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Article

Development of a Structured Cooking Program for Clients at the Senior Care Centres: A Mix-Method Feasibility Study

Rachel Ng Min Wen[1], Grace Chua Mei En[1], Clement Hong[2], Therese Marie Tay[2], Tianma Xu[1,*]

[1] Singapore Institute of Technology
[2] St Luke's Eldercare
* Correspondence: tim.xu@Singaporetech.edu.sg or xutianma@hotmail.com

Abstract: A 7-week group-based cooking program led by an occupational therapist was developed for older adult clients in Senior Care Centres (SCCs) in Singapore. This study aimed to test this cooking program's feasibility and clinical effects in a SCC. A mixed-methods study design was implemented over 3 months. Eligible participants were screened for participation. Feasibility was assessed by recording recruitment, attendance and attrition rates. Pre- and post-assessments at three time points were conducted to measure functional changes. Quantitative data were analyzed using STATA software, and all interviews were audio-recorded with permission and transcribed verbatim for thematic analysis. Six out of seven participants completed the program with a high attendance rate (80.4%). Participants demonstrated improvements in physical functions and community mobility immediately after the intervention and at a one-month follow-up. Participants shared their motivational factors for participating and demonstrated positive changes in lifestyle routines, dietary habits, and nutritional knowledge. Social and personal factors were found to play a crucial role in their compliance and active participation in the program. Our finding suggests that a structured cooking program for older adults at an SCC is acceptable and feasible in Singapore. Fine-tuning of the program content is necessary before conducting a larger trial.

Keywords: older adults; group intervention; activity; community; frailty

1. Introduction

In Singapore, the total number of older adults aged 65 years and above is projected to exceed 25% of the population by 2030 (Liu et al., 2015). As individuals age, there is typically a decline in cognitive function (Schirmer et al., 2020) and physical functions (Stolz et al., 2023). Consequently, this leads to an increased dependence and need for assistance for performing activities of daily living (ADLs) from caregivers (Gao et al., 2022). This results in increased caregiver burden, financial strain, and burnout (Fuhrmann et al., 2015; Aung et al., 2021).

Therefore, the Singapore government has developed various strategies to promote and support ageing in place. These initiatives encompass community-based services such as day rehabilitation centres, Senior Care Centres (SCCs) and Active Ageing Centres (AACs) (Agency for Integrated Care, 2024). The benefits of cooking align with the Activity Theory of Ageing, suggesting that as one ages, continued meaningful engagement in activities can increase a sense of well-being (Winstead et al., 2014). For some, cooking holds a deep personal significance, contributing to their sense of identity and life satisfaction (Nyberg et al., 2015). The "Share a Pot" program is a 12-week multi-component programme that is implemented in various AACs (Share a Pot, 2024). The programme involves volunteers who engage with the older adults, share cooking tips and recipes and engage in exercises together. It fosters meaningful connections, and mutual learning between participants, and encourages older adults to keep fit and meaningfully engaged. However, it is important to note that the above-mentioned activities and programs in Singapore are largely unstructured. To the best of our knowledge, there has been no study to date that has explored the potential benefits of a structured cooking program in local SCCs for community-dwelling older adults.

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Cooking groups and activities have demonstrated benefits in improving cognition and social interactions among older adults (Murai & Yamahuchi, 2017). Dietary habits play an important role in reducing the risks of chronic diseases and supporting healthy aging (Yeung et al., 2021). Moreau et al. (2015) demonstrated that a group-based cooking program, coupled with nutrition education facilitated by a nutritionist, increased older adults' confidence in their meal preparation skills and the adoption of healthier eating habits. Beyond local contexts, cooking is an activity commonly carried out, due to its familiarity and significance as a valued ADL for many elderly individuals (Farmer et al., 2018). Several studies have investigated the benefits and outcomes of cooking programs. For instance, a 12-week programme incorporating physical exercise and nutritional education led by a certified fitness trainer resulted in improvements in participants' health-related quality of life, balance and walking speed (Kwon et al., 2015). Another programme, 'Men Can Cook!' (Keller et al., 2004), was a nutritional and cooking programme facilitated by a dietician that targeted community-living older men. Participants reported improvements in cooking skills, social connections, confidence, and nutrition knowledge. Many of them emphasized the value of having a dietician in the program, as it helped them understand the link between cooking and health, motivating them to adopt healthier lifestyle practices.

Occupational Therapists (OTs) play a vital role in facilitating and modifying activities to provide the just-right challenge for participants, promoting learning (Biddiscombe et al., 2018). OTs are skilled in using meaningful activities as a means to improve the physical and cognitive functions of their clients (Mack et al., 2023) and often use occupation-focused models to guide the occupational therapy process (Hughes et al., 2023). They adeptly identify and adapt environmental factors to facilitate clients' engagement in meaningful activities (Wong & Fisher, 2015).

Over the past decade, structured programmes have been widely implemented both in local community care settings and abroad. For instance, the "Stepping On after Stroke' programme (Xu et al., 2021), a seven-week group-based programme for community-dwelling stroke survivors developed by an OT, demonstrated feasibility and acceptability in Singapore. This was evidenced by a high attendance rate, achievement of personal goals, increased safety awareness and enhanced community participation (Xu et al., 2021). Similarly, an 8-week pilot healthcare programme aimed at increasing older adults' healthcare knowledge and maintenance was proven feasible and effective (Cao et al., 2021). Participants reported increased confidence in performing exercises and increased nutritional awareness.

Hence, based on existing literature, the research team developed a seven-week multicomponent group-based cooking programme, that incorporated cooking activities, health talks and exercises led by an OT. Group-based exercises were chosen to target balance and physical functioning (Martins et al., 2018) as well as to promote social interactions between group members (Xu et al., 2023).

The study aimed to test the feasibility and clinical effects of a structured cooking programme in an SCC in Singapore. This study also aimed to explore the potential impacts of such a programme on older adult's physical functions and nutritional knowledge.

2. Materials and Methods

2.1. Study Design

This feasibility study utilised a mixed-methods design, incorporating both quantitative and qualitative data collection techniques. The recording of study procedures, and standardised outcome measures were part of the quantitative approach. Semi-structured interviews were part of the qualitative approach. A triangulation design was adopted to integrate qualitative and quantitative data to understand the research question better (Creswell et al., 2003). This study was approved by the Singapore Institute of Technology Institutional Review Board (Approval number: 2022150). As required by the Ethics Research Committee, participants were allocated a unique code (e.g., SC01) to maintain anonymity.

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2.2. Participants and Recruitment

The inclusion criteria consisted of participants aged 65 years or above, currently attending the day rehabilitation or day care services at the participating centre and being able to communicate verbally and understand English or Mandarin. Additionally, participants had to demonstrate an interest in cooking and be able to walk independently for a short distance (10 metres) with or without aids. Individuals with severe cognitive impairment, as indicated by an Abbreviated Mental Test (AMT) score of less than five (Pan et al., 2015) were excluded from this study.

