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1 **The psychological impact of a nurse-led proactive self-care program on independent, non-frail**  
2 **community-dwelling older adults: A randomized controlled trial**

3

4 Abstract

5 **Background:** Poor mental health is common later in life and is a crucial factor in determining older  
6 adults' ability to live independently in the community. Existing nurse-led proactive self-care  
7 programs for older adults focus on physical health, since many are living with chronic diseases. Little  
8 is known about their effectiveness on the psychological outcomes of independent, non-frail  
9 community-dwelling older adults.

10 **Aim:** The aim of this study was to examine the impact of a nurse-led proactive self-care program  
11 with a health-social partnership model for community-dwelling older adults on depressive  
12 symptoms, life satisfaction, and the mental component of health-related quality of life.

13 **Design and Methods:** This was a single-blinded, randomized controlled trial. Adults aged 60 or over  
14 who lived within the service areas and scored  $\geq 18$  in the Mini-Mental Status Examination were  
15 included. Data were collected using questionnaires pre- (T1), post- (T2), and three month after the  
16 intervention (T3). The program provided a comprehensive assessment, health and self-management  
17 information, and empowerment, and promoted the accessibility of community services by building a  
18 health-social partnership network in the community. Generalized Estimating Equation was used to  
19 calculate the group, time, and interaction effects. Intention-to-treat was employed as the primary  
20 analysis in this study.

21 **Results:** Of the 843 potential community-dwelling older adults who were assessed for eligibility, 457  
22 eligible participants were randomized into the intervention (n=230) or control group (n=227). Among  
23 them, 175 (76.0%) participants in the intervention group and 190 (83.7%) participants in the control  
24 group completed data collection at T3, 6 months after T2 at the completion of the program. The  
25 results showed a significant time effect between T1 and T2 (Wald  $\chi^2 = 25.7$ ,  $p < .001$ ) and T1 and T3  
26 (Wald  $\chi^2 = 7.40$ ,  $p = .007$ ) in terms of the presence of depressive symptoms.

27 **Conclusions:** Interprofessional care addressing health and social needs improves the depressive  
28 symptoms among older adults dwelling in the community.

29

30

31 What is already known about the topic?

- 32
- 33 • Research on community health-promoting programs for community-dwelling older adults  
34 tends to focus on physical health outcomes and less on psychological health. Psychological  
35 well-being forms an important part of holistic health.
  - 36 • Interventional studies that use interdisciplinary teams to improve psychological outcomes in  
independent, non-frail community-dwelling older adults are scarce.

37

38 What this paper adds?

- 39
- Psychological outcomes were improved by a nurse-led proactive self-care program.

- Empowering older adults to engage in their own care plan and exploring and overcoming any barriers that might derail their plan can reduce depressive symptoms.

Keywords: health-social partnership, psychological outcomes, depressive symptoms, community-dwelling older adults

## Background

In light of the aging population and the burden it is expected to place on health and social systems and tertiary care services, the ability and willingness of older adults to take initiative regarding their own care have become increasingly important. Self-care is defined as an independent, decision-making process involving maintaining one's own health through lifestyle modification, disease prevention and control, self-medication, and treatment seeking (World Health Organization, 2013). It is important not only due to the potential benefits that it can bring, such as improving physical condition and decreasing hospitalization (Eller, Lev, Yuan, & Watkins, 2018), but also because it can satisfy the desire of most older adults to live independently in a familiar home environment and age in place (Thoma-Lurken, Lexis, Bleijlevens, & Hamers, 2018). Loss of independence, on the other hand, makes older adults feel a loss of self-assurance, identity, sense of achievement, and meaning in life, signalling a compromise in their quality of life and life satisfaction (Cheung & Chui, 2016).

Given the impact of chronic diseases on the self-care ability of older adults, self-care programs usually concentrate on teaching them how to cope with age-related problems that are usually encountered in their daily living, such as the increased risk of falling (Kapan et al., 2017), hypertension (Jung & Lee, 2017), pain (Hurley & Carter, 2016), and vision impairment (Rees et al., 2015). The common approaches adopted are interdisciplinary case management, providing disease-specific information, and individually tailored coaching. These studies produce positive physical health outcomes for older adults, such as less disability in activities of daily living and health distress (Jonker, Comijs, Knipscheer, & Deeg, 2015; Nguyen, Douglas, & Bonner, 2019). In general, there is a paucity of research examining whether such interventions can bring psychological benefits to these older adults.

