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Title:
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Date:
2025-12-01

Citation:
Liew, S. J., Wong, M. C. P., Yi, H., Young, D. Y. L. & Hui, R. J. Y. (2025). What older adults say about participating in health-promoting activities to prevent frailty: a qualitative study. BMC Geriatrics, 25 (1), pp.945-. https://doi.org/10.1186/s12877-025-06640-y.

Persistent Link:
https://hdl.handle.net/11343/367953

BMC Geriatrics

RESEARCH

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What older adults say about participating in health-promoting activities to prevent frailty: a qualitative study

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Abstract

Background Health-promoting programs have been implemented to prevent frailty amongst older adults in Singapore which has a rapidly aging society. However, participation rate in such programs seemed lower than expected, despite the programs being physically and financially accessible. There is little local research about older adults' personal health beliefs and attitudes towards participating in health-promoting activities to prevent frailty, as well as external influences on their perceptions. Therefore, a qualitative study was conducted to explore older adults' lived experiences and perceptions of health-promoting activities.

Methods Semi-structured one-on-one interviews were conducted with 20 older adults (65–80 years) in a primary care setting from March through May 2023. In-person interviews were guided by a multi-level conceptual framework adapted from the Socioecological model and data were analyzed using framework analysis.

Results Analysis revealed three themes and associated sub-themes: 1. Personal health beliefs (personal interests, perceived benefits, perceived needs to change, self-efficacy, from awareness to action, perceived difficulties, protection of personal resources); 2. Interpersonal interactions and influences (observations of people becoming frail, family responsibilities, opinion of other people); and 3. Physical, social and policy environment (shared spaces and facilities, social environment, community support and services, nationwide initiatives and recommendations).

Conclusions Older adults' perceptions of health-promoting activities were influenced by personal, inter-personal and environmental factors. Contextualizing lifestyle modification programs that address their preferences and real-life situations may facilitate engagement. Older adults may also benefit from future initiatives that empower them to choose among feasible options to increase their self-efficacy for preventing frailty.

Keywords Frailty, Prevention, Public health, Health promotion, Ageing, Qualitative study

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Introduction

Frailty is an age-related dynamic state characterized by declines in physiological reserves in multiple body systems, and it often manifests across various domains (i.e., physical, psychological, cognitive and social) [1–4]. Risk factors for frailty span across a wide range of sociodemographic and lifestyle-related factors, and the manifestation of frailty differs across individuals [5]. The process of ageing further decreases older adults' adaptability to internal and external stressors that impact their ability to recover from illness or injuries, and increases their susceptibility to morbidities and mortality related to frailty [6–9]. A multifactorial concept that includes physical, cognitive and psychosocial domains forms an integral part to understanding frailty [10]. Accordingly, multidomain interventions are introduced for improving frailty-related prognosis among older people [11].

Globally, the prevalence of frailty was estimated between 12% and 24%, depending on the sociodemographic characteristics and criteria used to assess frailty in the regions [12]. By 2030, it was projected that approximately 1 in 4 Singapore citizens will be aged 65 years or above, and the prevalence of frailty is anticipated to rise [13]. Singapore national statistics revealed ageing-related challenges such as older adults having difficulty in performing basic activity in life and declining old-age-support ratio [14, 15]. Furthermore, frail adults utilized more healthcare services compared to their non-frail counterparts [16].

Reducing the risk factors associated with frailty is a public health priority to control healthcare utilization and improve older adults' quality of life [17–19]. In Singapore, several community-based screening and promising intervention programs for frailty have been implemented for older residents [20–22]. Although such programs were physically and financially accessible to the at-risk population, the participation rate was lower than expected [23]. There is a growing realization amongst health care providers and experts that the voices of older adults are under-explored [24].

From our review of research literature in local population, little is known about older adults' personal health needs and beliefs about frailty prevention, their attitudes towards participating in health-promoting activities to prevent frailty, as well as external influences on such beliefs and attitudes. A qualitative approach offers an in-depth opportunity to adaptively communicate with older adults to collect contextualized data and uncover meanings of their perspectives. Understanding their lived experiences, motivations and barriers would better inform the design of future elderly-friendly programs. Therefore, we conducted a qualitative study to explore multi-level influences entrenched in older adults' perceptions of health-promoting activities and the reasons behind their perceptions.

Methods

Study design and participants

This qualitative study involved semi-structured in-person interviews with older adults from a large subsidized primary care clinic situated in the North West of Singapore, which is part of National University Polyclinics (NUP). Potential participants were identified by clinical coordinators who approached them with a brief description of the study. Older adults who expressed interest to participate in interviews were referred to a trained research assistant who provided complete information about the study including the role of the interviewer, overall study aims, eligibility criteria, scope of interview, choice of interview location and reimbursements. Subsequently, older adults were included in this study if they met the study criteria: aged 65–80 years, Asian ethnicity (Chinese, Malay or Indian), had not undergone frailty screening for at least 6 months, had mental capacity to participate in interview, spoke English or Mandarin, and able to provide a written informed consent. A purposive sampling strategy was used to capture a broad range of perspectives and ensure diversity of participant characteristics by selecting individuals with maximum variation in terms of age, gender and ethnicity. Recruitment continued until no interview data emerged to generate new themes that would contribute meaningfully to the objectives and conceptual framework of the present study. The study procedure was reviewed and approved by the National Healthcare Group Domain Specific Review Board (DSRB Reference Number: 2022/00544).