Participants were referred to the researchers (Ng and Chua) by the staff at the participating centre. They were then screened by the researchers (Ng and Chua) for eligibility. The researchers explained the study's objectives and the participant's roles, before obtaining written consent from the participants without cognitive impairment (AMT scored >7). For individuals with AMT scored between 5-7, the researchers explained the details of the study to both the participants and their next-of-kin, seeking consent from both parties.

2.3. Intervention

Participants joined the seven-week structured cooking programme in a small group setting (8-10) facilitated by a programme leader who is a fully registered OT working at the participating SCC. The programme consisted of seven 1.5-hour weekly sessions, covering diverse topics including exercise, nutrition and energy conservation techniques by different healthcare professionals (e.g. OT and dietitian).

The exercises were adapted from the Otago Exercise Programme (Kyrdalen et al., 2014), including both strength (leg raises, calf raises, side hip strengthening, partial squats) and balance exercises (sit-to-stand and side walking). In addition, elbow flexion and open arms with a resistance band were also included since they are relevant to the various movements and positions involved in cooking tasks.

The session format entailed 30 minutes of sharing by the healthcare professional, followed by 10 minutes of reviewing and practising exercises, 40 minutes of meal preparation and cooking, and concluding with 10 minutes of clean-up and debriefing (see Supplementary File 1). Sessions were tailored by the OT to address participant's individual needs, informed by theoretical frameworks such as adult learning theories (Merriam & Bierema, 2014, p. 35-43). Participants were encouraged to share their daily activities and life experiences during each weekly session.

Dishes were carefully selected to ensure affordability and nutritional value in consultation with the participants. Participants were assigned weekly homework, including daily exercises and practice cooking the dishes learned during the session.

To reinforce the knowledge gained during the intervention, a booster session was conducted one month after the intervention. This session provided participants with an opportunity to review key topics and learning points. Additionally, participants were encouraged to share their cooking experiences from the past month, allowing for further discussion and reflection.

2.4. Data Collection

2.4.1. Feasibility

The feasibility of the programme was evaluated based on the weekly attendance and drop-out rates. Achieving a weekly attendance rate of 75 per cent (Smeulders et al., 2009) and a dropout rate at follow-up lower than 20 per cent (Xu et al., 2021) were deemed feasible.

2.4.2. Acceptability

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Acceptability of the intervention was assessed through responses gathered during semi-structured interviews, focusing on aspects such as the programme's implementation and practicality (Ryan et al., 2023).

2.4.3. Baseline characteristics

Descriptive data, including age, gender, caregiver support, comorbidities, Body Mass Index (BMI), living condition, community mobility, prior interest in cooking, level of independence in ADLs, and cognitive function (AMT scores) were gathered from participants during screening.

2.4.4. Pre-post-intervention outcome measures

Several outcome measures were used to test the clinical effects of the programme. For instance, the Life-space Assessment (LSA) was used as a measure of participant's level of mobility within their homes and communities (Baker et al., 2003). It evaluates changes in the frequency of travel or level of assistance required for mobility, reflected in its score range of 0 to 120, with a higher score indicating greater mobility in the community. The measure has a cut-off score of 60 (Curcio et al., 2024).

The Short Physical Performance Battery (SPPB) was used to measure changes in participants' functional capacity and lower extremity physical abilities (Pavasini et al., 2016). Its total score ranges from 0 (worst performance) to 12 (best performance). SPPB is also recognised for its high validity in assessing older adults' overall health status (Pérez-Zepeda et al., 2016).

EQ-5D-5L assesses changes in self-perceived quality of life in five different dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression (Herdman et al., 2011). Participants were asked to rate the level of problems (e.g., 1=no problems; 5=extreme problems) under each dimension and overall self-perceived health score (0-100) using a Visual Analogue Scale (e.g., the higher the score, the better health status they can imagine). This measure has a good reliability rating, with an intraclass correlation coefficient of 0.7 (Feng et al., 2021), and demonstrates good discriminant validity (Bhadhuri et al., 2020).

LSA, SPPB and EQ-5D-5L were conducted by the researchers who were independent accessors at the baseline, immediately post-intervention and one month post-intervention. Weekly attendance rates were recorded by the programme leader throughout the seven-week intervention and booster session.

Personal goals were formed in collaboration with the participants and were reviewed in the seventh session.

2.4.5. Interviews with older adult participants

One-to-one semi-structured interviews were conducted with participants either in English or Mandarin at the SCC by the researchers immediately post-intervention. A pre-defined set of questions was used to guide the interviews (see Supplementary File 2). Participants were encouraged to share their experiences, healthy lifestyle changes, nutrition knowledge gained and personal takeaways from the programme. Each interview lasted approximately 15 minutes and was audio-recorded with permission.

2.7. Data Analysis

Descriptive statistics using means and percentages were generated to present the baseline characteristics of the participants and to show the overall trend of the group performance. Analysis of variance and the chi-squared test were used to analyse the data between baseline, immediate post-intervention and one-month post-intervention to determine the clinical effects of the studied

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programme. STATA software was used to analyse all quantitative data. Given the small sample size, caution should be exercised regarding the extrapolation of the results (Faber & Fonseca, 2014).

Data gathered from the semi-structured interviews were transcribed verbatim by the researchers (Ng and Chua) in the original language. Mandarin transcripts were translated to English and then back-translated to Mandarin by two researchers who are proficient in both languages to ensure accuracy. Both English and Mandarin transcripts were reviewed and verified by another researcher (Xu) who is also proficient in both English and Mandarin. All transcripts were thematically analysed using an inductive approach (Braun & Clarke, 2006). Common codes and themes were generated by the researchers (Ng, Chua and Xu) as a team, checked against the original transcripts and discussed until a consensus was reached. Both quantitative and qualitative data were compared through the triangulation method to determine the feasibility and acceptability of the cooking program with older adults in the SCC.

3. Results

The baseline characteristics of the participants are summarised in Table 1. The mean age was 77.6 and all were Chinese females and lived with at least one family member. Four participants did not have a caregiver, while three did. The majority (85%) of the participants reported having two or more chronic health conditions. More than half (71%) had an AMT score of more than seven and two participants had mild cognitive impairment, with an AMT score of less than eight. Most participants (85%) were independent in basic self-care and had intact vision and hearing. Less than half (42%) required the use of walking aids for ambulation. Five of the participants attended the day care programme, while two attended the day rehab programme at the SCC.

Table 1. Baseline group characteristics.