Evidence suggests that one way to improve the psychological health of older adults is by providing a nurse-led proactive self-care program that addresses comprehensive physical and psychological dimensions rather than focusing on merely managing a single physical illness or condition (Canjuga, Zeleznik, Neuberger, Bozicevic, & Cikac, 2018). Existing community-based nurse-led proactive self-care programs have placed the focus more on medical problems than psychological issues, and psychological outcomes are not often included. The British Medical Association (2017) suggests the following possible reasons for overlooking programs' psychological impact: lack of holistic assessment tools, lack of emphasis on preventing psychological health conditions, and poor integration of mental health services with medical services. A few self-care programs have proved to be effective in helping frail older adults to reduce their risk of suffering from serious mental health-related symptoms. An interventional study that used a nurse case manager to provide a home visit program that included case management, care planning, health education and lifestyle modification found that loneliness and depressive symptoms decreased in intervention group participants when compared to those in the control group (Taube, Kristensson, Midlov, & Jakobsson, 2018). Another

1 study, which adopted an individual-centred approach and combined ongoing clinical assessment,  
2 medication management, care coordination, education, and goal setting, was proven to be  
3 successful in improving depressive symptoms in frail older adults with confirmed depressive state,  
4 though no effect was observed for community-dwelling older adults without the confirmed  
5 depression state (Bruce, 2015). However, little is known about the psychological impact of a nurse-  
6 led proactive self-care program on independent, non-frail community-dwelling older adults.

7 One study indicated that self-care performance may positively influence psychological outcomes  
8 including depressive symptoms, life satisfaction, and mental component of quality of life on older  
9 adults (Guo et al., 2014). In fact, these psychological outcomes are critical to older adults' health  
10 because one's psychological state affects one's energy and motivation for self-care. When older  
11 adults have increased depressive symptoms, poor life satisfaction, and a poor mental component of  
12 quality of life, they may rely on others to take care of them and may increase their usage of hospital  
13 and nursing home services (de Sousa et al., 2017). To the best of our knowledge, there is a limited  
14 number of published randomized controlled trials aiming to evaluate the effects of a nurse-led  
15 proactive self-care program in the community care setting to focus on these psychological  
16 outcomes. Even fewer studies have been conducted among community-dwelling older adults, who  
17 encounter difficulties in handling health and social issues in their daily living that are similar to those  
18 experienced by frail older adults. In this study, we examined specifically the effects on psychological  
19 outcomes, including the presence of depressive symptoms, life satisfaction, and the mental  
20 component of quality of life, among older adults living in the community. The empirical evidence  
21 might guide future policy decisions in addressing the challenges of preventing psychological distress  
22 for older adults, thereby maximizing their mental health well-being, minimizing their use of hospital  
23 services, and promoting their independent living in the community.

24

## 25 Purpose

26 The goal of the present trial was to evaluate the effectiveness of a nurse-led proactive self-care  
27 program on psychological outcomes. In this study, proactive is defined as the actions undertaken by  
28 the older adults to promote and achieve the goal of improved health, disease prevention, and early  
29 detection of disease (World Health Organization, 2018). Specifically, the outcomes included the  
30 presence of depressive symptoms, life satisfaction, and the mental component of health-related  
31 quality of life. We hypothesized that participants receiving the nurse-led proactive self-care program  
32 would demonstrate greater improvement in the presence of depressive symptoms, life satisfaction,  
33 and the mental component of health-related quality of life when compared to those receiving the  
34 usual care.

35

## 36 Methods

### 37 Study design

38 This was a single-blinded, randomized controlled trial. The study took place in 10 community centres  
39 in Hong Kong Island, Kowloon, and different parts of the New Territories in Hong Kong. Participants  
40 who were eligible and agreed to participate in this study signed a consent form. The study was  
41 conducted under the standards and ethical criteria of the Helsinki declaration and approved by the  
42 ethics sub-committee of the study university. It was registered at ClinicalTrials.gov with identifier

1 NCT02286375. Methods and procedures are fully described in the published protocol (Wong, Wong,  
2 & Chang, 2015) and summarized below.

