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What do older women want from a physical activity program? Stakeholder consultation to optimise design and recruitment for the Active Women over 50 trial

Abby Haynes^{1,2*}, Geraldine Wallbank^{1,2}, Heidi Gilchrist^{1,2}, Catherine Sherrington^{1,2}, Courtney Anne West^{1,2}, Juliana S. Oliveira^{1,2}, Sandra O'Rourke^{1,2} and Anne Tiedemann^{1,2}

Abstract

Background Effective recruitment and retention of participants are prerequisites for high quality physical activity intervention programs and evaluation trials, but this is underreported in the literature making it difficult to identify the most promising strategies. Incorporating stakeholder feedback in the design of program components and recruitment materials can optimise recruitment reach and the engagement of participants throughout programs and trials.

Methods The *Active Women over 50* randomised controlled trial is testing a program designed to support women aged 50+ to be more physically active. To optimise program design and recruitment flyers, we conducted one focus group and 17 interviews with diverse purposively sampled women aged 50+ living in New South Wales, Australia. Women were asked to review recruitment flyers and the four proposed program components: (1) health coaching, (2) dedicated website with resources, (3) private Facebook group and (4) motivational email and SMS messages. Data analysis incorporated framework methods, deductive analysis using the Adapted Mobile App Rating Scale for evaluating websites and abductive analysis to critique the underlying program theory.

Results Five themes were identified in relation to recruitment: I want to see (women like) myself, Keep it real, Readability is for everyone, Why should I do it? and Find us where we live. The four program components were strongly supported as a package, but were valued differently for their relative importance. Results were used to refine the health coaching scheduling; website appearance and content; promotion and moderation of the Facebook group; and the structure, appearance and content of messages. Not all suggestions were actionable due to technological and time constraints, and the desire to keep program costs low enough for delivery at scale during the study and beyond. The program theory was expanded to encompass two emergent concepts.

Conclusions This consultation resulted in substantial refinements to recruitment flyers and strategies, and all four program components. We anticipate that these refinements will increase the reach and appeal of the trial and

*Correspondence:

Abby Haynes
abby.haynes@sydney.edu.au

Full list of author information is available at the end of the article



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optimise future scale-up. Consultation feedback, while specific to this program, may have wider transferability for recruitment and the design of programs with similar components targeting women aged 50+.

Keywords Physical activity, Recruitment, Stakeholder consultation, Program design, Women

Background

Physical activity has multiple health benefits, even when taken up in later life [1]. It can be protective against cardiovascular disease, type 2 diabetes, stroke, colon cancer, breast cancer, osteoporosis, weight gain and premature death [2–4] and may be underestimated as a major contributor to health [5]. Physical activity is associated with lower incidence of Alzheimer's disease and all-cause dementia [6], and can improve symptoms of depression, anxiety and distress, including for people living with mental health disorders and chronic disease [7, 8]. Physical activity may also help to prevent frailty [9] and falls [10], improve sleep quality [11], and increase pain self-efficacy [12]. Nevertheless, physical inactivity remains a global problem. It is the 4th leading risk factor for mortality, accounting for approximately 3.2 million deaths [13] and contributing to a significant worldwide health burden [14]. High quality physical activity intervention trials are needed to identify programs that can support people to build physical activity in their daily lives.

Effective recruitment and retention of eligible participants are prerequisites for high quality intervention trials and the associated reduction of research waste. Poor recruitment and retention can result in trials that are prematurely discontinued or underpowered and produce biased results [15–18]. Retention is especially important given that effective recruitment for physical activity programs and intervention trials is time-consuming and can be very costly, consuming up to 46% of the project's total direct costs [19]. Optimal recruitment and retention strategies for trials of physical activity programs are also crucial for future implementation and scale-up. The importance of planning for scale-up at the start of program development and evaluation has been emphasised in recent years [20]. Yet recruitment and retention is an underreported aspect of physical activity research with few studies explaining how recruitment strategies were selected or designed [21], or what (if any) techniques were used to maximise acceptance and retention [22]. Thus it is difficult to identify effective strategies for use in trials and beyond.

Recruitment and retention of participants in physical activity trials, and programs more broadly, should also be equitable, attending to barriers that may be exacerbated by other forms of disadvantage [21]. Participants who drop out of physical activity intervention trials are more likely to live in poorer socioeconomic areas, be overweight and less physically active, and have lower walking self-efficacy and higher loneliness scores [23]. Programs

directed at women may need to take account of physical and attitudinal gender differences [24–26], especially for middle aged and older women who may be affected by a range of life stage challenges including menopause [27, 28] and 'sandwiched' caring roles [29–31]. Therefore, the design of interventions and recruitment strategies needs to take account of factors across the spectrum of ecological influence: individual, interpersonal, organisational and societal [32]. Stakeholder involvement in planning and design is increasingly regarded as essential if intervention trials are to take account of real world conditions [20]. Incorporating stakeholder feedback in the formative design of strategies for recruiting trial participants, and for maintaining their engagement throughout the trial, can make participation in the study more appealing to targeted groups, and thereby optimise recruitment and retention [33, 34]. This demands a person-centred approach to discern what factors matter most to potential participants [35].

Stakeholder feedback can also be used to critique program theory that will guide program evaluation. This involves eliciting stakeholders' implicit understandings of a program and what is needed to make it work [36]. Best practice recommendations are to develop program theory with involvement of diverse stakeholders at the beginning of a research project, and to refine it during successive phases [37].

The Active Women over 50 trial

Active Women over 50 (AWo50) is a planned effectiveness-implementation randomised controlled trial testing an intervention for women who would like support to increase their physical activity. Participants will be randomly allocated to an intervention group ($n=500$) which will receive immediate access to AWo50 program, or to a waitlist control group ($n=500$) which will receive the program six months later. The six-month program has four components: (1) two sessions of telephone-based health coaching, (2) access to the AWo50 website, (3) access to the AWo50 private Facebook group and (4) email or SMS behaviour-change messages. Women may participate if they are aged 50+; live in the community in New South Wales (NSW), Australia; have capacity to exercise regularly but do not meet the moderate-vigorous Australian physical activity guidelines; have access to an internet connected device; and can communicate in English sufficiently to access the program. Primary outcomes are daily steps at six months. Secondary outcomes include self-reported physical activity, fall rates, wellbeing, quality

of life, menopause-related quality of life, bodily pain and sleep quality.

This AWo50 program was designed with input from stakeholders across urban, regional and rural areas of NSW, and builds on the pilot trial of a previous 'low dose' version of the program which comprised a physical activity health coaching session, free activity tracker, choice of motivational SMS or email messages and access to a website designed with informal end-user input. The design was informed by our initial program theory (Fig. 1) comprising constructs from the COM-B model [38] and self-determination theory [39] with the added 'barrier' concept of competing priorities which have been found to be especially challenging for middle-aged women who are often juggling simultaneous demands such as working in senior roles, caring for aged parents, running the family home and dealing with their own health (and body image) challenges [40, 41].

