Different types of depression literacy and their impacts on reducing personal stigma towards late-life depression in older adults: results from a pre-and-post intervention study

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Different types of depression literacy and their impacts on reducing personal stigma towards late-life depression in older adults: Results from a pre-and-post intervention study

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Abstract

Personal stigma towards late-life depression, a barrier to help-seeking for older adults, may be reduced by improved depression literacy. This study adopted a pre-and-post-test design to investigate the relationships between types of depression literacy and stigma reduction. We recruited 976 older adults aged greater than or equal to fifty for a mental wellness education programme. The results of paired *t*-tests showed that the education programme improved participants' depression literacy and reduced personal stigma. Their knowledge about symptoms ($t = 9.10$, $P < .01$) and facts ($t = 3.05$, $P < .01$) of depression were improved, while the myths of depression ($t = -6.05$, $P < .01$), stereotypes ($t = -9.47$, $P < .01$), prejudice ($t = -6.66$, $P < .01$), and discrimination ($t = -5.60$, $P < .01$) to

late-life depression were reduced. We explored the change mechanism between depression literacy and personal stigma by multivariate regression analyses using residual scores. The significant association between depression literacy and personal stigma at baseline was not surprising. After the intervention, we found that enhanced knowledge about symptoms predicted decreased stereotypes ($\beta = -0.13$, $P < .01$). The decreased myths about depression contributed to the reduced stereotype significantly ($\beta = 0.18$, $P < .01$). Knowing more facts predicted increased prejudice ($\beta = 0.08$, $P < .05$). Future prevention and intervention for depression stigma may focus on knowing more about symptoms, interpreting facts cautiously, and debunking myths about depression.

Keywords: stigma; depression; older adults; mental health literacy.

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Introduction

Late-life depression, occurring at the age of fifty or older (Büchtemann et al. 2012), is a common mental health problem with a global prevalence as high as 35.1 percent (95% CI, 30.2%–40.4%) (Cai et al. 2023). The prevalence of depression rate among Chinese older adults is approximately 20.0 percent (95% CI, 17.5%–22.8%), with a higher prevalence in females, singles, and care home residents (Tang, Jiang, and Tang 2021, 2022). Late-life depression is often underdiagnosed without proper treatments (Wilson et al. 2001; Vieira, Brown, and Raue 2014; Pocklington 2017), which may result in physical health problems, cognitive decline, functional impairment, and increased suicide risks in older adults (Sun et al. 2012; Clouston et al. 2013; Verhoeven et al. 2018; Birk et al. 2019). Timely detection and intervention are essential (Wilson et al. 2001; Vieira, Brown, and Raue 2014; Pocklington 2017), yet many individuals do not seek help despite the availability of effective treatments (Magaard et al. 2017). Personal stigma towards depression serves as a significant barrier to seeking and adhering to treatment, as older adults may struggle to acknowledge their symptoms and access appropriate care (Conner et al. 2010; Corrigan et al. 2012; Hall and Reynolds 2014; Colligan et al. 2020).

Stigma encompasses stereotypes, prejudice, and discrimination, indicating its cognitive, affective, and behavioural dimensions according to the social-cognitive model (Corrigan 2000; Fox et al. 2018). Stereotype involves negative beliefs, prejudice entails adverse emotions, and discrimination is the resulting behaviour (Rüsch, Angermeyer, and Corrigan 2005). Public stigma reflects the general public's view (Pedersen and Paves 2014), while personal stigma refers to an individual's disapproval of depression and viewing persons with depression as socially undesirable (Griffiths et al. 2006; Latalova, Kamaradova, and Prasko 2014). Personal stigma differs from self-/internalized stigma,

which focuses on how persons with depression perceive themselves or accept external negative beliefs (Latalova, Kamaradova, and Prasko 2014). Manifestations of personal stigma include perceiving depression as a personal weakness, fearing unpredictability and displaying avoidance behaviours (Reavley and Jorm 2012). Socio-demographic factors like age, gender, education, and anxiety levels influence stigma towards depression (Dinos et al. 2004; Ansari et al. 2008; Stickney et al. 2012). Reducing stigma may encourage self-discourse and help-seeking in older adults with depression (Tieu and Konnert 2014; Henderson et al. 2017).

