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The Co-Design of an Evidence-Based Health Education Strategy to Improve Bowel Cancer Awareness and Screening in a Remote Tasmanian Community: Lessons Learned

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ABSTRACT

Issue Addressed: Generally, bowel cancer screening rates are lower in rural/remote Australia (40.6% major cities; 25.3% very remote areas, 2020–21). Rural/remote Tasmanians may need increased awareness to encourage screening, with recent decreased screening rates. This study aimed to co-design a health education strategy to improve bowel cancer awareness/screening in remote Tasmania.

Methods: A co-design method was used to conduct two group workshops with 17 participants (14 community members, three healthcare providers). Workshops were guided by previous interviews with the community. Workshop one: participants chose the top three screening barriers and designed interventions to overcome them. These interventions were collated and presented to participants in workshop two. Participants shared ideas to refine interventions, then completed an acceptability, feasibility and appropriateness questionnaire of the overall strategy. Data was collected via written notes and analysed through content analysis.

Results: A health education strategy with two components and multiple interventions was developed: local media campaign (signage, video, bookmark, flyer, poster) and community health education events. Events included community champions sharing personal stories and healthcare providers providing clinical information. Participants identified the strategy as feasible, appropriate and acceptable for a rural/remote Tasmanian community. Following workshops, strategy components were developed in collaboration with the community.

Conclusions: Large scale strategies which may be effective for metropolitan areas of Australia may not be accepted by or appropriate for those in rural/remote areas. Remote community members valued local relevance and community involvement.

Abbreviations: AIM, acceptability of intervention measure; BCW, behaviour change wheel; FIM, feasibility of intervention measure; IAM, intervention appropriateness measure; NBCSP, national bowel cancer screening program; SPSS, statistical package for the social sciences; SRQR, standards for reporting qualitative research; TDF(v2), theoretical domains framework, version 2.

So What? If successful, the health education strategy could be implemented across rural/remote Tasmania to raise awareness/encourage screening.

1 | Introduction

Current bowel cancer screening participation rates in the Australian National Bowel Cancer Screening Program (NBCSP) reduced from 43.8% (2019–20) to 40.9% (2020–21) [1]. Screening rates are generally lower in rural and remote areas of Australia, with 40.6% in major cities compared to 25.3% in very remote areas (2020–21) [2]. Due to lower screening rates amongst rural and remote communities, there is a need for community-based strategies to increase the awareness and uptake of NBCSP. Previous modelling has suggested that by 2020 if participation reached 60%, it could have prevented an additional 24800 deaths between 2015 and 2040 from the current 59000 preventable deaths with 40% participation [3]. According to the World Health Organisation [4], health education is "consciously constructed opportunities for learning involving some form of communication designed to improve health literacy, including improving knowledge, and developing life skills, which are conducive to individual and community health." Community health education strategies should educate individuals about bowel cancer, to raise awareness regarding the importance of screening. Health education strategies should include a focus on young individuals (e.g., from 30-years) and first-time screeners, as re-participation rates were 74% in 2020–21 [2, 5]. This demonstrated that individuals who had participated previously, were more likely to screen again. A study (un-published) by the present papers' authors found remote Tasmanians believed bowel cancer education should target eligible individuals and those younger than screening eligibility [6]. This was to allow younger individuals to become familiar with screening prior to eligibility and for behaviour changes of other preventative approaches to have positive impacts on their health [6]. The 2021 Cancer Council data [7] on NBCSP participation indicated that communication strategies were suitable to encourage screening for ~35% of eligible individuals who at that time, did not participate in screening. If communication strategies are successful, potentially up to ~75% participation could be achieved and prevent a considerable number of deaths.

Reasons why individuals do not screen have been identified as being too busy, an unpleasant procedure, or lost/forgotten the kit [8, 9]. Myers et al. [9] identified three groups of eligible individuals who did not screen and determined when they stopped engaging with the process. These included 'ignorers' who did not open the kit, 'readers' who only read the invitation letter, and 'leavers' who only read instructions [9]. Understanding when and why individuals stopped engaging could help develop health education strategies to overcome different behavioural change barriers. Multiple health education approaches may be necessary to account for the various behaviour changes required for differences amongst individuals to complete screening. For example, 'ignorers' may only benefit from mass media campaigns or general practitioner (GP) encouragement, whereas 'leavers' may need reminders to screen to encourage behaviour change [9].

When considering approaches to develop health education strategies, a participatory action research (PAR) approach has shown to be an effective tool to develop strategies through a co-design method, which allows researchers to work with the target group, identify their current capacity and build on it [10]. Rather than testing strategies developed by researchers or 'experts' who may not know local context for rural and remote communities, the PAR approach can work with those with the local knowledge to overcome potential challenges and find solutions [11]. For example, a Canadian study [12] co-designed a bowel cancer education strategy for outreach communities with community members and healthcare providers. Goodhew et al. [13] co-designed alcohol and other drug education with nurses, academics and those with lived experience of substance abuse. Goodwin et al. [14] compared NBCSP video evaluations between experts and consumers. The study found differing perspectives on the value of personal stories in encouraging screening, highlighting the importance of co-design with those targeted/impacted by the health education [14]. This present study aimed to utilise a co-design approach, with community members and healthcare providers working together to design a health education strategy to improve bowel cancer awareness and screening participation in a remote Tasmanian community.

