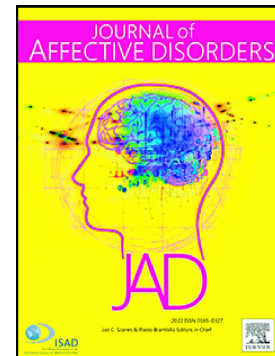


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Associations of one-to-one peer support service and intervention outcomes among older adults with depressive symptoms: evidence from a community-based stepped care programme for late-life depression in Hong Kong

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Abstract

Objective

Evidence on the outcomes of peer support for late-life depression is limited. This study examined whether the presence of a peer supporter alongside intervention improves older adults' mental health outcomes and the differential impacts of different peer support types and contents.

Method

From January 2024 to July 2025, depressive symptoms (Patient Health Questionnaire-9), generalised anxiety symptoms (Generalised Anxiety Disorder-7), and loneliness (3-item UCLA Loneliness Scale) of service users in the community-based mental health programme were collected at pre- and post-intervention. Linear mixed models examined the interaction effects between time and the presence of a peer supporter, service type, content, year of peer support experience, adjusting for sociodemographic variables, on mental health outcomes.

Result

Among 1,124 older adults, 591 received peer support. Those with peer support showed a greater reduction in depressive symptoms ($b = -0.42$, $CI = -0.80 - -0.05$) compared to those without. Home visits ($b = -1.27$, $CI = -1.97 - -0.57$) and sharing personal recovery stories and life experiences ($b = -1.07$, $CI = -1.87 - -0.26$) were associated with a greater reduction in depressive symptoms than those who did not receive any peer support service. Service users with a more experienced peer supporter had a greater reduction in anxiety symptoms ($b = -$

0.29, CI = -0.47 - -0.11) and loneliness ($b = -0.14$, CI = -0.24 - -0.03) following treatment.

Conclusion

Employing older adults as peer supporters may be a promising approach to improve service outcomes and promote productive ageing.

Keywords: peer support; older adult; depression; stepped care

1. Introduction

Late-life depression is a significant public health concern, and the estimated prevalence of major depressive disorder in older adults will be 4.53% in 2050 (Y. Wang et al., 2025), highlighting a need for accessible and effective geriatric mental healthcare. However, a persistent shortage of specialized mental health professionals presents a major barrier to meeting this need (Reynolds et al., 2022), which is further intensified by population ageing (Chen et al., 2025; Y. Liu et al., 2023) and the continuous upward trend of depression incidence and prevalence seen in older adults globally (Y. Wang et al., 2025). In response, there has been a growing interest in developing scalable, community-based models that complement or substitute professional services and leverage existing community assets (Tang et al., 2022; Yiu et al., 2025).

Peer support has emerged as a promising complementary strategy in mental healthcare. Peer support is typically defined as “a mutually agreed relationship in which individuals with lived experience of mental health or related psychosocial challenges provide social and emotional support to service users with similar experiences to foster self-determined change” (Fortuna et al., 2022). Peer supporters are employed, whether paid or unpaid, across various settings, such as primary care and community services (Fortuna et al., 2022; Høgh Egmose et al., 2023). Peer support work encompasses a wide range of tasks, including providing practical support to service users while they navigate healthcare services, providing one-to-one psychosocial support and mentorship, facilitating peer support groups, or even running services as an alternative to mainstream services.

Peer support in mental healthcare is grounded in multiple theoretical foundations, such as social support, experiential knowledge, social learning theory, and self-determination theory (Fortuna et al., 2022; Proudfoot et al., 2012), each positing a different pathway through which peer support benefits service users. However, results from empirical studies were largely mixed. While some reviews concluded that peer support interventions reduced depression and anxiety compared to standard care (Maddock et al., 2021; Shorey & Chua, 2023), others have shown effects only for recovery-oriented outcomes such as self-efficacy, but not symptom-level outcomes (Cooper et al., 2024; Lee & Yu, 2024; White et al., 2020; Yim et al., 2023).

In a systematic review of one-to-one peer support in mental health services, only one out of 23 studies focused on older adults, while others focused on younger or general adult populations (White et al., 2020). This is a critical gap as older adults face a myriad of unique challenges, including retirement, changing family roles, and managing physical health. They

may have distinct experiences and perceptions of mental health issues and may also have distinct preferences for peer support modalities. This highlights the need to examine outcomes of peer support services in older adults specifically. Interestingly, several recent studies have demonstrated that peer support interventions for older adults are feasible and effective in improving well-being (Fortuna et al., 2025; Joo, Xie, Choi, Gallo, Locascio, et al., 2025; Joo, Xie, Choi, Gallo, Zhong, et al., 2025).