The pilot program was found to be acceptable and feasible with encouraging findings of positive impact on physical activity [42]. The qualitative study of participants' experiences of this pilot [41] highlighted views that the revised AWo50 program seeks to address. These included the desire for a program that provides: flexible components and physical activity options which can fit with women's diverse lifestyles, preferences and physical capabilities; opportunities for social connectivity; positive encouragement and accountability which does not trigger guilt and shame; relevant life-stage health information and inspiration/ideas about how to get on track

with regular exercise [41]. The revised AWo50 program in the planned trial seeks to address these points but consequently includes some components that have not yet been tested. The revised program also seeks to cater to a broader geographical and socioeconomic participant group than the pilot. Therefore, the aim of this qualitative research was to review and refine the proposed content of the revised program in collaboration with a wider range of women over 50 in order to optimise the program's chance of success. We also sought to use this consultation process to optimise the flyers that would be used for trial recruitment, and to critique our program theory.

Methods

Study design

This was a pragmatic qualitative study design using framework and abductive analysis. The pragmatist paradigm asserts that the value of knowledge lies in "its context-dependent, extrinsic usefulness for addressing practical questions of daily life" [43]. Thus pragmatists focus on applied research that values different forms of knowledge and different methods for acquiring knowledge, privileging understanding over methodological purity. Pragmatism is concerned with social justice, asserting that social problems are best defined by the people who are experiencing them, making this approach especially suitable for person-centred research [44]. We chose this approach because we wanted to produce a practical, actionable critique of our proposed program,

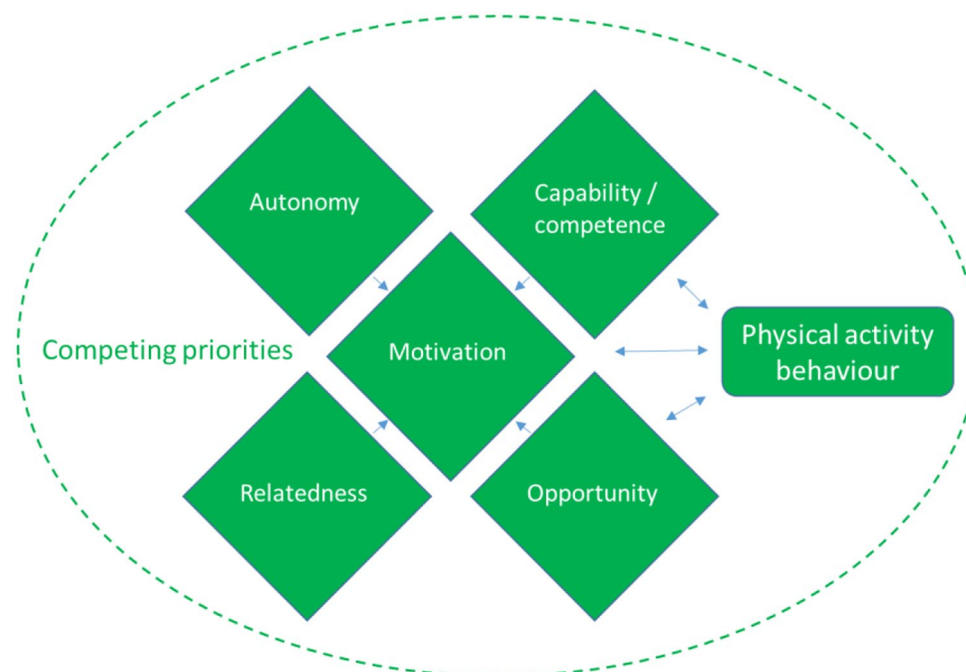


Fig. 1 Schematic program theory

recruitment flyers and program theory (i.e., ideas about how the program might work) drawing on the lived experience of women aged 50+. Semi-structured interviews and focus groups were selected as the best methods for achieving this [45].

Recruitment

We sampled purposively for maximum variation in age (50+ years), geographic location (across urban, rural, remote and regional NSW, Australia) and areas with different socioeconomic profiles, current engagement with physical activity and in conditions or disabilities which may moderate physical activity. We used existing networks to identify potential participants including contacts at the NSW Country Women's Association, community partners in the grants funding the trial, members of the Institute for Musculoskeletal Health's Consumer Advisor Registry and participants from previous studies. These contacts sent emails to potential participants with the study's participant information statement attached. Additional opportunistic snowball sampling was used to target specific participant characteristics. For example, having spoken to some women living in rural areas we asked them to refer other women aged 50+ who they knew lived in similar locations. We also asked participants to refer any women aged 50+ they knew who were living with disability or spoke English as a second language but had sufficient English to take part in this consultation.

All potential participants received a participant information statement, provided informed consent online via REDCap and then answered survey questions about demographics, health status and current self-rated physical activity ('active', 'sort of active', 'not active'). Out of 25 women who consented and completed the demographic screening, only 21 were selected for interviews due to our assessment as data collection progressed that no new insights were being generated (i.e., data saturation) [46]. The lead researcher emailed the four remaining women to thank them for offering to help us and to let them know they were eligible to enrol in the trial (participants in this consultation study were not eligible given they had prior exposure to some intervention components).

Data collection

All participants were emailed a PDF document (Additional file 1) at least one week before their interview or focus group and were asked to review the document beforehand. The document contained an image showing the four proposed AWO50 program components—health coaching, AWO50 website, a private Facebook group and motivational email/text messages—with a brief overview of the draft strategy for each. It also presented colour images of the four draft recruitment flyers, a sample of

seven text messages and a sample of three emails that could be sent to program participants, and the URL (website address) for the draft AWO50 website. We used a copy of the website so that this consultation would not affect the trial's data analytics.

We planned to consult primarily via focus groups due to their utility in generating ideas about an issue that participants have collective knowledge of [47]. However, there were logistical challenges in setting up focus groups with this population who were often time-constrained by the competing demands of work and caring roles. Others have encountered similar problems [48] and point out that recruitment to individual interviews is generally smoother because interviews can be scheduled flexibly and easily rescheduled if required [49]. Consequently, we conducted one focus group with women living in regional or rural areas, and 17 individual interviews. Interviews and the focus group were all conducted online using videoconferencing software and the share screen feature was used to display content for discussion using PowerPoint slides. These slides mirrored the content that had been sent in advance.

Interviews were conducted by a researcher with extensive qualitative experience. This researcher also led the focus group and was supported by a co-facilitator who also has extensive qualitative experience. Both researcher and co-facilitator are women over 50 years of age. These researchers were not involved in the design of the AWO50 intervention or recruitment strategy and this was stated in all data collection to encourage frank critical feedback. Interview and focus group questions focused on responses to the recruitment flyers and four program components. To ensure we covered the range of evaluative concerns associated with health websites, we asked additional questions about the AWO50 website informed by constructs in the Adapted Mobile App Rating Scale (A-MARS): a reliable scale modified specifically for evaluating health websites [50]. We did not ask questions explicitly about the program theory constructs (as we will in the trial evaluation) because in this late formative phase we were more interested in participants' unprompted views about if and how the program components were likely to work. See additional file 2 for a copy of the interview guide.