2 | Materials and Methods

This paper reported on a follow-up qualitative study with summarised methods from Gadd et al. [15], which aimed to identify barriers and enablers to bowel cancer screening in rural and remote Tasmania. It utilised data collected from semi-structured interviews [6, 15] and two group workshops to co-design a community-informed and evidence-based health education strategy with a small remote Tasmanian community. This paper reported on one phase of the co-design process (prototype design) [11]. According to the latest Modified Monash Model (2019), the community was classified as MM6 (remote community) [16]. In 2021, this community had a population of 997, with ~70% over 50 years [17]. Compared to the whole of Tasmania, the community had a lower median household income (community: $929 vs. Tasmania: $1358) and tertiary level education (community:14.4% vs. Tasmania: 21.9%) [17]. The community was chosen due to its remoteness, high percentage of population within screening eligibility (50-years at time of method development) and its participation rate in NBCSP (54.8% ($n = 670$) in 2018–19) [18]. The community had the highest screening rate in the state at that time [18]. This formed a template for a strength-based approach study. The current rate for screening in Tasmania was 44.4% (2020–21), a reduction from 48.2% (2019–20) [1]. This strength-based approach was utilised to enable researchers to understand what was working well in the community and find opportunities to extend positive aspects to other communities with poorer NBCSP participation [18]. The bespoke strategy which prioritised and incorporated the views of community members (as participants) aimed to improve bowel cancer information seeking behaviours, awareness and screening participation in rural and remote Tasmania. This study was reported using the Standards for Reporting Qualitative Research (SRQR) checklist [19].

2.1 | Design

2.1.1 | The Co-Design Method

The design of the health education strategy used a systematic and sequential co-design approach to integrate scientific evidence, expert knowledge and actively engage stakeholders' experiences and views to develop a prototype strategy. The process initially involved the identification of previous education strategies to improve bowel cancer awareness and screening participation through a scoping review [20]. Next, researchers identified barriers and enablers to screening participation, awareness and looking for bowel cancer information through semi-structured interviews with remote community members [6, 15]. The researchers identified which barriers and enablers could be modified to determine the changes necessary to allow behaviour change to occur. The Behaviour Change Wheel (BCW) [21] was used to map Theoretical Domains Framework, version 2 (TDF(v2)) domains [22] and organise them into a functional theoretical model of behaviour change for improved information seeking behaviour and screening participation. Based on these findings, the researchers developed the group workshop structure in consultation with an experienced participatory action researcher (Dr Suzanne Waddingham) (present paper). See Table S1 for the group workshop schedule. A short paper-based participant demographic and characteristics questionnaire was provided to be completed by participants at the start of each group workshop.

2.1.2 | Co-Design Group Workshop One

Prior to workshop one, the workshop presentation content was reviewed by three consumers with lived experience of bowel cancer. The consumers were recruited through Cancer Voices Australia. Cancer Voices Australia ran a Consumers in Research programme which trains, supports, and provides a "matching" service for consumers and researchers. The consumer vacancy brief was developed, and The Tasmanian Collaboration for Health Improvement assisted the researchers to connect with Cancer Voices Australia and submit the brief. Cancer Voices Australia recruited consumers to be involved in document review. Researchers then provided the consumers with the presentation content and a presenter voice-over for each slide. The consumers provided feedback on the content, advising on the use of plain language and clarity of the content. This consumer review meant that workshop participants were able to easily follow the workshop content and effectively contribute their ideas.

Group workshop participants included community healthcare providers (GPs, practise manager), researchers and community members aged 50 years (NBCSP eligibility at time of recruitment) and above who had or had not completed bowel cancer screening previously. Participants from Gadd et al. [6, 15] and the community's healthcare providers were invited to participate in addition to other community members interested in the study. The other community members were recruited through assistance from the community healthcare providers inviting them to participate and advertisement materials located in the community. Recruitment occurred during February to March 2023, and group workshops were conducted in March and April 2023 within the remote community. The study excluded individuals with cognitive impairment which limited their ability to understand or engage in the study.

Group workshop one began with a researcher (NG) presenting to the participants the content produced from the authors scoping review [20], interview findings [6, 15], and results on poor bowel cancer knowledge and awareness in Tasmania [23, 24]. Next, the screening barriers and enablers identified from the interviews [15] were presented on posters to participants. Participants were then asked to place coloured dots next to the top three barriers and enablers to focus on. The top three barriers and enablers chosen by the group became the focus for the education strategies. The participants worked in three groups, focusing on one barrier per group. The enablers were considered to strengthen the education strategies where relevant. Each group included a researcher, a healthcare provider, and a minimum of one community member. Researchers asked questions to guide group discussions to design the education strategies. In groups, participants discussed their views of what was needed to improve bowel cancer awareness and screening in their community. Participants discussed potential education ideas they believed would be accepted and effective in their community, including how to design the health education strategy, where, and how to implement it. Researchers collated the information provided by participants.