Characteristic	Experimental (n=7)
Age, mean (±SD)	77.6 (±7.3)
Sex, n (%)	
Female	7 (100)
Ethnicity, n (%)	
Chinese	7 (100)
Living arrangements, n (%)	
With children	6 (85.7)
With spouse	1 (14.3)
With helper	1 (14.3)
Caregiver availability, n (%)	
Available	3 (42.9)
Non-available	4 (57.1)
BMI, mean	27.6
Have ≥ 2 Chronic Health Conditions, n (%)	6 (85.7)
Have prior experience cooking, n (%)	5 (71.4)
Currently cooking (occasionally), n (%)	1 (14.3)
Intact vision, n (%)	6 (85.7)
Intact hearing, n (%)	6 (85.7)
AMT > 7	5 (71.4)
Independent in basic self-care, n (%)	6 (85.7)
Using walking aids, n (%)	3 (42.9)

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Attend day care	5
Number of days of day care attended	
5 times a week	4
3 times a week	1
Attends day rehab	2
Number of days of Day Rehabilitation attended	
One time a week	2

3.1. Feasibility

Figure 1 illustrates the study flow from July to October 2023. After screening, seven out of 12 referred participants were eligible for participation, resulting in a recruitment rate of 58.3%. The five participants were ineligible as they did not meet the inclusion criteria (AMT scored less than five).

The attendance rate of the 7-week intervention was 80.4%. Six out of seven participants enrolled were successfully followed up at one month post-intervention, indicating an attrition rate of 14.3%. One participant withdrew from the study after five sessions, citing dissatisfaction with the dishes, perceiving them as uninteresting and 'too healthy'. The remaining six participants who completed the seven-week intervention were assessed with the outcome measures at immediate and one-month post-intervention.

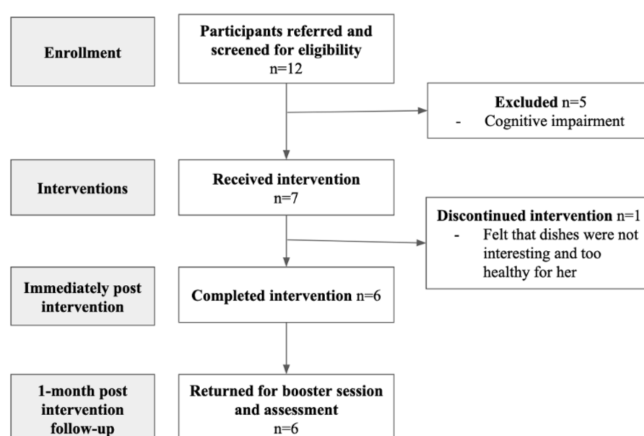

Figure 1. The study flow.

3.2. Quantitative Results

As shown in Table 2, there was an improvement in the level of mobility in the community (LSA) from pre-intervention to immediate post-intervention (41.1-44.8) and pre-intervention to one-month post-intervention (41.1-56.8).

Similarly, SPPB scores decreased slightly from pre-intervention (9.2 out of 12.0) to immediate post-intervention (9.0 out of 12.0). The results were sustained at one month post-intervention (9.0 out of 12.0).

Notable improvements were seen in EQ-5D-5L results for mobility, self-care, pain and discomfort, and anxiety and depression. However, there was no significant difference between the mean EQ-visual analogue scale (EQ-VAS) at pre-intervention (77.1) and immediate post-intervention (76.7).

The changes for LSA, SPPB and EQ-5D-5L scores did not reach statistical significance ($p>0.05$) when compared between baseline and immediate post-intervention and one-month post-intervention, this could be attributed to the small sample size.

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Table 2. Mean values of outcome measures at various contact points. p-value for comparison within the group of participants.

	Pre-intervention: Mean (±*SD*)	Immediate post-intervention: Mean (±*SD*)	one-month post-intervention: Mean (±*SD*)	Pre-intervention vs Immediate post-intervention: *p* value	Pre-intervention vs. one-month post-intervention: *p* value
LSA (0-120)	41.1 (±16.2)	44.8 (±8.3)	56.8 (±5.5)	0.656	0.0938
SPPB (0-12)	9.2 (±1.9)	9.0 (±2.0)	9.0 (±2.4)	1	0.813
EuroQol EQ-5D-5L					
Mobility (1-5)	1.7 (±0.8)	1.5 (±0.5)	1.3 (±0.5)	1	0.75
Self-Care (1-5)	1.2 (±0.4)	1.0 (±0.0)	1.0 (±0.0)	1	1
Usual Activities (1-5)	1.8 (±1.0)	1.3 (±0.5)	1.5 (±0.5)	0.5	0.5
Pain & Discomfort (1-5)	1.7 (±0.5)	1.5 (0.5)	1.5 (±0.5)	1	1
Anxiety/Depression (1-5)	1.5 (±0.5)	1.3 (±0.5)	1.2 (±0.4)	1	0.5
Health Rating Score (0-100)	77.1 (±20.2)	76.7 (±14.7)	78.3 (±7.5)	0.875	1

3.3. Qualitative Results

Data saturation was reached after interviewing the six participants. Five interviews were conducted in Mandarin, while one was in English. Each interview lasted for an average of 22 minutes.

Thematic analysis revealed four main themes: (a) motivational factors for participation in the programme, (b) personal and social factors affecting the programme outcomes, (c) positive behavioural changes and (d) programme outcomes. Motivational factors for program participation led to positive outcomes such as increased nutritional knowledge, and positive behavioural changes such as increased frequency of exercising and changes in personal dietary habits. Nevertheless, certain personal and social factors resulted in ineffective program results, such as a lack of change in cooking frequency. The relationship between the main themes and subthemes can be seen in Figure 2.

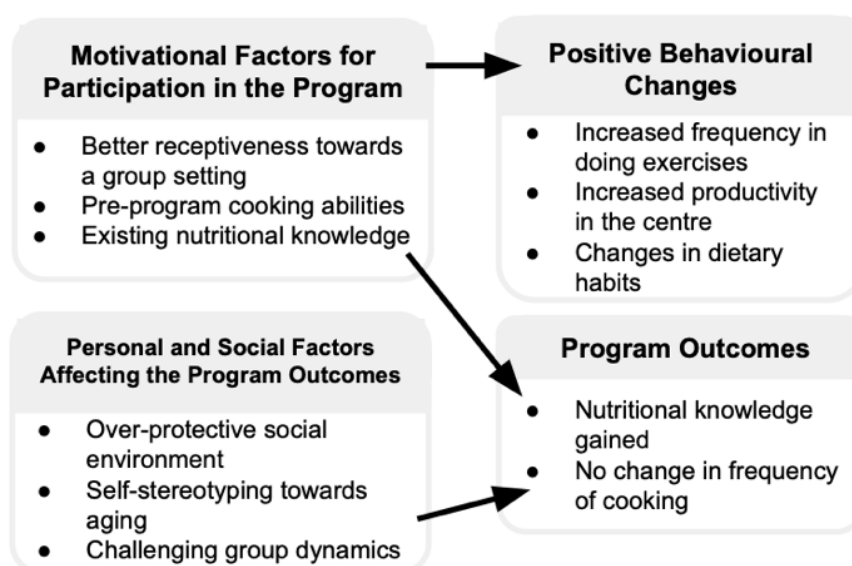

Figure 2. Relationship between themes.

