Trajectories of social engagement and depressive symptoms among long-term care facility residents in Hong Kong

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Abstract

Background: although social engagement and depressive symptoms are important concerns for long-term care facility residents, the dynamic relationship between them has not been adequately studied.

Objective: this study examines the relationship between social engagement and depressive symptoms and changes in social engagement and depressive symptoms among Chinese residents of long-term care facilities over 6 years.

Design and methods: a latent growth model was used to analyse six waves of data collected using the Resident Assessment Instrument Minimum Data Set 2.0 in the Hong Kong Longitudinal Study on Long-Term Care Facility Residents. Ten residential facilities with a total of 1,184 eligible older adults at baseline were included in the study.

Results: after controlling for demographic variables at baseline, a higher level of social engagement was associated with fewer depressive symptoms. Trajectories of social engagement were significantly related to trajectories of depressive
symptoms. Participants who recorded positive social engagement growth reported reduction in depressive symptoms. **Conclusion:** the findings of our study extend previous research by showing that increased social engagement is associated with decreased depressive symptoms over time. In long-term residential care settings, it is important for services to engage residents in meaningful social activities in order to reduce depressive symptoms.

**Keywords:** latent growth model, long-term care facility residents, social engagement, depressive symptoms, Chinese, older people

**Introduction**

Late-life depressive symptoms are substantially higher among residents of long-term care facilities (LTCFs) [1–4]. Studies have shown that among LTCF residents, higher depressive symptoms are associated with poor social engagement [5, 6]. The relationship between depressive symptoms and social engagement is less straightforward [7–9]. There may be reason to consider an opposite path, in which enhanced social engagement is associated with decreased depressive symptoms.

Social engagement in LTCFs has been defined as ‘an ability to take advantage of opportunities for social interaction … [and] to initiate actions that engage residents in the life of the home’ [10]. According to the behavioural model of depression, meaningful social interactions may reduce depressive symptoms by increasing enjoyable or pleasant experiences with positive reinforcement for LTCF residents. A recent study found that nursing home residents were engaged and showed pleasure when involved in structured activities and informal interactions [11].

Engaging in social activities was identified as a protective factor for depressive symptoms in residential homes [1–4]. According to the cognitive model of depression, LTCF residents who participate in self-initiated activities that aim to achieve personal goals are able to generate positive self-esteem and self-efficacy. As shown by a recent intervention study [12], enhanced self-efficacy was found to be a key mechanism between activity and depression. The potential pathway of enhanced social engagement to lower depressive symptoms over time is a positive spiraling cycle: If LTCF residents are able to engage in meaningful social activities by initiating contact with and accepting invitations from others, they will be able to obtain positive life experiences, generate a positive attitude towards self and others, and be less likely to experience depressive symptoms. In turn, experiencing fewer depressive symptoms will provide LTCF residents with a higher level of motivation to engage in self-initiating social activities and join activities organised by formal caregivers (Figure 1). It is well established that depressive symptoms are associated with deteriorated social engagement [1–4]. Unfortunately, there is a lack of research on the protective effects of increased social engagement on depressive symptoms in LTCFs over time.

**Residential long-term care services in Hong Kong**

The proportion of people aged 65 or older exceeded 13% by mid-2011 in Hong Kong and the proportion of older people staying in LTCFs reached 7% [13], which is higher than most other countries. In Hong Kong, a central system has been established since 2000 to allocate long-term care applicants to government-subsidised residential facilities. There is usually no special ward for residents with dementia, so rooms are typically shared by three to five peers with various levels and types of physical and/or mental impairments. Social workers at LTCFs are often in charge of organising activities for residents, including physical exercises, social gatherings, group activities, outings, volunteer visits, volunteer opportunities and open areas for informal communication. However, according to studies conducted in Hong Kong, older adults living in LTCFs are at risk of suffering from depressive symptoms [2, 4]. In addition, Hong Kong has one of the highest suicide rates among older persons in developed countries, and depressive symptoms have been identified as a significant risk factor for suicide among older persons in Hong Kong [14]. Hence, Hong Kong is an ideal location in which to examine the protective factors of late-life depressive symptoms among LTCF residents. The findings will not only enhance our knowledge of the dynamic relationship between social engagement and depressive symptoms among those living in

![Figure 1. Conceptual diagram of random effects model of social engagement on depressive symptoms.](image-url)
LTCFs, but also benefit the development and tailoring of intervention programmes for Chinese LTCF residents.