Interview guide

An interview guide was developed in English based on a multi-level conceptual framework adapted from the Socio-ecological Model (SEM) for promoting healthy and active living [25, 26]. The SEM model allows researchers to explore intrapersonal, social and ecological concepts that form the basis for promoting health and preventing diseases. In view of the diversity in human belief systems, community characteristics and policy contexts, a multilevel conceptual framework was tailored for our study population, which encompasses 3 levels: 1. individual 2. interpersonal (e.g. influences by family and friends, lived experience of other people), and 3. physical, social and policy environment (e.g. physical space and facilities, social environment, national initiatives and recommendations). Interview questions were reviewed by a mixed-gender (2 females and 2 males) research team comprising research fellow, primary care physician, teaching faculty and family physician consultant: SJL (PhD), DYLY (MD), HY (PhD) and RJYH (MMed). Clear and simple wordings

were used to improve the efficiency of communication with older adults. The English interview guide was forward translated to Mandarin by an independent bilingual research assistant (JHF) since Mandarin is the common spoken language amongst the Chinese population. A pilot phase was conducted (SJL, JHF) to test the use of language, wordings and recruitment feasibility. Interview questions were pre-tested among 8 older adults from the target community (4 English, 4 Mandarin speakers) who were not included in this study. Outcomes of the pilot study suggested that the wordings used were acceptable among older adults, however, the term "lifestyle program" required explanation. Therefore, a definition (in both languages) was added to the interview guides to achieve clarity and consistency in interviews (Additional file 1).

Data collection

In-person consent taking and one-on-one interviews were facilitated by the trained research assistant (JHF) using the approved interview guide. Interviews started with self-reporting of socio-demographics, followed by open-ended questions to explore older adults' views on: 1. participating in health-promoting programs, and 2. what elements should be included in such programs in order to help them prevent frailty. Each interview lasted approximately 40–60 min, and was conducted in a quiet meeting room within the clinics, at the participant's home or at a public location preferred by the participant where privacy was protected. Each participant was reimbursed SGD 30 upon completion of interview to compensate for the time, effort and transportation cost. Field notes and interviewer impressions were recorded to help researchers to understand the contexts and interactions between interviewer and participants, and capture observations during interviews. All participants were requested to use pseudonyms and refrain from disclosing identifiable information during the interviews. Prompting questions were used to encourage conversation and seek clarifications, whenever appropriate. All interviews were audio recorded, transcribed verbatim and translated by the trained research assistants and verified by investigator (SJL). Any ambiguity was discussed with the investigators (SJL, RJYH).

Data coding and analysis

Interview data were analyzed based on framework analysis where codes were arranged and organized into themes. First, two coders (1 female, 1 male) consisting of a Research Fellow (SJL) and a Primary Care Physician (MCPW) independently read and coded 3 transcripts according to the multi-level conceptual framework. Results were discussed and formed the basis for a coding matrix. Second, two additional transcripts were randomly selected. Interview responses were coded line-by-line (SJL, MCPW) by extracting and assigning excerpts to the coding matrix. Additional codes that did not fit the coding matrix but deemed relevant to the study were also analyzed. Third, the initial coding matrix, codes and themes generated based on the 2 randomly selected transcripts were discussed among a multi-disciplinary team of researchers involving primary care physicians, sociologist and public health researcher who do not have relationship with the participants (DYLY, RJYH, HY, SJL). Fourth, coding was completed independently using NVivo 14 by the two coders (SJL, MCPW) and ambiguities were resolved. Coding and data analyses continued until the two coders identified that additional interview data would not generate new codes that contribute meaningfully to the objectives and conceptual framework of the present study. Fifth, themes and sub-themes were discussed, reviewed and further refined by the research team (RJYH, DYLY, HY, SJL). The coders and research team members did not have direct relationship with the study participants prior to study commencement.

Rigour

The study methods and findings were reported in accordance with the COREQ (COnsolidated criteria for REporting Qualitative research) checklist [27] (Additional file 2). Two independent coders with domain knowledge in primary care, ageing and public health research read and coded all interview data separately, and held regular meetings to discuss the codes. Inter-rater agreement was not quantified in this qualitative study, however, codes were compared and iteratively discussed in meetings. Multiple successive meetings were conducted between the 2 coders at various study timepoints (i.e. initial phase, concurrent with data collection, and finalization). Initial phase aimed to ensure that the collected data were relevant to the study objectives and conceptual framework. Subsequently, the generated codes were discussed and viewpoints were complemented to reflect a shared understanding of the interview data. Additional codes (not captured by initial coding framework) that emerged from the interview data were also discussed to ensure alignment with the study objectives, conceptual framework and themes. Sub-themes with descriptions were added as deemed necessary to provide clarity in presenting participants' quotes. Finally, the coding results, illustrative quotes and themes presented in the manuscript were reviewed by research team.