Motivational Factors for Participation in the Programme

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Participants shared how personal and social factors influenced their motivations for participation. Common subthemes were identified: (1) pre-programme cooking abilities; (2) existing nutritional knowledge; and (3) better receptiveness towards a group setting.

Pre-programme cooking abilities. Four of the participants reported having prior experiences in cooking for themselves or others:

> I am very skilful. When I was only five years old, my mother let me cook, until now when I am old..... I cook curry, I know how to cook. (SC05)
>
> I cook noodles sometimes I cook porridge. I cook oats. Then sometimes I can cook the veggie soup. (SC04)
>
> I cook for my friend rice porridge to eat. (SC07)
>
> Existing nutritional knowledge. Two participants reported having prior knowledge of nutrition, which potentially aided in their understanding of the concepts taught. As mentioned by one participant: Sweet porridge … eaten less … Because I have diabetes… I have cut down already (SC07). Another participant added: The coffee has a little sugar added (SC08).

Better receptiveness towards a group setting. Four participants felt that learning in a group was beneficial as they could learn from others, and they enjoyed interacting with others. They recalled:

> I like to cook together. Then we make friends together. We can discuss anything, and together we can make something new. (SC04)
>
> It's better to be in a group. Because there are so many more things, more opinions, more of everything. Opinions, like one sentence from you, one sentence from me. We can consult each other about it, talk about it, and understand what is behind it. You can also learn from others and communicate with them. (SC01)
>
> Learning things, you can't do it alone. (SC02)
>
> If someone doesn't understand, teach them. (SC05)

Personal and Social Factors Affecting the Programme Outcomes

Participants were encouraged to do the weekly homework and cook the dishes learned at home. However, personal and social environmental factors limited their compliance and willingness to learn. Three sub-themes were identified: (1) self-stereotyping towards aging; (2) over-protective social environment; and (3) challenging group dynamics.

Self-stereotyping towards aging. More than half (66%) of the participants expressed personal views on aging as a limitation to their learning. As highlighted by participants:

> I'm old now and can't learn anything. Just being normal and that's fine. (SC01)
>
> You can't learn anything when you are old. (SC02)
>
> (I am) Old already, we cannot do it now. (SC04)

Over-protective social environment. Four participants experienced limited opportunities to participate in household chores at home due to restrictions by family members. This limited their participation in cooking at home. Participants shared:

> Let the maid do the cooking as usual because the maid is hired …. She (daughter) said, Mommy, you do your thing, she can do it by herself, don't be like this. (SC08)
>
> I don't have to cook now as my daughter-in-law cooks. (SC01)
>
> My daughter-in-law cooks sometimes. If she does not cook, then we take away food. (SC02)
>
> My daughter says, "Mommy better rest". Or else you will fall. (SC04)

Challenging group dynamics. The presence of mild cognitive impairment in two participants posed additional challenges to group dynamics and their active participation in group activities. One

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participant remarked that participants would often interrupt each other, disrupting the discussion: That's why we always keep quiet, and let them talk. If we talk together, I don't know which one to listen to. When the instructor was talking, somebody just interrupted her (SC04). Similarly, another participant expressed that sessions were usually noisy and disruptive: Everyone talks a lot … Everyone speaks different words, and it's very noisy (SC07).

Positive Behavioural Changes

Participants expressed positive lifestyle changes following the programme intervention. Three sub-themes were identified: (1) changes in dietary habits; (2) increased frequency in doing exercises; and (3) increased productivity in the centre.

Changes in dietary habits. Four of the participants shared how their dietary habits changed after the programme. One participant said: I didn't eat fruits before, but I do now. Eat it every night … I eat watermelon, pineapple, and papaya (SC02). Other participants also shared how they were more mindful of the nutritional contents in their diet: Less salt, less sugar, less oil … All this got the cholesterol high cholesterol one, don't cook, don't eat (SC04). What I want to eat is healthier, and fresher. It is healthier (SC01). I have cut down extremely a lot (snacks) (SC07).

Increased frequency in doing exercises. Half of the participants reported incorporating exercises into their daily routines and shared about the frequency and number of repetitions they did. As mentioned by one participant: Most of the time is in the afternoon. I'll do it myself. Do ten times, complete them, and I'm done. Once a week. I don't come here on Saturdays and Sundays, so I just do it at home. I do the exercises that I learn here at home (SC01). Others did exercises when they had pockets of time at home: I sometimes exercise. I do it at home when I have free time. Sometimes I do it, sometimes I don't (SC02). Another participant mentioned incorporating the exercises into her morning routine: Early in the morning, at 9.30 am, I start my exercise …. At home when I am busy, no exercise (SC04).

Increased productivity in the centre. Two participants shared that their time was more meaningfully spent in the centre: It allows us to participate because otherwise there are helpers and daughters at home … and we would just sit there and watch TV when we get home (SC08). We should do this (cooking activity) … better than only sitting down the whole day. (SC01)

Programme Outcomes

Participants were taught important nutritional information and encouraged to cook the dishes learned at home. They shared about what they learned and changes in lifestyle habits. Two common sub-themes were identified from the responses gathered: (1) nutritional knowledge gained; and (2) no change in the frequency of cooking.

Nutritional knowledge gained. Half of the participants shared nutritional facts that they learned from the sessions. As shared by one participant: Everybody can cook healthy… more healthy food. Less salt, less sugar and less oil (SC04). One participant also shared how she would apply the knowledge learned: Learn what is healthy and what is not so healthy … I will tell my friends if it is too salty (SC01). Another participant expressed what constitutes a balanced diet: protein, vegetables … how much we should be eating (SC07).

No change in the frequency of cooking. Three of the participants experienced challenges in being able to cook at home, citing reasons such as family resistance and a lack of need:

> I don't have to cook now as my daughter-in-law cooks. (SC01).
>
> My daughter-in-law cooks sometimes. If she does not cook, then we takeaway food. (SC02).
>
> Let the maid do the cooking as usual because the maid is hired. (SC08).

4. Discussion

This study assessed the feasibility of implementing a structured 7-week cooking programme for clients at an SCC in Singapore. The study recorded an attendance rate of 80.4% and a dropout rate of 14.3%, suggesting the feasibility of this structured cooking program to be conducted in the SCC in Singapore.

