

Salutogenic Healthy Ageing Programme Embracement (SHAPE) for senior-only households: A study protocol

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Abstract

Aims: To evaluate the effectiveness of a multi-dimensional community-based health promotion and risk prevention programme, named Salutogenic Healthy Ageing Programme Embracement (SHAPE) for senior-only households in Singapore.

Background: In view of ageing population and its significant impacts on economy, societal structure and policy-making, healthy ageing emerges as an important concept in maintaining health through the engagement of health-promoting behaviour and risk prevention actions in older people.

Design: A stratified randomized control trial with process evaluation is proposed.

Methodology: The salutogenic model, which focuses on positive well-being and optimizing health outcomes, provides an underpinning theoretical framework for this study. SHAPE is a 12-week intervention programme comprising of both weekly group-based activity sessions and home visits. One hundred and fifty-four eligible participants will be stratified and randomly allocated to either the SHAPE intervention or the control group. Both outcome and process evaluation will be conducted. Outcome measures include sense of coherence, quality of life, health-promoting behaviours, self-efficacy and other health-related outcomes. These data will be collected at four time points: baseline, 3 months, 6 months and 12 months. Individual qualitative face-to-face interviews will be conducted for older people receiving SHAPE to explore their views on the programme.

Discussion: The use of salutogenic model breaks away from the negatively connoted conventional biomedical model and addresses optimization of positive health, providing an overall holistic approach to care of older people. The intervention SHAPE seeks to identify, equip and strengthen resources for senior-only households, encouraging the adaption of health-promoting and risk-preventing actions to achieve better health outcomes and higher quality of life.

KEYWORDS

healthy ageing, nursing, quality of life, salutogenesis, senior-only household, sense of coherence

1 | INTRODUCTION

Population ageing, a worldwide growing phenomenon, is not unique to Singapore where it is predicted that people over 60 years will increase from 13% in 2005 - 38% in 2050 (United Nations, 2006). This has significant ramifications on future economic prospects, societal structures and policy-making. Thus, healthy ageing emerges as an important concept in maintaining health, by engaging in health-promoting behaviours and preventive actions (World Health Organisation, 2002). In a recent study, older people revealed the importance of keeping active, upholding sense of control and mastery over health and lifestyle and harmonizing social and financial resources in the comfort of their homes (Sixsmith et al., 2014). Keeping older people functioning well and independently in the community prevent institutionalization and reduce burden on society to care for the disabled, reducing economic impacts. However, age-related physiological changes might challenge the demands of older peoples' daily living and home maintenance (Fausset, Kelly, Rogers, & Fisk, 2011).

1.1 | Literature review

Residences where older people live alone by themselves or with their older spouses or another older person are referred as senior-only households. These older people are more vulnerable to feeling lonely, having poorer physical health, psychological well-being, self-esteem and lesser social support; they adopt lesser health-promoting behaviours and are less likely to use preventive care services (Chen, Hicks, & While, 2014; Lau & Kirby, 2009; Lim & Kua, 2011; Sok & Yun, 2011). In Singapore, about 30% of older people live alone or with their spouses or with another older person (Wong & Teo, 2011) and these numbers are expected to increase further (Kok, 2015; Teo, 2004). Although these older Singaporeans developed coping strategies to live independently, they reported feeling socially isolated and depressed, having declining health and diminishing resources (Tan, He, Chan, & Vehviläinen, 2015; Thang & Lim, 2012; Wong & Verbrugge, 2009). Thus, community-based initiatives in promoting healthy ageing in this group of vulnerable older people are necessary. Internationally, interventions conducted on senior-only households are primarily uni-dimensional (Zingmark, Fisher, Rocklov, & Nilsson, 2014) or disease-specific (Gethin-Jones, 2014; Huang, Wu, Jeng, & Lin, 2004), with a limited focus on multi-dimensional approach in health promotion and prevention.

When developing community-based interventions, the content and method of delivery must match the needs of recipients to maximize outcomes and minimize resources used. However, Lette, Baan, van den Berg, and de Bruin (2015) reported incongruity between demand and supply of community-based interventions, with overemphasis on physical health, rather than problems related to well-being, living circumstances, social participation and integration between health and social services that are crucial to older people. Additionally, community context such as demographics, economic conditions, values and norms have influences in moulding interventions through

Why is this study needed?

