

# Factors Influencing the Implementation of a Fall Prevention Exercise Program for Community-Dwelling Older Adults: A Qualitative Study Guided by the PRECEDE-PROCEED Model

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**Purpose:** Multiple falls prevention exercise programs have been rolled out globally, however, few studies have explored the factors necessary for their implementation. This study aimed to investigate the factors influencing the implementation of “Steady Feet” (SF), a 12-week community fall prevention exercise intervention, for older adults living in Singapore.

**Material and Methods:** This study utilized purposive sampling to recruit two participant groups: (i) older adults who declined or withdrew from the program and (ii) providers of the program (eg, instructors). We conducted 22 semi-structured interviews, recordings were transcribed and translated, followed by thematic analysis. Data collection and analysis were informed by the PRECEDE-PROCEED framework, focusing on predisposing, enabling, and reinforcing factors.

**Results:** Findings revealed two predisposing, four enabling, and two reinforcing themes. Predisposing themes encompassed (i) knowledge, attitudes, and practices of older adults towards exercises and falls prevention, and (ii) perceptions and attitudes of providers towards SF. Both older adults and providers identified several enabling elements in implementing SF, emphasizing the significance of (i) accessibility, availability, and affordability. Providers highlighted (ii) tools and structural support for continual engagement, (iii) minimizing variations in capabilities through a competency development program, and (iv) fostering synergistic partnerships. Positive reinforcement included (i) the role of providers in engaging and promoting participation, (ii) family support, social networks, and (iii) incentives for older adults. Conversely, both groups highlighted negative reinforcements, including (iv) communication issues and (v) repetitive exercises, while providers specifically identified (vi) labor constraints as a deterrent for implementation.

**Conclusion:** Findings indicate that effective implementation necessitates a multifaceted approach. Promoting participation involves engaging instructors, emphasizing social bonds and family involvement, offering incentives, and providing subsidized or free classes. A competency development program proved effective in reducing variations in providers’ capabilities. Strengthening community partnerships, with management support, was crucial for ensuring the availability and accessibility of falls prevention programs.

**Keywords:** falls prevention, community-dwelling, older adults, exercise, qualitative, precede-proceed

## Introduction

Globally, the older adult population (aged 65+) is projected to reach 1.5 billion by 2050.<sup>1</sup> In Singapore, the older adult population is expected to constitute 25% of its total population by 2030.<sup>2</sup> Approximately 14.7% of these individuals aged 60 and above experience at least one fall annually.<sup>3</sup> This is comparable with figures reported in other rapidly ageing

Asian countries<sup>4</sup> like South Korea (15.9%),<sup>5</sup> Japan (19.8%)<sup>6</sup> and China (14.0%).<sup>7</sup> Falls have significant health consequences, including physical injuries, mortality, and reduced quality of life.<sup>8,9</sup> Physical activity programs, especially those which integrated balance and strength exercises, have demonstrated efficacy in reducing falls among older adults, with an approximately/average 17% reduction in fall rates reported in a systematic review by Sherrington et al<sup>10,11</sup> However, despite the evidence, such tailored fall prevention programs are not widely available in the community setting in Singapore.<sup>12</sup> In view of these considerations, a multidisciplinary team from Changi General Hospital (CGH), including geriatricians, physiotherapists, exercise physiologists, and community care colleagues, partnered with community-based stakeholders like Sport Singapore, ActiveSG, and NTUC Health, to develop the “Steady Feet” (SF) fall prevention exercise program for community-dwelling older adults. A comprehensive description of SF has been previously described by Ong et al.<sup>13</sup>

It is widely recognized by researchers and policymakers that the success of healthcare programs relies not solely on interventions components, but also on implementation factors, which vary by contexts.<sup>14,15</sup> In Singapore, significant progress in research approaches related to fall prevention programs has been made across different settings (acute hospitals, long term care facilities and community). However, knowledge gap related to its implementation and research-to-practice gap still exist. This is particularly so for community-based fall prevention exercise program like SF that is still in its infancy.<sup>12</sup> While promising initial results were observed with SF, it is acknowledged that its implementation remains a challenge. Anecdotally the adoption of SF within the community was sub-optimal as it is yet to be integrated as part of routine clinical and/or community practices. Falls prevention is generally perceived to be less important compared to other pathologically defined health needs, and therefore not prioritized.<sup>12</sup> Most clinicians do not prioritise fall prevention in the clinic due to competing demands and time constraints and is poorly referred by clinicians.<sup>12</sup> This situation was exacerbated with COVID-19 pandemic where safe-distancing measure was imposed, restricting group exercises including SF.<sup>16</sup> Even after COVID-19 related restrictions were lifted, recruitment of participants into SF continued to be difficult.

Considering the substantial investments in developing and implementing fall prevention programs like SF,<sup>17,18</sup> it is crucial to understand and address context-specific determinants related to implementation so as to develop and/or tailor strategies to increase the likelihood of success. Cost, accessibility, time constraints, and alignment with social and cultural context were identified as aspects that could influence the implementation of fall prevention.<sup>19</sup> While closer coordination and collaboration between providers has been recommended,<sup>12</sup> engagement of older adults has also been advocated for.<sup>20,21</sup> Understanding their beliefs, attitudes, and priorities about falls and their management was highlighted as key for successful fall prevention intervention and has been highly recommended in the assessment of determinants. Nevertheless, there is limited understanding of determinants that influence the implementation of community-based fall prevention exercises like SF within the Singaporean context. As implementation is a dynamic and context-specific process which requires tailoring for every context, this study aims to understand factors influencing the implementation of SF using an implementation framework for evaluation, PRECEDE-PROCEED model from providers and older adults’ perspectives. The PRECEDE-PROCEED model, developed by Green et al,<sup>22</sup> guides systematic planning, implementation, and evaluation of health promotion and intervention programs, including those for older adults’ fall prevention<sup>23,24</sup> and physical intervention among children.<sup>25</sup> It comprises two phases: PRECEDE (Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation) and PROCEED (Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development). Purported as an useful tool, effective use of the PRECEDE-PROCEED model has been reported to enhance understanding and knowledge<sup>26</sup> and positive health behaviors.<sup>27</sup> This study focused on the PRECEDE phase which represents the process that precedes the intervention, and was relevant to the state in which SF was at. Predisposing, enabling, and reinforcing factors influencing health intervention and behaviors were explored. Pre-disposing factors include characteristics such as knowledge, attitudes, beliefs, self-efficacy, preferences, existing skills that motivate behavior. Enabling factors include skills or physical factors that facilitate achievements of motivation to change behavior. Reinforcing factors comprise of factors that reward or reinforce the desired behavior change, including social support, changing social norms and economic rewards.<sup>28</sup> Understanding these factors are crucial for refining SF’s implementation and designing exercises tailored to older adults’ unique needs.