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In our study, we observed that participants effectively incorporated exercise into their daily routines following the intervention. This positive outcome can be attributed to the inclusion of a weekly homework component, which has consistently shown to enhance intervention outcomes in various community-based programs designed for older adults (Brandao et al., 2021; Tang & Kreindler, 2017; Xu et al., 2023). Another contributing factor leading to such a positive behavioural change could be their personal interest and life experience in the relevant activity (i.e., cooking) as shared by our participants. This is supported by another similar study where motivation played a key role in sustaining engagement in the exercises post-intervention (Denny et al., 2019). Participants in our study experienced an increase in community mobility, as indicated by improvements in LSA and EQ-5D-5L mobility scores immediately post-intervention and one-month follow-up, but no improvement in overall physical functions (SPPB). This could be explained since the exercises in the cooking program were not graded by the program leader based on individual participant's progress. Resistance-based and individualized exercise training has been proven to be effective in both fall prevention and frailty management programmes (Clemson et al., 2004; Xu et al., 2023). Hence, there's a need for the programme leader to learn from exercise experts (e.g., physiotherapists) on individualization and gradation of different strength and balance exercises in future trials. A standardised exercise prescription can be included to increase the effectiveness and compliance rate for future programs (Clemson et al., 2004).

Most participants in the study reported experiencing minimal changes in their frequency of cooking at home. They attributed this trend to external factors, including an over-protective social environment and personal circumstances. In our study, it was discovered that both family caregivers and helpers demonstrated strong support and prioritized the safety of older adults. As a result, they took on the responsibility of tasks that the older adults used to engage in, including cooking. This was also reported in other local studies (Seah et al., 2020; Thang, 2015, p. 152-156; Xu et al., 2019), where family caregivers frequently offer close supervision and increased assistance with ADLs or take on responsibilities for housework to ensure the safety of their elderly parents at home. Furthermore, our study revealed that older adults may have developed negative self-perceptions of aging, which influenced their willingness to engage with the program and make lifestyle changes. In the Singapore context, it is common for older adults to possess an 'I am old' mindset (Thang, et al., 2019). This mindset may be attributed to personal factors, including negative past learning experiences and low mood (Wang et al., 2016). More importantly, the competency of programme leaders in group facilitation, such as facilitating group members in discussion and peer learning and the use of theoretical frameworks (e.g., adult learning principles) (Bryan et al., 2009) has been recognized as one of the key determinants for successful behavioural changes in the older adult population (Clemson et al., 2004; Xu et al., 2023).

The study's findings showed positive changes in participants' eating habits and nutrition knowledge, likely due to the involvement of a dietician who provided valuable information on nutrition and dietary practices (Laustsen et al., 2021). Participants' trust in the dietician may have influenced their receptiveness to the content taught and willingness to make dietary modifications. Having nutrition knowledge is essential for improving confidence in changing dietary habits (Lee et al., 2019). Participants were taught nutritious and healthy recipes through the dishes they prepared. A recent study by Lee et al. (2019) on a nutrition-based program for community-dwelling elderly supports these findings, demonstrating a positive impact on health behaviors and lifestyles through nutrition education and healthier meal options. Despite local governmental initiatives like the Healthier SG program in Singapore, many Singaporeans still struggle to maintain a balanced diet, as shown by the 2022 National Nutritional Survey (Ministry of Health, 2023). Improving nutrition has tangible benefits for older adults, including reducing and preventing age-related diseases (Clegg & Williams, 2018). Therefore, interventions and programs targeting dietary habits should be prioritized. It is recommended to use standardized outcome measures, such as the Mini Nutritional Assessment, for assessing changes in nutritional status among community-dwelling older adults (Razon et al., 2022). This should be considered in future studies to better detect changes in nutritional status.

Our study findings support the effectiveness of group-based programs in promoting active participation and positive learning outcomes for community-dwelling older adults, consistent with the findings of Makino et al. (2015). Implementing group-based sessions in Singapore offers a cost-effective solution to meet the challenges posed by the aging population and increased healthcare demands, as highlighted by Malhotra et al. (2019). Local evidence-based programs like Say No to Frailty (Xu et al., 2023) and the Healthy Ageing Promotion Program for You (Merchant et al., 2021) have demonstrated success in improving physical activity, social networks, fall prevention, and attendance rates. However, our study also identified challenging group dynamics, as attributed to individuals with mild cognitive impairment, as a barrier to effective learning and outcomes. This emphasizes the importance of well-trained program facilitators who can effectively manage group dynamics, as noted by Mahoney et al. (2017). Investing in facilitator training and development is crucial to enhance program outcomes and overcome these challenges. In conclusion, while group-based programs have shown positive outcomes for community-dwelling older adults, considering the potential impact of challenging group dynamics is essential. Future studies should explore the role of well-trained facilitators in improving program outcomes and further enhancing the effectiveness of these interventions.

4.1. Clinical Implications

This study has several implications for clinical practice. Firstly, community-based multi-component structured programmes can improve older adults' physical functions, overall well-being and social engagement. These programmes should also address common challenges faced by community-living older adults, such as lack of interests in participating centre-wide activities.

Secondly, it is important to recognize the significant role of nutrition education in influencing the dietary habits of older adults. Therefore, incorporating nutrition education into multi-component programs is essential. One effective approach is to include health professionals such as dieticians as part of the program. Their expertise can provide valuable guidance and support, leading to positive outcomes in terms of dietary improvements (Laustsen et al., 2021).

Lastly, it is important to highlight that this program offers older adults the opportunity to engage in meaningful activities, which is crucial for enhancing their well-being and quality of life (Hammell, 2018). In our study, we found that participants were generally motivated to participate in cooking activities but faced limitations due to their over-protective family members and low self-efficacy. To address these limitations and facilitate positive behavioural changes outside the centre, it is essential to actively involve caregivers from the start of the program. Caregivers play a vital role in providing support, encouragement, and assistance to older adults, which can significantly impact their ability to continue practising and implementing the skills learned in the program (Lindeza et al., 2020). By actively involving caregivers, we can create a supportive environment that fosters positive behavioural changes and enhances the overall effectiveness of the program for older adults.

4.2. Future Recommendations

Future studies could involve participants in the brainstorming and co-designing of the programme. For instance, dishes or recipes can be proposed by participants in the structured cooking programme. According to the Self Determination Theory, when individuals have a greater sense of autonomy, this leads to increased engagement, participation, intrinsic motivation and learning abilities (Rothes et al., 2016; Ryan & Deci, 2000).

To optimize the effectiveness of the cooking program, it is important to consider the inclusion criteria. Emphasizing a personal interest in cooking activities as a criterion can help minimize the attrition rate in future programs. It is worth noting that older adults with mild cognitive impairment can still benefit from the program. However, to facilitate behavioural changes and improve compliance with the prescribed exercises at home, it is advisable for them to be accompanied by a family caregiver. The presence of a caregiver can provide the necessary support and guidance to ensure the program's success for individuals with mild cognitive impairment.