Nevertheless, the extant evidence base is predominantly derived from Western, individualistic cultural contexts, which may not be directly applicable to non-Western settings. In particular, traditional peer support emphasizes empowerment and self-determination, which may seem alien to more collectivist societies (Yim et al., 2023). Collectivist values consider family and professionals to have higher priority than lay mental health workers, which may lead to under-recognition of peer supporters (Ong et al., 2023). The role of peer supporters is also viewed differently across cultures. While Western societies consider peer supporters as “role models” for recovery, in the Chinese context peer supporters are more often described as “generic support companions” who provide emotional support and help build social connections (E. L. Y. Wong et al., 2024). These cultural factors contribute to the complexity of peer support service outcomes, which remain unclear in non-Western contexts.

Peer support program in a non-Western context

The JC JoyAge project (“Jockey Club Holistic Support Project for Elderly Mental Wellness”) in Hong Kong is a territory-wide community-based stepped care intervention for Chinese older adults with mild to moderately severe depressive symptoms assessed by the Patient Health Questionnaire–9-item (PHQ-9). In this programme, trained social workers conduct psychological interventions (primarily cognitive behavioural therapy) under the supervision of clinical psychologists and with assistance from trained peer supporters. The project has trained more than 1,000 peer supporters aged 50 years or older since 2017, who support community-dwelling older adults with depressive symptoms through multi-modal services such as home visits, tele-support, and connecting social resources, alongside the psychological interventions provided by social workers.

Importantly, peer supporters within JoyAge are not required to have lived experience of depression or recovery. The JoyAge project proposes a broader conceptualisation of “lived experience”, in which peerness is grounded in shared ageing-related and life-stage experiences, such as retirement, caregiving responsibilities, loneliness, changing family roles, and adaptation to later life. This adaptation may allow for a wider and more inclusive pool of Asian community-dwelling older adults as peer supporters (Tang et al., 2022; Yiu et al., 2025).

The peerness of this peer support model was constituted by shared age-related challenges, which may be particularly suitable for older adults in Asian contexts. First, Asian age-related hierarchical norms may contribute to older adults' reluctance to seek recovery role models, particularly among younger adults (E. L. Y. Wong et al., 2024). Moreover, the pervasive stigma of mental health in Asian societies can make self-identification as a “mental health

peer” particularly challenging. Indeed, previous research has shown that while the lived experience of mental disorders among peer supporters facilitated service users’ recovery process, it also brought mental health stigma and workplace prejudice to peer supporters (Wall et al., 2022). As such, the JoyAge project offers a unique opportunity to understand the role of peer support in late-life mental healthcare in an Asian context.

Present study

Unlike well-structured Western peer support programmes that are ready to be integrated into hospital and community services (Høgh Egmosse et al., 2023), peer support interventions in mental healthcare settings in the Asian context are still in their infancy. Most non-Western peer support studies have adopted qualitative methods (Ong et al., 2023), resulting in a lack of quantitative evidence on the benefits of including peer supporters in mental health services. Also, limited studies have examined how the element of multi-modal peer support services (e.g., type, content) influences the service outcomes. As such, the current study aims to address two key research questions in the unique context of the JC JoyAge project:

- (1) Does the inclusion of peer supporters in a community mental health programme provide additional benefits in improving mental health outcomes among Asian older adults with depressive symptoms?
- (2) Do the type and content of peer support, and the level of experience of peer supporters influence symptom outcomes of service users?

We hypothesize that service users with peer supporters would experience a greater reduction in mental health symptoms following the intervention than those without peer supporters. Given the limited evidence on the **service outcomes** of different service types, content, and years of experiences, these factors were included in exploratory analysis without a specific hypothesized direction.

2. Method

This study was approved by the Human Research Ethics Committee (HREC) of the University of Hong Kong (ref. EA2003001). All procedures were performed in compliance with the Helsinki Declaration of 1975, as revised in 2008. Participation in the study was voluntary, and all participants provided informed consent.

2.1 Study Design

The present study is a secondary analysis of data collected from the JC JoyAge project. Service users’ depressive symptoms, anxious symptoms, and loneliness were assessed at before and after the stepped care intervention. While the effectiveness of the JoyAge stepped care intervention as a whole has been reported previously (T. Liu et al., 2026), the add-on value of one-to-one peer support service alongside this stepped care intervention remains unexamined. To answer research question (1), we compared intervention outcomes between two groups of service users: one assigned with peer supporters and another without peer supporters. Peer supporters were assigned on a non-randomized basis, subject to service users’ willingness to be matched with peer supporters. To answer research question (2), we

further examined the impacts of different service types and content of peer support, and peer supporters' years of experience, on the intervention outcomes.

2.2 Study Setting

The current study was conducted within the JC JoyAge project, which adapted a well-established stepped-care intervention model (Clark, 2018) to the local context of Hong Kong (T. Liu et al., 2022; S. M. Y. Wong et al., 2024). The JC JoyAge programme offers comprehensive psychosocial care, including social worker-led psychological interventions (primarily group-based cognitive-behavioral therapy), stepped care services, and peer support. After completing the intake process, all service users are assigned peer supporters upon their consent. Service users then receive the stepped care intervention of varying intensities and formats (e.g., individual or group) based on their symptom severity level, guided by the service protocol. Throughout the service period, peer supporters provide one-to-one support to the service user before, during, and after the clinical intervention.