Effective use of implementation frameworks, models and theories is known to be of great value as they provide a uniform language, increasing generalizability of findings and theoretical thinking, design, conduct and evaluation of studies.<sup>29</sup> Furthermore, utility of implementation framework also allow for systematic identification of implementation strategies which have been demonstrated in addressing specific determinants.<sup>30</sup> Insights gained will inform the development and implementation of future fall prevention intervention programs.

## Materials and Methods

### Study Design

Qualitative methods were utilized for this study to allow for an in-depth exploration of the multifaceted factors influencing the implementation of a fall prevention program among older adults and healthcare providers. Semi-structured interviews were utilized for in-depth exploration of participants' experiences, beliefs, and attitudes.<sup>31</sup> Interviews were considered appropriate for this study as it enabled us to capture context-specific insights crucial for a comprehensive understanding of program implementation. This study was reported in accordance with the COREQ checklist (Consolidated Criteria for Reporting Qualitative Research; [Supplementary 1](#)).<sup>32</sup> The chosen epistemological methodology is rooted in an interpretative approach, where researchers actively participated in the interpretation and comprehension of the subject matter, emphasizing the perspectives of the study's participants.

We employed purposive sampling to recruit two groups of participants: (A) older adults who either declined participation in or discontinued SF, and (B) providers involved with SF, including fitness instructors, program administrators, community nurse screeners, geriatricians, and physiotherapists. Group A participants were eligible if they were aged 60 or above, had a Short Physical Performance Battery score of 7 to 11, and had no significant cognitive or vision impairments. Group B participants were eligible if they were aged 21 or above and had roles in planning or executing SF. Three study team members contacted potential participants, and we achieved a 100% response rate. To prevent interview fatigue, participants who completed SF and participated in interviews conducted as quality improvement project were excluded from this study. With the aim of gathering comprehensive insights, including those who declined participation or withdrew is expected to provide new essential insights. Since closer coordination and collaboration across providers has been identified to be key to ensure sustainable and effective community-based fall intervention,<sup>12</sup> program administrators, fitness instructors (FI), and healthcare professionals involved in program development and delivery were included in this study.

Two separate topic guides ([Supplementary 2](#) and [3](#)) were developed according to the PRECEDE-PROCEED framework. This approach ensured that the interviews were tailored to the specific viewpoints and roles of the two respective groups. The first and second authors, RO and MN, developed these guides with input from the study team. Topic guide A was designed to address the needs and experiences of older adult participants (Group A), while topic guide B focused on topics related to program implementation, participant engagement, exercise perception, and role-specific barriers or facilitators for Group B. While formal piloting of the topic guides was not conducted, the guides' content underwent refinement through team discussions before commencement of interviews.

### Research Team Reflexivity

The first and second authors, RO and MN performed the interviews and analysis. Both interviewers have a master's in public health, have received formal training in qualitative research methodologies, and are affiliated with CGH. Interviewers were both females, of Chinese descent, and in their thirties, possessing proficiency in both English and Mandarin languages. There was no prior relationship with older adult participants and the interviewers prior to the interviews. While some providers had prior professional working relationships with the interviewers, this is unlikely to influence the responses due to non-involvement of interviewers in program decisions. During the informed consent process, participants were assured of anonymity and confidentiality. All participants were informed of the research's aims and objectives.

## Participants and Data Collection

Face-to-face semi-structured interviews were conducted in a private room at CGH's office premises between January and October 2020. Interviews were audio recorded using digital recorders, and notes were made after each interview. The SF intervention was implemented in cycles, with participants recruited in a rolling enrollment format. Providers and older adult participants were recruited after the completion of each SF cycle. This approach ensured that participants had completed the program before gathering their views. Participants received SGD\$50 cash reimbursement for their participation. While most participants spoke English, some Group A participants chose to converse in Mandarin, which was a language that could be accommodated by the interviewers. Interviews lasted approximately an hour. Demographics data, including gender and ethnicity were collected from both groups. Additionally, reasons for withdrawal/declining were collected from Group A during the interviews, while data on occupation type was collected from Group B. Regrettably, providers' ages were not recorded due to an administrative oversight, and only the age of older adults are reported in this study. Freelance transcribers were engaged for verbatim transcriptions of the interviews. For interviews conducted in Mandarin, a two-step process was employed: initial verbatim transcription in Mandarin, followed by translation into English by the same transcribers. To safeguard confidentiality, personally identifiable information was replaced with unique participant codes and only de-identified transcripts were analyzed. No repeat interviews or member checking were carried out.

## Qualitative Data Analysis

Interview data was analyzed using Braun and Clarke's thematic analysis.<sup>33</sup> Firstly, RO and MN read the transcripts to familiarize themselves with the data and gain a comprehensive understanding. Coding was performed through an iterative deductive-inductive hybrid approach to ensure that no relevant information was missed. PRECEDE served as the guiding theoretical framework for the deductive coding process. An inductive approach was also employed to accommodate codes that did not entirely align with the initial codes under the PRECEDE framework. Themes were derived from the codes, representing key patterns and recurring elements within the interview material. RO and MN periodically met to review these themes collaboratively, aiming to reach consensus on data interpretation and representation to minimize researcher bias. Data was coded using NVivo 12 plus for Windows (version 12.6.1). The analyses occurred after the completion of the interviews, rather than iteratively alongside it. Data saturation was achieved.

## Ethics Approval

This study was conducted in accordance with the Declaration of Helsinki and approved by the SingHealth Centralized Institutional Review Board (CIRB Ref. No.: 2018/2850). Written informed consent was sought from participants prior to the start of the study. Participants could withdraw from the study at any time without penalties.

## Results

10 older adults and 12 providers were interviewed. An overview of their profile can be found in Table 1. Older adult participants withdrawals or refusals were primarily attributed to (i) scheduling conflicts or time constraints, (ii) lack of interest, and (iii) perceived exertion from the exercises. Our main findings are summarized in Figure 1 and comprise 8 themes. Themes and sub-themes are presented in a narrative reporting style with relevant quotations.

## Predisposing Factors

### Theme 1: Knowledge, Attitude, and Beliefs of Older Adults Towards Exercise and Falls Prevention

#### Exercise Confidence Levels Influenced by Physical Abilities

Some providers observed confidence issues faced by older adults in their exercise classes.