Two main approaches to reducing the personal stigma of depression are mental health literacy and interpersonal contact with older adults (Couture and Penn 2003; Thornicroft et al. 2016; Yin et al. 2020). Direct and indirect interpersonal contacts reduce stigma effectively, especially in discriminatory behaviour (Corrigan et al. 2012). Mental health literacy education is a fundamental component of successful contact-based interventions and many anti-stigma campaigns (Brijnath et al. 2016; Thornicroft et al. 2016; Larkings and Brown 2018; Jorm 2020), although its impact on behavioural change may vary (Thornicroft et al. 2016; White and Casey 2017; Yin et al. 2020; Azman et al. 2023). The mixed evidence may be attributed to the variability of defining mental health literacy across studies, focusing on different aspects like causes, symptoms, treatments, and psychosocial interventions (Yokoya et al. 2018; Singh, Zaki, and Farid 2019; Spiker and Hammer 2019; Doll et al. 2022). It challenges the synergy of the evidence for investigating the working mechanisms of reducing stigma.

Depression literacy refers to the knowledge or beliefs about recognizing, preventing, and intervening in depression (Jorm 2000; Coles et al. 2016). Specific knowledge types or how it is framed may affect stigma differently. Understanding the causes through a biological or genetic lens can decrease individuals' blameworthiness or responsibility for their illness (Schomerus et al. 2012; Kvaale, Gottdiener, and Haslam 2013; Lebowitz 2019) while also potentially reinforcing stereotypes of unpredictability, dangerousness, and low likelihood of recovery (Haslam 2015; Lebowitz 2019). Recovery-oriented messages emphasizing the person over the disease contribute to stigma reduction (Clement et al. 2010). Research on depression literacy in adolescents showed the importance of knowledge on recognizing depression and help-seeking in reducing stigma towards depression (Chisholm et al. 2016; Singh, Zaki, and Farid 2019). Age-related differences have been noted in literacy education, with older adults (age $\geq$70) being less adept at recognizing symptoms, while adults (age $\leq$55) mastered knowledge about depression better (Farrer et al. 2008; Yokoya et al. 2018). There is a gap in research examining the connection between knowledge types and the various dimensions of stigma towards depression.

The Mental Health First Aid (MHFA) was to equip community members with knowledge and skills to offer initial support to persons with mental problems before receiving professional help (Kitchener and Jorm 2008). Widely used in over twenty-two countries, the standard MHFA training covers various mental problems and crisis management, while the youth version adds a focus on eating disorders (Hadlaczky et al. 2014; Morgan, Ross, and Reavley 2018). Mental illnesses in older adults can be precipitation and perpetuation of chronic medical conditions in the ageing process, such as 'pseudodementia' and 'vascular depression', presenting more somatic symptoms (Wuthrich, Johnco, and Wetherell 2015; Devita et al. 2022). The older adult version addresses common mental problems in late life, cognitive impairment and delirium replacing substance abuse, and barriers to seeking help (The Mental Health Association of Hong Kong 2024a). While the standard and youth versions have shown effectiveness in improving mental health literacy, reducing related stigma, and increasing supportive behaviours, evidence on the efficacy of the older adult version is limited (Svensson and Hansson 2017; Morgan, Ross, and Reavley 2018; Morgan et al. 2020). Research on the influence of knowledge types on reducing stigma in older adults should persist.

In a community-based mental health project ('JC JoyAge') (Liu et al. 2022), a mental health ambassador training program is developed to assist social workers in providing preventive care or early interventions for older adults at risk of or with depressive symptoms. Previous research has indicated that Chinese people lacked knowledge about the causes, treatments, and prevention of mental illnesses (Yang et al. 2020; Yin et al. 2020). They tended to believe that persons with depression should bear more responsibility for their condition than those experiencing psychotic syndromes (Lee et al. 2016). Although the training adapted from the older adult version of MHFA (The Mental Health Association of Hong Kong 2024b), it emphasizes the causes, symptoms, and effective interventions for late-life depression like physical exercise and psychosocial interventions (Karlin et al. 2013; Chen et al. 2021). Other mental health problems and evidence-based interventions are mentioned to a lesser extent. In Chinese communities, 'face' signifies one's moral status, and being diagnosed with a mental health disorder and seeking help are often seen as the loss of face for both individuals and families (Yang 2007). The training highlighted the 'face-saving' culture in mental health help-seeking and participants' awareness of their stigmatizing effects. Besides, it used experiential learning methods and a 3-h service briefing session to help participants apply their learning to practice. Participants completed a 15-h training over four weeks and received a training manual with supplementary notes.