For service users with mild depressive symptoms (PHQ-9 = 5–9), a lower-intensity intervention (i.e., six regular sessions with two booster sessions) was offered. For service users with moderate-to-moderately severe symptoms (PHQ-9 = 10–19), a higher-intensity intervention (i.e., eight regular sessions with two booster sessions) was offered. Service users can be stepped up or down from the service based on the severity of depressive symptoms after the first intervention.

To ensure scalability and sustainability, the programme was designed to be time-limited (up to nine months), protocol-driven, and predominantly group-based. The target exit criterion was the reduction of depressive symptoms to no clear symptoms (PHQ-9 = 0–4). Our programme has provided services in 51 centres in all districts across Hong Kong, all operated by non-profit organizations and funded by the government. Further details regarding the intervention have been reported elsewhere (T. Liu et al., 2022; S. M. Y. Wong et al., 2024; Yiu et al., 2025).

In JC JoyAge, peer supporters are individuals aged 50 years or above, without depressive symptoms (i.e., PHQ-9 0–4) and immediate suicidal risk. All peer supporters were officially employed on an hourly basis at salary rates exceeding the local minimum wage (HK\$70 to HK\$75 per hour; approximately USD\$8.75 to USD\$9.38 per hour). All peer supporters received an intensive series of 80-hour peer support training, covering six main areas: (1) geriatric mental health, (2) recovery model, (3) peer support skills and knowledge, (4) mental health resources, (5) self-care, and (6) clinical practicum. Although peer supporters in JoyAge were not required to have a previous diagnosis of depression or recovery experience, the recovery model was included in training as a guiding framework for delivering peer support. The training emphasised recovery-oriented values, including hope, empowerment, and strength. Personal storytelling was taught as appropriate sharing of ageing-related life experiences and coping with late-life challenges, rather than as disclosure of psychiatric history. This was intended to ensure that age- and life-experience-matched companions provided support in a person-centred and recovery-oriented manner.

Peer supporters and service users were matched by project social workers according to the severity of service users' symptoms, shared experiences (e.g., retirement, bereavement), and the preferences of service users. Service users could refuse to be matched with a peer supporter, and the peer support service was not a mandatory element of their clinical intervention. To address service challenges and provide adequate support, social workers conducted monthly individual and group supervision sessions with peer supporters. Handling of emergencies and suicidal risk was covered during the initial training and was continuously monitored during the supervision. Peer supporters' experiences of service challenges and strategies have been reported in a previous study (Yiu et al., 2025).

2.3 Participants

Service users were older adults aged 60 years or above with mild-to-moderately severe symptoms of depression assessed by the Patient Health Questionnaire–9-item (PHQ-9 = 5–19) (Kroenke et al., 2001). Those with major neurocognitive disorders (e.g., dementia), Parkinson's disease, or a known history of schizophrenia spectrum disorder, bipolar disorder, autism spectrum disorder, intellectual disability, or immediate suicidal risks were excluded from the programme and referred to alternative services.

A total of 1,485 service users received the JoyAge service between January 2024 and July 2025. Among them, 1,375 provided complete and valid intake and discharge assessment data. Of these, 1,124 service users were discharged within nine months of their service periods and included in the analysis. Reasons for missing data included loss of contact, self-withdrawal, failure to complete discharge assessment, or death. No participants or peer supporters dropped out of the peer support program in the analysed dataset.

2.4 Measures

Depressive symptoms

Depressive symptoms were assessed by the Chinese version of PHQ-9, which has shown good internal consistency in the local context (Cronbach's alpha = 0.86) (Kroenke et al., 2001; W. Wang et al., 2014). Items were rated on a 4-point Likert scale (0 'not at all' to 3 'nearly every day'), with higher scores indicating more severe depressive symptoms.

Generalised anxiety symptoms

Symptoms of generalized anxiety was measured by the Chinese version of Generalised Anxiety Disorder–7-item scale (GAD-7), which has shown good internal consistency in the local context (Cronbach's alpha = 0.91) (Spitzer et al., 2006; Yue et al., 2022). Items were rated on a 4-point Likert scale (0 'not at all' to 3 'nearly every day'), with higher scores indicating more severe symptoms.

Loneliness

Loneliness of service users was measured by the Chinese version of the 3-item UCLA Loneliness Scale (UCLA-3), with good reliability in the local population (Cronbach's alpha = 0.87) (T. Liu et al., 2020). In the locally validated version, all items of the UCLA-3 were

rated on a 4-point Likert scale (0 'never' to 3 'often'), with a higher score representing greater loneliness.