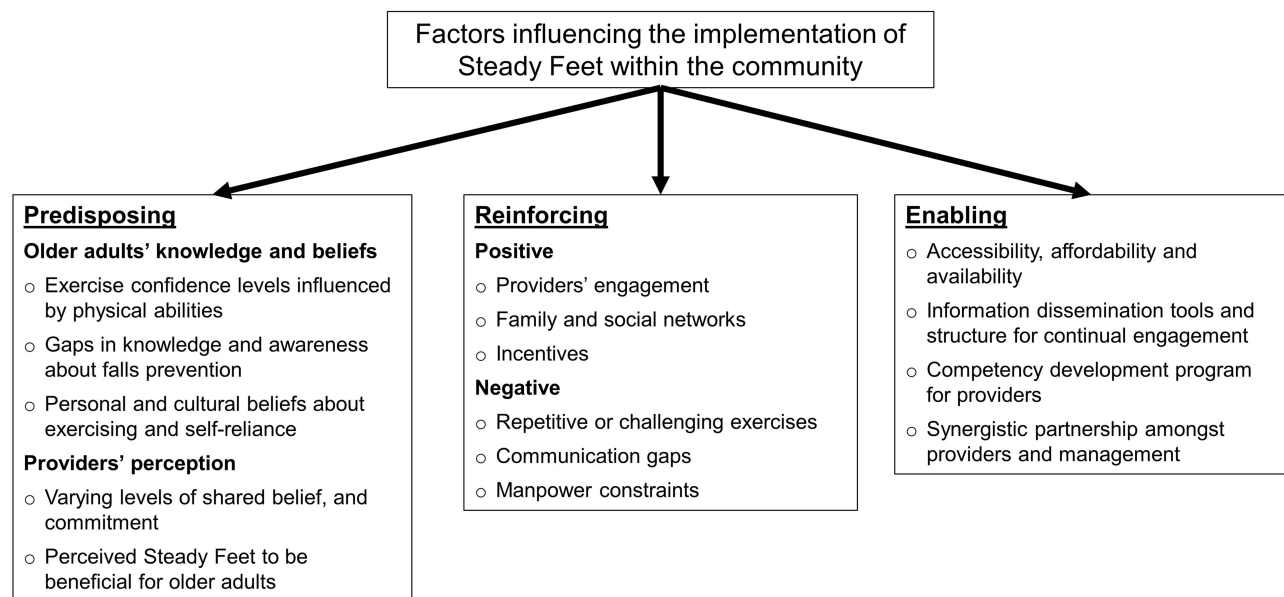
"Most of the... seniors I realized are not very confident with exercises... have not been exercising their whole life so they have a lot of pains everywhere". – *Fitness instructor; SFPRO004.*

**Table I** Interview Participants Profile

Group A (older adults)	N = 10
<b>Mean age (mean, SD)</b>	73.6 (6.6)
<b>Median age (IQR)</b>	73.0 (69.5–79)
<b>Gender (n, %)</b>	
Male	6 (60.0)
Female	4 (40.0)
<b>Ethnicity* (n, %)</b>	
Chinese	10 (100.0)
Malay	0
Indian	0
Others	0
Group B (providers)	N = 12
<b>Gender (n, %)</b>	
Male	5 (41.7)
Female	7 (58.3)
<b>Ethnicity* (n, %)</b>	
Chinese	7 (58.4)
Malay	4 (33.3)
Indian	0
Others	1 (8.3)
<b>Occupation Type (n, %)</b>	
Fitness instructor	5 (41.7)
Physiotherapist	2 (16.7)
Program administrator	4 (33.3)
Community nurse	1 (8.3)

**Notes:** \*Singapore is comprised of four main ethnic groups: Chinese, Malay, Indian, and Others.

Older adults elaborated upon this narrative, articulating the difficulties they encountered when attempting to participate in physical exercise due to the diminished physical capacities associated with the aging process. As an interviewee observed:

**Figure 1** Predisposing, reinforcing, and enabling factors surrounding the implementation of Steady Feet.

“Then you grow old, your movement is not as fast when you were young. I realize...I think of my past, I can run, now I cannot run. So, it is already ageing problem”. – *Older adult, SFP001*.

### Gaps in Knowledge and Awareness About Falls Prevention

The level of knowledge and awareness in fall prevention among older adults displayed considerable variation. For some, fall prevention remained relatively unfamiliar:

“For this (anything to prevent an elderly from falling) ... I have no idea” – *Older adult, SFP007*.

This limited awareness was emphasized by a provider who recognized that older adults often displayed limited interest in fall prevention initiatives unless they were integrated with broader health promotion initiatives.

“I realize that they (older adults) are not really very interested in falls (prevention) somehow, unless you tie it along with something (screening for other conditions)”. – *Program administrator, SFP008*

In contrast, other older adults reported being acutely aware of fall prevention initiatives. A minority recounted how previous falls acted as a salient reminder of the adverse outcomes associated with such incidents. This fear of falling motivated them to engage in fall prevention behaviors, such as using safety bars, as illustrated by one interviewee:

“I am very, very careful. I go to the bathroom, I...take my bath. The sink everything, I hold the bar. I change my clothing alone you know. Sometimes I worry, my wife also worried. That is the problem. This er, scared of falling... I fall down (previously)”. – *Older adult, SFP001*.

### Beliefs Related to Exercise Participation

The decision to engage in exercise was intrinsically tied to an individual's personal preferences and disposition. As articulated by an interviewee, there was a need to respect individual autonomy when encouraging exercise participation.

“If I constantly ask her (wife) (to join me for exercise) she will get irritated. Everyone has their own personality” – *Older adult, SFP002*.

Furthermore, most older adults believed in the merits of an active lifestyle. Their personal histories and past experiences helped shaped one's perspective and personal conviction on physical activity.

“All along I am active, during my younger days I was in the army, I was involved in a lot of activities. Since I have grown old, after retire, so I do part-time job to keep myself occupied. That is the only thing, I cannot stay at home, do nothing”. – *Older adult, SFP001*.

Interestingly, a prevailing theme among some older adults was their reluctance to engage in exercise, often stemming from the belief that they were too old to do so.

“I am old and it's not good to do exercise too much” – *Older adult, SFP007*.

When asked about the possibility of introducing exercise classes in a hospital setting, many older adults regarded hospitals as “taboo” which they are not keen to be associated with. This is highly pertinent among individuals of Chinese ethnicity.