3

#### 4 Participants

5 Inclusion criteria were (1) older adults aged 60 or above, (2) living within the service areas of the  
6 respective community centres, and (3) scoring  $\geq 18$  in the Chinese version of the Mini-Mental Status  
7 Examination (Tsai et al., 2016). Participants were excluded if (1) they could not communicate, (2)  
8 were bed bound, (3) were not reachable by phone, (4) were not living at home, (5) had been  
9 hospitalized with a known psychiatric problem within the previous six months, (6) were already  
10 engaged in structured health or social programs, or (7) would not be staying in Hong Kong for the  
11 three-month study period. Participants were dismissed from the study if they were no longer  
12 community-dwelling during the course of the study.

13

#### 14 Procedures

15 The staff in the community centres helped to formulate a list of potential participants in the  
16 community. A research team member who was not involved in either subject recruitment or the  
17 intervention prepared the random assignment schedule, generated by the computer software  
18 Research Randomizer. Block randomization was adopted using random block size and 1:1 ratio.  
19 Group assignments were placed in sealed envelopes and revealed sequentially at the time of  
20 randomization.

21 Baseline assessment (T1) was conducted by a research assistant who was blinded to group allocation  
22 and not involved in either the nurse-led proactive self-care program (intervention group) or the  
23 usual care (control group). After completion of baseline measures and successfully recruiting a  
24 participant, the research assistant would call the research team member for the random assignment.  
25 The research team member, who had no knowledge of the identity of the participant, made the  
26 assignment based on a computer number ('1' = intervention group; '2' = control group). Participants  
27 were unaware of their randomization status or the study hypotheses. Follow-up data were collected  
28 at 3 months, when the program was complete (T2), and at 6 months (T3) to test the sustained  
29 intervention effect. Data presented here were collected between May 2016 and April 2019.

30 Power analysis was used to calculate the sample size of this study. Assuming a power of 80%, level of  
31 significance of 5% and a small Cohen's *d* effect size from previous study (Wong, Ho, Yeung, Tam, &  
32 Chow, 2011), the required sample size is 190 participants per group. With reference to a 20% drop-  
33 out rate (Wong, Chan, Chan, & Tam, 2014), the total sample size needed is 228 participants per  
34 group, i.e. a total of 456 participants.

35

#### 36 Interventions

##### 37 Nurse-led proactive self-care program (intervention group)

38 It is a 3-month intervention program. The first month involved a more intensive arrangement,  
39 treated as a loading dose, including a home visit the first week and weekly telephone follow-up the  
40 subsequent three weeks. In the second and third months, a maintenance dose of biweekly  
41 alternative home visit and telephone follow-up was provided. There were in total four home visits

1 and four telephone follow-ups during the process. Each home visit and telephone follow-up were  
2 guided by standardized protocol with a duration of around one hour for each home visit and 20  
3 minutes for each telephone follow-up. The study flow can be found in Appendix 1.

4 The intervention dose involved an assessment, the intervention and an evaluation for promoting  
5 physical and mental health, and was delivered by a health-social partnership team led by a  
6 registered nurse and supported by community workers (CW) and social workers (SW). All providers  
7 in the team have more than 10 years' experience in working with the older adults in the community.  
8 Both the registered nurse and SW have obtained a master degree in their respective field. Training  
9 courses regarding telephone communication skills and appropriate attitudes, skills and knowledge in  
10 geriatric nursing were provided to the providers prior to the program to ensure they would  
11 implement the study consistently in the planned way. The composition of the health-social team is  
12 shown in Appendix 2.

13 The present study followed Gittel's relational coordination theory (Gittel & Weiss, 2004) which  
14 emphasized the facilitation of task integration among different specialties by focusing on cross—  
15 boundary working and social relationships. Guided by the theory, a standardized protocol was  
16 constructed to optimize the scope of practice of members of the health-social partnership team. The  
17 nurse who functions as a case manager (NCM), is well positioned to deliver most preventive health  
18 care services, including continuous comprehensive assessment, care coordination, case  
19 management, goal setting, and education. Meanwhile, the social worker plays an important role in  
20 meeting psychosocial needs, providing reassurance, and mobilizing community resources.