Peer support record

Records of peer supporter matching were reported by social workers for each service user, indicating whether the service user has received peer support during the JoyAge intervention. Peer supporters' years of service was calculated from the year of training completion (i.e., ranging from 2017 to 2023) to the year in which they were assigned to the service user (i.e., 2024 or 2025). Peer supporters' history of diagnosed depression was self-reported as a dichotomous measure (i.e., yes or no).

Peer supporters also documented the support they delivered to the service users. Specifically, they recorded the number of hours served, and the type and content of the service provided. Service types included: (1) *home visit*, (2) *tele-support*, (3) *accompany and assist with intervention group or community activities*, and (4) *help connect to community resources*. Service content included: (1) *share personal recovery stories and life experiences*, (2) *help set or work towards health and recovery goals*, (3) *share everyday knowledge and skills*, (4) *share information about community resources*, and (5) *provide support with intervention group homework*.

Sociodemographics

Sex (male/female), age, living status (living with others/alone), marital status, and highest educational attainment of the service users were collected at baseline in this study.

2.5 Data Analysis

To answer research question (1), a linear mixed model (LMM) was used to examine the interaction effect between time and the presence of peer supporters (with vs. without) on service users' depressive symptoms, generalized anxiety symptoms, and loneliness, adjusting for service users' sociodemographic variables and baseline symptoms.

To answer research question (2), two LMMs further investigated the interaction effect between time and peer support service type (e.g., home visit, tele-support), as well as the interaction effect between time and peer support service content (e.g., sharing personal experience, supporting intervention homework), on service users' mental health outcomes (i.e., depressive symptoms, generalised anxiety symptoms and loneliness), adjusting for service users' sociodemographic variables and baseline symptoms. Service users without peer support services were selected as the reference group of the models.

We also conducted a subgroup analysis focusing on those with peer supporters. A LMM was conducted to examine the interaction effect between time and number of years of peer support experience on service users' mental health outcomes, adjusting for the sociodemographics of service users and peer supporters, as well as the depression history of peer supporters.

To control for the potential influences of different intervention intensity across two different groups due to severity level, we have included the number of intervention sessions in the

LMM models.

For descriptive and baseline comparative analyses, p -values and effect sizes (d/Φ) were reported. For LMM results, unstandardized coefficients (b) with 95% confidence intervals (CIs) were reported. Service users with incomplete data were excluded from the analysis, resulting in no missing data in the analysis. A comparison of baseline characteristics between analysed and missing cases was also conducted (Supplementary Table A1). All quantitative analyses were conducted in IBM SPSS Statistics 30 and R Statistics. The *lme4* package was used in R for performing LMM models (Bates et al., 2015). All statistical tests were two-tailed, with significance level set at $p < .05$.

3. Result

Characteristics of service users

Among 1,124 service users, 591 agreed to be assigned a peer supporter, with an acceptance rate of 52.6%. The remaining service users were not assigned a peer supporter, with reasons mainly including privacy concerns, feeling uncomfortable connecting with strangers, and perceived lack of necessity. No mental health stigma-related refusal was reported from the service users. Table 1 shows the descriptive characteristics of service users from two groups. Service users with peer supporters had a relatively older age, a higher proportion with primary education or below, and greater depressive symptoms at intake than those without peer supporters. Participants assigned with peer supporters had a relatively higher mean PHQ-9 score at intake (9.51, $SD=3.24$) than those without peer supporters (9.08, $SD=3.21$), but the mean PHQ-9 scores at discharge were similar between the two groups (with peer supporters: 2.91, $SD=2.10$; without peer supporters: 2.91, $SD=2.46$).

Characteristics of peer supporters

Supplementary Table A2 shows the characteristics of 262 peer supporters involved in the study. Most of them are female, highly educated (secondary school or above), and without a history of diagnosed depression. They had a mean service year of 3.06, and most of them were assigned to more than one service user within the study period.

Effect of the presence of peer supporters

Table 2 shows the results of the interaction effect between time and the presence of peer supporters on service users' mental health outcomes. The interaction for depressive symptoms was significant. Service users with peer supporters showed a greater reduction in depressive symptoms after intervention compared to those without peer supporters ($b = -0.42$, $CI = -0.80 - -0.05$), after controlling for sociodemographic characteristics and baseline symptoms. There was no significant difference in the change in anxiety symptoms or loneliness among the two groups.

Effect of peer support service types and content

Among 591 service users with peer supporters, 330 had completed valid service records for the analysis. Tables 3 and 4 show the interaction effects between time and service types, and

between time and service content. Service users who received home visit service from peer supporters experienced a greater reduction in their depressive symptoms than those who did not receive any peer support service ($b=-1.27$, $CI=-1.97 - -0.57$). Regarding service content, service users who received recovery and life experience sharing from peer supporters had a greater reduction in their depressive symptoms than those who did not receive any peer support service ($b= -1.07$, $CI=-1.87 - -0.26$). There was no significant effect observed in other service types or content.