“Chinese don't like going to the hospital”. – *Older adult, SFP002*.

“Most of the elderly would think the same, must be something bad happened when you go to the hospital, and people might be scared” – *Older adult, SFP007*.

### Strong Emphasis of Self-Reliance Among Older Adults

The concept of self-reliance emerged as a prominent value mentioned by older adults. This belief underscored a desire for self-sufficiency and independence, with a reluctance to burden others with personal matters, including health-related concerns.



“But don’t rely on people all the time, my goodness. You don’t think expect your son or daughter to help you everything with your housework everything, no such thing. Do yourself. That is why I prefer this way of life.” – Older adult, SFP001

## Theme 2: Provider’s Perception and Attitudes Towards Steady Feet

### Varying Levels of Shared Belief, and Commitment

The fitness instructors interviewed shared a detached or passive perspective, viewing their role primarily as assistants for implementation, rather than active participants who play essential role in contributing to the objectives of SF.

“Because we are only assisting the physio, our job is not to know what is... further in what they are doing or what, because er all we know is that, okay we partake in the Steady Feet to help the physio run the program, that’s all, yah”. – Fitness instructor, SFPRO001.

This differs from the perspectives of other providers, such as the program administrators, who emphasized the importance of believing in the program’s purpose, which could foster commitment among the providers involved in SF. This commitment is seen as a key factor in improving the success of program implementation.

“They (SF providers) have to believe that, yes, the ... the reason why this program is as is, or why we are doing this at this moment, and then that the team will put in the effort, okay, the necessary effort to make it work”. – Program administrator, SFPRO006.

### Perceived Steady Feet to Be Beneficial for Older Adults

All providers perceived the program to be beneficial, highlighting the program’s potential to identify older adults at risk of falling, and the imparting of knowledge to older adults empowered them to take proactive steps in fall prevention beyond the program’s duration.

“To equip these participants to pass the knowledge, so here, I’m educating you, these are the things that you should do to reduce falls, in the hopes that you will actually take away and continue on”. – Program administrator, SFPRO008.

## Enabling Factors

### Theme 3: Accessibility, Availability and Affordability Influences Participation

#### Accessibility of Steady Feet

The statements made by interviewees highlighted mobility and transportation challenges faced by older adults. Inconvenient locations and physical limitations could significantly hinder older adults’ accessibility and participation in SF.

“Ya... Because some of them are walking sticks, and so they find it difficult to board the bus and everything...” – Fitness instructor, SFPRO002.

#### More Available Class Timings Might Encourage Participation

Increasing the number of class sessions might potentially enhance participation rates, as fixed schedules, and conflicting commitments often deterred attendance, as observed by an interviewee:

“There’s definitely attrition, but the ones (older adults) that I connected with I asked you know, why didn’t you come this week, and it’s because I have some other things on this schedule, it’s very fixed so I can’t make it, I have to just you know, skip”. – Fitness instructor, SFPRO004.

Additionally, some interviewees mentioned the importance of considering the schedule of caregivers, as many older adults relied on family members who have their own commitments.

“You can’t just eh (organize without giving consideration to family) Many households have working adults, they are not just idling around”. – Older adult, SFP008.

### Affordability of Steady Feet

All interviewees mentioned affordability as a key decision point. The majority consensus among older adults was that they would decline to participate if it required any form of payment, even a nominal fee.

“Don’t spend. Because I consider. It is a bit of a waste. I prefer if can get free, better. If not, I do my own exercise”. – Older adult, SFP001.

## Theme 4: Tools and Structure for Continual Engagement

### Information Dissemination Tools

Interviewees highlighted the importance of information dissemination tools in promoting engagement between the program and the older adults. These tools included program information sheets, and text message reminders.

“When you organize, it will be good if it comes with an information sheet providing details on who can participate, where the venue is etc”. – Older adult, SFP008.

### Structured Follow-Up Process and Timely Scheduling for Engagement

Having follow-up schedules and shorter time lapses between screening dates were key considerations mentioned by providers. When older adults were left uncertain about the subsequent program stages, their interest waned, potentially leading to disengagement, as shared by an interviewee:

“I will see a lot of clients and as part of a nurse assessment, I would assess falls risks... I have no idea when the next exercise program is. So sometimes then, my nurse will surface to me, eh this is one is like very good Steady Feet client but er... when are you going to do recruitment next? So then, we will then kind of keep them aside. But the thing is like that, when you keep them aside, number one, you delay and number two, the interest might fall off and number three, I will have to be honest, they might just fall through the ... gap.” – community nurse screener, SFPRO015.

## Theme 5: Variations in Capabilities are Minimized Through Competency Development

Age-related differences in learning approaches and class execution confidence levels were mentioned, FIs, particularly those from an older age group, faced challenges in memorizing exercises and appeared to have less confidence in conducting physical assessments.

“Because we had some trainers who were also uhm a bit of the older age group, who couldn’t really uhm... memorize the exercises or the assessments.” – Fitness instructor, SFPRO004.

Moreover, a broader challenge arose from the varying skills and capabilities of providers involved in program implementation. As noted by an interviewee, FIs exhibited diverse skill sets and competencies, which might impact the uniformity and quality of program execution.

“Okay. I think the other challenge is of course, er, the community partners (fitness instructors), I think their skill set and their competency is also quite varied.” – Program administrator, SFPRO009.

However, it was worth noting that most FIs emphasized the essential role of SF’s Train-The-Trainer program in developing their competencies. The establishment of a straightforward, standardized training protocol, comprehensive training material and a competency checklist were instrumental in maintaining uniform standards among providers within the program.

“It is very clear... because when we started off... like say first program, the first day... during the train the trainer, they actually already taught us what... the exercise is all about. So, we have the piece of it (instruction manual) also... yah we just have to follow it.” – Fitness instructor, SPRO001.

## Theme 6: Synergistic Partnership

### Close Communication and Strong Collaborations

All providers shared how close communication through various communication methods, and collaborations with



committed, and competent team members were vital components of a synergistic partnership for successful program implementation.

[Fitness instructor name] is very easy to work with. He is committed to the cause, so that's the good thing. He is really serious about learning the things and I think moving forward should be that way. – Physiotherapist, SFPRO014

### Management Support

Providers highlighted the importance of organizational support, and an understanding management team as one of the key factors in facilitating the successful implementation of SF.

"I mean, for any program to sustain, er strong management support is basically very much needed and valued." – Program administrator, SFPRO006.