21 The NCM was involved in the initial assessment of participants using the Omaha system. The Omaha  
22 system encompasses four domains: environmental, psychosocial, physiological and health-related  
23 behavioural problems. The team has deliberated on the problems listed in the Omaha system and  
24 classified them into health-, social-, and health-social partnership-focused. The NCM dealt with  
25 mostly the health-focused problems and worked with the SW to address the other problems. After  
26 identifying the problems, the NCM would intervene according to the Omaha intervention scheme,  
27 which comprises the following four areas: health teaching and counselling, treatment and  
28 procedures, case management, and surveillance (Wong et al., 2015). At the end of each visit, the  
29 NCM empowered the participants to get involved and set mutual goals so that they would have  
30 ownership of the care plan. The NCM provided education on the recognition of early signs and  
31 symptoms of an exacerbation or deterioration of disease condition, the frequency, dosage, duration  
32 of each activity that was of therapeutic value, and the techniques required to perform these  
33 activities. The sources of help and the appropriate times to seek assistance were also provided for  
34 the participants. Evidence-based protocols that targeted problems commonly encountered by older  
35 adults, including chronic pain, falls, nutrition, depression, medication adherence, constipation, and  
36 hypertension, were validated and adopted by the NCM. Pamphlets and booklets were used during  
37 the education process to help the older adults to review the information of needed in facilitating  
38 their self-care behaviours. Between the first and last home visits, the NCM also provided telephone  
39 follow-up calls once a month to monitor their progress, encourage ongoing self-care behaviour,  
40 provide health advice, assess the need for referral, and review their health and social goals. CWs  
41 were nursing students who were trained to support the NCM in monitoring the progress of the  
42 participants in accordance with their contract goals, providing social support and mobilizing  
43 community resources available in the district as appropriate with the help of the SW. The NCM  
44 would make the final home visit to review the contract goals, reinforce appropriate health and social  
45 behaviours, and intervene further as appropriate. All home visits and telephone follow-ups were  
46 documented on structured forms.

1 A referral protocol was established with the full support of the health and social sectors. The NCM  
2 initiated participant referral according to the set guidelines. Social referrals included meal delivery  
3 service, counselling from SW, home helper service, and financial service. Social services were  
4 provided by the SW in the health-social care team. Health referrals included primary care  
5 consultation, nurse clinic service, community nursing service, and hospital service if indicated.  
6 Health-social care team conferences were conducted once a month to review the cases and discuss  
7 issues in the reinforcement of the health-social partnership.

8

#### 9 Usual care (Control group)

10 Both intervention and control groups received usual community services. In the community centres  
11 of the study districts, all participants had access to regular health talks and basic health checks, such  
12 as measuring blood pressure, blood glucose, and body fat percentage, and participation was  
13 voluntary. Participants in this group received a monthly social control call from trained students to  
14 rule out the possible social effects of the intervention. These social calls included topics such as  
15 “what did you buy today?”, or “which TV channel do you like?” When the participants asked  
16 questions regarding their health, the trained students would suggest them to seek medical help if  
17 necessary.

18

#### 19 Outcome measures

20 The outcomes were assessed with the Chinese version of the Geriatric Depression Scale (Woo et al.,  
21 1994), a global item of life satisfaction (Zullig, Ward, & Horn, 2006), and the Chinese version of the  
22 Short Form Health Survey, version 2 (Lam, Lam, Fong, & Huang, 2013).

23 The Geriatric Depression Scale was specifically designed for use with older adults. The questionnaire  
24 consists of 15 questions used to explore participants’ feelings with dichotomous answers. Scores  
25 from each item are added for a total possible score of 15, with higher scores representing higher  
26 severity of depressive symptoms.

27 Life satisfaction was assessed using a global item of life satisfaction on a five-point scale. This single-  
28 item scale was shown to be a strong predictor of mental health function and the use of tertiary care  
29 service (Wong et al., 2010; Zhao & Wong, 2009).

30 Mental quality of life was measured by the Chinese version of the Short Form Health Survey, version  
31 2. This questionnaire is a generic measure, as opposed to one that targets a specific age and disease.  
32 It has been used for older Chinese patients in a previous study (Xiang et al., 2015). The second  
33 version of the scale was used because it simplifies the wording so that older adults can easily  
34 understand the questions (Lam et al., 2013).