- Older people residing in senior-only households experience declining health and have diminishing resources. They are at higher risk for poorer health outcomes and engage in lesser health-promoting and risk-preventive actions. However, there is a lack of intervention studies specifically targeting on health promotion and risk prevention in this group of vulnerable population.
- By equipping and strengthening resources for older people residing in senior-only households, SHAPE may potentially encourage the adaption of health-promoting and risk-preventing actions to achieve better health-related outcomes.

planning and implementation (Kegler, Rigler, & Honeycutt, 2011). Older people residing in senior-only households value independence and take pride in being autonomous and self-reliant in their homes (Tan et al., 2015; Thang & Lim, 2012). Thus, they will require personalized attention to cater to their individual needs. A local study observed that having an active neighbourly network and support is significant to senior-only households in rendering assistance when needed (Thang & Lim, 2012). While community activities provided by Senior Activity Centres in neighbourhoods are available to provide the social interaction, they are often non-programme based and recreational (Tan, Chan, & Vehviläinen-Julkunen, 2014; Tan, Vehviläinen-Julkunen, & Chan, 2014). Synergy of both individual home visits and group-based interventions may provide the personalized care to age healthily in their homes and allow these older people to reap the benefits derived from the social interaction and support from peers with similar experiences.

1.2 | Theoretical framework

Salutogenesis is a philosophical approach towards health promotion which seeks to explain the origin of health. Proposed by Antonosky (1987), salutogenesis focuses on improving human potential and sits at the positive end of health continuum, away from the traditional biomedical perspective on pathogenesis, in identifying the causes of diseases. The model allows a proactive multi-dimensional approach in creating conditions to promote holistic well-being and optimize health outcomes (Becker, Glascoff, & Felts, 2010). Key salutogenic concepts include Generalized Resistant Resources (GRRs) and Sense of Coherence (SOC). GRRs are protective factors, such as knowledge, material and social support, which allow people to understand and make sense of their lives. Having to enhance GRRs can better facilitate one to cope with life stressors (Lindstrom & Eriksson, 2005). SOC is a global orientation to perceive life as structured, manageable and meaningful, influencing how people think and behave by mobilizing the resources they possess (Lindstrom &

Eriksson, 2005). A systematic review revealed that SOC is a health-promoting resource which enhance resilience and promote self-rated health, quality of life and well-being (Eriksson & Lindstrom, 2006). It comprises of three measurable components: comprehensibility (believe that the challenge is understood), manageability (believe that resources to cope are available) and meaningfulness (having the motivation to cope). One with higher SOC is less vulnerable in the presence of stressors or difficult situations due to the ability to mobilize the most appropriate resources that are at one's disposal (Antonovsky, 1987).

Having positive life orientation allows one to have better coping mechanisms in managing one's health. Multiple studies have shown that higher SOC is associated with higher engagement of healthier lifestyle choices (Binkowska-Bury & Januszewicz, 2010; Suraj & Singh, 2011; Wainwright et al., 2007). Another prominent concept related to coping of resources and health behavioural change is self-efficacy (Bandura, 1997). It refers to one's belief in the capacity to perform in situations or achieve certain attainments. As both SOC and self-efficacy affect health behaviour, few studies have compared and contrasted these two concepts (Posadzki & Glass, 2009; Trap, Reijkjaer, & Hansen, 2016) and demonstrated that SOC is positively correlated to self-efficacy (Trap et al., 2016). Having to enhance self-perceived ability in performance reduces stress and thereby improves manageability of coping capabilities (Wiesmann & Hannich, 2008). The higher the sense of coherence, the greater the self-efficacy one exhibits, the more adoption of healthy lifestyle behaviour (Posadzki, Stockl, Musonda, & Tsouroufli, 2010). With SOC as the ubiquitous resource and self-efficacy as a potential GRR, health promotion studies targeting on SOC may influence self-efficacy and result in behavioural modifications (Trap et al., 2016).

In recent decade, salutogenesis has been studied as an approach to healthy ageing. A longitudinal study revealed that SOC is developmental, fortified by the accumulated experiences in older people which shaped their set of coping skills (Silverstein & Heap, 2015). However, in the presence of age-related health and social limitations,

their SOC declined (Silverstein & Heap, 2015). If resources in managing these health and social deficits are available, there is potential to improve SOC in older people (Tan, Vehvilainen-Julkunen, et al., 2014; Wiesmann & Hannich, 2008). Thus, identifying, strengthening and creating of resources specific to older people to age healthily are crucial to improve SOC, health outcomes and quality of life (Eriksson & Lindstrom, 2007). In seeking to understand the important mechanisms of responsiveness towards healthy ageing in senior-only households, this study uses Salutogenesis as a theoretical framework to underpin this intervention study (Figure 1).