2.1.3 | Co-Design Group Workshop Two

In workshop two, researchers presented the multiple health interventions designed in workshop one back to participants. Then, researchers laid out written descriptions of each intervention on tables around the room as earlier suggested in workshop one. Each health intervention was accompanied by a list of questions to refine them. The written questions encouraged discussion on potential challenges of the feasibility, acceptability, and appropriateness of the health education intervention for a rural/remote community. Participants were asked to move around tables and provide written responses for the different interventions, to allow for synergy and integration of ideas. The researchers answered participants questions and guided participants to work on unanswered written questions. Next, participants verbally explained each of the refined interventions back to the group. Then, participants were asked to individually complete three short measures on the feasibility, acceptability and appropriateness of the overall co-designed health education strategy with multiple interventions designed (Table 2). At the end of workshop two, researchers asked participants if they would like to stay involved, to provide their contact details on a sign-up sheet.

2.2 | Data Collection and Analysis

Group workshops were conducted face-to-face and held one month apart. Participants ideas were collected through written notes by the researchers in each group for workshop one (SL, MJS, KO). Participants had the option to write their own additional notes. In workshop two, participants wrote their own

notes. Conventional qualitative content analysis was used to analyse the data [26, 27]. Workshop one data was initially read by one researcher (NG) and collated into one Microsoft Word document. Data transcription and interpretations were checked by the researchers who were embedded in each group (SL, MJS, KO). Next, one researcher (NG) initially analysed the data by identifying relationships and patterns and categorising them into themes and sub-themes. Then, themes were analysed by the other researchers (SL, MJS, JH, KO) and adapted through discussion into a health education strategy with two components (themes) and multiple interventions sub-themes. Workshop two data was collated into one document and analysed using a similar approach. Initial themes and sub-themes developed were adapted through discussions amongst all researchers. Descriptive quantitative statistics was used to analyse participants characteristics/demographics and the feasibility, acceptability and appropriateness measure data using SPSS software [28].

2.3 | Techniques to Enhance Trustworthiness

Member checks were utilised during group workshops. In workshop one, the researchers who wrote notes of the participants ideas (SL, MJS, KO) checked the data to ensure NG had interpreted it correctly for the analysis. This information from workshop one was also presented back to participants in the second workshop [29]. At the end of workshop two, participants summarised the refined health education interventions verbally back to the group to ensure the information was understood [30].

3 | Results

There were 17 participants, including 14 community members, three health providers and four researchers. Workshop one included 11 participants (eight community members, three health providers e.g., two GPs and one practise manager). Workshop two had 13 participants (12 community members, and one GP). Across the two workshops, approximately 70% of participants were between 50 and 64 years. Approximately 70% ($n=12$) were female, 76.5% ($n=13$) had previously completed the NBCSP kit, and 35.3% ($n=6$) knew they had a family history of bowel cancer/polyps (Table 1).

3.1 | The Health Education Strategy

The process of incorporating the interview findings from Gadd et al. [15] into the group workshops, to co-design the health education strategy is shown in Figure 1. The top three screening barriers chosen by participants included: no sense of urgency to screen (7 votes), too busy to screen (5 votes) and a lack of awareness of bowel cancer and screening (4 votes). The top three enablers included: the belief the kit is simple to complete (5 votes), the belief that prevention is better than the cure (5 votes) and having an awareness that bowel cancer is treatable (5 votes).

In workshop one, participants identified numerous health education interventions targeting the three screening barriers for

TABLE 1 | Participant demographics and characteristics from the bowel cancer education strategy co-design group workshops with a remote Tasmanian community ($n=17$).

Demographics and characteristics		*n* (%)
Age (years)	50–54	5 (29.4)
	55–59	2 (11.8)
	60–64	5 (29.4)
	65–69	0
	70–74	4 (23.5)
	75+	1 (5.9)
Sex	Male	5 (29.4)
	Female	12 (70.6)
	Other	0
Country of birth	Australia	15 (88.2)
	Papua New Guinea	1 (5.9)
	United Kingdom	1 (5.9)
English speaking at home	Yes	17 (100)
	No	0
Highest level of education	Primary school	0
	High school	4 (23.5)
	Year 12	1 (6)
	TAFE/trade	8 (47)
	University	4 (23.5)
Employment status	Employed	11 (64.7)
	Unemployed	0
	Retired	6 (35.3)
Previously had a colonoscopy	Yes	9 (53)
	No	8 (47)
Number of previously completed bowel cancer screening tests	0	4 (23.5)
	1	3 (17.7)
	2	2 (11.8)
	3+	8 (47)
History of bowel cancer or polyps	Yes	3 (17.7)
	No	14 (82.3)
Family history of bowel cancer or polyps	Yes	6 (35.3)
	No	9 (52.9)
	Unsure	2 (11.8)
Number of people live with	1	3 (17.7)
	2	12 (70.5)
	3	0
	4+	2 (11.8)

rural and remote community members. Amongst the three barriers, there were consistencies between interventions chosen, including mass media, community champions, community events and healthcare provider involvement. Researchers incorporated participants suggestions into a co-designed health education strategy with two components and multiple interventions: (1) the local media campaign and (2) community health education. See Table S2 for summaries.