Results

Among 21 older adults who provided informed consent, one of them later declined interview due to lack of support from the spouse. Finally, we interviewed 20 older adults who attended outpatient clinics from March

Table 1 Socio-demographic characteristics of study participants

	Participant characteristics (*N* = 20)
Female (n, %)	7 (35)
Age at interview (n, %)	
65–69 years	13 (65)
70–74 years	4 (20)
75–79 years	3 (15)
Ethnicity (n, %)	
Chinese	12 (60)
Malay	4 (20)
Indian	4 (20)
Attained education level (n, %)	
Completed primary school	8 (40)
Completed secondary school	5 (25)
Polytechnic, Diploma, Institute of Technical Education or equivalent	5 (25)
Tertiary (bachelor's degree and higher)	2 (10)
Current work status (n, %)	
Working (full-time)	8 (40)
Working (part-time)	3 (15)
Retired or homemaker	9 (45)
Household member (n, %)	
Living with family	17 (85)
Living alone	3 (15)

through May 2023. Nineteen interviews were conducted in meeting rooms within the polyclinic and one at a participant's home. Each interview lasted an average of 45 min. Participants were predominantly male (65%), aged 65–69 years (65%), Chinese (60%), had primary or secondary education level (65%), working (55%) and living with family members (85%) (Table 1). Participants gained awareness of community-based health-promoting activities primarily through television or radio programs, advertisements posted in public areas, and home visits conducted by volunteers. Participants also shared that they improved their health literacy through regular consultations with their primary care doctors and other healthcare providers, attending health educational talks, learning from social media such as YouTube channels as well as sharing among people around them.

Our findings suggest that participants have developed varying ways to maintain good health through exercise and healthy eating, with some of them already engaged in social interactions to prevent decline in brain functions and cognition. Older participants (75–77 years) cited ageing-related capacity limitations (e.g. tiredness, disinterest in changing lifestyle), and were more concerned about adverse events such as falls, fainting and injuries. We did not observe substantial gender difference with regards to making lifestyle choices to prevent frailty. Despite employing a purposive sampling to include more participants from minority ethnic groups, we did not find ethnic difference except that a number of Chinese participants preferred Traditional Chinese Medicine (TCM) and herbs for maintaining good health. The Malay and Indian community might have their cultural-specific preventive health measures but this was not evident in our study.

Table 2 Multi-level influences on older adults' participation in health-promoting activities

Main and sub-themes	Examples of participants' viewpoints
Theme 1: Personal health beliefs	
1.1 Personal interests and benefits	Passions and interests, health benefits, maintaining independence and flexibility.
1.2 Perceived needs to change	Family history of diseases, poor health, retirement as a health milestone.
1.3 Self-efficacy	Developed personal routines, alternative therapies.
1.4 From awareness to action	Reliable knowledge and support from trusted sources, technology proficiency.
1.5 Perceived difficulties	Age-related constraints, inability to keep up with pace of program, inconveniences of home-based program.
1.6 Protection of personal resources	Availability of personal time and money altered life priorities, health-related choices and behaviors.
Theme 2: Interpersonal interactions and influences	
2.1 Observations of people becoming frail	Self-reflections, acknowledging the importance of cultivating a healthy lifestyle.
2.2 Family relationships and responsibilities	Fear of being a burden to others, occasional restrictions imposed by family members.
2.3 Opinions of other people	Advertisements, ratings of a program, and friend's advice influenced health-related choices and behaviors.
Theme 3: Physical, social and policy environment	
3.1 Shared spaces and facilities	Convenience, common spaces fostered social interactions.
3.2 Social environment	Diversity in socialization preferences, dynamics and coherence of social interactions, avoiding crowds.
3.3 Community support and services	Activities for individuals who share similar circumstances, common interests, peer support, spiritual support.
3.4 Nationwide initiatives and recommendations	Health promotion, lifestyle recommendations, incentives and rewards, self-monitoring of physical activity.

Multi-level factors influencing participation in health-promoting activities

Based on our conceptual framework, we explored multi-level factors influencing participants' opinions on participating in health-promoting activities. Analysis revealed 3 main themes and 13 sub-themes: 1. Personal health beliefs (6 sub-themes), 2. Interpersonal interactions and influences (3 sub-themes), and 3. Physical, social and policy environment (4 sub-themes) (Table 2).

Theme 1: personal health beliefs

1.1 Personal interests and perceived benefits

Participants' behaviors were primarily motivated by self-responsibility and benefits such as maintaining health and independence that they could derive from engaging in lifestyle activities:

> *"every day do a little (exercises) like saving money… What is fun? What are the benefits? I like to go, need to have friends… I don't isolate myself" (P2).*
> *"When I'm not well I like to fight it, to keep myself active… I want to be independent" (P5).*
> *"your own health… is yours" (P6).*

Aligning program content with personal interests and preferences will more likely capture the attention of older adults. Majority of participants viewed personal interests as important for engaging in health-promoting activities, for example:

> *"to keep myself active and help me to learn a lot of things… I always look forward to such activities" (P5).*

When programs are suitable for individuals' health conditions, bringing conveniences and relevant health benefits to them, they might be more likely to attend the activities. For instance, a participant shared personal reasons behind her decisions:

> *"If it is suitable for me, I can attend (by) myself (…) If it is too far then I cannot confirm that I will go… if it is daily then find a near one (…) for the health of (my) body, for the heart (…) there is also a lot to do (cooking) because we are eating at home… it should be in the morning to participate in these activities" (P12).*

Instead of following a rigid schedule, some participants felt that lifestyle activities should be flexible:

> *"Not necessarily like a fixed arrangement… I will go wherever I want to go" (P7).*

1.2 Perceived needs to change

I work therefore I'm healthy; I'm healthy because I work Some working participants perceived work as a health-promoting activity in itself and perceived retirement as a health milestone:

> *"After retirement, maybe. Because still… I'm healthy. I don't need to join" (P18).*
> *"when I'm working, I travel up and down, this is my exercise… My mind is working, my hand is moving… don't have to even plan. It's a routine" (P9).*

Change is conditional Lifestyle modifications became necessary when there are health impacts:

> *"I still like do some exercises… everything I eat. But so far, my (blood test) result all still normal. See my coming result. If the result a bit up and down, then I will start to diet. Then I take doctor's advice (P20).*
> *"because of my mom's medical history (of diabetes), I have to be very conscious… I have been watching my diet, my exercise. But I was diagnosed… blood sugar is borderline. I have to push myself harder" (P19).*

1.3 Self-efficacy

> *"Your action is related to your health… If you know what's good and healthy for you, you will do something about it" (P9).*

Many participants believed in their own capacity to execute behavioral changes for achieving desired physical and mental health outcomes:

> *"(when) sit there feel like wanting to sleep… I quickly get up and exercise" (P6).*
> *"I am very occupied with my sports… I keep on engaging with friends and people, then my mind is pre-occupied… I must ensure proper sleep because I think that's important" (P11).*
> *"I live by myself, so, what will happen to me when I become old? I slowly cut down on outside foods since outside foods are heavily salted" (P7).*
> *" I do the exercise every day… no need to go for course (…) Exercise and fruit… how much carbohydrate and then iron… watch these things lah (…) Meditation, we can release our stresses… we can pray to our god… can relax (our) mind " (P18).*

Alternative medical therapies were common amongst individuals who experienced less satisfaction with conventional treatment:

> *"I have been using Chinese medicine… for recuperating my heart… acupunctures on my arm… I always feel that Western medicine cannot completely remove that kind of illnesses" (P3).*
> *"I believe in TCM more… My stomach is not suitable to take western medicine" (P12).*

It is interesting to note that self-efficacy, being a motivating factor, could also be a reason for declining participation in lifestyle programs. One of them further suggested saving community resources for underprivileged people:

"I already have my own schedule. I know what I want to do, what I want to maintain" (P14).
"There are many people you all need to take care of. For me, I think I am able to take care of myself" (P19).

1.4 From awareness to action

Awareness of their own health status enabled participants to adopt healthier choices:

"because I have diabetes… I try to avoid food like sugar and salt intake" (P13).

Reliable knowledge and support were obtained from various trusted sources:

"nowadays, (people aged) until 85 years, they are (still able to) work… because regularly you go for medical checkup… so, you are healthy" (P18).
"The dietitian told me I have to eat this and that… my daughter bought tofu and nutritious foods… sometimes my granddaughter will make soup for me" (P21).

For a participant who was technologically proficient, digital tools seemed to bring an array of benefits such as greater health literacy, self-monitoring, and enhanced communications with healthcare provider:

"I can learn from Google or YouTube… The Healthy 365 App, I can check everything by myself… (when) I want to consult doctor I (use) tele-consult… The advanced technology is really helpful for saving time" (P18).

Although digital health platforms offer convenience and efficiency, accessing information was demanding for less tech-savvy participant:

"a lot of the things I don't know, I just go for the basic ones… Old people cannot catch up (with sophisticated features in mobile App)" (P9).

1.5 Perceived difficulties

Perceived barriers to participating in health-promoting activities included ageing-related constraints, and inability to keep up with the pace and dynamics of program activities:

"my stamina this time is not like what it used to be" (P2).
"I would rather stay at home and do some exercises by myself, my entire being will be more relaxed. Because when I go out, I cannot keep pace with others" (P21).

Although home-based activities may bring convenience to older adults, there were concerns about interacting with other people at home:

"Home-based, I don't think is good… I don't feel comfortable" (P1).

1.6 Protection of personal time and money

Participants tended to protect their personal resources. The availability of time and money altered their priorities, which in turn shaped their health-related choices and behaviors:

"I come back home (from work), I do marketing, I start to prepare and cook dinner" (P1).
"besides work and exercising, sometimes on my rest days, I want time to myself" (P7).
"I have my own activities already… So, at the moment is sufficient for me" (P11).
"healthier (foods) are for example vegetables, tofu… But fish is very expensive… I dare not (buy) fish" (P9).
"I don't want to go anywhere. No matter where you go, it's all about eating and drinking. It costs money to go anywhere" (P16).

Theme 2: Interpersonal interactions and influences

Interpersonal relationships of participants were influential. A participant shared that he gradually cut down on sugary diets as a result of his wife's influences:

"my wife dislikes sweet things (foods), I slowly followed her… about 15 years" (P4).