2 | THE STUDY

2.1 | Aims

This study aims to develop and evaluate the effectiveness of a multi-dimensional community-based health promotion and prevention programme, Salutogenic Healthy Ageing Programme Embracement (SHAPE) among senior-only households in Singapore. The following are the specific objectives:

1. To develop and evaluate the effectiveness of a multi-dimensional community-based health promotion and prevention programme, SHAPE, on sense of coherence, self-efficacy, health-promoting behaviours, quality of life and other health-related outcomes among older people residing in senior-only households in Singapore.
2. To explore the views of participants towards the responsiveness and usefulness as well as the strengths and weaknesses of SHAPE and identify areas for future improvement.

2.2 | Design

A single-blinded stratified randomized control trial with process evaluation is adopted in this study. Participants in the

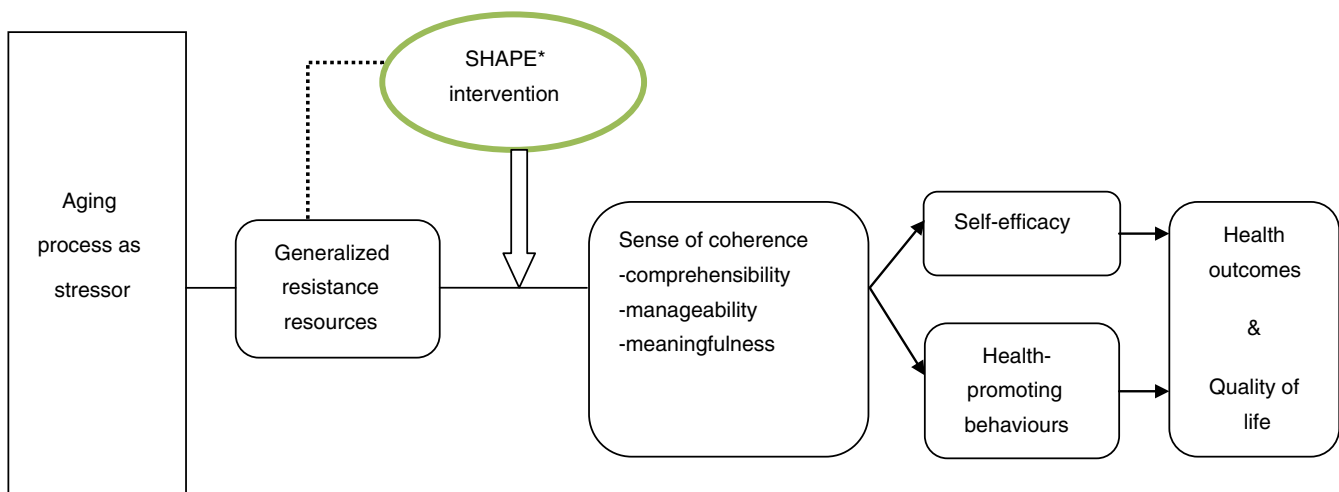


FIGURE 1 Conceptual framework. *Salutogenic Healthy Ageing Programme Embracement (SHAPE) [Colour figure can be viewed at wileyonlinelibrary.com]

experimental group will receive the 12-week SHAPE, while participants in the control group will receive existing community and care services provided in the community. Data will be collected at four different time points: baseline, 3 months, 6 months and 12 months.

2.3 | Hypotheses

Participants will be randomly allocated to either the SHAPE intervention group or control group. We hypothesized that participants in the experimental group receiving the SHAPE intervention, compared with the control group will have significantly:

1. Improved sense of coherence
2. Better quality of life
3. Higher levels of self-efficacy
4. Increase in taking up health-promoting actions
5. Better health outcomes, including improvement in blood pressure, body mass index and better physical functional mobility.

2.4 | Study setting and participants

This study will be conducted in a small residential estate in the West of Singapore. In 2015, there are approximately 31,100 residents, with about 3,000 older people age 65 and above. In the estate, senior-only households range from one-room to five-room public housing apartments, including those living in rented flats.

Posters and flyers will be distributed in public areas such as community centre and senior activity centre to recruit potential participants. Door-to-door recruitment will also be conducted to reach out to older people who are less socially active. Convenience sampling will be adopted. The inclusion criteria include older persons: (1) age 65 years and above; (2) living by himself/herself or living with his/her older spouse or living with an unrelated older person; (3) able to converse in either English or Chinese language; and (4) willing to participate and be followed up on home visits. Older persons with severe cognitive or psychiatric disorders, any severe hearing and/or visual impairment, terminal illness with life expectancy <12 months, home visit follow-ups with other organizations or involvement in other clinical trials will be excluded.