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Our findings highlight the importance of improving the facilitator's skills through pre-program training to enhance the effectiveness of the program (Ritchie et al., 2020). Specifically, considering that some participants have mild cognitive impairment, it is crucial for facilitators to have previous experience working with older adults in the community who have cognitive impairments. This experience will enable them to better understand the unique needs and challenges of this population. Reducing the facilitator-to-participant ratio can also enhance the facilitation of the session and better cater to individual participants' needs. Additionally, it would be beneficial to provide facilitators with the opportunity to practice with a group of older adults and receive feedback from participants, leaders, and experts. This feedback loop can help improve the fidelity of the program during its implementation (Mahoney et al., 2017). Furthermore, facilitators should possess strong language skills to ensure clear communication, and they should demonstrate good leadership skills to effectively guide and engage participants throughout the program. By investing in the training and skills development of facilitators, we can enhance group participation, adherence, and ultimately, the overall effectiveness of the program.

4.3. Limitations of the Study

This study has several limitations. Firstly, the generalisability of the study's findings to the Singapore population is constrained by the small sample size and sample homogeneity (all participants were Chinese females), as well as the recruitment from only one SCC. This might have prevented the detection of significant changes from pre-intervention to immediate and one-month post-intervention. Secondly, unblinded assessors may have resulted in detection bias, potentially influencing the reported outcomes. Lastly, considering that some of the participants had mild cognitive impairments and poor memory, there is a possibility of recall biases during the interviews. Therefore, the results should be interpreted with caution.

5. Conclusion

The structured cooking programme demonstrated its feasibility and positive trend in improving health outcomes for older adults in the SCC in Singapore. The competency of program leaders in group facilitation and exercise prescription may improve the effectiveness of the programme. Finetuning of the programme content is needed before the larger scale to test its clinical effectiveness.

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References

1. Agency for Integrated Care. (2024 April, 28). Care Services. https://www.aic.sg/care-services
2. Aung, T. N. N., Aung, M. N., Moolphate, S., Koyanagi, Y., Supakankunti, S., & Yuasa, M. (2021). Caregiver burden and associated factors for the respite care needs among the family caregivers of community dwelling senior citizens in Chiang Mai, Northern Thailand. International Journal of Environmental Research and Public Health, 18(11), 5873. https://doi.org/10.3390/ijerph18115873
3. Baker, P. S., Bodner, E. V., & Allman, R. M. (2003). Measuring life-space mobility in community-dwelling older adults. Journal of the American Geriatrics Society, 51(11), 1610-1614. https://doi.org/10.1046/j.1532-5415.2003.51512.x
4. Bhadhuri, A., Kind, P., Salari, P., Jungo, K. T., Boland, B., Byrne, S., Hossmann, S., Dalleur, O., Knol, W., Moutzouri, E., O'Mahony, D., Murphy, K. D., Wisselink, L., Rodondi, N., & Schwenkglenks, M. (2020). Measurement properties of EQ-5D-3L and EQ-5D-5L in recording self-reported health status in older patients with substantial multimorbidity and polypharmacy. Health and Quality of Life Outcomes, 18(1), 317. https://doi.org/10.1186/s12955-020-01564-0
5. Biddiscombe, R. J., Scanlan, J. N., Ross, J., Horsfield, S., Aradas, J., & Hart, S. (2018). Exploring the perceived usefulness of practical food groups in day treatment for individuals with eating disorders. Australian Occupational Therapy Journal, 65(2), 98-106. https://doi.org/10.1111/1440-1630.12442
6. Brandão, G. S., Brandão, G. S., Sampaio, A. A. C., Damas Andrade, L., Fonseca, A. L., Campos, F. K. R., Silva, A. S., Silva, M. M., Oliveira-Silva, I., Vieira, R. P., Donner, C. F., Silva, R. A., Jr, Camelier, A. A., & Oliveira, L. V. F. (2021). Home physical exercise improves functional mobility and quality of life in the elderly: A CONSORT-prospective, randomised controlled clinical trial. International Journal of Clinical Practice, 75(8), e14347. https://doi.org/10.1111/ijcp.14347
7. Bryan, R.L., M.W. Kreuter, and R.C. Brownson, Integrating adult learning principles into training for public health practice. Health Promotion Practice, 2009. 10(4): p. 557-563. https://doi.org/10.1177/1524839907308117
8. Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2). 77-101. https://doi.org/10.1191/1478088706qp063oa
9. Cao,Y., Liu, Y., Lai, J. H. Y., & Theng, Y. L. (2021). A pilot study of health coaching on older adults' personal healthcare and maintenance during the outbreak of Covid-19 in Singapore. Health, 13, 165-177. https://doi.org/10.4236/health.2021.132015
10. Clegg, M. E., & Williams, E. A. (2018). Optimizing nutrition in older people. Maturitas, 112, 34–38. https://doi.org/10.1016/j.maturitas.2018.04.001
11. Clemson, L., Cumming, R. G., Kendig, H., Swann, M., Heard, R., & Taylor, K. (2004). The Effectiveness of a Community-Based Program for Reducing the Incidence of Falls in the Elderly: A Randomized Trial. Journal of the American Geriatrics Society, 52(9), 1487-1494. https://doi.org/10.1111/j.1532-5415.2004.52411.x
12. Creswell, J. W., Plano Clark, V. L., Gutmann, M., & Hanson, W. (2003). Advanced mixed methods research designs. In A. Tashakkori & C. Teddlie (Eds.), Handbook of mixed methods in social and behavioral research (pp. 209–240). Thousand Oaks, CA: Sage.
13. Curcio, C. L., Perez-Trujillo, M., Gomes, C., Guerra, R., & Duque-Mendez, N. (2024). Cutoffs to identify restricted life-space mobility in older adults across different contexts: The international mobility in aging study. Ageing International. https://doi.org/10.1007/s12126-023-09553-6
14. Denny, K. G., Harvey, D., Meyer, O. L., Chan, M. L., Barba, C., & Farias, S. T. (2020). A combined treatment approach to support everyday function and promote brain health in older adults: A pilot study. Clinical Gerontologist, 43(2), 209–220. https://doi.org/10.1080/07317115.2019.1633574

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 27 November 2024 doi:10.20944/preprints202411.1999.v1