This study aims to (1) examine the effects of a designated training programme on increasing depression literacy and reducing personal

stigma in older adults and (2) investigate the relationship between knowledge type and dimensions of personal depression stigma. Specifically, we examined whether changes in any knowledge type would affect changes in different dimensions of stigma. A better understanding of the change mechanism of the training intervention improving depressional literacy is necessary to inform better intervention design and reduce personal stigma among older adults.

Method

Participants

This study adopted a pre-and-post-test design with a sample of 976 older adults enrolled in the ambassador training programme provided by clinical psychologists and social workers. Participants were recruited from community aged care centres in twelve districts of Hong Kong. Social workers screened applications against the inclusion criteria, (1) aged fifty years or above, (2) having no or only mild depressive symptoms (i.e. Patient Health Questionnaire-9, PHQ-9 score $\leq$9) (Cheng and Cheng 2007; Wang et al. 2014; Urtasun et al. 2019), (3) having risk factors for depression (e.g. number of chronic illnesses $\geq$4, loss of spouse within past two years) (Maier et al. 2021; Devita et al. 2022), and (4) being able to communicate in Cantonese and read or write in Chinese. The exclusion criteria were (1) a known history of autism, intellectual disability, schizophrenia-spectrum disorder, bipolar disorder, Parkinson's disease, or dementia/significant cognitive impairment, and (2) more severe than mild depressive symptoms.

Data collection

The Human Research Ethics Committee at the University of Hong Kong approved the study (Reference No.: EA2004028). Consented participants were required to complete the assessments before (T_0) and after the four-week training (T_1) through a self-administered questionnaire. Data were collected between May and December 2020.

Measures

Depression literacy was measured by the Knowledge of Late-life Depression Scale-revised (KLLD), a ten-item scale that includes symptoms of depression, facts about depression, and myths about depression (Davison et al. 2009; Karantzas et al. 2012). Cronbach's α for the three subscales was 0.70–0.75 (Karantzas et al. 2012), which is fairly good in

education science (Taber 2018). The mean sum score for each subscale indicates a command of knowledge about depression. Higher scores indicate a better command of knowledge, except for the myths subscale, in which lower scores indicate fewer myths about depression. We used the Chinese version of KLLD, which went through a standard forward and backward translation followed by experts' reconciliation and content validity evaluation.

The personal stigma of depression was measured by the Depression Stigma Scale-Personal Stigma Subscale (DSS-personal), and higher sum scores indicate more significant stigma (Griffiths et al. 2004). As stigma is culturally sensitive, adaptation is necessary to fit in the socio-political context in East and Southeast Asia. Subramaniam et al. (2017) omitted the item 'I would not vote for a politician if I knew they had been depressed', and our adapted version changed the item to 'I would not like my children to be looked after by a person I knew had been depressed' (Yang et al. 2020). The Chinese version of the personal stigma subscale demonstrates good internal consistency (Cronbach's $\alpha = 0.71$) with test-retest reliability of 0.90 (Yang et al. 2020). Leung et al. (2023) further validated the three-factor personal stigma scale in older Chinese people, including stereotype, prejudice, and discrimination.

The Generalized Anxiety Disorder Scale-7 item scale (GAD-7) measures anxiety levels with good reliability (Cronbach's $\alpha = 0.89$). The total scores range from 0 to 21, and higher scores indicate a higher level of anxiety (Tong et al. 2016).

Statistical analyses

Descriptive statistics describe the sample characteristics and baseline estimates of knowledge and stigma. The dropout rate was 10.3 percent. Little's MCAR tests were conducted for the missing patterns (see Supplementary Tables 2 and 3). The independent-sample *t*-tests and χ^2 tests were conducted to compare the sample characteristics between cases completing the assessments at T_1 and dropouts (see Supplementary Table 1). The complete case analyses were adopted for paired *t*-tests and multivariate regressions. Paired *t*-tests tested changes in participants' depression literacy and personal stigma of depression. Multivariate regression analyses tested the relationships between the knowledge types and stigma dimensions. The unstandardized residual change score computed by T_1 scores regressed on T_0 was used to indicate the changes in knowledge and stigma (Mattes and Roheger 2020). Regression analyses using the unstandardized residual change scores tested the associations of their changes. Covariates included age, gender, education, marital status, employment, personal and family history of mental illnesses, anxiety level, and residential district. The dummy variables were created for the

covariates with three levels or above. *P*-value <.05 indicates the statistical significance. All analyses were conducted in SPSS 27.0.