The statistical power analysis recommended by Cohen (1992) is used to determine the sample size of this study. Previous studies on community-based programmes conducted in community-dwelling older people on sense of coherence have reported medium effect size ($d = 0.46\text{--}0.57$) (Tan, Chan, Wang, & Vehvilainen-Julkunen, 2016). Sample size calculation is therefore calculated based on a medium effect size of 0.5. A minimum sample size of 64 participants in each group is needed to detect a difference between groups at an alpha of 0.05 and power of 0.80. We estimate 20% attrition rate, a total of 154 participants would be needed, with 77 in each group.

2.5 | Randomization

To account for differences in living arrangement and ensure that older persons living in the same household are assigned to the same intervention or control group, stratified permuted block randomization will be used in this study. Participants will be grouped according to either of the three strata: (1) single older person in a household; (2) two older persons from same household participating in the trial (a pair); and (3) only one out of two older person from same household participating in the trial. Blocks of four, with the assignment of two to experimental group and two to control group, will be used for each strata. Using a computerized randomization software, a statistician will generate the randomization list and prepare three different sets of sealed envelopes. According to their strata, the participant or the pair of participants will choose from the respective set of envelopes themselves to determine the group assignment.

2.6 | Intervention: Salutogenic Healthy Ageing Programme Embracement (SHAPE)

An insight to how older people in senior-only households in Singapore cope with existing resources to maintain their health and well-being paints a better picture of how resources can be equipped and enhanced to promote health, independence and achieve healthy ageing. Thus, the content of programme will be developed based on past literature and findings of a qualitative study which explores the perceptions of healthy ageing among these groups of older people to better cater to their needs and demands of daily living. This qualitative study used Appreciative Inquiry, a 'strengths-based' methodological approach (Cooperrider, Whitney, & Stravros, 2008) to obtain as many positive perceptions and responses on how these older people maintain and move towards positive health and well-being. It complements the salutogenic model on optimization work in creating positive health (Becker et al., 2010). In addition, the content of the programme will be further moulded by expert opinion from a group of multi-disciplinary healthcare professionals and researchers.

The SHAPE intervention seeks to identify, equip and strengthen resources in senior-only households. The proposed intervention is a 12-week programme comprising of at least two home visits, 10 weekly group-based activity sessions and a SHAPE health resource booklet. The home visit will involve assessment, observation and evaluation of older persons' health status, lifestyle and home environment, followed by guidance on health-promoting behaviour, with emphasis on strengthening inner health resources. This will provide an individualized approach to enhance personal health skills (Fagerstrom, Wikblad, & Nilsson, 2009). Group-based activity sessions are directed to facilitate group interaction among peers as well as equipping and enhancing external resources to the older persons. These group sessions will be conducted at a local community centre. Homework will be given at the end of each session to allow them to reflect on the contents of each session. Refer to Table 1 for the

TABLE 1 Proposed programme outline of Salutogenic Healthy Ageing Programme Embracement (SHAPE)

Week	Itinerary	Duration	Objectives
1	Home visit	2-3 hr	<ul style="list-style-type: none"> Assess, observe and evaluate participants' health status, lifestyle and home environment through appreciative inquiry Identify resources in participants, share and discuss how these resources can be mobilized as strategies on health-promoting and risk-preventive behaviour Setting personal goals and developing individualized plans in achieving targeted goals
2	Group-based activity	2 hr	To get to know peers within group
3			To incorporate team bonding activities as group-based learning strategies
4			Encourage participants to share personal experiences
5			Sharing information on available external resources in promoting healthy ageing (Specific content to be developed from qualitative study)
6			
7	Home visit	2-3 hr	<ul style="list-style-type: none"> Keep track of individual's progress on achieving targeted goals Review of personal goals and individualized plans Further equip with internal health resources
8	Group-based activity	2 hr	Promote interactive learning and facilitate discussion among participants on health resources to enhance active ageing
9			
10			Sharing information on available external resources in promoting healthy ageing (Specific content to be developed from qualitative study)
11			
12			Participants share their progress on achieving personal goals

proposed programme outline. Special considerations will be taken during the design of SHAPE health resource booklet to cater to older people's needs such as larger prints, shorter sentences and pictorial examples. Two voluntary seniors will also be involved in shaping the content of the booklet.