15. Faber, J., & Fonseca, L. M. (2014). How sample size influences research outcomes. Dental Press Journal of Orthodontics, 19(4), 27–29. https://doi.org/10.1590/2176-9451.19.4.027-029.ebo
16. Farmer, N., Touchton-Leonard, K., & Ross, A. (2018). Psychosocial benefits of cooking interventions: A systematic review. Health Education & Behavior: The Official Publication of the Society for Public Health Education, 45(2), 167–180. https://doi.org/10.1177/1090198117736352
17. Feng, Y. S., Kohlmann, T., Janssen, M. F., & Buchholz, I. (2021). Psychometric properties of the EQ-5D-5L: A systematic review of the literature. Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation, 30(3), 647–673. https://doi.org/10.1007/s11136-020-02688-y
18. Fuhrmann, A. C., Becker Kottwitz Bierhals, C. C., dos Santos, N. O., & Paskulin, L. M. (2015). Association between the functional capacity of dependent elderly people and the burden of family caregivers. Revista Gaucha de Enfermagem, 36(1), 14–20. https://doi.org/10.1590/1983-1447.2015.01.49163
19. Gao, J., Gao, Q., Huo, L., & Yang, J. (2022). Impaired activity of daily living status of the older adults and its influencing factors: A cross-sectional study. International Journal of Environmental Research and Public Health, 19(23), 15607. https://doi.org/10.3390/ijerph192315607
20. Hammell K. W. (2018). Opportunities for well-being: The right to occupational engagement. Canadian Journal of Occupational Therapy, 84(4-5), 209–222. https://doi.org/10.1177/0008417417734831
21. Herdman, M., et al. (2011). Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Quality of Life Research, 20, 1727-1736. https://doi.org/10.1007/s11136-011-9903-x
22. Hughes, S., Murray, C. M., McMullen-Roach, S., & Berndt, A. (2023). A profile of practice: The occupational therapy process in community aged care in Australia. Australian Occupational Therapy Journal, 70(3), 366–379. https://doi.org/10.1111/1440-1630.12860
23. Keller, H. H., Gibbs, A., Wong, S., Vanderkooy, P., & Hedley, M. (2004). Men can cook! Journal of Nutrition for the Elderly, 24(1), 71-87. https://doi.org/10.1300/J052v24n01_06
24. Kwon, J., Yoshida, Y., Yoshida, H., Kim, H., Suzuki, T., & Lee, Y. (2015). Effects of a combined physical training and nutrition intervention on physical performance and health-related quality of life in prefrail older women living in the community: A randomized controlled trial. Journal of the American Medical Directors Association, 16(3), 263.e1–263.e8. https://doi.org/10.1016/j.jamda.2014.12.005
25. Kyrdalen, I. L., Moen, K., Røysland, A. S., & Helbostad, J. L. (2014). The Otago Exercise Program performed as group training versus home training in fall-prone older people: a randomized controlled Trial. Physiotherapy Research International: The Journal for Researchers and Clinicians in Physical Therapy, 19(2), 108–116. https://doi.org/10.1002/pri.1571
26. Laustsen, C. E., Petersson, P., Westergren, A., & Haak, M. (2021). Involvement of professionals in research: knowledge integration, development of practice, and challenges: a group concept mapping study. Health research policy and systems, 19(1), 115. https://doi.org/10.1186/s12961-021-00763-5
27. Lee, J. C. B., Robert, C., Naharudin, N. B., Erdt, M., Vijayakumar, H., & Theng, YL. (2019). Examining the effectiveness of a holistic nutrition programme among community-dwelling elderly in Singapore. Proceedings of Singapore Healthcare, 29(1), 10-18. https://doi.org/10.1177/2010105819885953
28. Lindeza, P., Rodrigues, M., Costa, J., Guerreiro, M., & Rosa, M. M. (2020). Impact of dementia on informal care: a systematic review of family caregivers' perceptions. BMJ Supportive & Palliative Care, 14, 38-49. Advance online publication. https://doi.org/10.1136/bmjspcare-2020-002242
29. Liu, G., Yap, P., Wong, G. H., Wei, H. X., & Hua, E. C. (2015). Day care centers for seniors in Singapore: Looking back and looking ahead. Journal of the American Medical Directors Association, 16(7), 630.e7-11. https://doi.org/10.1016/j.jamda.2015.04.004
30. Mack, R. A., Stanton, C. E., & Carney, M. R. (2023). The importance of including occupational therapists as part of the multidisciplinary team in the management of eating disorders: a narrative review incorporating lived experience. Journal of Eating Disorders, 11(1), 37. https://doi.org/10.1186/s40337-023-00763-6
31. Mahoney, J. E., Clemson, L., Schlotthauer, A., Mack, K. A., Shea, T., Gobel, V., & Cech, S. (2017). Modified Delphi consensus to suggest key elements of Stepping On Falls Prevention Program. Frontiers in Public Health, 5, 21. https://doi.org/10.3389/fpubh.2017.00021
32. Makino, K., Ihira, H., Mizumoto, A., Shimizu, K., Ishida, T., & Furuna, T. (2015). Associations between the settings of exercise habits and health-related outcomes in community-dwelling older adults. Journal of Physical Therapy Science, 27(7), 2207–2211. https://doi.org/10.1589/jpts.27.2207
33. Malhotra, R., Bautista, M. A. C., Müller, A. M., Aw, S., Koh, G. C. H., Theng, Y. L., Hoskins, S. J., Wong, C. H., Miao, C., Lim, W. S., Malhotra, C., & Chan, A. (2019). The aging of a young nation: Population aging in Singapore. The Gerontologist, 59(3), 401–410. https://doi.org/10.1093/geront/gny160
34. Martins, A. C., Santos, C., Silva, C., Baltazar, D., Moreira, J., & Tavares, N. (2018). Does modified Otago Exercise Program improve balance in older people? A systematic review. Preventive Medicine Reports, 11, 231-239. https://doi.org/10.1016/j.pmedr.2018.06.015
35. Merchant, R. A., Tsoi, C. T., Tan, W. M., Lau, W., Sandrasageran, S., & Arai, H. (2021). Community-based peer-led intervention for healthy ageing and evaluation of the 'HAPPY' Program. The Journal of Nutrition, Health & Aging, 25(4), 520–527. https://doi.org/10.1007/s12603-021-1606-6

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 27 November 2024 doi:10.20944/preprints202411.1999.v1

