Examining the Effectiveness of Two Home-based Chronic Disease Management Interventions for Hong Kong Community-dwelling Older Adults: Health Coaching Program and Buurtzorg Nursing Program

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Project Summary

Title	Examining the Effectiveness of Two Home-based Chronic Disease Management Interventions for Hong Kong Community-dwelling Older Adults: Health Coaching Program and Buurtzorg Nursing Program
Methodology	12-week multicentre interventional single-blinded randomised parallel trial
Study Duration	4 years
Objectives	To examine the effectiveness of two home-based healthcare intervention – (1) health coaching intervention for pre-frail community-dwelling older adults, and (2) Buurtzorg nursing intervention for frail community-dwelling older adults – in managing chronic diseases and health risks
Targeted Sample	2800 community-dwelling older adults with any of the following health conditions, including hypertension, hyperlipidaemia, diabetes mellitus, heart diseases, chronic obstructive pulmonary disease (COPD), elevated blood pressure and/or blood glucose, central obesity, and chronic pain.
Inclusion Criteria	1. Aged 60 years or above 2. Community-dwelling 3. Referred by collaborating non-government organisations 4. Residing in Hong Kong 5. Able to communicate in Cantonese, Mandarin or English 6. With at least one of the following health conditions: a. Hypertension b. Hyperlipidaemia c. Diabetes d. Heart disease e. Chronic obstructive pulmonary disease (COPD) f. Elevated blood pressure and/or glucose g. Central obesity h. Chronic pain
Exclusion Criteria	1. Aged 59 or below 2. Residing outside Hong Kong 3. Having no health conditions as listed in "Participant Inclusion Criteria" 4. Adverse home environment, such as woodlouse and/or severe hygienic problem 5. Diagnosed with mental disorder, such as schizophrenia and/or depression 6. Unstable mental conditions, such as violent tendency and/or paranoid delusion 7. Not able to communicate in Cantonese, Mandarin and English 8. Have severe hearing problem which cannot be corrected by hearing aids

Study Intervention and Control	1. Health coaching group led by social work coaches (HC-SW) — Receive a 12-week health coaching intervention aimed to enhance participants' knowledge and skills in self-managing their chronic diseases — The intervention is conducted by health coaches with social work training 2. Health coaching group led by non-social work coaches (HC-non-SW) — The content and format of the health coaching intervention are the same as HC-SW group, except that the intervention is conducted by health coaches without social work training 3. Buurtzorg nursing group (BZ) — Receive a Buurtzorg nursing intervention conducted by trained nurses to provide direct home-based nursing care and enhance participants' healthcare network with caregiver support and community resources 4. Individual control group (CG) — A sample of patient data, matched with the participants' characteristics in BZ group (e.g., age, sex, medical diagnoses), retrieved from the Hospital Authority Data Sharing Portal
Outcome Measures	1. All the outcomes in health coaching groups (HC-SW and HC-non-SW) are assessed before (Time 1) and immediately after (Time 2) the intervention. — The outcome measures include: engagement in health-promoting behaviours, self-care functional capacity, cognitive function, social engagement, loneliness, depression, medication-taking behaviours, quality of life, risk of fall, patient activation, and physiological outcomes (e.g., blood pressure, blood glucose). 2. The utilisation of medical services in Buurtzorg nursing group and individual control group, including hospitalisation, length of stay, and emergency room visits, is recorded assessed before (Time 1) and immediately after (Time 2) the intervention.

Background

As one of the regions with the highest life expectancy, an increasing number of older adults in Hong Kong are expected to live with chronic diseases at some points in their lives. The high prevalence of chronic diseases among older adults (> 60%) aggravates the demand for subsidized healthcare services and extends the already-long waiting time for such services. Therefore, effective intervention for older adults' management of their chronic diseases is becoming increasingly important to reduce the risk of developing complications of chronic diseases, and thus for mitigating the pressure on healthcare system and ensuring the quality of their prolonged lifespan. Under these circumstances, this project aims to implement two home-based healthcare interventions for older adults with chronic diseases or health risks and evaluate the intervention effectiveness in improving their well-being.