35

#### 36 Statistical analysis

37 Descriptive analyses were used to describe the baseline demographic data, which was presented as  
38 mean and standard deviation for continuous variables, median and inter-quartile range when the  
39 continuous variables were not normally distributed, and percentage and frequency for categorical  
40 variables. Normality was assessed by a normal quantile-quantile plot and Kolmogorov-Smirnov test.

1 The study used Generalized Estimating Equation (GEE) to calculate the changes or differences  
2 between the intervention and control groups (between-group effects), within-group (time) effects,  
3 and interaction effects (group X time). Unlike repeated measures analysis of variance, GEE does not  
4 require the outcome variable to have a normal distribution. This feature was highly beneficial to this  
5 study, as we anticipated that outcomes such as depressive symptoms and life satisfaction for  
6 community-dwelling older adults would be skewed. Linear link function was employed for the  
7 continuous outcomes. In the adjusted models, quasi-likelihood information criterion was applied to  
8 examine the strength of association between demographic data and each outcome measure. The  
9 potential confounding variables were then controlled in the analysis process to ensure unbiased  
10 effect estimation. Little's test was used to check whether the missing data in this data set was  
11 missing-completely-at-random (MCAR). Intention-to-treat (ITT) was employed as the primary  
12 analysis in this study. Per-protocol (PP) analysis was adopted as the secondary analysis and  
13 performed separately.

14 Statistical tests were performed with the Statistical Package for Social Sciences (SPSS) version 23  
15 software. A significant result was indicated when the p-value (level of significance) was less than  
16 0.05 for a two-tailed test.

17

## 18 Results

### 19 Participants flow

20 Of the 843 potential community-dwelling older adults who were assessed for eligibility, 457 eligible  
21 participants agreed to join the program and were randomized into intervention (n=230) or control  
22 groups (n=227). During the 12-week program, 18 participants (7.83%) in the intervention group  
23 refused to continue due to the intensive schedule of the program. Similarly, six participants (2.64%)  
24 in the control group withdrew because of time constraints. Two participants were admitted to  
25 elderly homes and one died during the process. At the completion of the program at week 12, 17  
26 and 8 participants declined T2 data collection in the intervention and control groups respectively. At  
27 the 6-month follow-up, 18 and 20 participants were lost to follow-up in the respective intervention  
28 and control groups due to elderly home admission, death, and data collection refusal (Table 1). The  
29 numbers and durations of each intervention session are shown in Appendix 3.

30

### 31 Sample description

32 Baseline demographic characteristics and scores for the outcomes of each group are reported in  
33 Tables 2 and 3, respectively. Participants in the intervention and control groups did not differ  
34 significantly in either demographic characteristics or outcomes. The majority of participants were  
35 female (75.1%). Their mean age was 78, with a standard deviation of 7.92. Most lived in apartments  
36 (97.8%) and alone (52.3%), and 26.5% lived with their spouses. Financially, 88.4% reported that they  
37 had sufficient money to support themselves. Their financial resources came from their families  
38 (29.3%), their personal savings (10.5%), or the government (88.4%). Most of them claimed that they  
39 took care of themselves (89.5%). Some were taken care of by their children (44.4%), friends (2.20%),  
40 or neighbours (2.20%).

41

### 42 Impact of the interventions on outcomes

1 Since the results of ITT and PP were comparable, only ITT results are reported here. As seen in table  
2 4, the GEE model showed significant time effects between T1 and T2 (Wald  $\chi^2 = 25.7, p < .001$ ) and  
3 T1 and T3 (Wald  $\chi^2 = 7.40, p = .007$ ) in depression scores. However, there were no significant  
4 between-group differences (Wald  $\chi^2 = 1.02, p = .31$ ).

5 Figure 1 illustrates changes in the mean depression scores of the two groups at baseline and after  
6 three months. The baseline mean scores for both groups were below the cut-off point of 5  
7 (Pocklington et al., 2016). Both groups had low level of depression at baseline and improved over  
8 time. The GEE analysis revealed that the intervention group had a greater improvement in the mean  
9 depression score from baseline to the three-month point (intervention 1.22 vs control 0.60).