Data analysis

Data analysis was conducted in two phases. First, framework analysis was used to synthesise the data rapidly and present it in an actionable form to inform revisions of the recruitment flyers and final program design. Second, abductive analysis was used to draw out deeper insights from the data in relation to our program theory. Both analytical approaches are outlined below.

Framework analysis

Framework analysis facilitates systematic yet rapid synthesis of qualitative data [51] and provides an accessible and largely transparent overview of the data which can be easily read by others and applied [52, 53]. This approach to data analysis is what Braun and Clarke refer to as ‘code-book’ thematic analysis, noting that it is pragmatically positioned between reflexive interpretive approaches and post-positivist quantitative-influenced approaches [54]. This analysis was conducted concurrently with data collection. An initial matrix was developed in a Word document, assigning each row to a case (in this instance, an audio file from each interview or focus group). Column headings were assigned to concepts we were targeting in our consultation as indicated by the interview and focus group guide questions (e.g. various components of the proposed AWO50 program). The lead researcher listened to each audio file and summarised the relevant content within the matrix. Following further data collection, the matrix was reviewed by the second researcher who had co-facilitated the focus group and the column headings and data summaries were discussed in relation to their thoroughness in capturing key feedback from participants, and their utility for decision-making by colleagues who were designing the AWO50 program and leading trial recruitment. Verbatim quotes were included where they appeared to crystallise a point of view. As the analysis progressed we found that several of the columns were too granular and so they were merged into higher order concepts. Final matrix headings were: Participant name and age, Recruitment flyers, Text messages, Email messages, Website, Health coaching, Facebook group, Ranking and Other comments.

The focus group audio was treated in a similar manner to the interview audio, but attention was paid to ensuring the summary captured variation of views and areas of strong agreement across the participants. We did not attempt to analyse dynamics within the focus group having noted that the members had agreed with and built on each other’s points, with no apparent shifting of ideas or power imbalances detected [47].

Once all data collection was complete, we synthesised the contents of each column to provide a more aggregated and actionable overview of the whole consultation. This was inductive for all but the website data which was synthesised in a table according to the A-MARS [50] constructs we had selected as most relevant to our study. We also reviewed data across the matrix columns to identify key themes related to recruitment.

Abductive analysis

In a second phase of analysis we followed an abductive thematic analysis approach [55] in which we coded data using the six constructs in the program theory that had

informed the design of the AWO50 program (Fig. 1). These were five physical activity-promoting constructs: Autonomy, Relatedness, Competence/Capability, Opportunity and Motivation; and one physical activity-impeding construct: Competing Priorities. We identified data related to each construct and reviewed it for information that supported, nuanced or refuted the appropriateness of that construct for the AWO50 program. We also coded to identify any data that related to important ideas about how the program might work and which were not currently captured in the program theory. This data was used to develop two additional constructs.

Results

A total of 21 women participated in this consultation. Ages ranged from 50 to 80 with an average of 62 years. Eleven participants were currently working and ten had carer responsibilities (seven had both). Ten participants lived in or near a major city, seven lived in inner regional areas, three in outer regional areas and one in a remote area as classified by the Australian Statistical Geography Standard.

which divides Australia into areas of remoteness according to relative access to services [56]. Thirteen participants lived in higher income areas, four in medium income area, and four in low income areas as defined by the Australian Bureau of Statistics’ Socio-Economic Indexes for Areas [57]. Ten participants reported physical conditions which affected their ability to engage in physical activity. Three said they did no physical activity at all but wished they did. Four described themselves as somewhat active. Fourteen considered themselves to be physically active, but in conversation most did not seem to be meeting the WHO physical activity guidelines [58]. Three spoke English as a second language. Three had participated in the AWO50 pilot trial two years previously.

The focus group for women living in regional and rural areas included four people and lasted 83 min, and the 17 interviews lasted between 28 and 59 min, with an average of 44 min.

Feedback and advice about trial recruitment

Five themes were identified in relation to recruitment, focused on a review of four draft recruitment flyers.

I want to see (women like) myself

Many women commented on the power of well-chosen photographs to capture attention (“they hit you in the face”) and to convey the ‘flavour’ of the program while also making a persuasive case about its potential value and its inclusivity. The explicit diversity of women in photos was strongly appreciated, “It’s good to see women of colour and with different shapes and sizes”. The photo of a woman exercising with a walking frame was valued

for its clear message that the program aimed to include people living with disability.

But photos could convey misinformation too. Photos of women taking part in yoga and using hula hoops alarmed some who thought these might be mandatory program activities, and one interviewee said the emphasis on photos of women laughing during communal activities was off-putting because, *“It makes you feel like you have to be in a group, like you have to have fun rather than maybe do things for stress, or just feeling better in yourself. It’s very extrovert.”* Several women mentioned they liked seeing the LGBTQIA+Progress Pride flag on the flyers, but a few questioned how other marginalised groups might feel about their absence.

Keep it real

Some felt that the photos verged on exaggeration. The ubiquity of smiles and laughter in the photos prompted one woman to state that *“Everyone looks happy to be exercising – maybe too happy to be convincing?”* Several expressed surprise at the photo of women using hula hoops, *“Would women over 50 really do that?”* and another felt the photos looked American rather than Australian. ‘Real’ attributes that were valued included diversity, less-than-glamorous exercise wear and visible sweat.

Readability is for everyone

Many women made the point that good readability enhances engagement more broadly. Aspects they identified as increasing readability included the use of icons and subheadings which helped to break up the text and make it more scannable, and a plain background and lots of white space. The uncluttered look of the flyers was important so the relatively limited information about the trial, and range of options for finding out more using different strategies—telephone, website and a QR—was felt by most to be a good balance. They noted that photos with clear contrast were important for those with visual impairment.

Why should I do it?

Most, but not all, argued that no explicit statement about why exercise is beneficial was required since *“we all know that nowadays”*, and the pleasures of the program were largely conveyed by the photographs which emphasised women enjoying being active. However, conveying the *“non-threatening”* nature of the program was regarded as essential. This included making it clear that the program was flexible in terms of physical activities (what, when and who with) and also in choice of program components. Concerns were raised particularly about perceptions that Facebook might be a requirement because,

“there’ll be women out there who don’t want to have anything to do with Facebook”.

The program’s credibility was considered to be especially important in an era when self-appointed wellness gurus abound. The university logo and statement that health coaching was provided by physiotherapists gave women confidence they could trust what was on offer. Several pointed out that we had failed to mention that participation was free—and that this was likely to be a deal-maker for many—or to explain the timeframe. Both of these were considered essential information.

