$.
CI, confidence interval; IMD, index of multiple deprivation; OR, odds ratio.
IMD quintiles are calculated based on the rank of the GP practice which ranges from 1 (the most deprived area) to 32,844 (the least deprived area).

future inequalities arising from non-participation in screening as evidence demonstrates tackling barriers at first-time participation would support continuous participation of this biennial screening programme (18).

Additionally, the analysis of the main reasons for not participating in the previous screening round revealed several practical barriers, such as missing test kits or lack of information. These barriers were also frequently mentioned by individuals from ethnic backgrounds and those with disabilities and are in line with findings from previous studies (8–10). The unpublished qualitative evaluation of CFAK patient experience with a sub-sample of CFAK attendees ($n = 12$) further support the quantitative evaluation findings. We identified that CFAK was effective demystifying beliefs around bowel cancer screening as well as giving advice for how to complete the test kit which highlighted the educational component of patient navigation interventions (19). The qualitative evaluation further showed that CFAK addresses three main barriers to screening: not knowing how to complete the kit, low awareness of screening purposes, and fear of future outcomes. CFAK's person-centered approach involves using lay terms, preferred

language and gender, and giving patients the choice of in-person or telephone consultations. This allows non-responders to make informed decisions about screening participation, which contributes to a positive experience and in return addresses barriers to screening participation reported by screening non-responders.

Strengths and limitations

The main strength of this project is that it is an evaluation of an accomplished community engagement intervention in primary care which has previously demonstrated its effectiveness. This has subsequently informed further data collection to be included in this evaluation such as the extended call logs with additional sociodemographic information such as disability status, the capture of the main reasons for not taking part in screening. As a result, the strength of this dataset includes the diverse sample of non-responders, with over 40% of the sample being non-White. This allows the differentiation and comparison between ethnic groups which is often a limitation of evaluating the impact and representativeness of randomized controlled trials (20).

However, this evaluation study has several limitations that warrant further research. Firstly, the observational nature of this study limits our ability to make causal inferences. This is due to the project being a service evaluation of an existing health promotion programme implemented in the English National Health Service in Lancashire. It is not known the actual impact of CFAK on screening uptake or coverage as the data captured only represents those who were targeted and invited to CFAK. To better assess CFAK's effectiveness, future studies should employ an experimental design that compares CFAK with no intervention or alternative interventions. Second, the relatively small sample size limited the statistical analysis, necessitating the grouping of some ethnic groups and disabilities due to small cell counts. Third, we only had access to GP practice postcodes to estimate area deprivation. Fourth, as in the previous study, no detailed data on the content of in-person and phone consultations were recorded. However, the similarity in our results suggests that the consultations were consistent across studies. Fifth, although Lancashire's population diversity is similar to the UK average [81.7% White, 9.3% Asian, 4.0% Black, 2.9% Mixed, and 2.1% Other (21)], the results may not be applicable to regions with significantly different population diversity. Therefore, CFAK might not have the same acceptance and outcomes in addressing inequalities elsewhere. Future research should evaluate CFAK in different locations to improve the generalizability of the findings. Lastly, while the analysis included characteristics of individuals less likely to engage with CFAK (e.g., those who did not answer phone calls), we have limited information on whether these individuals eventually completed a screening test kit. In 2021–2022, self-referral test kits requested within a year of the initial CRC screening invitation only accounted for 2% of the total population invited to participate. To our knowledge, there is no evidence on how many kits were returned. Consistent with previous suggestions for improving this evaluation's robustness, trial methodology is needed to understand the extent to which CFAK contributes to improving CRC screening targets in England among non-responders.

Recommendations for future research and practice

Future research should explore the key components of these consultations to better understand the most frequently discussed barriers (13). The analysis of the main reasons for not participating in previous screenings suggests that CFAK should address not only practical barriers, such as missing test kits, lack of information, mental or physical health issues, and forgetfulness, but also psychological barriers like indifference to screening and fear. Given CFAK's demonstrated effectiveness in addressing inequalities in CRC screening compared to population-based interventions, it is important to further investigate the components that contribute to its success, such as cultural competence training and non-clinical structure. Future research should delve deeper into the CFAK model to understand its relevance and applicability in reducing inequalities in broader preventive health contexts, using implementation science. Additionally, future evaluations of the intervention could involve the assessment of the cost-effectiveness. A recent systematic review has shown that studies the use of patient navigation services as part of routine patient care are not only cost-effective in international settings (15). Given the high dropout rate during the stage of contacting non-responders, future studies should test interventions, such as prenotification text messages, to increase response rates. Previous studies have demonstrated that these interventions can be effective in enhancing engagement (22). Lastly, the preference for phone-based consultations highlights the need to compare their effectiveness with in-person consultations. Given the higher costs of in-person clinics and potential restrictions on access to GP practices during the ongoing COVID-19 pandemic (23, 24), a randomized comparison and cost-effectiveness analysis would be valuable.

Conclusion

In conclusion, this study shows that the CFAK intervention was successful in getting 14.1% of the non-attenders targeted to participate in the CRC screening programme. Importantly, CFAK holds promise in engaging non-responders, especially ethnic minorities and individuals with disabilities, and thereby reduce important inequalities in participation.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: the data that support the findings of this study are available from the corresponding author upon reasonable request. Requests to access these datasets should be directed to Sandro Tiziano Stoffel, s.stoffel@unibas.ch.

Ethics statement

Ethical approval was not required for the studies involving humans because the evaluation was conducted as part of a service improvement initiative, and therefore, ethical approval was not required in accordance with our institution's guidelines. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and institutional requirements because the study was part of a service evaluation.

Author contributions

SS: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. SH: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – review & editing. LM: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Resources, Validation, Visualization, Writing – review & editing. RK: Conceptualization, Investigation, Methodology, Validation, Visualization, Writing – review & editing. YH: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. CV: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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In memoriam

The authors would like to dedicate this manuscript to Sadiq Patel, one of the key leaders and early adopters of the Lancashire BCSP CFAK, who sadly passed away in October 2024. Sadiq Patel led the implementation of the CFAK clinics in Lancashire which made significant contributions to addressing bowel cancer inequalities in this region.

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fcacs.2026.1518293/full#supplementary-material

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