Objectives of the study

The present study has two goals. One is to examine the cross-sectional relationship between social engagement and depressive symptoms. The other is to investigate the relationship between changes in social engagement and depressive symptoms over time. Findings of the present study may be useful in illuminating the underlying mechanisms between the changes of two very important variables (social engagement and depressive symptoms) for long-term care quality. The present study controlled variables identified in previous studies as risk factors that significantly predict depressive symptoms; namely, functional health, cognitive impairment, pain and demographic characteristics [1, 3].

Methods

Data and sample

The data for this study were obtained from the Hong Kong Longitudinal Study on Long-Term Care Facility Residents, a research project that aimed to investigate the well-being of older adults living in 10 residential LTCFs served by one of the largest non-governmental organisations in Hong Kong. The study is a secondary data analysis that will use data originally collected to review and improve clinical practice in LTCFs. The advantage of using clinical data for data analyses is that the data are collected on a regular basis, allowing examination of dynamic relationships between variables over time.

In the 10 LTCFs, trained assessors with professional backgrounds in nursing, social work, occupational therapy and physiotherapy utilised the Minimum Data Set Resident Assessment Instrument (MDS-RAI) to collect data. Nurses oversaw the assessment and coordinated care. The non-governmental organisation conducted in-house standardised training for each assessor. The reliability and validity of assessing social engagement and depressive symptoms using the MDS-Home Care instrument were tested in the Hong Kong context [15, 16]. After the baseline assessment, the residents were reassessed based on the following guidelines set by the agency: (i) reassessment should be conducted if a resident experiences four clinical variations, including fall, discharge from hospitalisation, sudden change of health status or withdrawal from services; and (ii) re-assessment should be conducted annually.

The present study utilised a sample of 1,533 residents who were initially assessed in 2005 and re-assessed through 2010 according to the re-assessment guidelines. For the purposes of this study, the following exclusion criteria were adopted: (i) residents who were recorded as having any psychotic disorders and (ii) residents who were receiving any psychosocial interventions at any time during the study period. These characteristics would impact on social engagement, depressive symptoms and/or the relationship between social engagement and depressive symptoms. After excluding those residents (2.3%), the final sample for analysis consisted of 1,184 participants.

Measures

All study variables were measured using a validated Chinese version of the RAI 2.0 for nursing home care [15, 16]. The RAI 2.0 assesses a core set of screening, clinical and functional status variables, laying the foundation for a comprehensive assessment of nursing home residents. According to the instrument manual, the assessment of depressive symptoms was based on interviewing the resident directly for ‘indicators maybe expressed verbally or through non-verbal indicators or behaviors that can be monitored by observing the person during usual daily routines’ [17]. Observations during the assessment period in any direct contact with the resident were also taken into consideration. The assessment of social engagement was based on discussion with the resident and ‘with staff members who have regular contact with the person’ [17]. The variables analysed in the current study are discussed below.

Depressive symptoms were measured using the 7-item depression rating scale (DRS) [17]. Each item was ranked on a 3-point scale: 0 (did not occur during the past 30 days), 1 (occurred five or fewer times a week) and 2 (occurred nearly every day). The internal consistency in the present study (Cronbach’s alpha = 0.60) was acceptable and in line with findings from previous studies [18]. Total scores on the DRS can range from 0 to 14, with a higher score indicating more depressive symptoms. The advantages of using this scale included the fact that the DRS measures depressive symptoms using available information assessed regularly in daily practice and can help strengthen care-related decision-making by practitioners. Moreover, repeated measures of the DRS provide empirical data on changes in depressive symptoms rather than static information.