Find us where we live

Many expressed interest in where these flyers would be displayed and argued that women should encounter them in everyday settings. In addition to social media, suggestions included placing flyers in libraries, on shopping mall boards and medical centre walls. They advised us to contact local councils, many of which run activity and healthy ageing / healthy community programs and could email residents or post information on their website. They also suggested specialist groups who have reach into the targeted demographic such as the NSW Country Women’s Association, Menopause Society, BreastScreen, seniors’ groups and community groups such as Probus. Participants emphasised the power of word-of-mouth recommendations and suggested we build that into the recruitment process by asking women who consent to the trial to pass on information to eligible friends and family.

Component-specific feedback and advice about the AWo50 program

Participants gave feedback about the value of each of the four proposed program components: health coaching, access to online resources via the AWo50 website, a private Facebook group, and messaging (by text and/or email). When asked to rank these components in terms of value, most participants said they were unable to rank them because the components were complementary and were likely to function synergistically as a whole package. The assumption was that women could benefit even if they did not make use of the whole program.

Health coaching

There was universal feedback about the value of health coaching which was emphasised by participants in rural and regional areas where access to health services, especially at low cost, was very poor. The draft program design stated that there would be two up-to-40 min sessions of health coaching for each participant. Many participants felt it was *“a shame there can’t be more”* but acknowledged that cost-effectiveness was an important consideration. However, several women suggested we find ways to do *“mini check-ups”* or build alternative

accountability mechanisms into later stages of the program because, “... *there’s a danger that everything is happening at the beginning whereas sustaining the program might be the hard thing*” so “*Some later check-in mechanism might keep people’s eyes on the horizon*”. Two suggested breaking up the health coaching sessions, “*Would 4 sessions of 20 minutes be better? You could give people the choice. People who don’t have support may need more input over time.*”

The timing and mode of health coaching sessions attracted strong feedback. Participants agreed that the first session should take place at the beginning of the program (as currently planned) to help women think about how to be active, set goals and problem-solve. Most felt the second session should take place approximately 4 weeks later, but many argued that this should be flexible.

Choice was also important regarding the mode of the health coaching: specifically, the opportunity to choose telephone or videoconferencing sessions, the latter of which might enhance rapport and individualised feedback from the health coach, “*Zoom would be better for feeling they had seen me, looked at my body and really seen who I am. But others may prefer phone – we’re Zoomed out*”.

There was positive feedback about the credibility and suitability of the proposed health coaches who were to be mature women who were experienced physiotherapists trained in motivational health coaching. Participants urged us to highlight this in promotional materials to instil confidence,

You should explain the coaches are women over 50 too – that’s fabulous. I was talking to a friend recently about having her makeup done and how she didn’t want a 20-year-old doing it. She wanted a 50+ woman who would understand her. So let women know that it won’t be a 20-year-old looking gorgeous in Lycra because that would put people off, especially if they are more self-conscious.

AWo50 website

The AWo50 website generated the most feedback, probably because the draft site had different sections with a wide range of resources, and we guided participants to comment on different aspects of the site: content, usability and visual appeal. These findings are reported according to constructs from the Adapted Mobile App Rating Scale (Table 1) which is used to evaluate health websites [50].

Private facebook group

All participants agreed it was worthwhile to offer a private, moderated Facebook group as part of the AWo50

program mix, seeing it as an opportunity for social connection, information sharing, inspiration and motivation, “*I love the idea! People can share goals, set each other challenges, check in with each other, ask questions, share tips, feel accountable to the group*”.

Although these women agreed that Facebook was “*the right platform for this demographic*”, the question of whether they would have joined the AWo50 Facebook group if they were trial participants was polarising. Those who currently engaged with Facebook, and were often members of shared interest groups, reported that they generally found it to be a supportive space with useful exchange of information and resources, “*I like to know what others are doing. I like to be able to ask questions and offer ideas*”. These women were enthusiastic and said they would definitely join a Facebook group like this and would be likely to benefit from it, “*Absolutely! People can feed off of Facebook. If they’re feeling down they can put it out there and other people will help lift them up. That’s what we should be doing – helping and inspiring each other*”. However, a minority of others were sceptical and two said they would definitely not join it because it could undermine confidence rather than boosting it,

I wouldn’t be persuaded to join the Facebook group. I don’t want to hear a bunch of women sitting around and talking about fitness. It creates comparisons with other women.... You don’t want to hear that someone’s run 10 K if you are feeling bad about yourself.

Two participants raised concerns about the possibility that Facebook could present cyber-threats, “*I would be worried about phishing and pressing the wrong link which could download a virus or something*”. They stated the research team needed to investigate and address this possibility and “*...reassure people that this is not a risk*”.

Everyone agreed that the group must be moderated, ideally by one or more women aged 50+ who are somewhat active. Careful moderation with clear group rules was essential because, “*You don’t know what direction it will go in. That’s the problem with social media, it’s not in your control*”.

They advised that the research team, “*will need very clear rules and protocols*” in order to manage the tone and to “*...keep advertising and inappropriate or irrelevant content off it. Weight loss supplements and the whole wellness movement could hijack it!*”. Some participants suggested the moderator could help different voices to be heard, including making sure the group “*doesn’t get taken over by the over-achievers who want to tell you they’ve run a marathon*”. Importantly, “*No body shaming should be a rule*”. The focus group argued that the Facebook group would probably need multiple moderators who are

Table 1 Participant feedback in relation to adapted Mobile App Rating Scale (A-MARS) constructs