## Reinforcing Factors

### Theme 7: Positive Reinforcements

#### Providers' Engagement and Promotion of Participation

Providers played an active role in encouraging older adults to enroll and sustain their participation in SF; older adults mentioned being persuaded to participate in SF through proactive engagement by SF team members. Additionally, most older adults mentioned that it was crucial for FIs to create a fun, supportive, and engaging atmosphere. It was in this environment that they felt motivated and committed.

"Young or good looking or not is another matter, ah, most important thing is friendly, because old people, it is not possible to swear loyalty, haha." – Older adult, SFP006.

#### Family Support and Social Networks

All older adults attributed their active involvement in other similar community programs to the social networks and the formation of strong bonds with fellow participants from the program.

"I was quite lonely at home, after that my friend introduce more friends to me, we used to chit-chat after we done with Qigong, chit-chatting like that." – Older adult, SFP007.

This was also observed by providers, who shared that such camaraderie not only enriched the social lives of older adults, but also served as a motivator for sustained participation.

"Well definitely number 1 factor would be the social aspect. Like once they start making friends, they keep calling each other, whether or not they are coming, and then gathering to eat after that" – Fitness instructor, SFPRO004.

In tandem with social networks, some older adult interviewees felt that family support played an indispensable role in encouraging participation in community programs, as family members often hold a position of trust and influence in older adults' lives.

"You need their (older adult) family members to encourage them. You can't do it! They face each other everyday. You see them just twice a year, how will they listen to you?. Yes, so you should encourage his (older adult's) family members, (who will) then encourage him" – Older adult, SFP008.

#### Incentives That Reinforce Participation

Interviewees acknowledged that incentives could motivate older adults to actively engage in SF. These incentives could take various forms, both monetary rewards and non-monetary benefits, such as noticeable physical improvements or mental and social benefits.

“They (older adults) are very willing to participate because of one is reimbursement, and another one is they think that they are being looked after very well.” – Clinician, SFPRO010

## Theme 8: Negative Reinforcements

### Exercises Might Be Repetitive or Challenging for Some Older Adults

Some participants said that the exercises tended to be repetitive, potentially diminishing the interest and commitment levels of older adults.

“I heard... that the exercises are a bit er repetitive after the few sessions. So, they (older adults) would then say that oh, I do not have to attend anymore, I can just do (the exercises) at home).” – community nurse screener, SFPRO015.

Although many providers viewed the exercises as straightforward and uncomplicated, there existed a noticeable contrast between this perception and the challenges encountered by older participants. An interviewee narrated:

“Ok, when I first saw it (the exercise steps) I thought it was a piece of cake. Until when I see the participants struggling un the first few sessions, then I realized I take things for granted that, these simple things to do right, for me, it actually, may be a challenge to some of the older folks.” – Fitness instructor, SFPRO005.

### Communication Gaps

Most providers shared communication gaps and delays, which hindered the flow of information between various providers, potentially affecting the implementation of SF.

“Let’s say I need to run the class in a certain month, to get them (providers) to sort of er agree ah or, to that schedule er sometimes the getting the answer from them got some delay.” – Program administrator, SFRPO009.

Communication gaps were also expressed by older adults, a lack of clarity and understanding regarding the purpose of the program, potentially resulting in apprehension or reluctance to participate.

“I don’t know why they, they call me one day to go to Tampines Hub to interview and then take part in this.” – Older adult, SFP001.

### Manpower Constraints Affected the Planning Process

Narratives from providers revealed the challenges faced in securing available manpower, which could potentially influence trainer continuity and availability and the scheduling of program activities.

“It’s very difficult for us to plan things if things aren’t certain... So, like for example Steady Feet runs are dependent on the fitness instructor time, the rehab time. So, if they are not sure when they are available, that will have impact on our schedule.” – Program administrator, SFPRO008.

## Discussion

This study examined the perspectives of both older adults and providers, allowing for insights from both consumer and provider viewpoints. This approach facilitated the exploration of predisposing, enabling, and reinforcing factors that influenced the implementation of SF, resulting in the identification of eight main themes (Figure 1).

Effective community fall prevention programs require an understanding of older adults’ beliefs, attitudes, and knowledge.<sup>34</sup> Our findings highlight the significant influence of cultural factors on the choice of implementation location. For instance, a participant noted “Chinese do not like going to the hospital”. Cultural taboos in Chinese communities surrounding discussions related to diseases and death can lead to reluctance to engage with programs in a hospital setting.<sup>35,36</sup> This underscores the importance of considering cultural beliefs and attitudes when implementing programs for diverse older adult populations. Hence, SF should continue to maintain its delivery in non-hospital settings. Intriguingly, our study revealed that some older adults ( $\geq 74$  years old) perceived themselves as “too old” to engage

in fall prevention programs, while prior research suggests that younger older adults ( $\leq 65$  years old) may view themselves as “too healthy” to participate despite previous falls.<sup>37</sup> These divergent attitudes toward program participation emphasize the need for tailored strategies to address motivational barriers in different age groups.

It is well established that providers play a significant role in the success and sustainability of fall prevention program.<sup>38</sup> Interestingly, our study revealed that FIs often viewed their role as passive assistants responsible for implementing predefined exercise routines, contrasting with other providers in the program who emphasized the importance of actively embracing SF’s purpose. This divergence in perspective underscores the need to align all program providers, regardless of their roles, with a shared sense of purpose and commitment. Successful fall prevention programs often require a collective “buy-in” from all stakeholders, viewing the implementation process as an ongoing quality improvement effort.<sup>39</sup> To bridge this gap in perspective, efforts should be made to ensure that all providers not only understand their specific roles but also recognize their active contribution to the broader context and objectives of the program. Several providers highlighted knowledge and skill disparities among their peers and the value of standardizing competencies through initiatives like SF’s Train-The-Trainer program. The significance of such competency development lies in their capacity to offer a structured mechanism to enhance the quality and consistency of program implementation, crucial for efficacy and safety,<sup>40</sup> while also promoting a culture of continuous learning and skill development among providers.<sup>41</sup>

Both SF providers and older adult participants identified several factors that influence the implementation of fall prevention programs. Among these factors, limited knowledge about falls and awareness of fall prevention initiatives in the community is a common theme, consistent with previous research.<sup>42</sup> This highlights the need for effective dissemination of fall-related information, and our study highlights the role of providers in facilitating this dissemination. Healthcare professionals play a crucial role in initiating referrals to fall prevention initiatives, while FIs are essential for sustaining interest and attendance in these programs. They can assist older adults in navigating the system to find a suitable and beneficial fall prevention program.<sup>43</sup> However, for successful implementation, effective coordination and communication among providers are important to prevent duplication and service fragmentation,<sup>44</sup> as also emphasized by providers in our study. However, some did mention that there were still opportunities for improvement. Effective coordination and collaboration optimizes resource allocation, reduces redundancies, and streamlines the implementation process.<sup>44</sup> This collaborative approach enhances the overall efficiency of fall prevention initiatives, ultimately benefiting the well-being of older adults in the community.