Results

Characteristics of participants

The mean age of 976 participants was 64.82 ($SD = 7.27$), with 80.3 percent female, 83.6 percent completing secondary or tertiary education, and 85.1 percent not employed (see Table 1). More than 50 percent lived with a marital partner, and 30 percent of participants or their family members had experienced depression or other mental problems. Anxiety level was low (mean = 1.48, $SD = 2.40$, range: 0–21). Except for

Table 1. Sample characteristics at baseline ($N = 976$).

	N (%)/Mean (SD)
Age (years, 50–94)	64.82 (7.27)
Gender (female)	784 (80.3%)
Educational level	
Primary education or below	160 (16.4%)
Secondary education	598 (61.3%)
Tertiary education or above	218 (22.3%)
Marital status[a]	
Single	161 (16.5%)
Married	562 (57.6%)
Separated/divorced/widowed	252 (25.8%)
Employment[b]	
Full-/part-time employment	145 (14.9%)
Retired/not in employment	829 (85.1%)
Self or family member's mental illness history[a]	
Yes	323 (33.1%)
No	652 (66.9%)
Anxiety (GAD-7, 0–21)[a]	1.48 (2.40)
Districts in Hong Kong	
Central and Western	56 (5.7%)
Wan Chai	80 (8.2%)
Southern	55 (5.6%)
Sham Shui Po	138 (14.1%)
Wong Tai Sin	82 (8.4%)
Kwun Tong	126 (12.9%)
Kwai Tsing	113 (11.6%)
Tsuen Wan	58 (5.9%)
Yuen Long	65 (6.7%)
Tai Po	21 (2.2%)
Sai Kung	104 (10.7%)
North	78 (8.0%)

Note: GAD-7, Generalized Anxiety Disorder.
[a]$n = 975$.
[b]$n = 974$

residential districts, there were no significant differences in other demographic characteristics between the completed cases ($N = 875$) and dropouts ($N = 101$) at T_1 (see Supplementary Table 1).

Associations between depression literacy and personal stigma at baseline

Controlling for covariates, we found positive associations of myths of depression with stereotypes ($\beta = 0.23$, $P < .01$), prejudice ($\beta = 0.17$, $P < .01$), and discrimination ($\beta = 0.14$, $P < .01$). More knowledge about symptoms of depression was associated with lower levels of stereotypes ($\beta = -0.07$, $P < .05$) and discrimination ($\beta = -0.10$, $P < .01$). More knowledge about the facts of depression was associated with a higher level of prejudice ($\beta = 0.11$, $P < .01$). Age was positively associated with personal stigma across all dimensions. Participants with a lower education level or in employment held the stereotypes at a higher level. Male participants or those who had completed tertiary education displayed lower levels of prejudice towards depression. Participants who were more anxious or had no personal or family history of mental illnesses exhibited higher levels of discrimination towards depression. Anxiety levels were positively associated with discrimination towards depression (see Table 2 for more details). The cluster effect caused by the residential district did not substantially affect participants' personal stigma.

Changes in knowledge and personal stigma of depression after training

After training, participants' depression literacy significantly improved, and personal stigma was reduced (see Table 3). Participants gained more knowledge about symptoms ($t = 9.10$, $P < .01$) and facts ($t = 3.05$, $P < .01$) and believed fewer myths about depression ($t = -6.05$, $P < .01$). The stereotypes ($t = -9.47$, $P < .01$), prejudice ($t = -6.66$, $P < .01$), and discrimination ($t = -5.60$, $P < .01$) towards late-life depression all reduced.

Associations between changes in depression literacy and changes in personal stigma

Improved knowledge about symptoms ($\beta = -0.13$, $P < .01$) and reduced myths ($\beta = 0.18$, $P < .01$) about depression predicted the reduction of stereotypes of depression ($R^2 = 0.13$, $P < .01$) (see Table 4). Conversely, improved facts about depression ($\beta = 0.08$, $P < .05$) predicted an increase in prejudice toward depression ($R^2 = 0.06$, $P < .01$).

Table 2. Association between depression literacy and personal stigma of depression at baseline ($N = 974$).