A-MARS construct	Definition	Feedback
1. Engagement	Is the website engaging? Do users want to use it?	Overarching feedback was positive about the website's diverse content, attractive appearance and good usability, strongly suggesting the site was both engaging and interesting for our participants. Comments included <i>"there's enough variety of information to appeal to different interests and take you further into specific interests"</i> and <i>"Lots of ideas for women who are not already active and need ideas and help to get started without feeling overwhelmed"</i> . The use of questions to trigger self-reflection was considered to be <i>"a good hook"</i> . The <i>"great selection"</i> of video- and photo-stories (commissioned by the research team) received positive feedback from everyone who reviewed them, <i>"They help you identify with other women"</i> . The main suggestion for improvement was to create larger and <i>"more inviting"</i> topic headings and to include illustrative images and/or graphics, <i>"Content topics should be clearer. The icons [logos] to some of those organisations are just not appealing. I felt I should read them, but wasn't interested in them."</i>
2. Interest	Does it present information in an interesting way?	
3. Customisation	Can users change sound, content, notifications, reminders or display?	The prototype website tested in this consultation did not include customisation or interactivity features, but participants were asked for their views about the potential addition of a personal dashboard that would enable these features. Some thought this could add value to the program if it could sync with activity trackers and be used to collate data and monitor progress, <i>"... anything where people can see their progress is useful"</i> . Others felt this was already accessible to them via mobile phone apps and would confuse the purpose of the website, <i>"I want to connect to real people not a website. I don't want to track data. I see the website as information, not personalised stuff"</i> .
4. Interactivity	Does it allow user input or data exchange with other devices, provide feedback or prompts, or adapt to user input?	
5. Target group suitability	Is the content (visuals, language, design) appropriate for the target audience?	Feedback strongly suggested that the website content, appearance and usability was appropriate for Australian women aged 50+ who wanted to be more active. This finding is supported by the enthusiasm of participants about the site, and their descriptions of useful and inspiring content that was easy to explore, with images that <i>"resonated"</i> .
6. Performance	Do all components work with reasonable speed and no glitches?	We did not ask about performance directly but the website functioned smoothly during interview and focus group testing, and no glitches or delays were mentioned by participants, most of whom who had browsed it beforehand.
7. Ease of use	How easy is it to use? Are the menu labels, icons and instructions clear?	One participant told us, <i>"I hated all the drop down boxes – you lose track of where you are. There's too much fiddly back and forth"</i> , and another found that the moving messages on the landing page transitioned too rapidly. Otherwise, the ease of use, navigability and layout of the website was assessed positively— <i>"It's clean and clear and it all makes sense"</i> —including by a participant who had poor fine motor skills due to cerebral palsy, <i>"You can move easily from section to section and it's clear where you go for more information"</i> . One noted that, <i>"Websites are always tricky – you can feel you're going down a rabbit hole – but the content is good and the layout seems as clear as it can be"</i> . Participants said that the three sections of the website (Why be active?, How to be Active and Be inspired) organised the content logically with clear, meaningful subheadings. Areas for clicking and hovering were clear and sufficiently large for unsteady hands. Usability was aided by uncluttered pages with medium-large typeface and, mostly, good contrast. Suggestions for improvement included sharper contrast on a few of the darker photos and on some coloured text.
8. Navigation	Does movement between pages make logical sense?	
9. Layout	Is the arrangement and size of buttons, icons, menus and content appropriate?	
10. Visual appeal	How appealing is the website to look at?	The majority of participants liked the <i>"soothing"</i> mauve colour scheme although few found it <i>"passive"</i> and <i>"more spiritual than active"</i> and would have preferred <i>"hot"</i> , <i>"bolder"</i> , <i>"energising colours"</i> , but noted these were often present in the photos of active women. The diversity of these photos was strongly appreciated with feedback that echoed themes from the review of recruitment flyers such as <i>I want to see (women like) myself</i> and <i>Keep it real</i> , e.g., <i>"Those chunkier bodies are good. I like that many of them look like ordinary women wearing ordinary clothes – you think 'That could be me'"</i> . However, some pointed out that the background image of a beach on the landing page could be seen as <i>"tone deaf"</i> given that women living in inland areas would have no access to the ocean.

Table 1 (continued)

A-MARS construct	Definition	Feedback
11. Content quality	Is the content up-to-date with current evidence, well written and relevant to the website's purpose?	Participants were generally enthusiastic about the content and appreciated the range of information and resources, including articles tackling diverse aspects of physical activity for specific health conditions and ages, exercise videos, local directories, podcasts, FAQs, tips, inspiring stories and many quality resources. Suggestions for enhancing the content included adding an article on exercise myths to counter misinformation, providing tips on setting up and using fitness apps, guidance about how to convert other forms of PA data into steps. Several participants noted that the section with stories could be more diverse, <i>"I think you could do better with the multicultural and other forms of diversity with the stories. It would be good to have more women of colour and some English-as-a-second-language who have accents, and people who are more working class and/or less articulate but still passionate"</i> . Others argued for the inclusion of trans women and <i>"more who are staying active despite injury or disability"</i> . The focus group suggested a quiz— <i>"How long since you've exercised? Do you have an injury? etc"</i> —which would direct users back to the appropriate section of the website. <i>"Some people will be looking for motivation and accountability while others are looking for exercise they can do safely, or how to get started slowly"</i> . They noted that <i>"Getting going again' is missing currently"</i> .
12. Content comprehensiveness	Is the information comprehensive and relevant but concise?	
13. Credibility	Is the content from a credible (evidence-based) source?	Participants said the use of <i>"reputable"</i> organisational logos on the website frame (including three universities and a government health authority), plus authoritative sources linked to much of the content, assured them that the website had a credible foundation and its content was trustworthy.

working with rules devised (and refined as required) by the wider team. They advised us not to delay participants' contributions by checking them pre-posting because immediacy is a drawback with Facebook posts; rather, we should remove unsuitable posts periodically and reassert the rules when needed.

Participants agreed that the AWO50 Facebook moderator should also provide content, *"e.g., a weekly tip or story"*, *"using humour and sharing ideas"*. And they envisaged the role as someone who engages and interacts with the community authentically as a *"real person"*; *"She should be personally involved so we could get to know her and she should lead the sharing, especially early on"*. This was regarded as a strategy for creating a safe space and building rapport,

I'm in a private Facebook group re my [health condition] and it feels very safe. I'm willing to share personal info there. We get to know the moderator as she tells us about herself too, and that is reassuring that we can trust her.

The rural focus group was asked if we should consider offering separate groups for women living in rural/regional and metropolitan areas. The group said no, *"they have things to offer each other"* but the moderator would *"... need to be sensitive to needs/experiences of country women as well as urban"*. Two participants asked about the possibility of local Facebook groups, *"I want something that makes me feel 'This is my place'"*, but acknowledged that local connections with subgroups might develop organically.

Additional feedback focused on the need for strong, early reassurance about the psychological safety of the forum *"so people don't just dismiss it without considering it"*.

Text and email messaging

In general, messaging was regarded as a positive component of the program with potential to increase engagement, knowledge and motivation, *"Keeping in touch is good – when you get a text or an email it feels like the researchers are thinking of you"*. Women highlighted the limitations of generalised unidirectional messaging, but argued that this was reasonable within the program-as-a-whole if expectations were managed, *"Unidirectionality is okay because you have other options for asking questions and getting feedback (I'm thinking of the coaching and Facebook page), and I wouldn't expect it be two-way anyway"*. Strategies for making messages feel more personal included signing emails with the coach's name and targeting message content at specific points in the program, *"You may not be able to individualise the messages, but you could at least say 'Now you're in week 6 of the program' so people feel the program knows what they are doing"*.

Choice was, again, a central concern. Participants liked that women in the AWO50 trial could choose either texts or emails or no messaging, and had some say in how often they were received, *"It's great that people can choose frequency because there will be a lot of diversity in preferences"*. This was viewed as a way to minimise irritation, *"texts will quickly lose impact and become annoying and will be ignored."* Women suggested that messages would be more effective if trial participants could choose which days and at what time they receive them as this could help the messages stand out against *"the constant junk on all our phones"*. Timing could be selected to align with exercise preferences too, *"the time of day may be a factor – if I don't exercise first thing it won't happen"*. We were advised to check participants' preferences throughout the trial so they could adjust timing and frequency,

“You may need to change it during the program too as life circumstances and your message-tolerance changes.”