2.7 | Control: usual activities

Participants in the control group will continue to participate in activities offered or facilitated by senior activity centres and community centres. Examples of such activities include playing simple ball games, singing karaoke and playing tile-based games. Participants can also register and attend classes, e.g. cooking and flower arrangement on their own accord which are provided by community centres.

2.8 | Outcomes: Quantitative data

2.8.1 | Sense of coherence

The 13-item Orientation to Life Questionnaire (SOC-13) measuring sense of coherence consists of three domains: comprehensibility, manageability and meaningfulness. Total score ranges from 13–91, where higher scores indicate higher SOC. It is a widely used cross-cultural valid and reliable instrument (Eriksson & Lindstrom, 2005) and the Cronbach's α for total scale of Chinese version is 0.82 (Ding, Bao, Xu, Hu, & Hallberg, 2012).

2.8.2 | Quality of life

The World Health Organization Quality of Life-Older Adults module (WHOQoL-OLD) is a 24-item valid and reliable cross-cultural geriatric-centric instrument consisting of six subscales: sensory

abilities, autonomy, past, present and future, social participation, death and dying and intimacy (Power, Quinn, Schmidt, & Group, 2005). The total score ranges from 24–120, with higher scores suggesting higher quality of life. The WHOQoL-OLD has been demonstrated to have good internal consistency of Cronbach's α 0.89 (Liu et al., 2013).

2.8.3 | Health-promoting behaviours

The Health promotion lifestyle profile-II (HPLP-II) is an established instrument measuring multi-components of health promotion lifestyle behaviours. This established instrument consisted of 52 items with the following six subscales: spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility and stress management. It has an overall internal consistency of Cronbach's α 0.92, with its subscales alpha coefficients ranging from 0.70–0.91 (Walker, Sechrist, & Pender, 1987). Both English and Chinese versions of the instrument are available. The 4-point Likert scale reflects how often the individual engages in the listed behaviour. The total score ranges from 52–208, with higher scores suggesting greater engagement in health-promoting behaviours.

2.8.4 | Self-efficacy

The 10-item Generalized Self-efficacy Scale (GSE) was developed to assess perceived self-efficacy with the intention to predict coping with daily events and adaptation of stressful life events (Schwarzer & Jerusalem, 1995). Both the English and Chinese version of the tool have a good internal consistency, with Cronbach alpha ranging from 0.76 to 0.90. (Schwarzer & Jerusalem, 1995), including the Chinese version (Schwarzer, Born, Iwawaki, & Lee, 1997). A higher score indicates better ability to cope with stressful situations.

2.8.5 | Functional mobility

The Time-Up Go test (TUGT) is a simple, quick and widely used clinical test to assess lower extremity function, mobility and fall risk, even in healthy older individuals (Herman, Giladi, & Hausdorff, 2011). Participants will be asked to stand up from a standard chair, walk a distance of three metres, turn, walk back and sit down. While routine walking aids are allowed, they are not permitted to use their arms to stand up and no physical assistance is offered. A stopwatch will be used to record the time to complete the task and the average time of two attempts will be taken as a reading. Shorter times reflect better functional mobility.

2.8.6 | Cognitive function

The Mini Mental State Examination (MMSE) is a highly common screening instrument for cognitive impairment and it has satisfactory reliability and construct validity (Tombaugh & McIntyre, 1992). This tool measures the global cognitive functioning of an individual, which comprises of memory, attention, language, praxis and visual-spatial ability. The tool was modified by Feng, Chong, Lim, and Ng (2012) to ensure its cultural validity for Singapore context. The total scores of MMSE ranged from 0–30, with higher scores demonstrating better cognitive functioning.

Biomarkers such as blood pressure and fasting blood glucose will be measured. Participants are to rest and stabilize for 10 min before taking their systolic and diastolic using a standard mercury sphygmomanometer on the right upper arm (unless contraindicated). Capillary blood glucose will be taken using the same blood glucose machine from participants' fingertip after 8 hr of fasting. Body mass index will also be taken based on the calculation of weight and height (weight/height²). Frequency of hospital admissions will also be assessed.

Socio-demographic data which include gender, age, ethnicity, religion, marital status, employment status, living arrangement, number of children, household ownership, source of financial support and amount of disposable allowance will be collected. In addition, self-reported medical health conditions such as past medical history will be obtained from participants.