2.1 Observations of people becoming frail

Participants expressed how they became aware of the importance of being physically active to prevent frailty by observing the decline in health of others including their family members, friends and neighbors:

"my neighbor… as soon as he retired, (stayed) at home. (I) asked him to go for a walk he doesn't want… kept declining, very quickly" (P6).
"I see people deteriorating in front of my eyes. They lack of exercise… their walking become very slow,

they develop knee problem… I don't want to be in (that) stage" (P14).

Individuals with prior experience in providing care for ill parents tended to be more aware of their own health condition, and that self-awareness became a motivator for cultivating healthy behavior:

"my mother is 94 (years old), she is now hospitalized… very frail. So… if you don't exercise, if we don't keep ourselves fit… you may be bedridden… it becomes a problem for your children to take care of you" (P11).

2.2 Family relationships and responsibilities

Many participants shared their sentiments about aging in the context of family relationships and responsibilities. '*Not becoming a burden to my family*' was repeatedly narrated during our interviews:

"For example, you can't go toilet you have to depend on people, it is a burden" (P9).
"Getting sick is just a lot of money. Don't keep burdening the children, they are also having a hard time" (P2).
"Children also have their own activities… they can take care you one day, maybe? But to take care of you the whole time is not so simple" (P11).
"(if frailty happens to me) that means I'll be a burden to my daughter. She's my only child… I don't want to be a burden" (P19).

Occasionally, family members could also impose restrictions on participants' involvement in health-promoting activities:

"I was walking at corridor… I saw an elderly sitting there. I talked to his child and he replied 'You can't let him go downstairs… can't come back home anymore'" (P6).
"my daughter is worried… if you want to go (join group activities), you have to rely on yourself to follow them… (if) you get dizzy and faint, then resulting in you not being able to walk, then it will be terrible… I thought about it and she was right" (P21).

2.3 Opinions of other people

To a certain degree, advertisements, ratings of a program and friends' advice matter in participants' behavior and attitude towards frailty prevention:

"As long as there is advertisement says it's good, then we join" (P17).

"my friend told me to go to the park… run every day… my blood sugar reduced very intensely" (P3).

Theme 3: Physical, social and policy environment

3.1 Shared spaces and facilities

Participants expressed positive feelings about having common exercise spaces and shared facilities in their neighborhood. They seemed to be able to harness the advantages of community spaces for improving both physical and social well-being:

"in the afternoon it is very hot outside, I walk downstairs (housing void deck) … when downpour, I still come down… so, I say, very thankful that our government did all these (for) seniors like us" (P2).
"The neighborhood which I live in, there is a big garden… Sometimes during my rest days, I walk around there in the mornings. Sometimes after work I would carry my backpack and walk around there, then head home" (P7).
"I would go downstairs to the park to use those metal fitness apparatus, to lift my body up, or exercises like pumping" (P4).

Neighborhood parks are places that fostered social interactions:

"when I go running I seen Uncle there… I say "Uncle!", I chat with him and he will chat with me" (P6).
"I go to the garden for walks every morning. I like sunbathing… Exercise may improve blood pressures… Sometimes I bump into my friend I will talk to them" (P12).

3.2 Social environment

We explored participants' opinions on expanding their social network through participating in community-based activity, and their responses varied. Some participants were eager to socialize, some already established their own social groups, and others were averse to making new social connections:

I am keen to make new friends "I interact with people a lot… it makes you feel good… you share knowledge… and you get that social cohesiveness or happiness" (P14).
"We go there (a Senior Activity Centre in community), we talk to each other, we motivate each other… Keep others happy, you will be happy too" (P5).
I have my own friends "Those friends that I drink tea with… for over 10 years… we have a lot of topics

to talk about, that is what I want. I am very happy when I talk to them" (P4).
"My own program with my friend… I don't want to engage more than that" (P11).
I try to avoid crowds "huge crowd of people… they have many conflicts about right and wrong… I try to avoid going, talking about so much right and wrong" (P3).
"more people, there are many different conversations happening. Sometimes when you see something you like, but the other person might not like, and vice versa" (P7).

3.3 Community support and services

Participants shared their experiences in community-based services that are elderly-friendly such as health-promoting activities organized by Senior Activity Center and Community Clubs:

"I walk to the [Senior Activity] center which is not far away (from home). They take my blood pressure everyday… I do a lot of exercises… we have a lot of elderly people aged 80 years plus reaching 90 years, but they are very active… There are also people on wheelchair, but they still exercise, moving their body parts" (P5).
"They [Community Club members] conduct activities, dance, simple exercises for the old age… I feel it's good… for old people like me… for health […] Ah, maybe one hour (per session) enough? Maybe Monday, Wednesday, Friday" (P10).

Common interests, peer support and spiritual support that arise during community-based activities brought positive feelings to some participants:

"Many people having the same physical disability or weakness… (I) start communicating with them. Some have gone through a lot of these programs, they can give you advice, they encourage you, that's how I find it useful… many retirees… (can) develop friendship" (P13).
"every Thursdays I go out for devotional (religious) singing sessions… It keeps me happy and fine. Peace of mind" (P5).