Older adults in our study noted that costs, even nominal ones, deter participation in SF particularly for those from lower socio-economic status.<sup>45</sup> To address potential health disparities related to socio-economic status, subsidies based on means-testing should be made available to facilitate uptake of fall prevention programs. Additionally, the accessibility, and availability of program venues were identified as crucial for enabling attendance, a point echoed by prior research.<sup>42,43</sup> While SF venues are currently conveniently situated at transportation hubs, both providers and older adults have proposed the addition of more venues, such as void decks, to improve access for a larger number of older adults. Additionally, increasing the number of classes may be a feasible strategy in enhancing uptake rates. However, this could strain manpower availability and place increased pressure on program resources.<sup>12</sup> Manpower constraints have already been mentioned by a provider as a factor affecting the planning and delivery of SF. Therefore, striking a balance between increasing SF accessibility and availability, while maintaining SF’s quality is essential. Achieving this is a complex task that requires careful resource management and coordination among providers. Leadership support was mentioned by providers as being critical for implementation, both at the organization level (eg, hospital and ActiveSG management) and at the unit level (eg, department heads). Leaders have the influence to actively facilitate contextual attributes that impact implementation,<sup>46</sup> such as resource acquisition (eg, funding and venue) and serving as advocates for SF, thereby potentially enhancing its success.

Tools and structured engagement processes were perceived to be vital for delivering SF effectively. Information dissemination tools, which also sent out class reminders, a structured follow-up process, and timely scheduling of engagements can facilitate behavioral change by increasing access and reducing attendance barriers. Older adults’ participation may be hindered by forgetfulness<sup>47</sup> or a lack of information about program schedule, which could reduce their interest and may ultimately lead to disengagement as observed by our study’s participant.

Our study suggests that participation in SF was motivated by factors including various incentives, both monetary and non-monetary incentives, such as social benefits. This aligns with existing literature, which suggested a positive correlation between incentives and engagement in community exercise program.<sup>48–50</sup> Notably, studies involving older adults have shown that even modest monetary incentives (eg, SGD\$2 per day) can boost physical activity engagement, surpassing levels seen in younger counterparts.<sup>50</sup> This responsiveness might be attributed to the lower incomes prevalent among older adults,<sup>51</sup> making them more sensitive to monetary incentives.<sup>52</sup> It is important to note that while monetary incentives can drive short-term behavioral changes, they often fall short in sustaining these changes over time.<sup>53</sup> In contrast, non-monetary incentives, such as social benefits, enjoyment, and a sense of belonging, have been identified as factors that promote adherence to community-based healthy lifestyle programs over time.<sup>48,54</sup> Additionally, the establishment of new social support systems complements family involvement, which our study noted as a reinforcing factor facilitating participation in SF. Ahmad et al found that family encouragement reinforces older adults' participation in physical exercise.<sup>55</sup> The creation of a supportive environment is a vital aspect of implementing fall prevention exercise programs within the community.

This study possesses some strengths worth highlighting. First, the enrolment approach adopted in this research encompassed older adults who both declined or withdrew from SF and providers involved in SF. This provided new valuable insights and guidance for the enhancement of SF, offering a holistic view from both consumer and provider standpoints. Existing studies had only included those who participated in physical interventions<sup>19,56</sup> and including older adults whose perspectives were rarely assessed enlarged the scope of information gathered. The use of commonly utilized implementation framework allowed systematic assessment of essential implementation factors which has previously demonstrated to be beneficial for further development of interventions and facilitate sharing of lessons across settings.<sup>27</sup> Furthermore, the coding process was conducted by two independent coders, this served to reduce some bias and enhance the analytical rigor. Nevertheless, this study has some limitations. The participant pool exclusively consisted of individuals of Chinese ethnicity. Consequently, the perspectives and experiences of individuals from different ethnicities, which could yield unique insights, were not explored. Although data saturation was achieved, we still acknowledge that the relatively small sample size may limit the generalizability of the study findings to broader population groups. It is important to contextualize the study's findings according to other populations with different ethnic compositions or cultural backgrounds.

## Conclusion

In conclusion, this study identified the factors influencing the implementation of SF. These insights highlight cultural sensitivity and the need for tailored strategies to address age-specific motivational barriers. Furthermore, the active engagement and alignment of providers around a shared sense of commitment emerge as vital factors for success. Competency development initiatives play a crucial role in ensuring quality and consistency, especially when uniformity is essential for safety and efficacy. Additionally, healthcare professionals and FI have pivotal roles in facilitating access and engagement among older adults, necessitating effective coordination and communication among providers. Cost and venue accessibility stand out as substantial considerations, underscoring the importance of providing subsidies or free classes and enhancing venue accessibility. Leadership support at various levels is a critical enabler for program implementation. The multifaceted nature of incentives, both monetary and non-monetary, can drive participation in fall prevention programs. Overall, these insights offer a comprehensive understanding of the factors influencing SF's implementation, which can be applied to the refinement of future fall prevention interventions, enhancing the well-being of older adults in the community.

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## Disclosure

The authors report no conflicts of interest in this work.