Social engagement was measured using the 6-item index of social engagement (ISE) [10]. The internal consistency of the ISE in the present study (Cronbach’s alpha = 0.72) was satisfactory and in line with findings of previous studies in Hong Kong [19]. Total scores on the ISE can range from 0 to 6, with a higher score indicating a higher level of social engagement.

Functional health was measured using the activities of daily living (ADL) long form [20]. The internal consistency of the ADL long form in the present study (Cronbach’s alpha = 0.97) was satisfactory.

Cognitive impairment was measured using the cognitive performance scale (CPS) [21]. In the present study, the internal consistency (Cronbach’s alpha = 0.82) was satisfactory.

Pain was measured using a pain scale (PS), which consisted of two items [22]. The internal consistency of the PS in the present study (Cronbach’s alpha = 0.90) was satisfactory and in line with the findings of a previous study in Hong Kong [15].
Demographic characteristics included age, sex, marital status, familial financial support and level of education. The level of education was measured by nine categories ranging from 0 (no formal education) to 9 (postgraduate or higher). Sex was coded as a dichotomous variable (1 = male; 0 = female). The marital status was measured by five categories (currently married, never married, widowed, divorced and separated) and coded as four binary variables. Receipt of financial support from family members was coded as 1 = yes and 0 = no. Age was measured in years by asking for year of birth.

Statistics

Random coefficients (growth) models were used to measure the trajectories of social engagement and depressive symptoms throughout the assessment period [23]. In the first-level equations, we used a quadratic growth process that assumed that the measurement quadratically depended on the time when the intercept, the linear growth and the quadratic growth of the curve were the individual-specific random coefficients. The second-level equations allowed for the inclusion of covariates to differentiate individual trajectories, in which the intercept, linear growth and quadratic growth were linear functions of the covariate vector described below. The independent and dependent variables included in the model were the trajectories of social engagement and depressive symptoms. The variances of the observed variables explained by the model were calculated using \( R^2 \) values. During the study period, a number of subjects left the sample (largely due to death or change of residence) and some were omitted from one or several assessments. To compensate for the missing data without deleting observations, the models were estimated using the full-information maximum likelihood method, which was developed as an estimation method to address data with random missing values [24].

Results

Sample characteristics and descriptive statistics

The demographic characteristics of the sample at baseline (2005) and the distributions of key variables are listed in Table 1.

With regard to depressive symptoms, the mean scores across the six waves ranged from 0.23 to 0.40, including a slight decrease in the last two waves. In terms of social engagement, the scores ranged from 1.98 to 2.27, indicating a relatively low level of social engagement. Descriptive statistics for all variables analysed at all assessment points are listed in Table 1.

Relationship between social engagement and depressive symptoms

We applied a random effects growth model to examine the impact of social engagement and other covariates on depressive symptoms over time. The values of the root mean square error of approximation (0.04) and the comparative fit index (0.97) showed an adequate model fit. The explained variances of depressive symptoms measured in each wave ranged from 45% to almost 100%.

The result showed that social engagement at baseline was negatively associated with depressive symptoms at baseline (coefficient = −0.10) (Table 2). A higher level of social engagement was associated with fewer depressive symptoms. Results showed that being female, being comparatively younger, and having a higher level of education resulted in a higher level of social engagement at baseline. Functional health, cognitive impairment and pain had negative effects on social engagement at baseline.

Relationship between change of social engagement and depressive symptoms

Changes in social engagement had a significant association with changes in depressive symptom scores over time (Table 2). A 1-point linear increase on the social engagement scale during 1 year resulted in a 0.11-point linear decrease in the DRS score, and the effect of the quadratic change (coefficient = −0.07) followed a similar pattern.

Discussion

The results of the present study show that social engagement is negatively associated with depressive symptoms, and that an increase in social engagement is associated with a decrease in depressive symptoms over time among LTCF residents in Hong Kong.