The multiple health education interventions recommended by participants were compared with previous literature to identify new recommendations and a success criterion for implementing the overall co-designed health education strategy (Table S3). Most health interventions recommended in the workshops had similarities with the literature; although participants recommendations were more tailored towards a community focus. All recommendations were mapped onto behaviour change theories including BCW [21] and TDF(v2) [22].

3.1.1 | Bowel Cancer Education Strategy Component One: Local Media Campaign

The local media campaign involved four health interventions: flyers, signage, video and local social media page posts. See Table S2 for further description of each intervention.

3.1.1.1 | Health Intervention One: Flyers. Participants suggested to give the community ownership of the flyers they should be locally designed "graphic artists (local)" (Workshop two participants (W2)) and disseminated in local businesses, newsletters or through letterbox drops. A bookmark flyer should be disseminated in library books, "the local librarian could create a bookmark flyer which could be inserted in each customer/patrons book" (W2). Another flyer should use plain language and be quick to read on how to do the screening kit or explain the prevalence of bowel cancer and that it is preventable. "How To flyer on how to complete a home test kit. Simple. Quick to read" (W2). The flyer should be displayed in the pharmacy where pharmacists and/or pharmacist assistants can use it to provide health education. Pharmacist assistants should receive training to provide education.

3.1.1.2 | Health Intervention Two: Signage. The participants recommended signs be locally designed and developed with community groups and volunteers. "Bowls club specific... 'we will bowel you over' or something similar" (W2). The signs are to be positioned in permanent locations around the community. They should have bowel health messages and be sponsored by local businesses. "Billboards include the sponsor. Simple, snappy slogan that relates back to the business... on each billboard" (W2).

3.1.1.3 | Health Intervention Three: Video. The participants recommend creating a short video to be displayed on local social media pages or via QR codes in the community. The video should show "consequences of not screening (mass media campaign)" (Workshop one participants (W1)), the outcomes of doing screening, "what happens when you do the kit, what

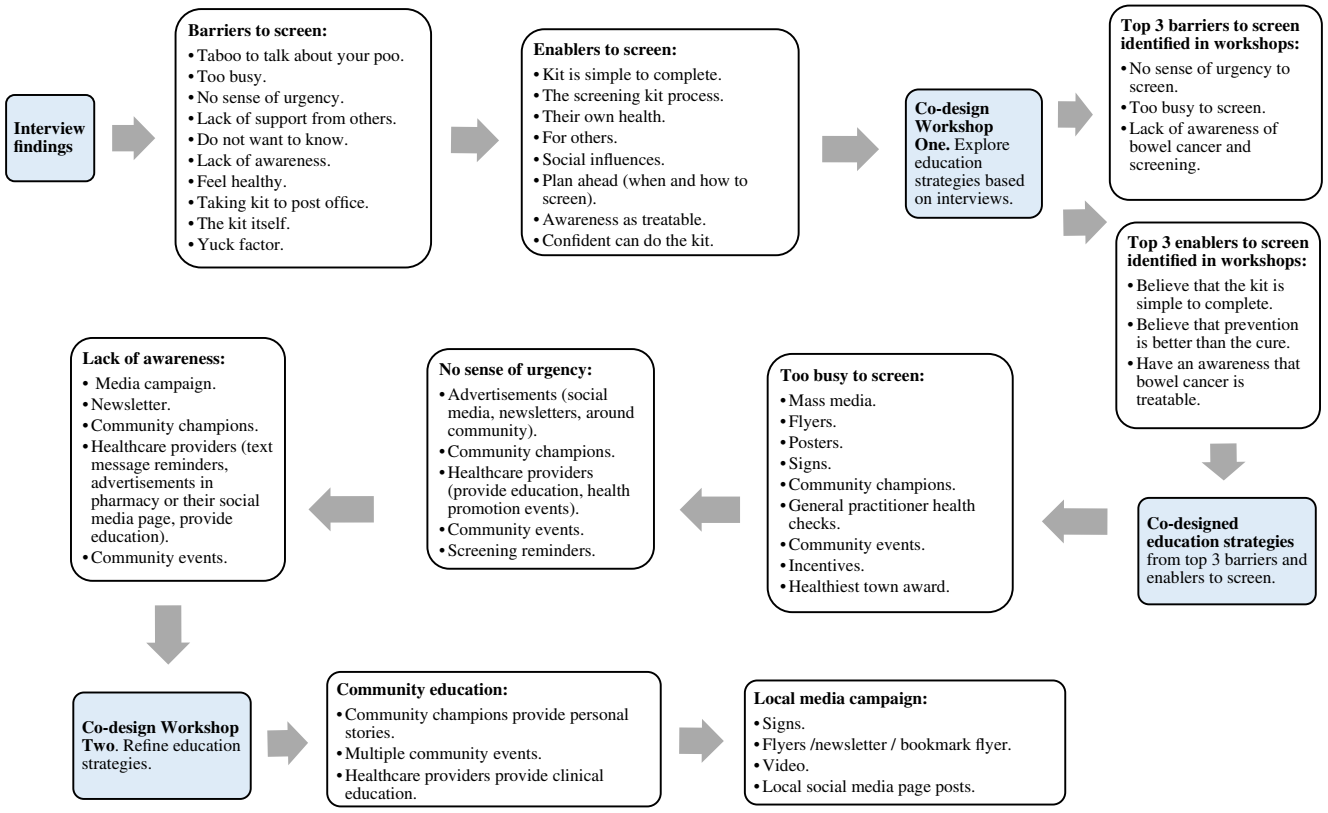

FIGURE 1 | The co-design process incorporating previous interview findings [6, 15] into the two group workshops to co-design the bowel cancer awareness and screening education strategy with a remote Tasmanian community.