10 The baseline scores of life satisfaction for both groups were above 3, which represented a fair to  
11 satisfactory level (Wong et al., 2010). Table 4 shows that there were no significant differences in the  
12 mean changes in life satisfaction scores from the baseline to the three-month interval, or from the  
13 baseline to the six-month follow-up interval. Similar results were seen in the interaction effects  
14 between groups and time. However, figure 2 clearly shows that life satisfaction increased from  
15 baseline to the three-month interval in the intervention group, while there was a decreasing trend in  
16 life satisfaction for the control group within the same period. No significant group difference was  
17 found in the GEE analysis after adjusting the baseline scores.

18 Though no statistical between-group effects or interaction effects between groups and time on the  
19 mental component of quality of life (Table 4), the average scores increased by 7.0 and 4.8 between  
20 T1 and T2 in the intervention and control groups respectively (Figure 3). Both groups fulfilled the  
21 minimally important difference of 3 for the Short Form Health Survey (Markle-Reid et al., 2017).

22

## 23 Discussion

24 This trial is one of few investigating the effectiveness of a nurse-led proactive self-care program on  
25 selected psychological outcomes for independent, non-frail community-dwelling older adults. The  
26 evidence suggests that comprehensive coverage of important aspects in both physical and mental  
27 dimensions is important to proactively maintain older adults' psychological well-being and enable  
28 them to age successfully in their own community.

29 Previous proactive self-care programs carried out by multidisciplinary teams have thus far produced  
30 inconclusive evidence of their effectiveness on psychological outcomes among older adults. Wilkins  
31 et al. (2019) adopted a quasi-experimental, pre-post study design and implemented a 6-month  
32 health multidimensional intervention that included calcium and vitamin D supplementation and  
33 teaching sessions on exercise, medication adherence, nutrition, depression prevention and  
34 management, and fall prevention to a group of underserved community-dwelling older adults. The  
35 results showed improvement of depressive symptoms immediately post-intervention at 6 months,  
36 but worsened than the baseline at 12 months. The reduced effect may be due to participants not  
37 adhering to the recommendations from health care professionals after the relatively short  
38 intervention program. Another study adopted a nurse-led care coordination approach and provided  
39 comprehensive geriatric health assessment and case management to older adults for one year  
40 (Suijker et al., 2016). Although the study involved general practitioners, physiotherapists and  
41 occupational therapists, the results found neither clinically nor statistically significant intervention  
42 effects for emotional wellbeing and self-perceived quality of life. According to the authors,  
43 insufficient time to build a steady collaboration between the nurse and the general practitioners was  
44 the main reason for its failure to obtain between-group differences (Suijker et al., 2016).



1 By contrast, the strength of this program was the building of a high-functioning health-social  
2 partnership team with dedicated professionals. In fact, collaboration between two different parties  
3 with different values and cultures is not easy. It requires the commitment of the team members to  
4 share goals and knowledge within the team to co-design working protocols in complementing each  
5 other's role (Barrow & Gasquoie, 2018). While there are growing numbers of studies and policy  
6 makers from different countries like Scotland and Norway acknowledging the importance of health-  
7 social partnerships, the integration of health and social services is still weak and the members in the  
8 team tend to work separately, with no sharing of clients' health profile and few interdisciplinary  
9 communication and meetings (Huby, Cook, & Kirchoff, 2018; Schoeb, 2016). This study tackled these  
10 issues by providing interventions that were underpinned by Gittel's relational coordination theory  
11 to facilitate providers in different disciplines to share goals and knowledge and ensure their  
12 communication is timely and with a problem-solving focus. The research team invited and  
13 empowered the health-social team to co-design planned guidelines and structured protocols that  
14 suited their needs before the commencement of this program. Within the health-social team, the  
15 nurse served as the leader and facilitated the interdisciplinary collaboration by organizing meetings,  
16 raising questions and discussing the progress and concerns of older adults, modifying or adjusting  
17 care planning during the care process. Through interdisciplinary meetings, regular case conferences,  
18 and co-developed agreements and referral forms, the nurse and social worker in the team had clear  
19 roles and responsibilities, so that they were able to provide comprehensive and integrated care to  
20 meet the complex health and social needs of the participants. The collaborative work provided by  
21 the team thus helped the older adults to maintain their physical and psychological health, which has  
22 positive associations with depressive symptoms, life satisfaction and quality of life.