Objectives

1. To identify health risks of community-dwelling older adults and provide immediate and individualised healthcare interventions;
2. To examine the effectiveness of health coaching intervention to pre-frail community-dwelling older adults on enhancing their healthy behaviours and psychosocial well-being; and
3. To examine the effectiveness of Buurtzorg nursing intervention to frail community-dwelling older adults on reducing their utilisation of medical services.

Methodology

Study Design

This is a 12-week multicentre interventional single-blinded randomised parallel trial involving 2800 community-dwelling older adults.

Duration of the Study

Eligible participants will be assessed with a designed questionnaire in a baseline visit. Following the baseline visit, eligible participants will be stratified into two arms – health coaching and Buurtzorg nursing groups – based on their cognitive functioning and fall risk. Participants in the health coaching group will be further randomised into two groups based on their sex, chronic diseases, and health risks: one group receiving health coaching intervention conducted by health coaches with healthcare license, and another group receiving health coaching intervention by health coaches without healthcare license. The interventions last for 12 weeks. Participants' psychosocial well-being outcome and/or utilisation of medical services will be assessed before (Time 1) and immediately after (Time 2) the intervention. Thus, the duration of this study for each participant will be a maximum of 5 months.

Study Population and Selection Criteria

Participants in this study are community-dwelling older patients with any of the following health conditions, including hypertension, hyperlipidaemia, diabetes mellitus, heart diseases, chronic obstructive pulmonary disease (COPD), elevated blood pressure and/or blood glucose,

central obesity, and chronic pain. All participants will be required to sign an informed consent and meeting the following inclusion criteria:

1. Aged 60 years or above
2. Community-dwelling
3. Referred by collaborating non-government organisations
4. Residing in Hong Kong
5. Able to communicate in Cantonese, Mandarin or English
6. With at least one of the following health conditions:
    a. Hypertension
    b. Hyperlipidaemia
    c. Diabetes
    d. Heart disease
    e. Chronic obstructive pulmonary disease (COPD)
    f. Elevated blood pressure and/or glucose
    g. Central obesity
    h. Chronic pain

People with be *excluded* from the study based on the following criteria:

1. Aged 59 or below
2. Residing outside Hong Kong
3. Having no health conditions as listed in "Participant Inclusion Criteria"
4. Adverse home environment, such as woodlouse and/or severe hygienic problem
5. Diagnosed with mental disorder, such as schizophrenia and/or depression
6. Unstable mental conditions, such as violent tendency and/or paranoid delusion
7. Not able to communicate in Cantonese, Mandarin and English
8. Have severe hearing problem which cannot be corrected by hearing aids

Arrangement for the Baseline Visit

Once an eligible participant has provided verbal consent to participate in this study, the project staff will contact the participant to schedule a home visit for conducting the baseline visit. Once the project staff arrive at the participant's home, a signed informed consent will be obtained. The baseline assessment will proceed afterward.

Assignment of Intervention Groups

Following the baseline visit, eligible participants will be stratified into two arms. Participants with satisfactory cognitive functioning (a score > 16^{th} percentile in MoCA 5-min), low or moderate fall risk (Timed Up and Go test < 30 seconds), and without a diagnosis of dementia will be assigned to the health coaching group. Participants with impaired cognitive function (a score ≤ 16^{th} percentile in MoCA 5-min), high fall risk (Timed Up and Go test ≥ 30 seconds), and/or a diagnosis of dementia will be assigned to the Buurtzorg nursing group. Participants in the health coaching group will be further randomised into two groups based on their sex, chronic diseases, and health risks: one group receiving health coaching intervention conducted

by health coaches with healthcare license, and another group receiving health coaching intervention by health coaches without healthcare license. The details of each group are as below:

1. Health coaching group led by social work coaches (HC-SW)
   - Receive a 12-week health coaching intervention aimed to enhance participants' knowledge and skills in self-managing their chronic diseases
   - The intervention is conducted by health coaches with social work training
   - The intervention involves 6 face-to-face sessions and 6 telephone follow-up sessions on an alternate week basis
   - All face-to-face sessions are conducted via home visits
   - Assessments are conducted before (Time 1) and immediately after (Time 2) the intervention, respectively

2. Health coaching group led by non-social work coaches (HC-non-SW)
   - The content and format of the health coaching intervention are the same as HC-SW group, except that the intervention is conducted by health coaches without social work training
   - Assessments are conducted before (Time 1) and immediately after (Time 2) the intervention, respectively

3. Buurtzorg nursing group (BZ)
   - Receive a Buurtzorg nursing intervention conducted by trained nurses to provide direct home-based nursing care and enhance participants' healthcare network with caregiver support and community resources
   - Omaha system is used to monitor their health conditions and guides the care plan
   - The intervention lasts for 6 – 12 weeks depending on the participants' health assessment results
   - The medical service utilisation before (Time 1) and immediately after (Time 2) the intervention, and 12 months after the intervention (Time 3) will be retrieved from eHealth system in the Hospital Authority

4. Individual control group (CG)
   - A sample of patient data, matched with the participants' characteristics in BZ group (e.g., age, sex, medical diagnoses), will be retrieved from the Hospital Authority Data Sharing Portal
   - The data includes demographics, and medical service utilisation during the BZ intervention period and 12 months after the intervention
   - No intervention is provided for CG group.

Outcome Measures

All the outcomes in health coaching groups (HC-SW and HC-non-SW) are assessed before (Time 1) and immediately after (Time 2) the intervention. The outcome measures include:

1. Engagement in health-promoting behaviours is measured using the physical activity and nutrition subscales of the Chinese version of the short-form Health-Promoting Lifestyle Profile-II (Teng et al., 2010; Chung et al., 2023).
2. Self-care functional capacity is measured using the Katz's Index of ADL (Katz et al., 1963) and Lawton's Instrumental Activities of Daily Living Scale (Lawton & Brody, 1969).
3. Cognitive function is measured using the 5-min Montreal Cognitive Assessment (Wong et al., 2015).
4. Social engagement is measured using the short-form Lubben Social Network Scale (Lubben et al., 2006).
5. Loneliness is measured using the short-form UCLA Loneliness Scale (Hoghes et al., 2004; Liu et al., 2020).
6. Risk of depression is measured using the brief version of Geriatric Depression Scale (van Warwijk et al., 1995).
7. Medication-taking behaviours are measured by the Morisky Medication Adherence Scale (Morisky et al., 2008).
8. Quality of life is measured by the five-level EuroQol Five-Dimensional Questionnaire (Wong et al., 2015)
9. Risk of fall is measured by Timed Up and Go test (Podsiadlo & Richardson, 1991) and Single Leg Stance test (Kawai et al., 2018).
10. Patient activation is measured by the Patient Activation Measure (Judith et al., 2004).
11. Physiological outcomes are indicated by blood pressure, blood glucose, body mass index, and waist circumference.

The utilisation of medical services in Buurtzorg nursing group and individual control group, including hospitalisation, length of stay, and emergency room visits, before (Time 1) and immediately after (Time 2) the intervention, and 12 months after the intervention (Time 3) will be retrieved from the eHealth system in the Hospital Authority and the Hospital Authority Data Sharing Portal. Three items about the outcome rating in the Omaha system are also used to assess the change in knowledge, behaviour and health status in Buurtzorg nursing group. Furthermore, satisfaction towards intervention is measured a month after the interventions, using ten self-developed satisfaction items

Safety Considerations

Trained Personnel

Each project staff will receive 28-hour training for assessment to ensure inter-rater reliability, in addition to home visitor safety training.