2.9 | Outcomes: Qualitative data

To explore the responsiveness, strengths and weaknesses of SHAPE, individual face-to-face interviews will be conducted for participants from the intervention group after the start of intervention at 6 months. Purposive sampling will be used to select participants with significant changes in pre- and post outcomes and those without significant changes to obtain feedback on the content, activities and delivery of programme. A semi-structured interview guide (Table 2) will be used to explore the perspectives of participants towards the responsiveness and usefulness of SHAPE intervention, as well as to understand the strengths and weaknesses of the programme and identify areas for future improvement.

TABLE 2 Semi-structured interview guide for process evaluation

Item	Interview questions
1.	What is your experience of the programme?
2.	In what way is the programme useful? What are the benefits of participating in this programme?
3.	How has the programme influence you?
4.	What do you like about the programme?
5.	What do you not like about the programme?
6.	What are the reasons (if applicable) why you would not continue with the programme?
7.	What are the strengths or advantages of this programme?
8.	What are the weaknesses or disadvantages of this programme?
9.	Can you tell me which aspect of the programme needs improvement? What can be done better?
10.	How can this programme be made well-received to other older adults?

2.10 | Data collection procedure

On the approval of ethics, the researcher will collaborate with the community site investigator and volunteers from residents' committee to recruit study participants. Eligibility of participants will be assessed face-to-face by two researchers before obtaining informed consent from participants. Figure 2 summarizes the data collection protocol. Data will be collected at four different intervals: baseline (pre-test), 3 months (posttest 1), 6 months (posttest 2) and 12 months (posttest 3) from the baseline. A research assistant who is not involved in the delivery of intervention will be blinded to group assignment. She/he will arrange appointment with participants to collect the data through face-to-face interviews.

At 6 months from baseline, some participants from intervention group will be contacted and recruited for one-to-one qualitative interviews. Interviews will be conducted in the participants' preferred spoken language, either English or Chinese language, by a bilingual research team member till data saturation. Each interview is estimated to take 30–45 min.

2.11 | Data analysis

Data will be analysed using SPSS version 24. Intention-to-treat analysis will be used to manage missing data. Baseline categorical demographic characteristics between the experimental and control groups will be examined using chi-squared or Fisher's exact test. Independent t-test will be used for quantitative variables if normality and homogeneity assumptions are satisfied; otherwise Mann-Whitney *U* test will be used. Repeated measures analysis of variance (ANOVA) will be performed to analyse the interaction effect (time × group) between two groups on numerical outcomes over time, setting level of significance at $p < .05$ for two-tailed test. In addition, general linear mixed model (GLM) will be used to compare the study outcomes between two groups at each time point. To correct for type 1 error