TABLE 2 | Feasibility, acceptability and appropriateness of the co-designed bowel cancer education strategy determined by the group workshop two participants ($n = 12$).

Questions	Completely disagree *n* (%)	Disagree *n* (%)	Neither agree nor disagree *n* (%)	Agree *n* (%)	Completely agree *n* (%)
Acceptability of intervention measure (AIM) ($n = 12$)					
Q1. The bowel cancer education intervention meets my approval.	0	0	0	6 (50)	6 (50)
Q2. The bowel cancer education intervention is appealing to me.	0	0	1 (0.8)	6 (50)	5 (41.7)
Q3. I like the bowel cancer education intervention.	0	0	0	5 (41.7)	7 (58.3)
Q4. I welcome the bowel cancer education intervention.	0	0	0	4 (33.3)	8 (66.6)
Intervention appropriateness measure (IAM) ($n = 12$)					
Q1. The bowel cancer education intervention seems fitting for a rural community.	0	0	0	6 (50)	6 (50)
Q2. The bowel cancer education intervention seems suitable for a rural community.	0	0	0	7 (58.3)	5 (41.7)
Q3. The bowel cancer education intervention seems applicable for a rural community.	0	0	0	8 (66.6)	4 (33.3)
Q4. The bowel cancer education intervention seems like a good match for a rural community.	0	0	1 (0.8)	7 (58.3)	4 (33.3)
Feasibility of intervention measure (FIM) ($n = 11$)					
Q1. The bowel cancer education intervention seems implementable.	0	0	1 (0.9)	7 (63.6)	3 (27.3)
Q2. The bowel cancer education intervention seems possible.	0	0	0	6 (54.5)	5 (45.5)
Q3. The bowel cancer education intervention seems doable.	0	0	0	7 (63.6)	4 (36.4)
Q4. The bowel cancer education intervention seems easy to use.	0	0	3 (27.3)	5 (45.4)	3 (27.3)

Note: AIM, IAM and FIM adapted from Weiner et al. [25].

happens when you don't" (W1), it should reaffirm the enabler to screening that the kit is simple to complete, reduce the stigma of poo and highlight the likelihood of developing bowel cancer compared to other cancers.

3.1.1.4 | Health Intervention Four: Local Social Media Page Posts. The community's local social media pages should post messages about bowel cancer with testimonials from survivors or a profile and photo of people who did not survive,

provided by family members. Community champions and volunteers can post on various pages.

> Sometimes [using] positive messages [help], at other times, message should be straight in people's face that people can die. Such messages/testimonial can come from family members of those who did not survive. (W1)

> Social media insert at any time (pop-ups are frequent and can be limited to target groups by algorithm). This could be a cheap method with good reach. (W2)

3.1.2 | Bowel Cancer Education Strategy Component Two: Community Health Education

The community health education component involved three health interventions: community events, community champions and local healthcare providers.

3.1.2.1 | Health Intervention One: Community Events. Participants suggested the information provided through events should promote bowel and general health rather than only bowel cancer. "*Not just about bowel messages but includes general health messages as well. Not a cancer message*" (W1). The health education should dispel myths regarding barriers to screening, explain why bowel cancer screening works and that it is a treatable cancer. A "*scatological humour approach*" (W2) was suggested to discuss topics or "provide catchy phrase/s (bowel screening version of slip, slop, slap)" (W2), like the Australian Cancer Council skin cancer campaign slogan [31].

3.1.2.2 | Health Intervention Two: Community Champions. Participants recommended events included guest speakers of both local healthcare providers and community champions. Community champions could provide their personal stories and advice. Community champions should be authentic individuals from the community who had lived experience of bowel cancer as a survivor, carer, or family member. Participants suggested "ensure diversity amongst community champions and this should include Aboriginal and Torres Strait Islander and migrant community champions" (W1). There should be diverse champions to reach various individuals, "farmer, (male because blokes need better involvement). Testify to the simplicity of the screening" (W2). To reduce stigma, community champions should receive training on bowel cancer and screening to be proficient without hesitation in showing others that screening is simple.

3.1.2.3 | Health Intervention Three: Local Healthcare Providers. Participants suggested healthcare providers, including GPs and pharmacists, could educate on clinical facts within community events and targeted education in healthcare settings. To be more accepted, male GPs should speak with males and female GPs should speak with females, at any age. There should be a presentation material package developed for healthcare providers to facilitate presentations. In healthcare settings, healthcare providers must deliver consistent information and resources by working together with clear roles. This is achievable, as rural/remote healthcare providers can communicate well. GPs could provide men's health checks, text message reminders from an automated system, and receptionists should hand out screening invitations to eligible patients on arrival. Pharmacists or pharmacist assistants could provide health education in the pharmacy of how to screen. A young men's health check could familiarise them with doing screening and normalise health checks. Automated text message reminders should be routinely sent from medical software to patients aged 50, 60 and 70 years, to target individuals who had not had screening for over 3 years.