Sub-group analysis: Effect of peer supporters' characteristics

Table 5 illustrates the interaction effect between time and peer supporters' years of experience on service users' mental health outcomes. Being assigned a peer supporter with more years of experience was associated with a greater reduction in service users' generalised anxiety symptoms and loneliness than those with fewer service years (Generalised anxiety symptoms: $b= -0.29$, $CI= -0.47 - -0.11$; loneliness: $b= -0.14$, $CI= -0.24 - -0.03$). However, peer supporter experience did not seem to influence change in depressive symptoms. Moreover, the presence of a past diagnosis of depression among peer supporters was not a significant predictor of changes in service users' mental health outcomes.

Table 1. Descriptive characteristics

Mean (SD)/ n(%)	Total (n=1,124)	With peer support ers (n=591)	Without peer support ers (n=533)	p- valu e	effe ct size (d/ Φ)
Demographics					
Age, Mean (SD)	73.1 (7.61)	73.74 (7.67)	72.39 (7.48)	0.003	0.179
Gender				0.188	0.039
Female	953 (84.8%)	509 (86.1%)	444 (83.3%)		
Male	171 (15.2%)	82 (13.9%)	89 (16.7%)		
Education level				<0.001	0.111
Primary or below	534 (47.5%)	312 (52.8%)	222 (41.7%)		
Secondary or above	590 (52.5%)	279 (47.2%)	311 (58.3%)		
Marital status				0.723	0.011
Married	502 (44.7%)	261 (44.2%)	241 (45.2%)		

	)				
Single/Divorced/Separated/Widowed/Co-habiting	662 (55.3%)	330 (55.8%)	292 (54.8%)		
Living condition				0.17 6	0.0 4
Living alone	443 (39.4%)	244 (41.3%)	199 (37.3%)		
Living with others	681 (60.6%)	347 (58.7%)	334 (62.7%)		
Depressive symptoms (PHQ-9)					
Intake, Mean (SD)	9.30 (3.23)	9.51 (3.24)	9.08 (3.21)	0.02 7	0.1 32
Discharge, Mean (SD)	2.91 (2.27)	2.91 (2.10)	2.91 (2.46)	0.99 7	<.0 01
Generalised anxiety symptoms (GAD-7)					
Intake, Mean (SD)	6.60 (4.48)	6.58 (4.61)	6.62 (4.43)	0.88 5	0.0 09
Discharge, Mean (SD)	3.23 (3.04)	3.17 (2.97)	3.30 (3.12)	0.46 5	0.0 44
Loneliness (UCLA-3)					
Intake, Mean (SD)	3.78 (2.85)	3.88 (2.87)	3.67 (2.81)	0.21 4	0.0 74
Discharge, Mean (SD)	2.07 (2.08)	2.08 (2.08)	2.07 (2.07)	0.88 9	0.0 08

Note. PHQ-9: Patient Health Questionnaire–9-item ;GAD-7: Generalised Anxiety Disorder–7-item; UCLA-3: 3-item UCLA Loneliness Scale

Table 2. Linear mixed model results- Clinical outcome of service users matched with peer supporters (n=1,124)

<i>Predictors</i>	<i>PHQ-9</i>		<i>GAD-7</i>		<i>UCLA-3</i>	
	<i>b</i>	CI	<i>b</i>	CI	<i>b</i>	CI
(Intercept)	11.59	10.18 – 13.00	9.73	7.71 – 11.75	4.92	3.58 – 6.27
Time	-6.17	-6.45 – -5.90	-3.32	-3.67 – -2.96	-1.61	-1.82 – -1.40
Number of intervention sessions	0.12	0.09 – 0.15	0.11	0.07 – 0.15	0.05	0.03 – 0.08
Demographics						
Age	-0.05	-0.06 – -0.03	-0.07	-0.09 – -0.04	-0.03	-0.04 – -0.01

			0.61	0.08 – 1.13	0.03	-0.32 – 0.38
Gender (Female)	-0.28	-0.64 – 0.09				
Education level (Primary or below)	0.59	0.31 – 0.87	0.30	-0.09 – 0.69	0.17	-0.09 – 0.43
Marital status (Married)	-0.24	-0.57 – 0.08	0.29	-0.17 – 0.76	-0.45	-0.76 – 0.14
Living alone	-0.06	-0.38 – 0.27	-0.05	-0.51 – 0.42	0.67	0.36 – 0.98
Main effect						
Matched with peer supporter	0.06	-0.27 – 0.40	-0.35	-0.81 – 0.12	0.03	-0.27 – 0.33
Interaction effect						
Time × Matched with peer supporter	-0.42	-0.80 – 0.05	-0.09	-0.58 – 0.40	-0.19	-0.49 – 0.10

Note. b: unstandardized coefficient ; PHQ-9: Patient Health Questionnaire–9-item ;GAD-7: Generalised Anxiety Disorder–7-item; UCLA-3: 3-item UCLA Loneliness Scale

Table 3. Linear mixed model results- Interaction effects between peer support profiles and intervention (n=863)