On-site Safety

"Crisis Management Protocol" and "Physiological Assessment Protocol" will be developed to guide the project staff such that the can be can be familiar with the procedures for responding to critical incidents that arise during home visits. Project staff will assess the home environment to identify any potential safety hazards and address them promptly. Project team will

plan their route and list of visiting elderly, inform team members, supervisors and partnering organization's office for their itinerary for safety reason.

Case-reporting Mechanism

The project team will have weekly case conference throughout the project period. Coaches, nurses, and supervisors will discuss each case through the weekly case conference. The supervisors will provide suggestions about follow up the goal to each case. The project team will discuss the barriers from the cases and practical solutions to overcome them. Project staff will also report to the partner organizations in case of critical incidents during home visits.

Emergency Procedures

For any threatening or violent situation, project staff will refer to "Crisis Management Protocol". For unstable physiological status of participants, project staff will refer to "Physiological Assessment Protocol". If adverse weather warning is expected, the home visit will be terminated and rescheduled.

Statistical Analysis

The intervention arms (health coaching and Buurtzorg nursing) will be compared against the corresponding control group for all analyses. Two-way repeated ANCOVAs will be conducted to examine the changes in outcome measures.

Data Management

Data Entry and Management System

Data entry will be conducted by staff with signed confidentiality agreement on password-protected computers, the data will be stored in the project office in a secured building in City University of Hong Kong and be stored in a locked room with locked filing cabinets, which access to these cabinets are granted to project staff only.

Data Handling

Participants' confidential information will be anonymised by assigning a sequentially generated reference key to replace HKID in a way that will enable us to link together records of the same person over time and across different services. The anonymised data will be saved on a password-protected USB key, whose content will be destroyed afterwards the completion of the study. The anonymized data will be analysed off-site to develop sampling frame for risk assessment, including eligibility and priority.

When the all assessments are completed, any information/materials containing identifiable information of the participants will be first stored back at offices of partnering organisations. Only assessment forms with no personal identifying information are taken back to a secured building in City University of Hong Kong and be stored in a locked room with locked filing cabinets, which access to these cabinets are granted to project staff only.

Quality Assurance

Data quality management will be conducted by statistic team of Jockey Club School of Public Health and Primary Care, Chinese University of Hong Kong, the data cleaning and management will be conducted twice every week. Weekly case conference hosted by experienced nurse and social worker will be conducted once per week to monitor clinical delivery quality. A steering committee consisting of Principal investigator, project manager, advisers, will be meeting every 3 months to monitor the progress and statistics of the project.

Dissemination of Results and Publication Policy

Planned publication in a high-impact peer-reviewed journal and presentation at international conferences.

Problems Anticipated and Mitigation

To improve participation rate, upon mutual agreement with collaborating organisations, organisational staff will contact targeted participants and get their verbal consent before scheduling for baseline assessments.

For data security purpose, each staff handling data must sign confidentiality agreement between university and collaborating organisations. Anonymized data will be stored in the project office in a secured building in university and be stored in a locked room with locked filing cabinets, which access to these cabinets are granted to project staff only.

Project Management

Person	**Role**	**Responsibility**
Prof. Youhua Frank CHEN	Principal Investigator	Responsible for all study related issues; set and monitor the overall research direction and quality
Ms. Hera LEUNG	Project Manager	Ensure overall project progress, accurate financial reporting, and manpower resourcing; liaise with external social services organisations for recruiting research participants

Ethics

Existing members of the collaborating organisations will be recruited as participants. Organisational staff will contact the targeted participants and get their verbal consent before passing their details to project team. The contact details will only be accessed within organisations' premises for home visits scheduling purpose. Each participant would receive an explanation of the study prior to signing informed consent. For participants potentially having cognitive impairment, secondary consent from their family members/guidance must be obtained.