Sequential development of both emails and text messages was suggested to help build progress week-by-week, and help participants connect with other parts of the program in a logical order. This included “*exit planning*”: *“You will need an email near the end to help people think about planning their exit and how to sustain being active – ask ‘What’s your plan?’ ‘What have you learnt that you can use?’”*

Text messages were liked for their succinct prompts, hyperlinks to resources, and their encouraging tone, *“They’re inquiring, reaching out. It invites participation without being preachy.”* This was regarded as essential because *“... it’s so easy to feel bad and a failure.”* But some suggested that the content should function less like reminders and more like *“a call to action”* which encouraged women to reflect by asking them questions, e.g., *“What can you squeeze in today?”*, *“What could you do differently next week?”*. Some advised we should not use negative phrasing (e.g., *‘Feeling a bit down?’*), but rather, *“Make it positive. Say something like, ‘Get those good feeling endorphins going!’”* Others suggested we *“mix it up”*: *“Sometimes a tip, sometimes a quote. You want to have variety in the content to prevent text fatigue.”* Most women agreed that clear branding with an AWO50 logo was important *“... so I can trust it’s from AWO50 and not yet another scam”*.

Emails were liked for their *“deeper information”*, but many felt they were too long (*“a slab of text”*) with layouts that were dense and lacked visual interest, *“They’re way too long. It’s daunting. You think ‘Oh no, this is a lot of work I’ve got to do’”*. The language was reasonable, *“I like the wording – nothing technical or jargony. I don’t speak English as first language but could read it all with no problem”*; however, many felt it could be *“chattier”*, *“snappier”* and more engaging. Hyperlinks to quality resources and interactive tools such as quizzes was highly valued as a *“hook”* for engagement. Suggestions for improving the emails included: shorter paragraphs with more white space; breaking up the text with headings, text boxes, bullet points and infographics; using headings to generate interest (e.g., *“Quick tips”* and *“How active are you?”*); focusing on one key message per email; careful phrasing so messages are succinct and *“punch home the key message in the first paragraph”* with no repetition.

Accessibility was a concern for emails. Women suggested using larger typeface, formatting so they would display clearly on different devices and being mindful of including content such as images that might affect downloadability and readability, *“Be careful of making them too busy – people will be reading it on their phone. I want things to be easy to read. I often differ from my colleagues*

on this as they want cute graphics and all sorts on our newsletters – but it can be too much.”

Ranking components

When asked the question, *“If we had to drop one of these components, which would you choose?”*, most women said the text messages, with the two who shunned Facebook nominating that component. However, everyone pointed out that women over 50 were a highly heterogeneous population and a successful program should use a range of engagement strategies that target different needs and preferences, and function complementarily, *“It’s all useful because different bits will work for different women”*.

Using consultation data to review our program theory

The inclusion of all constructs was supported by the consultation data as outlined briefly below.

Autonomy

As is evident in the findings above, choice was a dominant theme in the data. Person-centred coaching that supported self-directed goals and individualised physical activity programs, combined with the ability to pick and choose between components, and to engage with those components differently (e.g. choice of messaging type and frequency), was considered likely to broaden uptake of the AWO50 program, increase women’s confidence and sense of ownership in physical activity and their likelihood of maintenance. This strongly supports the inclusion of autonomy as a driver for program success in our program theory.

Relatedness

Consultation data confirmed that relatedness was highly valued in supporting physical activity, but suggested that this could be the weakest aspect of the AWO50 program. This was because of limited health coaching sessions, unidirectional messaging, and the antipathy some women will feel about Facebook. However, participants were realistic about cost/benefit considerations, noting that, *“Two sessions [of health coaching] isn’t long enough to build a relationship but it could still be very helpful”*. They offered suggestions for building rapport in these sessions, explaining that coaching should be *“kind” “encouraging”* and *“demonstrate understanding and empathy around challenges and lack of services in regional areas”*. Coaches were also advised to, *“... think about how best to connect with people over Zoom. Make sure you use it well. You may need to think creatively about that”*.

Similarly, Facebook moderators were advised to be interactive and authentic to foster trust, but we were warned not to treat Facebook as a substitute for real world social engagement, *“there’s an assumption that social media fills the gap of social connection, but it really*

doesn't". To this end, women asked us to use all the program components to "encourage women to make real world connections in their communities to support being physically active". Suggestions included seeking "local representatives" via Facebook who could "volunteer as an AWo50 ambassador" and organise community activities such as walking groups. Participants also suggested a greater focus on social connection on the website, including tips for finding an exercise buddy and making use of community programs like Park Run.

Capability / competence

The importance of building women's capabilities and self-efficacy was evident in participants' discussion of the need for encouragement that, "You can do it!". They asserted that goals must be "modest", "realistic" and incrementally progressive, and recommended we provide more resources that "[Target] where people are starting from: Are you a beginner? Are you trying to get back to exercise? Are you looking for ways to expand your exercise routine? Are you dealing with an injury?". Reassurance about the "non-threatening" nature of the AWo50 program was regarded as essential in recruitment given that poor self-efficacy could be a major deterrent.

Opportunity

The AWo50 program was regarded as offering opportunities directly via health coaching and, indirectly, by 'pointing' to other opportunities in the website resources. For example, some had tested the activity directories and sourced local opportunities for themselves, "I found a walking group in my area which I'm going to follow up". They thought the Facebook group might generate information about further opportunities. Several pointed out that offering the free trial opened opportunities up to some women who might otherwise not be able to afford a physical activity program.

Motivation

All participants acknowledged that motivation was a major challenge for many women aged 50+ and that the AWo50 program had to tackle this. Several participants advocated stronger messaging about the benefits of PA in coaching, on the website and in recruitment, "Maybe sell the message that the more active you are the longer and better your life will be. Your body and brain will both work far better. Your psychology will be affected". However many advocated for encouragement while also warning us about the potential for women to feel hectored or shamed by messaging which could alienate rather than motivate them. For example, website content was appreciated because, "The tone, the encouragement and positivity is great. It's normalising the challenges of time, caring, fatigue, etc. so there's nothing guilt inducing. We have

enough guilt already!". Photos and videos on the website were generally considered to be "very motivational" because they depicted 'real' women who modelled being physically active in achievable ways. They noted that the program was using a range of strategies and felt this was appropriate given that women will be motivated by different things. For example, some felt motivated by activity tracking (e.g. monitoring step counts), and enjoyed 'rewards' for achievement, but they cautioned against building a dashboard into the website that would encourage data sharing and competition, "I don't want to compare. I want to listen to myself and find my own rhythm".

Competing priorities

The flexibility of the AWo50 program was regarded as essential given the limited time and energy that many women aged 50+ struggle with. We were encouraged to confront this head-on in recruitment, for example, rather than ask "Do you want support to be more active?" on every flyer we could ask "Are you struggling to get exercise into your busy life?". The focus group highlighted how competing priorities could play out differently for some women in rural areas when, "During harvest people have weeks when they're completely unable to fit anything else in".