<i>Predictors</i>	<i>PHQ-9</i>		<i>GAD-7</i>		<i>UCLA-3</i>	
	<i>b</i>	CI	<i>b</i>	CI	<i>b</i>	CI
(Intercept)	10.99	9.30 – 12.67	9.21	6.77 – 11.65	4.95	3.37 – 6.53
Time	-6.19	-6.44 – -5.93	-3.25	-3.60 – -2.90	-1.65	-1.86 – -1.44
Number of intervention sessions	0.15	0.11 – 0.19	0.09	0.04 – 0.15	0.05	0.01 – 0.09
Demographics						
Age	-0.04	-0.06 – -0.02	-0.06	-0.09 – -0.03	-0.03	-0.05 – -0.01
Gender (Female)	-0.20	-0.63 – 0.24	0.75	0.13 – 1.37	0.19	-0.21 – 0.60
Education level (Primary or below)	0.50	0.18 – 0.83	0.20	-0.27 – 0.66	0.13	-0.17 – 0.43
Marital status (Married)	-0.44	-0.82 – -0.06	0.36	-0.19 – 0.91	-0.42	-0.78 – -0.06
Living alone	-0.14	-0.52 – 0.24	0.08	-0.47 – 0.63	0.71	0.35 – 1.07

Main effect

	0.38	-0.24 –	-0.05	-0.92 –	0.01	-0.55 –
Home Visit		1.00		0.82		0.56
	-0.71	-1.35 –	-	-0.42	-1.33 –	-0.21
Tele-support		0.06		0.50		0.37
Assist in intervention or community activities	0.06	-0.46 –	0.16	-0.56 –	-0.14	-0.60 –
		0.57		0.89		0.32
	0.32	-0.64 –	1.24	-0.12 –	0.69	-0.18 –
Link to community resources		1.29		2.60		1.56
	-0.27	-1.07 –	1.29	0.15 –	1.32	0.59 –
Other services		0.54		2.43		2.04

Interaction effect

	-1.27	-1.97 –	-	-0.83	-1.76 –	-0.47
Time × Home Visit		0.57		0.11		0.10
	0.70	-0.03 –	0.10	-0.89 –	0.10	-0.50 –
Time × Tele-support		1.44		1.09		0.70
Time × Assist in intervention or community activities	0.24	-0.36 –	0.43	-0.36 –	0.42	-0.06 –
		0.83		1.22		0.91
	0.06	-1.06 –	-0.39	-1.90 –	0.03	-0.89 –
Time × Link to community resources		1.18		1.11		0.94
	0.71	-0.22 –	0.03	-1.22 –	-0.60	-1.37 –
Time × Other services		1.65		1.29		0.16

Note. PHQ-9: Patient Health Questionnaire–9-item; GAD-7: Generalised Anxiety Disorder–7-item; UCLA-3: 3-item UCLA Loneliness Scale

Table 4. Linear mixed model results- Interaction effects between peer support service contents and intervention (n=863)

<i>Predictors</i>	<i>PHQ-9</i>		<i>GAD-7</i>		<i>UCLA-3</i>	
	<i>b</i>	CI	<i>b</i>	CI	<i>b</i>	CI
(Intercept)	10.97	9.29 –	9.38	6.93 –	5.17	3.59 –
		12.64		11.82		6.75
	-6.18	-6.44 –	-3.27	-3.62 –	-1.61	-1.82 –
Time		5.92		2.92		1.39
	0.16	0.12 –	0.11	0.05 –	0.06	0.02 –
Number of intervention sessions		0.19		0.17		0.09
Demographics						
	-0.04	-0.06 –	-0.06	-0.09 –	-0.03	-0.05 –
Age		0.02		0.03		0.01
Gender (Female)	-0.19	-0.62 –	0.76	0.14 –	0.20	-0.21 –

		0.23		1.39		0.60
	0.49	0.16 –	0.18	-0.29 –	0.12	-0.19 –
Education level (Primary or below)		0.81		0.64		0.42
	-0.45	-0.82 –	0.33	-0.22 –	-0.45	-0.81 –
Marital status (Married)		0.07		0.88		0.10
	-0.13	-0.51 –	0.07	-0.48 –	0.68	0.33 –
Living alone		0.25		0.62		1.04
Main effect						
Share personal recovery stories and life experiences	0.39	-0.30 –	0.06	-0.93 –	0.04	-0.59 –
		1.09		1.04		0.66
Help set or work towards health and recovery goals	-0.52	-1.13 –	-0.35	-1.21 –	-0.06	-0.60 –
		0.08		0.50		0.48
	-0.27	-0.97 –	-0.34	-1.33 –	0.39	-0.24 –
Share everyday knowledge and skills		0.43		0.66		1.03
Share information about community resources	0.09	-0.64 –	-0.02	-1.06 –	-0.64	-1.30 –
		0.83		1.03		0.03
Provide support with intervention group homework	0.01	-0.56 –	0.49	-0.32 –	0.09	-0.43 –
		0.58		1.30		0.60
Interaction effect						
Time × Share personal recovery stories and life experiences	-1.07	-1.87 –	-0.48	-1.56 –	-0.50	-1.16 –
		0.26		0.60		0.16
Time × Help set or work towards health and recovery goals	-0.22	-0.91 –	-0.27	-1.19 –	-0.28	-0.84 –
		0.46		0.64		0.28
Time × Share everyday knowledge and skills	0.73	-0.09 –	0.61	-0.48 –	0.14	-0.52 –
		1.54		1.70		0.81
Time × Share information about community resources	-0.16	-1.01 –	-0.32	-1.47 –	0.13	-0.57 –
		0.70		0.83		0.83
	0.34	-0.32 –	-0.09	-0.97 –	0.26	-0.28 –
Time × Support intervention homework		1.01		0.80		0.80