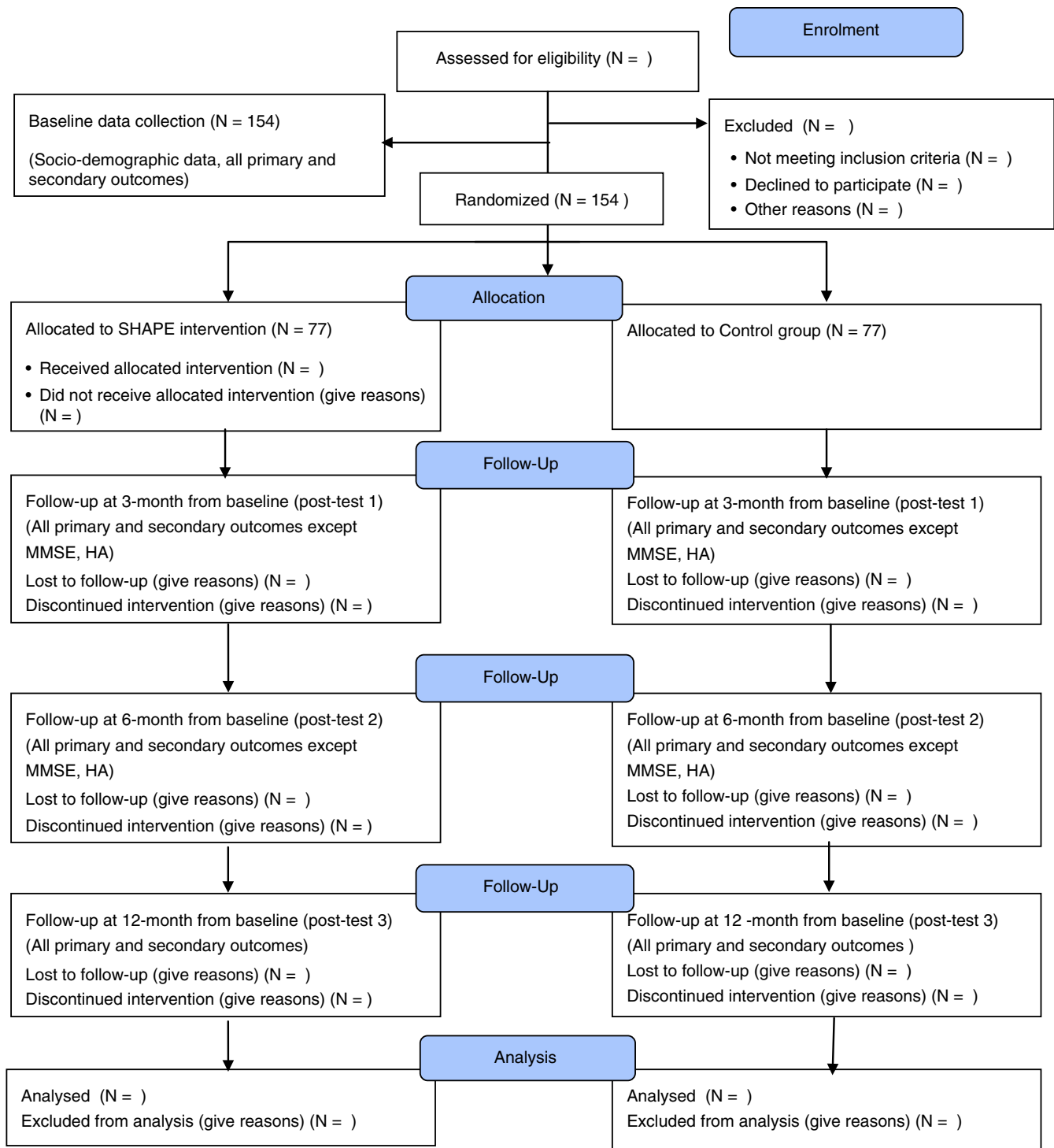


FIGURE 2 CONSORT flow diagram. SHAPE, Salutogenic Healthy Ageing Programme Embracement; MMSE, Mini Mental State Examination; HA, frequency of hospital admissions [Colour figure can be viewed at wileyonlinelibrary.com]

on multiple comparisons for each time point, statistical significance will be set at $p < .01$.

Interviews will be audio-taped with the participants' permission and transcribed into either Chinese or English verbatim respectively, depending on the language used during interviews. The transcripts will be analysed in its original language to capture the views of

participants closely by bilingual research team members proficient in English and Chinese language. Thematic analysis, using Braun and Clarke (2006)'s six steps of analysis, will be adopted to provide in-depth and rich analysis of narrative sharing of experiences by older people (Vaismoradi, Turunen, & Bondas, 2013). All themes and meaningful codes will subsequently be translated to English during

report writing and counter-checked among bilingual research team members to ensure the meaning of translated themes and codes are congruent to the participants' voices.

2.12 | Validity and reliability

Randomization is employed to control pre-intervention confounding variables to avoid selection bias. To further enhance the internal validity of this study, intention- to-treat analysis is used to account for participants who dropped out. This study uses the Salutogenic Model, a theoretical underpinning framework to develop the SHAPE intervention. The content of the intervention would be validated by a multi-disciplinary team of expert panel to ensure the accuracy of content delivered and applicability to the local community. Although not all instruments used in this study to measure the outcome measures have been employed in local research studies, they are psychometrically tested and are culturally applicable.

To ensure trustworthiness of qualitative studies, measures will be taken to enhance credibility, dependability, confirmability and transferability (Lincoln & Guba, 1985). Agreement of data is obtained through member checking by summarizing discussion content before the end of each interview. Audio-recorded interviews, checking of themes and meaningful codes during report writing by another bilingual research team member and analysis of data with co-researchers to seek consensus on themes are some procedures taken to enhance credibility and conformability. Dependability of findings is maintained by keeping an audit trail of methodological steps and research decisions, such as field notes, memos and documents illustrating various stages of data analysis. Careful selection of participants via purposive sampling and provision of thick descriptions of findings will be performed to ensure transferability.