> Automated via medical software. Can be routine at age 50 [years], can also be targeted to individuals who have not had screening for more than 3 or 4-years (W2).

> Individual education could be in room at [the] pharmacy or community setting at [the] health and wellbeing centre. Pharmacy... good opportunities to educate, get [the] message to community (W2).

3.1.3 | Strategic Planning: Community-Driven, Engaging and Timely Health Education

Participants recommended both health education components run alongside each other. The media campaign be advertised around the community alongside community health education events twice a year, "targeted timeslot (twice yearly) drives to increase number of people" (W1). The campaign should run for one month, "during the 'bulk screening' month or prior. So, the message is live and current and not a constant drone" (W2). It was suggested to align with other rural/remote health initiatives that come to the community, "schedule community champions to coincide with other campaigns (Breast bus/Bone bus)" (W1) e.g., BreastScreen Tasmania mobile unit [32].

Participants recommend community health education be provided to the whole community across multiple community events to raise awareness of bowel cancer and screening before they are eligible for NBCSP screening (50-years at the time of workshops, now 45-years). The events should be fun men's/women's health nights or information sessions for community groups. Events should run "twice a year and align it with the breast bus and bone bus" (W1), alongside the local media campaign and ad hoc in formal and informal settings.

3.1.4 | The Feasibility, Acceptability and Appropriateness of the Bowel Cancer Education Strategy

Participants reported the co-designed health education strategy was feasible, acceptable and appropriate for a rural/remote Tasmanian community. Majority of the results were > 90% participants either agreed or completely agreed, with > 73%, > 92% and > 92%, respectively (Table 2). 'The bowel cancer education intervention seems easy to use' question in the feasibility

measure, was the only question with a higher number of neutral responses (27.3% neither agreed nor disagreed).

3.1.5 | The Development of Local Media Campaign Materials

Following workshop two, eight participants assisted in the development of the media materials (flyers, posters, bookmarks, signs) and video across numerous occasions. The local graphic designer recommended by participants in the workshops was provided with a task brief (suggestions by participants) and designed draft materials. Drafts were displayed in a community drop-in session run by one researcher, where participants provided written feedback. The graphic designer incorporated the feedback to develop the final versions. For the video, a Tasmanian videographer was provided a brief and recorded a series of video interviews with community champions and local healthcare providers. Participants helped identify interviewees. One offered to be interviewed (community champion), and another community champion was suggested. Two healthcare providers were interviewed. One was a participant, and the other was a pharmacist recommended by participants. The media materials were printed, and both materials and the videos were collated into a webpage with a QR code.

3.1.6 | Recommended Changes for the National Bowel Cancer Screening Program

Workshop one participants provided unprompted additional information regarding implementation recommendations for the NBCSP. The recommendations aim to improve the programme delivery and screening uptake. Participants recommended aligning with other cancer screening programmes, providing reminders and incentives, and broadening the eligibility age range, "people living longer is 74 [years] too early to cut off" (W1). Changes to the kit included suggestions for the letter, brochure, envelope, kit package and sample tube. "Some catchy image/picture and couple of words e.g., this is the simplest and quickest thing you could ever do to save your life" (W1).

4 | Discussion

This study aimed to co-design a health education strategy in a remote Tasmanian community, to improve bowel cancer awareness and screening participation. The study examined the perspectives of community members on the feasibility, acceptability and appropriateness of the entire health education strategy co-designed for a rural/remote community. Through group workshops, participants co-designed a health education strategy with two components: a local media campaign and community health education events. The local media campaign involved multiple interventions—flyers, video, signs and local social media page posts. The community health education events involved local healthcare providers and community champions providing clinical information and personal stories within community events. These two educational components together were identified by participants as feasible, acceptable and appropriate.

4.1 | Small, Local Media Campaign

The local media campaign was suggested by the community to disseminate information to individuals of all ages. To be effective, participants suggested the media campaign needs to be a culturally tailored campaign on a small scale and should target the community through a video with local community members, healthcare providers and locally designed printed materials. Within the printed materials, bookmark flyers through library books were suggested and to the authors knowledge is novel in health promotion research. The authors were only able to identify one un-published study where GPs handed out bookmarks amongst other flyers, reporting them as more discreet than larger flyers, as individuals could collect them without drawing attention from others [33]. Published studies are needed to explore the use of bookmark flyers disseminated through library books as a health promotion approach. The local media component of the proposed health education strategy addressed capability (psychological, physical) and opportunity (physical) in BCW [21]. For example, the video could be recalled when individuals receive the kit. This recall could be useful for first-time screeners or those who had never screened as a reminder of how and why to screen. Whilst majority of the literature on bowel cancer screening and awareness media campaigns focus on mass media [20], some discussed small media approaches [34, 35]. Cancer Council Victoria [34] for example suggested tailored small media campaigns like the one proposed in the present study can be useful for those who refuse to screen. This is by showing relatable messaging from those in similar scenarios and showing the use of kits to be simple and clean [34]. Sur et al. [36] tested culturally tailored bowel cancer screening educational workshops using videos with Pacific Islander cancer survivors and printed materials with Pacific Islander participants. The study found the culturally tailored health education strategy as effective with a 70.9% increase in knowledge and 73.5% of participants intended to screen post-intervention [36]. Small media (videos, printed materials) has also been found to be a sustainable approach without the availability of future funding [37]. This could be useful for the proposed rural community health education strategy, as the community could maintain the campaign without applying for additional funding. The present study suggested disseminating the media campaign in the rural or remote community twice a year could sufficiently target regular exposure, as more frequent campaign waves could be "*a constant drone*". Similarly, Lofti-Jam et al. [38] reported the use of regular bowel cancer screening campaigns can promptly remind those newly eligible and eligible to retest. Therefore, it is suggested that regular culturally tailored small media intervention may be the appropriate approach with frequent and relatable messaging for rural and remote communities [5, 20].