Note. PHQ-9: Patient Health Questionnaire–9-item ;GAD-7: Generalised Anxiety Disorder–7-item; UCLA-3: 3-item UCLA Loneliness Scale

Table 5. Linear mixed model results- Interaction effects between peer support profiles and intervention

<i>Predictors</i>	<i>PHQ-9</i>		<i>GAD-7</i>		<i>UCLA-3</i>	
	<i>b</i>	CI	<i>b</i>	CI	<i>b</i>	CI
(Intercept)	10.63	7.97 – 13.29	10.77	6.84 – 14.71	2.62	-0.02 – 5.25
Time	-6.21	-6.74 – -5.69	-2.45	-3.13 – -1.76	-1.35	-1.76 – -0.95
Number of intervention sessions	0.10	0.07 – 0.13	0.12	0.06 – 0.17	0.05	0.02 – 0.09
<i>Participants' Demographics</i>						
Age	-0.05	-0.07 – -0.02	-0.08	-0.12 – -0.05	-0.04	-0.06 – -0.01
Gender (Female)	-0.45	-1.10 – 0.20	0.55	-0.40 – 1.51	0.06	-0.58 – 0.70
Education level (Primary or below)	0.73	0.38 – 1.09	0.57	0.04 – 1.09	0.30	-0.05 – 0.65
Marital status (Married)	-0.05	-0.48 – 0.39	0.18	-0.47 – 0.82	-0.18	-0.61 – 0.25
Living alone	-0.01	-0.44 – 0.42	-0.25	-0.88 – 0.39	0.96	0.53 – 1.38
<i>Peer supporter's Demographics</i>						
Age	0.01	-0.02 – 0.04	-0.02	-0.06 – 0.03	0.04	0.01 – 0.07
Gender (Female)	0.57	-0.05 – 1.19	0.30	-0.63 – 1.22	0.13	-0.49 – 0.75
Education level (Primary or below)	-0.63	-1.49 – 0.23	-0.64	-1.91 – 0.64	-0.67	-1.52 – 0.19
History of diagnosed depression (Yes)	0.36	-0.11 – 0.84	-0.51	-1.21 – 0.20	0.01	-0.47 – 0.48
Years of experience	0.09	-0.04 – 0.22	0.33	0.14 – 0.51	0.11	-0.01 – 0.23
Interaction effect						
Time × Years of experience	-0.12	-0.26 – 0.02	-0.29	-0.47 – -0.11	-0.14	-0.24 – -0.03

Note. PHQ-9: Patient Health Questionnaire–9-item; GAD-7: Generalised Anxiety Disorder–7-item; UCLA-3: 3-item UCLA Loneliness Scale

4. Discussion

To our knowledge, this is the first Chinese study to provide quantitative findings from an Asian community-based program on the effects of peer support services for older adults with depressive symptoms. The hypothesis is supported by the finding that service users paired up with peer supporters experienced greater symptom reduction following intervention than those without peer supporters. In particular, service users who received home-visit services and personal sharing from peer supporters reported significantly lower depressive symptoms following interventions than those who did not. Further subgroup analyses demonstrated that the effect of peer support varied according to the peer supporters' service experience.

Apart from confirming the well-established benefits of peer support, this study examined the effect of specific types and content of peer support services in a non-Western context. Our findings showed that home visit service was beneficial to service users. This aligned with a Western study showing that face-to-face interactions were associated with better well-being than having telephone or digital interactions (Macdonald et al., 2021). Friendly home visits were also suggested to be a form of realistic and sustainable service for supporting older adults (Laermans et al., 2023). This highlighted that Asian older adults may have a higher preference towards face-to-face peer support, which may be reinforced by the collectivist culture that values interconnectedness (Triandis, 1995). Consistent with this, Asian older adults perceived digital telehealth as lacking human contact and preferred face-to-face consultations (Man et al., 2025).