Predictors	Baseline scores of personal stigma (DSS-personal)					
	Stereotype		Prejudice		Discrimination	
	B (SE)	β	*B* (SE)	β	*B* (SE)	β
Types of depression literacy at baseline (KLLD)						
Symptoms of depression	−0.26 (0.12)	−0.07*	−0.05 (0.13)	−0.01	−0.51 (0.19)	−0.10**
Myths of depression	0.78 (0.11)	0.23**	0.57 (0.12)	0.17**	0.65 (0.17)	0.14**
Facts about depression	0.04 (0.15)	0.01	0.50 (0.16)	0.11**	−0.07 (0.23)	−0.01
Covariates						
Age (years)	0.03 (0.01)	0.13**	0.03 (0.01)	0.13**	0.04 (0.01)	0.13**
Sex (ref: male)	−0.2 (0.13)	−0.05	0.33 (0.13)	0.09*	−0.04 (0.19)	−0.01
Education (ref: primary school or below)	–	–	–	–	–	–
Secondary education	−0.56 (0.14)	−0.18**	−0.29 (0.15)	−0.09	−0.15 (0.21)	−0.03
Tertiary education or above	−1.08 (0.18)	−0.29**	−0.42 (0.19)	−0.11*	−0.13 (0.27)	−0.02
Marital status (ref: married)	–	–	–	–		
Single	−0.18 (0.13)	−0.04	−0.09 (0.14)	−0.02	0.25 (0.20)	0.04
Separated/Divorced/Widowed	0.06 (0.12)	0.02	−0.16 (0.13)	−0.04	0.27 (0.18)	0.05
Employment (ref: no)	0.39 (0.15)	0.09**	0.17 (0.16)	0.04	−0.02 (0.22)	0.00
Self or family member's mental illness history (ref: no)	−0.08 (0.11)	−0.02	−0.05 (0.12)	−0.02	−0.46 (0.16)	−0.10**
Anxiety (GAD-7)	−0.02 (0.02)	−0.03	0.00 (0.02)	0.00	0.11 (0.03)	0.12**
Districts in Hong Kong (ref: Western and Central)	–	–	–	–	–	–
Wan Chai	−0.48 (0.26)	−0.09	0.27 (0.28)	0.05	0.06 (0.39)	0.01
Southern	−0.63 (0.28)	−0.10*	0.10 (0.30)	0.02	0.20 (0.42)	0.02
Sham Shui Po	−0.27 (0.24)	−0.06	0.18 (0.25)	0.04	0.16 (0.36)	0.03
Wong Tai Sin	−0.07 (0.26)	−0.01	0.25 (0.28)	0.04	0.22 (0.39)	0.03
Kwun Tong	−0.29 (0.25)	−0.06	0.38 (0.27)	0.07	0.40 (0.38)	0.06
Kwai Tsing	−0.25 (0.25)	−0.05	−0.04 (0.26)	−0.01	0.27 (0.37)	0.04
Tsuen Wan	−0.45 (0.28)	−0.07	0.08 (0.30)	0.01	0.18 (0.42)	0.02
Yuen Long	0.22 (0.27)	0.04	0.22 (0.29)	0.04	−0.28 (0.40)	−0.03
Tai Po	0.20 (0.38)	0.02	0.02 (0.40)	0.00	−0.73 (0.56)	−0.05
Sai Kung	−0.55 (0.25)	−0.11*	0.10 (0.27)	0.02	0.32 (0.38)	0.05
North	−0.25 (0.26)	−0.04	0.11 (0.28)	0.02	0.51 (0.40)	0.06
	$R^2 = 0.19$, $F = 8.416$**		$R^2 = 0.10$, $F = 3.977$**		$R^2 = 0.10$, $F = 3.898$**	

Note: β, standardized coefficient; B, unstandardized coefficient; DSS-personal, personal stigma subscale of Depression Stigma Scale; GAD-7, Generalized Anxiety Disorder; KLLD, Knowledge of Late-Life Depression Scale.
*$P < .05$.
**$P < .01$.

Discussion

As far as the authors are aware, this is the first study to explore the impact of various types of depression literacy acquired by older adults on stigma reduction across different dimensions. The findings highlight the usefulness of this education programme, as it led to improvements in all aspects of depression literacy and a reduction in personal stigma among older adults. The result on the associations between depression literacy

Table 3. Paired *t*-test results of depression literacy and personal stigma of depression before and after training.