3.4 Nationwide initiatives and recommendations

In Singapore, nationwide health promotion initiatives, public health recommendations and digital health efforts (e.g. step trackers, wellness mobile applications and virtual rewards) have impacted some participants' lives [28, 29]. For example, the National Step Challenge offered a free wrist-worn physical activity tracker and incentives to promote physical activity [28].

Adhering to public health recommendations and self-monitoring using digital wearables provided free of charge by the national health promotion agency seemed to promote physical activity in older adults:

"We wear that watch. We are always moving… I exceed (the recommended ten thousand steps) every time… Government doesn't encourage seniors stay at home all the time" (P2).
"I walk nearly 4 to 5 kilometers. Yah, every day, that means ten thousand steps… sometime I tired, so it can six to ten thousand steps every day" (P18).

In addition to physical activity, the Healthy 365 mobile App which was designed by the national health promotion agency, provided reliable information to prevent major diseases and incentivized healthy lifestyle behavior [29]:

"do exercise, get points, they give you incentives. You can use the vouchers to buy things from local supermarkets… It motivates and rewards, that's very good" (P9).
"I can check everything inside by myself… the first thing is exercise… Second is fruits, food, everything… for diabetes (prevention)" (P18).

However, work commitments especially shift work, prevented participants from participating in recommended wellness programs:

"I have to do shift work… sometimes it's very hard to plan" (P9).
"usually, I don't go for course. The courses (schedules conflict with) work shift time" (P18).

Suggestions for future health-promoting program

We asked participants what elements should be included in future programs that would motivate and benefit them. Participants' suggestions are organized by individual, interpersonal and environmental levels (Table 3). Overall, raising awareness of pre-frailty and frailty would help participants take necessary measures to prevent or delay physical and cognitive declines. Understanding the needs of older adults and communicating in their vernacular language are important to them.

According to participants, health-promoting activities need to be tailored to their health conditions and capacity. Quality of program content and instructors matters. Older adults might benefit from programs facilitated by domain experts and employed systematic approaches

Table 3 Participants' suggestions for future health-promotion program and illustrative quotes

Suggestions	Illustrative quotes
Theme 1: Individual level	
When individuals' challenges are overcome and interests are met, participants may be empowered to act within their available resources and derive benefits from health-promoting activities.	
Benefits beyond current lifestyle routine	*"Timing, location… the quality of the program, the people involved, these are all factors that may affect my (decision to join a program) … if it is beneficial to me, I don't mind going that extra distance. I can always make adjustment… if I see it contributes to my current lifestyle, then of course I join" (P14)*
Personal challenges	*"to do it (exercise) alone ah, you don't know what to do actually. So, with structured program (exercises guided by certified trainer) right, after you attend it, then you know… have to do this this this… step by step" (P13)*
Filling knowledge gap	*"learn from each other, learning. Good, good, good, very good! I like this kind… Like I don't know Hanyu Pinyin (Chinese pronunciation), I come to learn… also very good!" (P2)*
Personal interests	*"Reading books is the best. … (allows you to) think of how to write that character… sometimes, at home I will still self-learn a little bit… write Chinese characters" (P3)*
Theme 2: Interpersonal level	
Participants suggested that they may benefit from effective communications and establishing good rapport with the other people involved in the programs.	
Encouragement, protection of feelings	*"know what the old folks want, and say encouraging words… let the old folks feel welcome. Let the old folks feel that I will come back, for these activities again… they are very sensitive. They feel inferior about themselves. So, must say some kind words to them, encourage them" (P19)*
Speaking their 'language'	*"talk to them slowly… because when people grow older… some of them tend to be like a baby… reason out with them slowly, the Do's and Don'ts… try to make them understand… not only that, to entertain them, play with them… more or less an education system" (P15)*
Living without medication	*"If possible, the doctor tells you don't need to take medicine, you go and exercise… it is best (if) can come up with a set, that doesn't rely on medication, (which) can let body and mind be healthy… can also prevent frailty, prevent high blood sugar… ah, is the best" (P3)*
Theme 3: Environmental level	
For achieving population health, it may require broader efforts to understand population frailty status and improve older adults' knowledge to prevent pre-frailty and frailty.	
Raising awareness as early as possible	*"it's better to know, the pre, before you hit the phase (frailty)… and you can do something about yourself… before you get it… you (could) try to prevent (frailty), diet, your environment and all that" (P13)*
Understanding the needs of older adults	*"make a survey… this estate, how many old folks… and the place you choose must be convenient for the old folks to go there… I think the best thing is give out food voucher where the old folks can go to nearby coffee shop to buy lunch for themselves" (P19)*
Tailoring programs to individuals' conditions	*"You must have tailored program. And your tailored program ah must be horizontal and lateral… by age group and by fragility (frailty)… Pre-frail, most-frail. It cannot be a one (size) fits all type of program… providing facilities is not good enough… you must have people…available to assist… (what) your trainer will do for you… it must be based on their (old folks') condition" (P14)*
Improving quality of daily living	*"it should be at the downstairs of our apartment… volunteers come to promote… activity to let the elderly better know how to take care of themselves… teaching us how to eat healthily… teach us how to make the room … (remove) obstacles" (P3)*

to teach them how to improve their overall health and well-being.