## References

1. United Nations Department of E, Social Affairs Population D. *World Population Ageing 2020 Highlights: Living Arrangements of Older Persons*. United Nations New York; 2020.
2. Fang CS S'pore's population ageing rapidly: nearly 1 in 5 citizens is 65 years and older. Available from: <https://www.straitstimes.com/singapore/singapores-population-ageing-rapidly-184-of-citizens-are-65-years-and-older>. Accessed Aug 25, 2023.
3. Dai W, Tham Y-C, Chee M-L, et al. Falls and recurrent falls among adults in a multi-ethnic Asian population: the Singapore epidemiology of eye diseases study. *Sci Rep*. 2018;8(1):7575. doi:10.1038/s41598-018-25894-8
4. Organisation for Economic C-o, Development. *Fiscal Challenges and Inclusive Growth in Ageing Societies*; 2019.
5. Jang IY, Lee HY, Lee E. Geriatrics fact sheet in Korea 2018 from national statistics. *Ann Geriatr Med Res*. 2019;23(2):50–53. doi:10.4235/agmr.19.0013
6. Tanimoto Y, Watanabe M, Sun W, et al. Sarcopenia and falls in community-dwelling elderly subjects in Japan: defining sarcopenia according to criteria of the European working group on sarcopenia in older people. *Arch Gerontol Geriatr*. 2014;59(2):295–299. doi:10.1016/j.archger.2014.04.016
7. Zhang L, Ding Z, Qiu L, Li A. Falls and risk factors of falls for urban and rural community-dwelling older adults in China. *BMC Geriatr*. 2019;19(1):379. doi:10.1186/s12877-019-1391-9
8. Terroso M, Rosa N, Torres Marques A, Simoes R. Physical consequences of falls in the elderly: a literature review from 1995 to 2010. *Eur Rev Aging Phys Activity*. 2014;11(1):51–59. doi:10.1007/s11556-013-0134-8
9. Hartholt KA, van Beeck EF, Polinder S, et al. Societal consequences of falls in the older population: injuries, healthcare costs, and long-term reduced quality of life. *J Trauma Acute Care Surg*. 2011;71(3):748–753. doi:10.1097/TA.0b013e3181f6f5e5
10. El-Khoury F, Cassou B, Charles M-A, Dargent-Molina P. The effect of fall prevention exercise programmes on fall induced injuries in community dwelling older adults: systematic review and meta-analysis of randomised controlled trials. *BMJ*. 2013;347:f6234. doi:10.1136/bmj.f6234
11. Sherrington C, Whitney JC, Lord SR, Herbert RD, Cumming RG, Close JCT. Effective exercise for the prevention of falls: a systematic review and meta-analysis. *J Am Geriatr Soc*. 2008;56(12):2234–2243. doi:10.1111/j.1532-5415.2008.02014.x
12. Koh VJW, Matchar DB, Chan AW-M, et al. Reducing falls among community-dwelling older adults from clinicians' perspectives: a systems modelling approach. *Innov Aging*. 2023;igad077. doi:10.1093/geroni/igad077
13. Ong RHS, Nurjono M, Jumala J, et al. A community-based single fall prevention exercise intervention for older adults (STEADY FEET): study protocol for a randomised controlled trial. *PLoS One*. 2022;17(10):e0276385. doi:10.1371/journal.pone.0276385
14. Miake-Lye IM, Hempel S, Ganz DA, Shekelle PG. Inpatient fall prevention programs as a patient safety strategy. *Ann Internal Med*. 2013;158(5\_Part\_2):390–396. doi:10.7326/0003-4819-158-5-201303051-00005
15. Filiatrault J, Parisien M, Laforest S, et al. Implementing a community-based falls-prevention program: from drawing board to reality. *Canad J Aging*. 2007;26(3):213–225. doi:10.3138/cja.26.3.213
16. Ministry of Health Singapore. Stricter safe distancing measures to prevent further spread of COVID-19 cases. Available from: <https://www.moh.gov.sg/news-highlights/details/stricter-safe-distancing-measures-to-prevent-further-spread-of-covid-19-cases>. Accessed Nov 30, 2023.
17. Robertson MC, Campbell A. *Optimisation of ACC's Fall Prevention Programmes for Older People: Final Report 28 November 2008*. Dunedin, NZ: Accident Compensation Commission; 2008.
18. World Health Organization A, Life Course U. *WHO Global Report on Falls Prevention in Older Age*. Geneva, Switzerland: World Health Organization; 2008.
19. Child S, Goodwin V, Garside R, Jones-Hughes T, Boddy K, Stein K. Factors influencing the implementation of fall-prevention programmes: a systematic review and synthesis of qualitative studies. *Implement Sci*. 2012;7(1):91. doi:10.1186/1748-5908-7-91
20. Montero-Odasso M, van der Velde N, Martin FC, et al. World guidelines for falls prevention and management for older adults: a global initiative. *Age Ageing*. 2022;51(9). doi:10.1093/ageing/afac205
21. Stevens JA; Centers for Disease C, Prevention. National center for injury p, control division of unintentional Injury P. A CDC compendium of effective fall interventions: what works for community-dwelling older adults. In: *Centers for Disease Control and Prevention. National Center for Injury Prevention and Control*. 2nd ed. Division of Unintentional Injury Prevention Atlanta, Ga; 2010.
22. Green LW, Green LW, Kreuter MW. *Health Promotion Planning: An Educational and Ecological Approach with Powerweb Bind-in Card*. 4th ed ed. McGraw-Hill New York; 2005.
23. Kittipimpanon K, Amnatsatsue K, Kerdmongkol P, Maruo S, Nityasuddhi JD. Development and evaluation of a community-based fall prevention program for elderly Thais. *Pac Rim Int J Nurs Res*. 2012;16:222–235.
24. Banerjee AT, Strachan PH, Boyle MH, Anand SS, Oremus M. Factors facilitating the implementation of church-based heart health promotion programs for older adults: a qualitative study guided by the precede-proceed model. *Am J Health Promotion*. 2015;29(6):365–373. doi:10.4278/ajhp.130820-QUAL-438
25. Drury VB, Saw SM, Finkelstein E, Wong TY, Tay PK. A new community-based outdoor intervention to increase physical activity in Singapore children: findings from focus groups. *Ann Acad Med Singap*. 2013;42(5):225–231.