At baseline, a higher level of social engagement is associated with a decreased likelihood of experiencing depressive symptoms, which is consistent with previous literature [1–4]. Findings on the dynamic relationship between changes in social engagement and changes in depressive symptoms supported our theory of a spiraling cycle between changes in social engagement and depressive symptoms. We hypothesised that if residents enhanced their active participation in social activities, such as chatting with peers, engaging in organised and self-initiated activities and accepting invitations to join other social activities, they would be more likely to experience positive outcomes such as positive emotion, a sense of companionship and a greater sense of meaningfulness, which would be associated with a decreased likelihood of developing depressive symptoms [11, 12]. In turn, a decreased likelihood of experiencing depressive symptoms would result in more motivation for LTCF residents to engage in meaningful social activities on a daily basis, which would prompt another cycle of greater social engagement.

Our findings suggest that long-term care practitioners in Hong Kong can enhance the social engagement of older LTCF residents by increasing opportunities for self-initiated activities or providing targeted interventions that enhance daily activity levels. References can be taken from...
intervention programmes such as BE-ACTIV, a low-cost behav- 
ioral intervention programme that has high ecological 
feasibility [25].

In terms of covariates and their relationship with depres-
sive symptoms, the findings suggest that pain was a signif-
ificant contributing factor to depressive symptoms at baseline,
which is consistent with the literature [26]. Our findings 
further suggest the existence of an undesirable negative cycle 
between pain and depressive symptoms that requires tailor-
made interventions and further examination.

Given that depressive symptoms may vary depending on 
cultural setting [27], caution is merited when generalising 
the findings of the present study to the rest of the world. It 
is believed that the current study findings could have rele-
vance to cultural contexts that emphasise collectivism, 
obedience to authority and somatisation of mental health 
symptomology [28].

Despite the significance of the findings, the present 
study has several limitations. The observed means of de-
pressive symptoms was comparatively small according to 
DRS values. The comparatively lower level of reported de-
pressive symptoms among Chinese residents compared 
with other ethnic groups was consistent with previous 
studies in the USA [28]. Chinese persons tend to report 
less on emotional reactions but more on somatic symptoms 
[28]. Also, in terms of the professional–client relationship,
Asians were found to share less and even fear being too 
intimate with helping professionals [29]. Moreover, the RAI 
2.0 is based on professional assessment of negative mood 
by looking for behaviours such as sadness, fear, anger and 
crying. The ability of practitioners to recognise depressive 
symptoms was a concern, which was in line with findings 
based on MDS assessment in other countries [17] and a 
study in Hong Kong using the Geriatric Depression Scale 
[4]. Assessors have received standardised training on how 
to use the full assessment tool but may not stress specific 
parts such as depression and social engagement and asso-
ciated symptoms. In-house training needs to be strength-
ened to improve staff competence in assessing depressive 
symptoms and social engagement. Fortunately, repeated 
measures showed consistent levels of depressive symptoms 
and social engagement, which implied that system error 
could be possible rather than random error due to different 
criteria adopted by individual assessors. Nevertheless, the 
focus of our paper is on the relationship between changes 
in depressive symptoms and changes in social engagement. 
Even if changes in the mean DRS score are small, the rela-
tionship between changes in social engagement and DRS 
scores is still significant. Future studies should include mul-
tiple assessments of depressive symptoms.

A second limitation is that the sample of the study came 
from one non-governmental organisation in Hong Kong. 
However, residents of this organisation were allocated by a 
central waiting list, in which their demographic