2.13 | Ethical considerations

Ethics approval has been obtained from National University of Singapore Institutional Review Board (NUS IRB). All study participants will be informed of the aims and objectives of study, study procedures, risks and benefits before obtaining their written consent. At any point in time of the study should participants wish to withdraw from the study, they may do so by informing the Principle investigator and no penalties or loss of benefits will be imposed. Confidentiality of participants will be maintained as data collected will not be used for other purpose other than for this research study. All audio-taped and transcribed qualitative data will be coded with pseudo-names at the earliest possible stage of study. During the face-to-face interviews, participants will be advised that they can take a rest during data collection if they feel tired. Should any participant experience psychological distress or fatigue during the data collection, the researcher will discontinue and attend to his/her needs. All softcopy data collected, including participants' personal details, will be encrypted with password. Only the research team will have access to the hardcopy and softcopy of data. There is minimal foreseeable risk posed to participants in this study.

3 | DISCUSSION

The intervention SHAPE seeks to identify, equip and strengthen resources for senior-only households, encouraging the adaptation of health-promoting and risk-preventing actions to achieve better health outcomes and higher quality of life. This study is non-prescriptive. It distinctively recognizes and identifies the specific needs of senior-only households in Singapore to develop a personalized yet social interactive intervention to promote healthy ageing. This increases the applicability, effectiveness and sustainability of programme.

The use of the Salutogenic Model in this study breaks away from the negatively connoted conventional biomedical model and addresses on optimization of positive health, providing an overall holistic approach to the care of older people. In the prior qualitative study which the content of SHAPE will be based on, the use of Appreciative Inquiry to collect data hones in on what worked well for senior-only households, instead of focusing on deficits. It sheds light on the various positive coping strategies which facilitated them to maintain their health. Such strengths-based approach concedes that individuals live their lives, acquiring experiences on coping strategies, internal and external resources (Hirst, Lane, & Stares, 2013). Correspondingly, the healthcare professionals delivering the SHAPE home visits will need to adopt such perspective during assessment, to identify strengths of the participant, enhance and build on existing resources. Instead of performing the conventional clinical assessment which is characterized as a problem-based approach, further information, consistent with strengths-based approach, on individual's past experiences, existing interests and goals will also be obtained (Sullivan & Fisher, 1994). The dialogue between the healthcare professional and participant is crucial in creating a common understanding of situation and collaborative management to the participant's health and well-being. Time will be required to listen to the stories of these older people during assessment (Hirst et al., 2013).

While the home visits provide an individualized care management of health, the group-based education covers broad-ranging health-related topics, providing information on the availability and accessibility of existing health and social resources. One of the key challenges anticipated during the group-based education sessions is the ability to sustain interest of older people over the 12-week programme to minimize participant attrition. Interactive learning strategies such as having group discussions and sharing of personal experiences are incorporated to engage participants, ensuring that they have a part to play during the sessions and their voices are heard.

Several measures are taken to enhance the fidelity of the intervention and ensure the quality of study design. To ensure consistency of intervention delivery, only two trained healthcare professionals will be conducting the home visits and the intervention providers conducting group-based activities will be the same for all classes in the intervention group. Data collection will be performed by another research team member to abide to the single-blind study design. The research team will adhere to the

standardized study protocol closely and monthly research team discussions will be conducted to improve on the quality of intervention delivery.

Studies have shown that functional decline and dependency in older people place huge financial strains on both short-term and long-term healthcare services (Fried, Bradley, Williams, & Tinetti, 2001; Reuben et al., 2004). Such healthcare cost can translate to higher taxes and influence the society at large in view of the ageing population. Although this proposed study does not measure the cost-effectiveness of SHAPE intervention, it is believed that the prevention of functional decline and disability through the programme can potentially reduce economic burden in the long run.

3.1 | Limitations

While the SHAPE intervention seeks to address the needs of senior-only households in Singapore and move towards positive health, there are a few limitations. It is not possible to perform a double-blinded study, as older participants will know if they receive SHAPE intervention. As multiple instruments are used to measure various aspects of health and health-related outcomes, some older participants may take more than 45 min to complete the questionnaire. This may compromise the data collected and contribute to attrition rates. Clinical assessments such as blood pressure and fasting blood glucose are performed at intervals during data collection to encourage participants to take breaks.

4 | CONCLUSIONS

This study seeks to develop and evaluate the effectiveness of a community-based personalized yet social interactive programme to promote healthy ageing. It targets on equipping senior-only households with resources and encourage the adaptation of health-promoting and risk-preventing behaviours. This eventually may improve their quality of life and health-related outcomes. If positive results are yielded, future studies can explore on the sustainability, cost-effectiveness and expansion of programme to senior-only households in other residential estates in Singapore. Ultimately, this study is the first step to providing an evidence-based intervention to achieve better health outcomes and quality of life in senior-only households through healthy ageing.

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AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (<http://www.icmje.org/recommendations/>)]:

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

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