However, we also identified two prominent concepts in the data that were not well captured by the current program theory. First, the need for reassurance about online safety: psychological and technological. We are conceptualising this as *A safe enough space* in our revised program theory model (Fig. 2) and see this as potentially extending to experiences of social and physical safety in environments in which participants exercise.

Second, women in our consultation often reflected on the enduring question of how women can be supported to make physical activity a priority without triggering guilt and inadequacy when plans go awry. We conceptualised this as *Responsibility without blame*. Given its salience, we also added this construct to our program theory as another condition which should be addressed in the AWo50 program evaluation.

Discussion

This consultation study found that, overall, the intervention design and recruitment plan for the *Active Women over 50* (AWo50) trial was sound, but aspects could be improved with stakeholder review and feedback.

Recruitment

We identified principles that helped us critique and refine our current recruitment flyers but could also be applied to other recruitment materials for this stakeholder group. These included the advice to 'keep it real' and to show diverse images that reflect ordinary women's

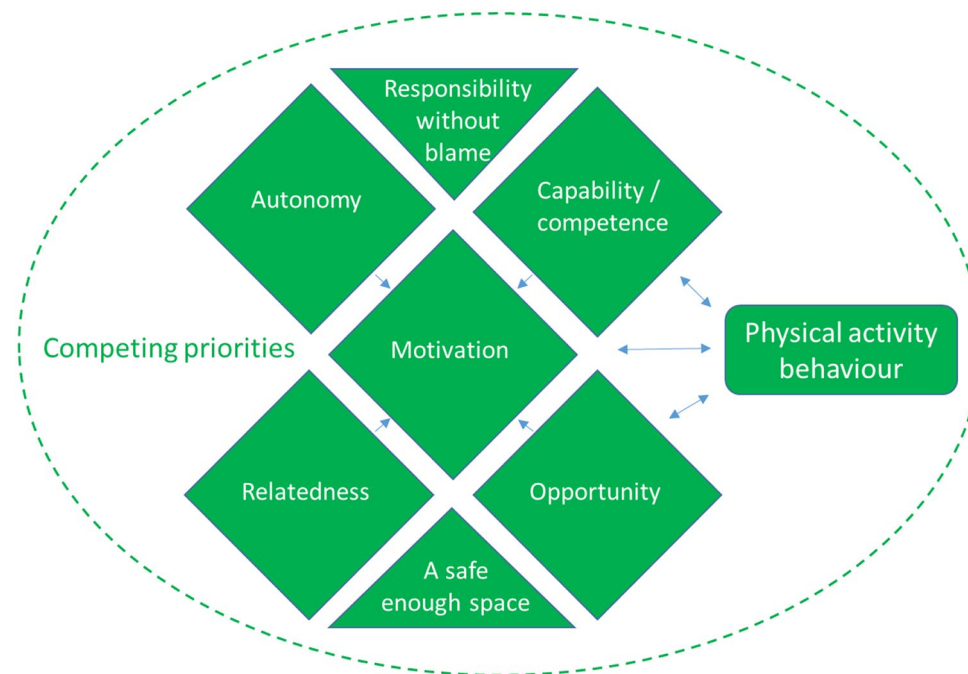


Fig. 2 Revised program theory for further testing and refinement during the planned AWO50 RCT

bodies authentically, and depict them using their bodies positively. This aligns with studies of older women's attitudes to advertising in which they report feeling patronised by stereotypical or idealised images and want to see “normal” women like themselves, who are acting with purpose [59, 60]. Feedback about recruitment flyer text helped us improve readability and include clearer descriptions of the program's format, credibility and potential benefits. This fits with Wong et al.'s [61] findings that improving comprehension, building legitimacy and framing risks and benefits clearly are key strategies for improving research participant recruitment and retention. Importantly, we highlighted that the program was free which we hope will encourage women from lower socioeconomic groups who frequently report that the cost of physical activity options is a barrier [62].

Suggestions from women about placing recruitment advertising in a wide range of everyday physical and online locations, and targeting some groups through specific channels, including word-of-mouth recommendations, is also supported by the literature. Maghera argues that a variety of methods is needed to recruit across diverse participant demographics [63]. Several studies suggest that active outreach by researchers (e.g. in lower socioeconomic status neighbourhoods and with special interest groups) and encouraging targeted word-of-mouth recruitment can be more successful with disadvantaged and hard-to-reach groups [19, 21, 64]. The AWO50 trial will follow this guidance.

Program design

There was strong support for the AWO50 program as proposed. The four intervention components were valued differently but participants agreed that they had different purposes and were likely to function complementarily to address different aspects of support. Health coaching could support realistic goal-setting and build confidence that many women would need to get started with regular exercise. The website provided education, ideas and inspiration for women with different needs and preferences, and resources targeted at different needs. The private Facebook group could offer some social connection, peer-encouragement, and generate ideas. Text or email messages could provide motivational reminders, tips and links to resources. The flexibility of the program—including the ability to opt in or out of components, and to choose the type and frequency of messages—was considered to be essential for attracting diverse women to the trial and sustaining their engagement.

Health coaching by experienced physiotherapists was the most highly valued program component. Health coaching is consistently shown to increase physical activity in older people [65, 66] and the empowerment focused model planned for the AWO50 program may have particular value for women for whom self-efficacy can be a greater barrier [67]. Ideally, the women we spoke to would have liked more than two sessions to develop a relationship and sustain accountability throughout the program. The number of health coaching sessions was a feature of the program that we were unable to change given the impact on scalability of such substantial

additional program costs; however, we do plan to offer the two sessions approximately 4 weeks apart, with options for different spacing, as suggested.

The AWo50 website was also highly valued, and many women in our consultation (who were not eligible to take part in the trial) said they had made use of it. It is well established that information alone is not sufficient to drive behaviour change [68], but feedback indicated this website not only increased awareness of opportunities, but also presented a persuasive rationale for physical activity and provided a wide range of practical ideas and resources. However, there was room for improvement. Refinements to the website based on consultation feedback included: restructuring the landing page so that women would not be faced with auto-change text as the headline, replacing the website background photograph of beach scenes with Australian bushland (in consideration of the many participants who will not live on the coast), new 'Myth busting' content designed to counter common misperceptions, an emphasis on activities as headings rather than using organisational logos, and more in-depth information about the potential benefits (and safety) of joining the Facebook group with instructions for doing so. Given there was mixed feedback about the value of a web-based personal dashboard, no interactive elements were added at this stage.

Although all our participants argued in favour of including a private Facebook group as a component of the AWo50 program, there was polarised feedback about how much it appealed to each woman individually. This reflects the complexity of attitudes to Facebook found in the literature. Studies have shown that Facebook groups can provide supportive and empowering spaces for older women [69] and have the capacity to positively support physical and mental health [70], while also potentially exposing women to negative comments and comparisons that undermine their wellbeing [71]. Thus middle-aged and older women, while often using Facebook, may also view it with distrust and self-censor accordingly [72]. This hesitancy was exacerbated by the fact that Facebook groups can evolve in ways that researchers cannot control. However, the literature suggests that women experience private groups as safer spaces [71], and that moderators using transparent criteria can positively influence the evolution of Facebook groups [73]. Consistent with the views of our participants, the AWo50 Facebook group moderator will be a woman aged 50+ who actively encourages positive participation and who shares information and ideas. She will moderate according to transparent criteria. We aim to appoint someone to this role who has a background in coordinating online community groups.