<table>
<thead>
<tr>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 3</th>
<th>Wave 4</th>
<th>Wave 5</th>
<th>Wave 6</th>
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<td>Age, M (SD)</td>
<td>81.67 (8.81)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Male, %</td>
<td>404 (34.38)</td>
<td>—</td>
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<tr>
<td>Marital status, %</td>
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<tr>
<td>Never married</td>
<td>127 (10.73)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Currently married</td>
<td>323 (27.28)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Widowed</td>
<td>680 (57.43)</td>
<td>—</td>
<td>—</td>
<td>—</td>
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</tr>
<tr>
<td>Separated</td>
<td>24 (2.03)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Divorced</td>
<td>30 (2.53)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Education Level, %</td>
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<tr>
<td>No formal education</td>
<td>497 (41.98)</td>
<td>—</td>
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<tr>
<td>Primary education</td>
<td>306 (25.84)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Primary graduate</td>
<td>154 (13.01)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Junior secondary</td>
<td>90 (7.60)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Senior secondary</td>
<td>83 (7.01)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Above senior secondary</td>
<td>54 (4.56)</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Familial Financial Support, %</td>
<td>373 (31.50)</td>
<td>—</td>
<td>—</td>
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<td>—</td>
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<tr>
<td>Pain medication, %</td>
<td>406 (34.26)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
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<td>DRS, M (SD)</td>
<td>0.28 (0.77)</td>
<td>0.40 (1.00)</td>
<td>0.35 (0.88)</td>
<td>0.28 (0.79)</td>
<td>0.23 (0.39)</td>
</tr>
<tr>
<td>5-year change, M (range)</td>
<td>−0.08 (−5 to 5)</td>
<td></td>
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</tr>
<tr>
<td>ISE, M (SD)</td>
<td>2.13 (1.81)</td>
<td>1.98 (1.76)</td>
<td>2.08 (1.79)</td>
<td>2.17 (1.84)</td>
<td>2.27 (1.86)</td>
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<tr>
<td>5-year change, M (range)</td>
<td>−0.10 (−5 to 4)</td>
<td></td>
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<td>ADL long form, M (SD)</td>
<td>9.24 (11.08)</td>
<td>10.29 (11.17)</td>
<td>10.68 (11.26)</td>
<td>10.24 (11.13)</td>
<td>10.08 (11.19)</td>
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<tr>
<td>5-year change, M (range)</td>
<td>3.71 (−7 to 28)</td>
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<td></td>
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<tr>
<td>PS, M (SD)</td>
<td>0.49 (0.78)</td>
<td>0.48 (0.76)</td>
<td>0.46 (0.75)</td>
<td>0.51 (0.77)</td>
<td>0.48 (0.77)</td>
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<tr>
<td>5-year change, M (range)</td>
<td>−0.04 (−3 to 3)</td>
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<tr>
<td>CPS, M (SD)</td>
<td>1.75 (2.13)</td>
<td>1.97 (2.18)</td>
<td>2.08 (2.23)</td>
<td>2.00 (2.23)</td>
<td>1.88 (2.20)</td>
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<tr>
<td>5-year change, M (range)</td>
<td>0.58 (−3 to 6)</td>
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</tbody>
</table>

ADL, activities of daily living (range: 0–28); CPS, cognitive performance scale (range: 0–6); DRS, depression rating scale (range: 0–14); ISE, index of social engagement (range: 0–6); PS, pain scale (range: 0–4).
Table 2. Growth model of social engagement, disability, cognitive impairment and pain trajectories on depressive symptoms trajectory