Discussion

The present study explored older adults' perceptions of health-promoting activities and the reasons behind their perceptions. Our participants valued independence, flexibility and a sense of purpose. Majority of them have developed their own lifestyle routines adapted to their personal interests and living contexts. Therefore, lifestyle modifications were deemed unnecessary except for those who identified clear needs to change such as dealing with chronic conditions to improve health outcomes. This study also highlights diverse perspectives related to personal time management and socialization preferences.

For improving older adults' own capacity in making healthier choices, cues to action may include gaining knowledge about preventable functional and cognitive declines that are crucial for them to maintain health and independence; tailoring reliable health knowledge via elderly-friendly platforms; and enabling them to recognize the right time and trusted sources to seek support. Older adults' participation in health-promoting activities may be enhanced by aligning program objectives with personal time and interests; ensuring social coherence and elderly-friendly timing and pace of program activity; and enabling them to recognize the benefits they could derive from engaging in health-promoting activities.

Consistent with international literature, our study also observed multi-level and life-course influences on participants' willingness to take part in programs that aim to prevent physical and psychological decline [30–33]. Personal factors affecting participation in health-promoting activities included the availability of time, personal

interest and priorities, individuals' health condition, perceived needs for change and the capacity to perform [29]. Known barriers included ageing-related factors (e.g. lack of stamina, unable to keep up), restricted freedom of action and self-reliance [31]. Factors that might help older adults adhere to real-life programs, e.g. perceived benefits, program design and content, engagement with volunteers or organizers, and sense of belonging were identified in the literature [34]. All of these factors accentuate the importance of considering both individual and external factors in designing programs for older people.

Individual level

The present study suggests that participants' perceptions were influenced by their readiness to adjust their current routines and social circles. Participants emphasized the importance of deriving benefits from changing their current lifestyle and personal fit to a health-promoting program such as timing and pace of program activity. Eliminating older adults' barriers to understanding the concepts of pre-frailty and frailty empowers them to recognize cues to action, helps strengthen their beliefs in the benefits of prevention programs, and improves their self-efficacy [35]. Furthermore, majority of participants were aware of changes that happened to their body. Therefore, program developers could encourage them to acknowledge such bodily changes in a positive light as these details may serve as facilitators to planning frailty prevention programs.

Contrary to the common understanding that older adults generally have more time than younger adults for additional leisure activities such as engaging in social and community programs, our participants seemed to be protecting their valuable time for activities they perceived as important. In this study, the availability of personal time and money altered some participants' priorities, which in turn influenced their perceptions and made health-promotion a lower priority in daily life. From the literature, it is known that low socioeconomic status negatively impacts one's physical and mental health [36]. Offering timely education and support to help older adults reduce their feeling of overwhelming potentially due to declining coping ability and stresses related to financial and time constraints might enable them to give health-promotion precedence, enhance their ability to make heathier choices and increase their opportunity to connect with society [37]. When programs are aligned with older adults' personal sense of purpose and intrinsic motivators such as happiness and enjoyment, their acceptance and adherence to the programs will likely be improved [38]. It also requires these activities to aim at ensuring protection and dignity as they age [39].

Interpersonal level

The quality and dynamics of interpersonal interactions were important considerations for our participants to engage in social activities, and diversity in their socialization preferences was observed. Socialization behavior described by our participants ranged from intentionally restricting social engagement to interacting only with friends who share common interests, and to expanding social network to make new friends, as noticed by a previous study [40]. While some participants enjoyed social interactions and looked to encouragement by other people, some participants intentionally cut out on social engagement to reduce stresses and protect well-being. Considering the diversity in socialization behavior and preferences, personalized health-promoting strategies may be needed to empower one to act in his context for preventing social frailty [41].

We observed contrasting impacts of family dynamics on our study participants' thought process and their involvement in activities. On a positive note, a participant in this study reflected on the benefits she received that have resulted from her family's involvement in preparing healthier foods for her. On another front, some study participants refused outdoor activities in response to family members' concerns about their physical safety. Often, older adults turn to their family for support in decision-making. Nonetheless, it is also possible that feeling supported by family members might create contrasting decision outcomes. While positive reinforcement from family may improve older adults' lifestyle behavior, some older adults may experience guilt related to participating in extra activities for fulfilling their own benefits at the expense of their family's time and resources [42, 43]. To facilitate family support in older adults' participation in health-promoting activities, future studies could aim to explore older adults' views regarding accepting care from family members to inform programs design and implementation.

Environmental level

Enabling older adults to do what they value in their own environment and contexts is central to promote health and eliminate barriers to preventing frailty. Environment for healthy ageing is characterized by external factors, i.e. built spaces, communities, policies and services [44]. As people age, it is assumed that older adults' geographic boundaries would shrink due to mobility and cognition constraints. Older adults will depend increasingly on the available resources within their residential settings to maintain or improve their well-being and experience social interactions [45, 46]. From our interviews, we learned that many participants were already utilizing the common spaces and shared facilities or services in their residential areas for regular exercises and social activities.