There was less enthusiasm for text and email messages, but no one argued that they should be dropped. They

were recognised as adjunct tools which women could take or leave as desired, but which had the potential to make a big difference for some. This is supported by studies which show that messaging interventions can increase physical activity levels [74, 75]. However, the email message format was strongly critiqued by our participants and was therefore completely revised. A graphic designer was employed to make messages more visually pleasing using images, embedded videos and breaking up the text with scannable heading and summary boxes. Photos reflect the diversity of our targeted cohort and the sign-off comes from the study's chief investigator rather than a faceless 'team'. Flexibility regarding the frequency and timing of emails was constrained by the email platform which was unable to offer both complex design features and flexible scheduling. The research team decided that visual appeal was the priority. Text messages were also refined for visual appeal based on consultation feedback, e.g., using women's names occasionally for greater personalisation and clear AWo50 branding. The text messaging platform enabled the research team to schedule a month of twice-weekly text messages followed by the option to increase or decrease message frequency, but they were unable to schedule times of days flexibly without complex programming which could affect program scalability.

Program theory

Consultation feedback about the likelihood of program components working synergistically are consistent with evidence that combinations of components delivering a range of behavioural change techniques are most effective for increasing physical activity [76]. Participants' feedback generally supported the program theory, agreeing that interventions targeting motivation and capability, and which provide opportunities, are well placed to encourage physical activity [77]. Also, that self-efficacy is a critical mediator of physical activity for middle-aged and older women [78] and self determination and relatedness are motivators of sustained physical activity [79]. In the AWo50 trial evaluation, we anticipate learning valuable lessons about how different aspects of the implemented program function in relation to the constructs in our program theory. In particular, how relatedness works (or fails to work) in practice. Data from this consultation offered some nuanced ideas about how those constructs might be operationalised and this will inform our data collection instruments.

We identified two additional constructs that were not well captured in our existing program theory. A *safe enough space* which addresses women's need for reassurance about safety: physical, technological, psychological and social. Consultation comments about Facebook's risks and the threat of body shaming, plus the literature

on women's safety when exercising in public spaces, support this [80]. The second construct was, *Responsibility without blame* which addresses the fine balance in supporting women to be more physically active without triggering guilt and inadequacy. This echoed findings from our evaluation of the pilot AWo50 program in which some participants viewed their inactivity through a lens of self-blame and defeatism [41]. Harman argues that these moral judgements of personal failure or social transgression, which are especially pervasive in women, can taint the very idea of physical activity [81]. We intend to explore the value of these new constructs in the trial evaluation and use that data to modify the program theory, including describing apparent relationships between previous and new constructs (which are currently slotted into the revised schematic model—Figure 2—without defined relationships).

Strengths and weaknesses

We spoke to a wide range of women across age groups and localities, but despite actively seeking women from lower socioeconomic areas only four participated, and only one woman from a remote area of Australia. Although half the women we consulted reported having physical conditions which affected their ability to engage in physical activity, only one described herself as living with disability. Participation in physical activity by women with disability is disproportionately low [82, 83], so this is an important gap in our consultation that we are attempting to address via targeted recruitment through community disability groups. We may also be missing perspectives from other groups of women we did not sample for. Intersectionality may create complex systems of social status and privilege which can result in a 'multiple jeopardy effect' of inequality and poor health outcomes for some groups [84]. Thus women of colour who have low levels of education and low incomes have poorer rates of physical activity than white men with higher education and incomes [85]. Greater representation in our consultation might have strengthened the appropriateness of AWo50 for these women. This is a topic that our qualitative process evaluation (which will use purposive sampling) will tackle.

Another potential weakness is that data collection was conducted entirely online. Videoconferencing may be less effective at facilitating rapport and close observation of non-verbal cues [86, 87]. However, studies have found that online interviews and focus groups do not appear to result in substantially different thematic findings than in-person data collection [88] and the assumption that face-to-face data collection is the 'gold standard' is questioned [86]. Videoconferencing can also be fraught with technical glitches [86]. There were no connectivity problems for women taking part in regional and remote areas (as

we feared), but one interviewee accidentally shut off her video and could not reestablish it during our conversation. Overall, this method of data collection enabled us to include women who lived in rural and regional areas around NSW that we would otherwise have been unable to reach other than by telephone, which has less scope for establishing rapport [89] and for sharing visual content than videoconferencing.

Lastly, reflecting on the impact of this consultation, we believe that earlier participative involvement of diverse women using a co-design approach [90] would have been beneficial. The investigator team behind the AWo50 trial does include some consumers and representatives of targeted groups, such as women living in regional and rural areas of NSW, but this wider consultation generated many additional ideas, some of which we were unable to act on because it was relatively late in the program design process. The literature increasingly indicates that co-design approaches can create more meaningful programs with better outcomes [91].

Conclusion

The *Active Women over 50* program is designed to support middle-aged and older women to be more physically active. The program is soon to be tested in an effectiveness-implementation randomised controlled trial. We conducted a consultation with diverse stakeholders to optimise the program design and recruitment flyers. This consultation resulted in substantial refinements to the recruitment flyers and strategy, and all four of the program components, albeit to different degrees. Not all suggestions were actionable due to technological and time constraints, and the desire to keep program costs low enough for delivery at scale during the trial and beyond. The AWo50 program was designed for mature women, by mature women. We anticipate that the refinements made as a result of this consultation process will increase its reach and appeal for women aged 50+ across New South Wales. The feedback, while specific to this program, may have greater transferability for other recruitment strategies and program design using similar components and targeting this demographic.

Abbreviations

AWo50	Active Women over 50
NSW	New South Wales

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12889-024-20345-8>.

Supplementary Material 1

Supplementary Material 2

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Author contributions

The AWO50 trial is led by AT and CS, and is managed by GW and JSO. GW designed and led the AWO50 pilot, supervised by AT. AH led the design, data collection and analysis for this study, and is the lead writer of this manuscript. HG contributed to data collection and analysis. CW and SO support the program of work associated with AWO50 trial, including recruitment and data management. All authors have read, contributed to and approved the final manuscript.

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Data availability

All relevant data is included in the manuscript. Raw data is identifiable and cannot be shared according to the ethical approvals for this study.

Declarations

Ethics approval and consent to participate

This project was reviewed and approved by the Human Ethics Research Committee of The University of Sydney, approval number 2023/573. All participants provided informed consent to use their deidentified data in presentations and publications.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Institute for Musculoskeletal Health, Sydney Local Health District, King George V Building, Missenden Road, Camperdown, Sydney, NSW 2050, Australia

²Sydney School of Public Health, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia

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