36. Merriam, S. B., & Bierema, L. L. (2014). Traditional learning theories. In S. B. Merriam & L. L. Bierema (Eds.), Adult learning linking theory and practice (pp. 35-43). Jossey-Bass.
37. Ministry of Health. (2024 April, 28). National health surveys highlight need to focus on healthy diets and lifestyles. https://www.moh.gov.sg/news-highlights/details/national-health-surveys-highlight-need-to-focus-on-healthy-diets-and-lifestyles
38. Moreau, M., Plourde, H., Hendrickson-Nelson, M., & Martin, J. (2015). Efficacy of nutrition education-based cooking workshops in community-dwelling adults aged 50 years and older. Journal of Nutrition in Gerontology and Geriatrics, 34(4), 369–387. https://doi.org/10.1080/21551197.2015.1084257
39. Murai, T., & Yamaguchi, H. (2017). Effects of a cooking program based on brain-activating rehabilitation for elderly residents with dementia in a Roken facility: A randomised controlled trial. Progress in Rehabilitation Medicine, 2, 20170004. https://doi.org/ 10.2490/prm.20170004
40. Nyberg, M., Olsson, V., Pajalic, Z., Örtman, G., Andersson, H. S., Blücher, A., Wendin, K., & Westergren, A. (2015). Eating difficulties, nutrition, meal preferences and experiences among elderly: A literature overview from a Scandinavian context. Journal of Food Research, 4(1), 22–37. https://doi.org/10.5539/jfr.v4n1p22
41. Pan, CW., Wang, X., Ma, Q., Sun, HP., Xu, Y., & Wang, P. (2015). Cognitive dysfunction and health-related quality of life among older Chinese. Scientific Reports 5, 17301. https://doi.org/10.1038/srep17301
42. Pavasini, R., Guralnik, J., Brown, J. C., di Bari, M., Cesari, M., Landi, F., Vaes, B., Legrand, D., Verghese, J., Wang, C., Stenholm, S., Ferrucci, L., Lai, J. C., Bartes, A. A., Espaulella, J., Ferrer, M., Lim, J. Y., Ensrud, K. E., Cawthon, P., Turusheva, A., Frolova, E., Rolland, Y., Lauwers, V., Corsonello, A., Kirk, G. D., Ferrari, R., Volpato, S., & Campo, G. (2016). Short Physical Performance Battery and all-cause mortality: systematic review and meta-analysis. BMC medicine, 14(1), 215. https://doi.org/10.1186/s12916-016-0763-7
43. Pérez-Zepeda, M. U., Belanger, E., Zunzunegui, M. V., Phillips, S., Ylli, A., & Guralnik, J. (2016). Assessing the validity of self-rated health with the Short Physical Performance Battery: A cross-sectional analysis of the international mobility in aging study. Plos One, 11(4), e0153855. https://doi.org/10.1371/journal.pone.0153855
44. Ritchie, M. J., Parker, L. E., & Kirchner, J. E. (2020). From novice to expert: A qualitative study of implementation facilitation skills. Implementation Science Communications, 1, 25. https://doi.org/10.1186/s43058-020-00006-8
45. Rothes, A., Lemos, M. S., & Gonçalves, T. (2016). Motivational profiles of adult learners. Adult Education Quarterly, 67(1), 3-29. https://doi.org/10.1177/0741713616669588
46. Ryan, M., Abujaber, N., Travers, A., McBride, K. A., Blum, P. T., Engels, M. Alshini, A., Greene, H., Githaiga, S., Didenko, A., & Vallières, F. (2023). The acceptability, appropriateness, and feasibility of implementing supportive supervision within humanitarian contexts: A qualitative study. Social Science and Medicine – Mental Health, 3, 100202. https://doi.org/10.1016/j.ssmmh.2023.100202
47. Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. The American Psychologist, 55(1), 68–78. https://doi.org/10.1037//0003-066x.55.1.68
48. Schirmer, A., Romero-Garcia, R., Chiu, M. H., Escoffier, N., Penney, T. B., Goh, B., Suckling, J., Tan, J., & Feng, L. (2020). Rhythmic timing in aging adults: On the role of cognitive functioning and structural brain integrity. Psychology and Aging, 35(8), 1184–1200. https://doi.org/10.1037/pag0000575
49. Seah, B., Espnes, G. A., Ang, E. N. K., Lim, J. Y., Kowitlawakul, Y., & Wang, W. (2020). Supporting the mobilization of health assets among older community dwellers residing in senior-only households in Singapore: A qualitative study. BMC Geriatrics, 20(1), 411. https://doi.org/10.1186/s12877-020-01810-6
50. Share a Pot Singapore. (2024 April, 28). Share a Pot. https://www.shareapot.sg/
51. Smeulders, E. S., van Haastregt, J. C., Janssen-Boyne, J. J., Stoffers, H. E., van Eijk, J. T., & Kempen, G. I. (2009). Feasibility of a group-based self-management program among congestive heart failure patients. Heart & Lung: The Journal of Critical Care, 38(6), 499–512. https://doi.org/10.1016/j.hrtlng.2009.01.007
52. Stolz, E., Mayerl, H., Muniz-Terrera, G., & Gill, T. M. (2024). Terminal decline in physical function in older adults. The Journals of Gerontology: Medical Sciences, 79(1), 1-10. https://doi.org/10.1093/gerona/glad119
53. Tang, W., & Kreindler, D. (2017). Supporting homework compliance in cognitive behavioural therapy: Essential features of mobile apps. JMIR Mental Health, 4(2), e20. https://doi.org/10.2196/mental.5283
54. Thang, L., L. (2015). Social Networks and the Wellbeing of Older Adults in Singapore. In ST. Cheng., I. Chi., H. H. Fung., & L. W. L. J. Woo (Ed.), Successful Ageing: Asian Perspectives (pp. 152-156). Springer. https://doi.org/10.1007/978-94-017-9331-5
55. Thang, L. L., Lim, E., & Tan, S. L. S. (2019). Lifelong learning and productive aging among the baby-boomers in Singapore. Social Science and Medicine, 229, 41-49. https://doi.org/10.1016/j.socscimed.2018.08.021
56. Wang, R., Donder, L. D., Backer, F. D., Shihua, L., Honghui, P., Thomas, V., Vanslambrouck, S., & Lombaerts, K. (2016). Back to school in later life: Older Chinese adults' perspectives on learning

Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: 27 November 2024 doi:10.20944/preprints202411.1999.v1

participation barriers. Educational Gerontology, 42(9), 646-659. https://doi.org/10.1080/03601277.2016.1205385
57. Winstead, V., Yost, E. A., Cotten, S. R., Berkowsky, R. W., & Anderson, W. A. (2014). The impact of activity interventions on the well-being of older adults in continuing care communities. Journal of Applied Gerontology: The Official Journal of the Southern Gerontological Society, 33(7), 888–911. https://doi.org/10.1177/0733464814537701
58. Wong, S. R., & Fisher, G. (2015). Comparing and Using Occupation-Focused Models. Occupational Therapy in Health Care, 29(3), 297–315. https://doi.org/10.3109/07380577.2015.1010130
59. Xu, T., O'Loughlin, K., Clemson, L., Lannin, N. A., Dean, C., & Koh, G. (2019). Developing a falls prevention program for community-dwelling stroke survivors in Singapore: Client and caregiver perspectives. Disability and Rehabilitation, 41(9), 1044-1054. https://doi.org/10.1080/09638288.2017.1419293
60. Xu, T., Clemson, L., O'Loughlin, K., Lannin, N., Dean, C. M., & Koh, G. (2021). Stepping on after stroke falls-prevention programme for community stroke survivors in Singapore: A feasibility study. British Journal of Occupational Therapy, 84(6), 366–375. https://doi.org/10.1177/0308022620946640
61. Xu, T., Yeh, T., Ng, Y.J., Wong, W.R., Koh, S.J. (2023). Testing the effects of a Multicomponent Frailty Management Program for Community-Dwelling Older Adults in Singapore: A Feasibility Study. Journal of Aging and Physical Activity, 31(5), 849-859. https://doi.org/10.1123/japa.2022-0084
62. Yeung, S. S. Y., Kwan, M., & Woo, J. (2021). Healthy diet for healthy aging. Nutrients, 13(12), 4310. https://doi.org/10.3390/nu13124310

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