4.2 | Community Champions

Community champions within community health education events involved individuals known within the community with lived experiences of bowel cancer. Participants suggested community champions could raise awareness and encourage screening by sharing personal stories and experiences across multiple community events. These align with three components

within BCW, capability (psychological), opportunity (social) and motivation (automatic, reflective) (Table S3) [21]. For example, community champions are an opportunity for providing social support to encourage screening. Literature has shown lay community educators or community champions to be well-tested health education interventions to improve bowel cancer awareness and screening [20]. Literature showed mixed results in changes to awareness and screening. A Victorian study [39] trained migrant community members to run health education sessions within their communities and found 75% intended to screen and 33% increased their understanding of bowel cancer screening to good or very good post-intervention. This showed community-based and culturally appropriate health education sessions as a good delivery method for screening information. Lofti-Jam et al. [38] trialled a bowel cancer screening comedy show by an Aboriginal comedian, in an Aboriginal community, as studies have found humour to be a good health communication approach for this population group. Post-show, 88% of eligible participants intended to screen and 76% reported good or very good understanding of bowel cancer screening, compared to 30% pre-show [38]. James et al. [40] also found community champions in regional Australia could be useful through trusted relationships, for social support, and because health-related conversations often occur between friends or community members when someone recently experienced the health condition. These studies support the engagement of community champions to provide culturally tailored information which could improve the likelihood of success of the health education strategy.

4.3 | Health Professional Involvement

Participants suggested local healthcare providers e.g., GPs and pharmacists could provide clinical education for community members through both community events and in clinical settings. Healthcare providers could encourage individuals to screen as trusted community sources. The BCW components aligning with healthcare provider education include capability (psychological, physical), opportunity (social, physical) and motivation (reflective). According to the success criteria in Table S3, healthcare providers and community champions providing health education together in community events could improve both awareness and screening. Cassel et al. [41] for example, found together community champions and healthcare providers improved screening intentions/uptake for those with cultural barriers to screen. Both approaches together could target different types of individuals who do not screen. For example, GP encouragement could assist 'ignorers', plus community champion social support could be reminders for 'leavers' or encourage those who are 'readers', as they may be aware of bowel cancer, but need support as they have not decided or are not engaged in the process [9].

Healthcare provider involvement in screening encouragement or health education has been well researched more so in clinical settings rather than community events [38, 39]. Though, to the authors knowledge, less literature exists on GPs discussing bowel cancer screening with their same gender, to have the information more accepted (as suggested by the present study). Several studies have however shown a preference for same gender physicians in general and sexual health [42, 43]. Fink et al. [42] reported male and female patients preferred same gender GPs, as they felt more at ease with discussions and physical exams. Schreuder et al. [44] also found female patients preferred female GPs due to embarrassment discussing symptoms with male GPs. This embarrassment could be similar for patients discussing bowel cancer symptoms and warrants consideration. A South Australian study [45] found many participants more likely to undergo bowel cancer screening if their GP endorsed it. Other Australian studies also found primary healthcare providers promotion of screening increased participation rates [38, 39]. For example, providing patients with education resources e.g., postcards, letters in consultations or using electronic reminder systems through medical records have shown to improve screening [39]. When considering GP involvement in community health education strategies as proposed in the present study, their time availability must be considered. Community events twice a year shows recognition of rising issues with GP retention in Australia, particularly rural areas, with an estimated shortage of 11 517 by 2023 [46, 47]. Their availability to support such programmes is limited, and twice a year may be feasible. Rural communities with non-clinical health professionals e.g., health promotion/public health officers and coordinators could also consider such professionals to facilitate interventions, as participants emphasised the importance of 'local' health professionals. Bush et al. [48] found rural community health worker-led heart health education events useful to improve participants knowledge and hypertension management. Further research in the involvement of non-clinical health professionals providing bowel cancer health education is needed.