26. Saulle R, Sinopoli A, De Paula Baer A, et al. The PRECEDE-PROCEED model as a tool in public health screening: a systematic review. *Clin Ter.* 2020;171(2):e167–e177. doi:10.7417/ct.2020.2208
27. Kim J, Jang J, Kim B, Lee KH. Effect of the PRECEDE-PROCEED model on health programs: a systematic review and meta-analysis. *Syst Rev.* 2022;11(1):213. doi:10.1186/s13643-022-02092-2
28. Green LW. *Health Education Planning: A Diagnostic Approach*. 1st ed. Palo Alto, Calif: Mayfield Pub. Co; 1980.
29. Nilsen P. Making sense of implementation theories, models and frameworks. *Implement Sci.* 2015;10(1):53. doi:10.1186/s13012-015-0242-0
30. Proctor EK, Powell BJ, McMillen JC. Implementation strategies: recommendations for specifying and reporting. *Implement Sci.* 2013;8(1):139. doi:10.1186/1748-5908-8-139
31. Adams WC. Conducting Semi-Structured Interviews. *Handbook Prac Prog Eval.* 2015;492–505.
32. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care.* 2007;19(6):349–357. doi:10.1093/intqhc/mzm042
33. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77–101.
34. Jang H, Lovarini M, Clemson L, Willis K, Lord S, Sherrington C. Fall prevention programs for culturally and linguistically diverse groups: program provider perspectives. *Ethn Health.* 2021;26(2):299–317. doi:10.1080/13557858.2018.1493436
35. Ni K, Gong Y, Li F, et al. Knowledge and attitudes regarding hospice care among outpatients and family members in two hospitals in China. *Medicine.* 2019;98(16):e15230. doi:10.1097/md.00000000000015230
36. Liu Y, Kong Q, Wang S, Zhong L, van de Klundert J. The impact of hospital attributes on patient choice for first visit: evidence from a discrete choice experiment in Shanghai, China. *Health Policy Plann.* 2020;35(3):267–278. doi:10.1093/heapol/czz159
37. Dillon L, Clemson L, Nguyen H, et al. Recipient and instructor perspectives of an adapted exercise-based fall prevention programme for adults aged 50+ years with vision impairment: a qualitative study nested within a randomised controlled trial. *BMJ Open.* 2020;10(9):e038386. doi:10.1136/bmjopen-2020-038386
38. van Scherpenseel MC, te Velde SJ, Veenhof C, Emmelot-Vonk MH, Barten JA. Contextual determinants influencing the implementation of fall prevention in the community: a scoping review. *Front health serv.* 2023;3. doi:10.3389/frhs.2023.1138517
39. Ireland S, Kirkpatrick H, Boblin S, Robertson K. The real world journey of implementing fall prevention best practices in three acute care hospitals: a case study. *Worldviews Evid Based Nurs.* 2013;10(2):95–103. doi:10.1111/j.1741-6787.2012.00258.x
40. Eckstrom E, Neal MB, Cotrell V, et al. An interprofessional approach to reducing the risk of falls through enhanced collaborative practice. *J Am Geriatr Soc.* 2016;64(8):1701–1707. doi:10.1111/jgs.14178
41. Marks B, Sisirak J, Chang Y-C. Efficacy of the healthmatters program train-the-trainer model. *J Appl Res Intellect Disabil.* 2013;26(4):319–334. doi:10.1111/jar.12045
42. Malik H, Virag B, Fick F, Hunter PV, Kaasalainen S, Dal Bello-Haas V. Fall prevention program characteristics and experiences of older adults and program providers in Canada: a thematic content analysis. *J Appl Gerontol.* 2020;39(10):1124–1133. doi:10.1177/0733464819874600
43. Dickinson A, Horton K, Machen I, et al. The role of health professionals in promoting the uptake of fall prevention interventions: a qualitative study of older people's views. *Age Ageing.* 2011;40(6):724–730. doi:10.1093/ageing/afr111
44. Wong AKC, Wong FKY, Wong MCS, Chow KKS, Kwan DKS, Lau DYS. A community-based health-social partnership program for community-dwelling older adults: a hybrid effectiveness-implementation pilot study. *BMC Geriatr.* 2022;22(1):789. doi:10.1186/s12877-022-03463-z
45. Barmentloo LM, Olij BF, Erasmus V, Smilde D, Schoon Y, Polinder S. Personal preferences of participation in fall prevention programmes: a descriptive study. *BMC Geriatr.* 2020;20(1):185. doi:10.1186/s12877-020-01586-9
46. Worum H, Lillekroken D, Ahlsen B, Roaldsen KS, Bergland A. Otago exercise programme—from evidence to practice: a qualitative study of physiotherapists' perceptions of the importance of organisational factors of leadership, context and culture for knowledge translation in Norway. *BMC Health Serv Res.* 2020;20(1):985. doi:10.1186/s12913-020-05853-8
47. Teng B, Rosbergen ICM, Gomersall S, Hatton A, Brauer SG. Physiotherapists' experiences and views of older peoples' exercise adherence with respect to falls prevention in Singapore: a qualitative study. *Disability Rehabil.* 2022;44(19):5530–5538. doi:10.1080/09638288.2021.1938705
48. Parra DC, Wetherell JL, Van Zandt A, Brownson RC, Abhishek J, Lenze EJ. A qualitative study of older adults' perspectives on initiating exercise and mindfulness practice. *BMC Geriatr.* 2019;19(1):354. doi:10.1186/s12877-019-1375-9
49. Lachman ME, Lipsitz L, Lubben J, Castaneda-Sceppa C, Jette AM. When adults don't exercise: behavioral strategies to increase physical activity in sedentary middle-aged and older adults. *Innov Aging.* 2018;2(1):igy007. doi:10.1093/geroni/igy007
50. Marc SM, Stephanie LO, Aviroop B, et al. Financial incentives for physical activity in adults: systematic review and meta-analysis. *Br J Sports Med.* 2020;54(21):1259. doi:10.1136/bjsports-2019-100633
51. Perdana A, Mokhtar IA. Seniors' adoption of digital devices and virtual event platforms in Singapore during Covid-19. *Technol Soc.* 2022;68:101817. doi:10.1016/j.techsoc.2021.101817
52. Haff N, Patel MS, Lim R, et al. The role of behavioral economic incentive design and demographic characteristics in financial incentive-based approaches to changing health behaviors: a meta-analysis. *Am J Health Promot.* 2015;29(5):314–323. doi:10.4278/ajhp.140714-LIT-333
53. Gneezy U, Meier S, Rey-Biel P. When and why incentives (don't) work to modify behavior. *J Econ Perspect.* 2011;25(4):191–209.
54. Holland CA, Everitt P, Johnson A, Devi R. The 'healthy passport' intervention with older people in an English urban environment: effects of incentives and peer-group organisers in promoting healthy living. *Ageing Soc.* 2008;28(4):525–549. doi:10.1017/S0144686X07006939
55. Ahmad MH, Shahar S, Nimf T, Manaf ZA, Sakian NIM, Omar B. Applying theory of planned behavior to predict exercise maintenance in sarcopenic elderly. *Clin Interventions Aging.* 2014;9:1551–1561. doi:10.2147/CIA.S60462
56. Worum H, Lillekroken D, Roaldsen KS, Ahlsen B, Bergland A. Reflections of older people about their experience of fall prevention exercise in the community- A qualitative study exploring evidence-based practice. *BMC Public Health.* 2020;20(1):1671. doi:10.1186/s12889-020-09630-4



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