In Singapore, nationwide initiatives [28, 29] provide the residents with cues to action to enhance people's experience of living in the city state. Since community-based health programs are already physically and financially accessible for most residents, other key considerations such as dynamics between program instructors and participants, and adaptable program content should be addressed to improve older adults' participation and adherence rates [47]. Likewise, for preventing frailty in the older population, giving older adults a voice in the process of frailty prevention may enhance their personal fit to health-promoting programs, improve their proactiveness, and also enable stakeholders to optimize resources in planning for health programs.

Strengths and limitations

This present study has several strengths. We explored older adults' perceptions of health-promoting activities beyond their personal interests, revealing diverse perspectives related to their access to health knowledge, perceived needs to change their current lifestyle, personal time management and socialization preferences, interpersonal influences and use of shared facilities and services. The study methodology enabled us to explore a combination of factors including personal, family, friends, current work and living contexts, that affected participants' health-related decisions. We also collected participants' suggestions, which offer various modes to deliver frailty prevention messages to them. We acknowledge several limitations of this study. First, all participants were recruited from primary care clinics, which may have attracted health-conscious individuals, therefore limit the generalizability of study findings. Second, the purposive sampling approach yielded 40% representation by minority ethnic groups in this study, however, ethnic differences were not apparent in the interviews. We encourage future studies to navigate ethnic-specific cues and nuances to complement our findings. Third, we acknowledge social desirability bias in face-to-face interviews that may have affected our understanding of participants' attitudes and behaviors. Besides, a small number of participants expressed fatalistic views about ageing and were reserved in expressing their views; therefore, future studies could aim to improve the engagement with these individuals. Lastly, this qualitative study involved a small sample size to explore perceptions and preferences; future larger studies are warranted to confirm the findings. Overall, the present qualitative study covers a wide range of perspectives and provides initial understanding of elderhood in the target population. We encourage future research undertakings to employ conceptual frameworks that would help to delve into specific topics such as ethnic-specific cues, older adults' technology literacy, attitudes towards interpersonal relationships, etc.

In summary, we observed heterogeneity in older adults' perceptions and preferences, which were shaped by their health condition, socio-economic status, lived experiences and attitudes, and their exposure to social and environmental factors. Giving older adults a voice and understanding multifaceted aspects of elderhood may be meaningful to tailor interventions for preventing frailty in their own living contexts. Program providers could consider assessing the needs and preferences of the target population they wish to serve before designing programs or enrolling older adults to the appropriate program.

Conclusions

Older adults' perceptions of health-promoting activities were influenced by personal, interpersonal and environmental factors. Contextualizing lifestyle modification programs that address their preferences and real-life situations may facilitate engagement. Older adults may also benefit from future initiatives that empower them to choose among feasible options to increase their self-efficacy for preventing frailty.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12877-025-06640-y.

Supplementary Material 1.

Supplementary Material 2.

Acknowledgements

We thank Dr Zhipeng Zhang, former Head of Choa Chu Kang Polyclinic (CCKP) and the healthcare providers, clinical care coordinators and patient service associates from CCKP for their support and selfless contribution to this research effort. We appreciate research assistant, Ms Jiahui Fan (JHF), for her great effort in recruiting patients and conducting interviews while in the service with NUP. We also thank our study assistants, Ms Jiahui Fan and Ms Eunice Teo, for their assistance in transcribing and translating the transcripts. Last but not least, we owe our gratitude to our participants for taking the time and stepping forward to share their stories and perspectives on this research topic.

Authors' contributions

D.Y.L.Y., S.J.L., H.Y., R.J.Y.H. conceptualized the present study. S.J.L. drafted a coding framework, S.J.L. and M.C.P.W. coded the transcripts. H.Y. provided advices on qualitative methodologies. D.Y.L.Y. and R.J.Y.H. provided medical and patient care perspectives to the study. R.J.Y.H. supervised the conduct of the study at the polyclinics. S.J.L. generated initial themes and drafted the manuscript. R.J.Y.H., D.Y.L.Y. and H.Y. reviewed the themes and edited the manuscript draft. All authors reviewed and approved the final version of the manuscript.

Funding

This study was supported by the National University Health Services Research Seed Grant (NUHSRO/2021/065/RO5 + 6/FMPCHSRGMar21/03) and National University of Singapore Yong Loo Lin School of Medicine (NUHSRO/2022/049/NUSMed/DFM/LOA).

Data availability

The data used and generated during this study are not publicly available to minimize the risk of identifying the participants. Datasets are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The study procedure was reviewed and approved by the National Healthcare Group Domain Specific Review Board based on Declaration of Helsinki and the ethical principles in the Belmont Report (DSRB Reference Number: 2022/00544). All methods were performed in accordance with the relevant guidelines and regulations by the ethics committee. Informed consent was obtained from all participants.

Consent for publication

Not applicable.

Competing interests

S.J.L., M.C.P.W. and R.J.Y.H. declare that they have no known competing interests. D.Y.L.Y. as a member of the Editorial Board and H.Y. as an Editor declare no known competing interests and are not involved in decisions to publish this article.

Received: 10 April 2025 / Accepted: 17 October 2025
Published online: 24 November 2025

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