Pharmacy involvement in bowel cancer community health education could be feasible. In Australia, pharmacies are required to undertake health promotion activities through the Quality Care Pharmacy Program [49]. According to Sendall et al. [49], studies have shown "pharmacies are the most visited healthcare service in Australia; 94% of Australian adults use a pharmacy each year." This supports that pharmacies could be ideal settings for bowel cancer promotion/health education interventions. A six-week health education campaign led by pharmacists which provided screening kits to participants had screening uptakes of 97%, with 47% reported they would not have screened without the campaign [50]. Another study found improvements in both bowel cancer awareness and screening uptake following pharmacist counselling and provided kits [51]. Similarly, a systematic review found it feasible for community pharmacies to recruit and educate community members on cancer screening [52]. A mixed-methods study focusing on Queensland community pharmacists found pharmacists believed bowel cancer health promotion to be consistent with their role in health promotion [49]. This paper reported pharmacies were also good services for low-socioeconomic individuals to receive health advice. Therefore, pharmacy-led health education could be a useful strategy to easily target a high volume of community members to raise bowel cancer awareness and encourage screening. A pilot of the proposed health education strategy in the present paper is needed to test the feasibility of this pharmacy-led intervention within the larger health education strategy.

4.4 | Further Research and Implications for Practise

The co-design method and continued involvement of the community who are impacted by the health education have ensured the health education strategy was locally relevant for the community. The authors intend to pilot and evaluate the strategy to see if it can improve awareness and screening outcomes. Future research involving a health education strategy design should consider involving the target group in the design, development and implementation of the health education through co-design methods. They should also consider ways to incorporate screening enablers to mitigate barriers in strategies which aim to improve screening uptake. Studies should consider the feasibility of health professional (clinical and non-clinical) involvement in bowel cancer education strategies. By examining whether health professionals can provide bowel cancer education sessions in non-clinical/community settings or the need to consider strategies from within clinicians' clinics. As individuals who do not regularly attend their local GP or pharmacy need to be targeted to encourage screening, non-clinical health professionals could play a key role in this. Further research is also needed to determine the effectiveness of small media campaigns in rural/remote communities.

4.5 | Strengths and Limitations

The use of the co-design method was a strength as it involved the target population (the community) within the development and as participants, along with other key stakeholders (community healthcare providers). This co-design method drew upon literature, behaviour change models (BCW [21] and TDF(v2) [22]) and ideas of the community in the design. After the workshops, eight participants stayed involved to assist the development of the education strategies and ensured the health education remained applicable for rural/remote Tasmanians. Another strength was the researcher's collaboration with consumers with bowel cancer lived experiences to review the content presented to participants in workshop one. This ensured the information was easily understood by participants. Doing this ensured participants were informed on bowel cancer awareness and screening information before they engaged in the design. A limitation was the health education strategy may be tailored towards one remote community and may not translate to other rural/remote communities. Other limitations were the small sample size; only two workshops were conducted, and there was limited representation from those who did not screen. Only four participants reported they had not screened through NBCSP. Although researchers tried to include more of such individuals, it is unknown if the health education strategy would have been different if more participants had not engaged with screening previously. In workshop one, participants suggested pharmacy-led interventions; however, community pharmacists were unavailable to participate in workshop two. This lack of pharmacist representation may have impacted the health education strategy and FIM, AIM and IAM findings. The FIM, AIM and IAM were completed by participants for the entire health education strategy. It is unclear if within the strategy, participants identified specific interventions as less or more feasible, acceptable, or appropriate for a rural/remote Tasmanian community.

5 | Conclusions

Through two group workshops, participants co-designed a health education strategy with two overarching components with multiple interventions: community health education and a local small media campaign. The health education strategy was identified by participants as feasible, acceptable and appropriate for a rural/remote Tasmanian community. Multi-intervention strategies could target different types of people who do not screen through different ways. Bookmark flyers through library books were identified as a novel health promotion approach that could target those who do not attend healthcare services. Culturally tailored local media could be useful in rural/remote communities. Community health education events run by local healthcare providers and community champions with lived experiences of bowel cancer may improve awareness and screening.

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Ethics Statement

This study received ethical approval from the University of Tasmania Human Research Ethics Committee (approval number: 27256).

Author Contributions

Nicola Gadd: conceptualisation (supporting); data curation (lead); formal analysis (equal); investigation (equal); methodology (lead); project administration (lead); resources (lead); visualisation (lead); writing – original draft preparation (lead); writing – review and editing (lead). **Simone Lee:** conceptualisation (supporting); data curation (supporting); funding acquisition (equal); formal analysis (supporting); methodology (supporting); supervision (supporting); writing – original draft preparation (equal); writing – review and editing (equal). **Matthew J. Sharman:** conceptualisation (supporting); data curation (supporting); formal analysis (supporting); methodology (supporting); supervision (supporting); writing – original draft preparation (equal); writing – review and editing (equal). **Jessica Hughes:** formal analysis (equal); investigation (equal); writing – original draft preparation (equal); writing – review and editing (equal). **Ha Hoang:** methodology (supporting); supervision (supporting); writing – review and editing (equal). **Kehinde Obamiro:** conceptualisation (lead); data curation (supporting); funding acquisition (equal); formal analysis (supporting); methodology (supporting); supervision (lead); writing – original draft preparation (equal); writing – review and editing (equal).

Conflicts of Interest

As this study was conducted within a small remote community, the authors declare a conflict as Nicola Gadd knew participants within the study. This was managed by Nicola Gadd facilitating the workshop activities and three other researchers (Kehinde Obamiro, Matthew J. Sharman, Simone Lee) engaging with participants in the workshop activities.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.