<table>
<thead>
<tr>
<th></th>
<th>ISE</th>
<th>ADL</th>
<th>Cognitive impairment</th>
<th>Pain</th>
<th>Depressive symptoms</th>
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<tr>
<td></td>
<td>Intercept</td>
<td>Linear</td>
<td>Quadratic</td>
<td>Intercept</td>
<td>Linear</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.99***</td>
<td>−0.38</td>
<td>0.08</td>
<td>−5.96</td>
<td>−1.91</td>
</tr>
<tr>
<td>Male</td>
<td>−0.67***</td>
<td>0.03</td>
<td>−0.01</td>
<td>2.26**</td>
<td>0.03</td>
</tr>
<tr>
<td>Age</td>
<td>−0.01*</td>
<td>0</td>
<td>0</td>
<td>0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>Education</td>
<td>0.13***</td>
<td>0.05*</td>
<td>−0.01</td>
<td>−0.34</td>
<td>0.08</td>
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<tr>
<td>Married</td>
<td>0.16</td>
<td>0.06</td>
<td>−0.02</td>
<td>7.41***</td>
<td>0.54</td>
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<tr>
<td>Never married</td>
<td>−0.11</td>
<td>0.14</td>
<td>−0.03</td>
<td>3.14</td>
<td>0.38</td>
</tr>
<tr>
<td>Widowed</td>
<td>0.14</td>
<td>0.14</td>
<td>−0.03</td>
<td>4.24*</td>
<td>0.3</td>
</tr>
<tr>
<td>Separated</td>
<td>0.35</td>
<td>−0.07</td>
<td>−0.01</td>
<td>1.07**</td>
<td>0.42</td>
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<td>Familial financial support</td>
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<td>−0.03</td>
<td>−0.01</td>
<td>−1.91</td>
<td>0.23</td>
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<tr>
<td>ADL intercept</td>
<td>−0.02***</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>ADL linear</td>
<td>−0.05***</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ADL quadratic</td>
<td>−0.05***</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cognition intercept</td>
<td>−0.40***</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Cognition linear</td>
<td>−0.24***</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Cognition quadratic</td>
<td>−0.57***</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Pain intercept</td>
<td>−0.26***</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Pain linear</td>
<td>−0.08</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Pain quadratic</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>ISE intercept</td>
<td>0.19***</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>ISE linear</td>
<td>0.15**</td>
<td>0</td>
<td>0</td>
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<tr>
<td>ISE quadratic</td>
<td>0.21***</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>$R^2$ (latent)</td>
<td>0.35</td>
<td>0.1</td>
<td>0.11</td>
<td>0.06</td>
<td>0.01</td>
</tr>
<tr>
<td>$R^2$ (observed)</td>
<td>2005</td>
<td>0.95</td>
<td>0.99</td>
<td>0.97</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>0.9</td>
<td>0.97</td>
<td>0.95</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td>0.91</td>
<td>0.98</td>
<td>0.93</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>0.89</td>
<td>0.96</td>
<td>0.95</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>0.9</td>
<td>0.96</td>
<td>0.96</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>0.92</td>
<td>0.95</td>
<td>0.99</td>
<td>0.92</td>
</tr>
<tr>
<td>Chi-square</td>
<td>1398 (478)</td>
<td>0.04</td>
<td>0.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.04</td>
<td>0.97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>0.97</td>
<td>0.97</td>
<td></td>
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</tr>
</tbody>
</table>

ISE, index of social engagement; ADL, activities of daily living; CFI, Comparative Fit Index; RMSEA, root mean square error of approximation.

*P < 0.05.

**P < 0.01.

***P < 0.001.
characteristics including gender, age and education level were comparable with census reports [30]. Nonetheless, caution should be exercised when generalising the findings of the current study. Third, although the sample of the present study was drawn from 10 LTCFs, the nesting of individuals was not included in the multilevel models due to data limitations. Future studies could include this variable. Fourth, the 10 LTCFs followed standardised guidelines to provide necessary treatment for individual residents determined to have mood problems. However, due to the unavailability of data, treatment for depression was not included in the present study. In future research, this data should be included. Fifth, during the 6-year-study period, an approximate attrition rate of 30% was recorded. Survival effect could have an impact on the trajectories of social engagement, depressive symptoms and control variables, and this requires further examination. Finally, the present study was a panel study with repeated observations, the growth models employed could not establish the causal relation between the trajectories of social engagement and depressive symptoms.

Key points

• Social engagement was significantly and negatively associated with depressive symptoms at baseline.
• A 1-point linear increase on the social engagement scale during 1 year resulted in a 0.11-point linear decrease in the depressive symptoms score.
• The explained variances of depressive symptoms measured in each wave ranged from 45 to 100%.
• The time invariant risk factors and the four trajectories explained 8% of the linear and quadratic growth of depressive symptoms.

Conflicts of interest

None declared.

References

Objective measurements of daily physical activity patterns and sedentary behaviour in older adults: Age, Gene/Environment Susceptibility-Reykjavik Study

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Abstract

Background: objectively measured population physical activity (PA) data from older persons is lacking. The aim of this study was to describe free-living PA patterns and sedentary behaviours in Icelandic older men and women using accelerometer.