23 It is worth noting that there is one feature in our program that seems to be less mentioned in other  
24 studies in leading to improvements in depressive symptoms, which is helping older adults learn to  
25 see themselves as their own best resources. According to a longitudinal study, not being consulted  
26 for major decisions concerning their own care influenced the extent of older adults' depressive  
27 symptoms (Pilania, Bairwa, Khurana, & Kumar, 2017). The current study empowered participants to  
28 discuss and decide on their own care plan with nurses or social workers on, to explore and overcome  
29 any potential barriers to their plan. Through active involvement in their care planning, older adults  
30 can have a sense of control and reduce their sense of powerlessness, simultaneously strengthening  
31 their self-efficacy and feelings of self-worth, which eventually prevent or reduce depressive  
32 symptoms (Huang, Sung, Wang, & Wang, 2017).

33 Regarding the improvement of depressive symptoms in the control group, previous studies have  
34 revealed that obtaining support from telephone calls and perceptions of increased social support  
35 can also help older adults to cope with difficulties (Orgeta, Brede, & Livingston, 2017). It is  
36 reasonable to expect that the monthly social call provided to the control group can provide social  
37 support to reduce the risk of depression. However, the result in our study demonstrates that the  
38 improvement is better in the intervention group than in the control group, since the program not  
39 only provided social support to the older adults, but also developed a strong health-social  
40 partnership network in the community that helped empower them to decide their own care  
41 management, connect them to community resources, and satisfy their complex health and social  
42 needs.

43 When interpreting the findings, it should be noted that there are several study limitations. Since this  
44 study required older adults to perform self-care behaviour and follow the intervention plan, the  
45 subjects did not include those who were bedbound, not communicable, and not reachable by phone  
46 and living at home. Hence, the study result cannot be generalized to the whole aging population.

1 While the program was implemented in one city, the issues faced by the older people dwelling in the  
2 community and the challenge of implementing health-social partnership are shared elsewhere. This  
3 study offers an evidence-based program that is effective to promote psychological well-being of the  
4 community-dwelling older people for further testing elsewhere. In addition, the long-term and  
5 sustainable effects of the intervention program were not measured. Changes in mood happen from  
6 time to time, especially for those who have to deal with physical limitations (Panacani, Ausili, Greco,  
7 Vellone, & Riegel, 2018). Factors such as sudden changes in health condition, the social or physical  
8 environment, and the presence of life stressors can instantly affect their emotions and mental  
9 health. The tools used may not be sensitive to change and evaluate the sustainable effects in a 6-  
10 month period. The self-care program in our study is also complex, because it includes several  
11 components, such as comprehensive assessment, care coordination, case management,  
12 empowerment, and education provided by a health-social care team. This research employs the  
13 complex intervention strategy and it can be challenging for the researchers to determine the  
14 contribution of specific components in bringing about the study effects. Future studies may extend  
15 our knowledge by further compare and contrast the effectiveness of each intervention component  
16 on the psychological outcomes among community-dwelling older adults.

17

## 18 Conclusion

19 In this study, we have found that to improve psychological outcomes, including the presence of  
20 depressive symptoms, life satisfaction, and mental quality of life among independent, non-frail  
21 community-dwelling older adults, holistic care should be provided. Researchers in the current study  
22 targeted these crucial domains by building a strong health-social network in the community that  
23 provides comprehensive assessment, health and self-management information, encourages  
24 participation in goal setting and decisions about health care, promotes access to community  
25 services, and maintains and expands adults' social networks.

26

## 27 Author contributions

28 AW and FW developed the conception and design of the initial study. FW was responsible for  
29 obtaining funding. AW was the study centre coordinator. AW conducted the sample size calculation,  
30 randomization, statistical planning and data analyses. Both authors drafted, revised, and approved  
31 the manuscript.

32

## 33 Conflict of interest

34 The authors declare that they have no potential conflict of interest.

35

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38 the conduct of the study, data collection, analysis, interpretation of results, or preparation of the  
39 manuscript.

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1 Reference

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