Our findings also provided empirical support for the potential value of personal sharing in peer support, which has been conceptualized as a core element of peer support in Western literature (Shalaby & Agyapong, 2020; Stefancic et al., 2019). Specifically, service users who received recovery- and life-experience sharing from peer supporters showed greater reductions in depressive symptoms than those who did not receive peer support. This finding underscores the importance of emotional support, appropriate self-disclosure, and authentic sharing in building emotional relevance with the service users (Davidson et al., 2012; Truong et al., 2019). Conversely, instrumental and task-oriented forms of support, such as setting goals, helping with daily tasks, providing information about community resources, and helping with intervention homework, were not associated with additional symptom improvement.

Importantly, the present findings also help clarify the role of recovery-oriented practice in the JoyAge peer support model. Although JoyAge peer supporters were not required to have a formal history of mental disorder or recovery from psychiatric illness, they could still draw on shared ageing-related life experiences, including retirement, physical decline, and caregiving roles. Through appropriate sharing of these experiences, peer supporters may model productive ageing, resilience, and adaptive coping in later life, which are protective factors against mental health difficulties. Their role as trained, paid peer supporters may itself serve as a form of productive ageing and empowerment, offering service users a concrete example of active engagement despite late-life challenges. Together, these findings highlight

the value of strengthening the face-to-face engagement and personal sharing skills in peer support training within an Asian context.

Beyond extending existing evidence to a Chinese context, this study showed how peer supporters' years of experience influenced the outcome. Service users paired with more experienced peer supporters (i.e., longer service year) showed greater reduction in generalised anxiety symptoms and loneliness, outcomes that are beyond the intervention's primary target of treating depressive symptoms. While newly joined peer supporters may find their roles emotionally draining and practically demanding, they would develop a stronger sense of value, motivation, and strategies once they adjusted over time (Gillard et al., 2022; Yiu et al., 2025). These highlight the importance of continuous training, workforce retention, and ongoing supervision of peer supporters to maintain better clinical outcomes (Aarons et al., 2009; Yiu et al., 2025).

Implication

The current study suggests that including peer supporters may be a potentially useful add-on to improve mental health outcomes of service users receiving psychosocial interventions for depression. It also highlights the value of including peer supporters in mental health services as a paraprofessional role (Everly, 2002). This recommends future studies to further examine peer supporter-led services alone for late-life depression. In the current study, each service user received approximately 15 hours of peer support during their time enrolled in the programme, with an estimated cost of HK\$1,050 to HK\$1,080 (approximately USD \$131 to USD \$135) per service user based on the peer supporters' hourly salary. Recruiting older adults as peer supporters represents a valuable and scalable resource to handle the increasing demands of later-life mental health issues. Moreover, employing older adults can promote productive ageing by enabling them to contribute to the community and mental health services through paid peer support work (Yiu et al., 2025).

Limitation

Several limitations of this present study have been noticed. First, most of our peer supporters and service users were older female adults, and therefore, the findings may not generalize to male and younger generations. Second, our findings are based on a non-randomized study. The observed outcomes may be influenced by preference and self-selection bias, whereby service users who prefer to be matched with peer supporters may show a difference in motivation, expectations, engagement, or openness towards the psychosocial interventions and peer support services when compared to those who refused peer support. Besides, our study conducted multiple subgroup analyses across service types, service content, and peer supporter profiles without correction, which increases the risk of false positives. Future replications that confirm our findings are warranted. The relatively small interaction effect of having peer support compared to the main effect of time indicated that caution is needed when interpreting the results. To better establish the clinical meaningfulness of one-to-one peer support alongside clinical intervention, future studies should confirm the current findings using a randomized controlled trial, where service users are allocated randomly to receive or not receive peer support. Lastly, the current study only analyzed participants with

complete intake and discharge data, and comparative analyses (Supplementary Table A1) revealed that the missing cases had relatively higher baseline depressive symptoms than those included in the final sample. Though the missing data accounted for less than 10% of the total dataset, the results should be interpreted with caution due to the potential of selection bias.

5. Conclusion

In a community-based mental health stepped care programme, older adults with depressive symptoms who were provided with peer support had better intervention outcomes compared to those without a peer supporter. Home visits and sharing personal experiences were found to be particularly helpful in improving depressive symptoms of service users. Service users matched with more experienced peer supporters had a greater reduction in generalised anxiety symptoms and loneliness. A culturally adapted peer support service alongside intervention would be beneficial for older Asian adults. Future studies could further explore other peer-led services as standalone interventions for managing older adults' depressive symptoms and examine potential moderators to identify subgroups that benefit most from peer support.

Declaration of competing interests

The authors declared no potential conflicts of interest.

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Ethics

This study was approved by the Human Research Ethics Committee of The University of Hong Kong (reference number: EA2003001). Participation in the study was voluntary, and all participants provided written consent.

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Highlights:

- Older adults with peer supporters alongside the psychosocial intervention were associated with a greater reduction in depressive symptoms than those without peer supporters
- Providing home visits and sharing personal stories were effective peer support elements for reducing service users' depressive symptoms
- More years of peer support experience were beneficial to service users in reducing generalized anxiety symptoms and loneliness