Outcome variables	*N*	Mean (SD)		Paired *t*-test (baseline vs post-test)		
		Baseline	Post-test (4 weeks after)	MD (SD)	95% CI	t
Types of depression literacy (KLLD)						
Symptoms of depression (1–4)	875	2.79 (0.42)	2.94 (0.51)	0.16 (0.51)	[0.12, 0.19]	9.10**
Myths of depression (1–4)	875	2.56 (0.46)	2.45 (0.50)	−0.11 (0.53)	[−0.14, −0.07]	−6.05**
Facts about depression (1–4)	875	2.79 (0.35)	2.83 (0.38)	0.05 (0.43)	[0.02, 0.08]	3.05**
Personal stigma of depression (DSS-personal)						
Stereotype (0–8)	871	3.09 (1.54)	2.58 (1.55)	−0.51 (1.60)	[−0.62, −0.41]	−9.47**
Prejudice (0–8)	874	4.10 (1.56)	3.69 (1.65)	−0.41 (1.81)	[−0.53, −0.29]	−6.66**
Discrimination (0–16)	875	5.59 (2.20)	5.17 (2.39)	−0.42 (2.21)	[−0.57, −0.27]	−5.60**

Note: CI, confidence interval; DSS-personal, personal stigma subscale of Depression Stigma Scale; GAD-7, Generalized Anxiety Disorder; KLLD, Knowledge of Late-Life Depression Scale; MD, mean difference; SD, standard deviation.
*$P < .05$.
**$P < .01$.

and personal stigma is consistent with prior research (Griffiths et al. 2008; Wang and Lai 2008; Corrigan et al. 2012; Yin et al. 2020), but the study further revealed that not all types of depression literacy were equally effective in reducing the personal stigma of depression.

Myths about depression are crucial in depression literacy, having a notable impact on the personal stigma of depression in older adults. Myths were the only type of depression literacy associated with all dimensions of personal stigma, including stereotypes, prejudice, and discrimination. In our study, we found that older adults who held more myths about depression were more likely to incorrectly attribute certain life events in old age, such as the loss of a partner, decline in functioning, or transitioning to a care facility, as direct causes of depression. This inclination to generalize these events as definitive triggers for late-life depression may result in neglecting other potential contributors to depression, such as genetic, interpersonal, and environmental factors (Khalsa et al. 2011) and potentially intensify ageism (Bai, Lai, and Guo 2016). Those who internalize these myths as truths may start associating depression with personal frailty due to ageing and be unaware of their own biases. Once irreversible ageing was viewed as a primary cause, late-life depression would become inevitable. The biased perception (i.e. stereotypes) can lead to unfounded judgments about older adults with depression (i.e. prejudice) and avoidance or neglect at the behavioural end (i.e. discrimination). Correcting misconceptions by contrasting myths with factual information is the common strategy of educational programmes to reduce reliance on stereotypes (Corrigan et al. 2012; Thornicroft et al. 2016). Indeed, our study also found that resolving the myths of depression demonstrates their potent effects on

Table 4. Associations between changes in depression literacy and changes in the personal stigma of depression.

Predictors	Residual change scores of personal stigma (DSS-personal)					
	Stereotype ($N = 871$)		Prejudice ($N = 874$)		Discrimination ($N = 875$)	
	B (SE)	β	*B* (SE)	*B*	*B* (SE)	β
Residual change scores of types of depression literacy (KLLD)						
Symptoms of depression	−0.38 (0.10)	−0.13**	−0.05 (0.12)	−0.02	−0.24 (0.15)	−0.06
Myths of depression	0.52 (0.10)	0.18**	0.18 (0.12)	0.05	0.19 (0.15)	0.04
Facts about depression	0.08 (0.13)	0.02	0.35 (0.15)	0.08*	0.04 (0.20)	0.01
Covariates						
Age (years)	0.02 (0.01)	0.12**	0.03 (0.01)	0.14**	0.04 (0.01)	0.16**
Sex (ref: male)	0.07 (0.12)	0.02	0.05 (0.13)	0.01	0.23 (0.17)	0.05
Education (ref: primary school or below)	–	–	–	–	–	–
Secondary education	−0.12 (0.13)	−0.04	−0.22 (0.15)	−0.07	−0.41 (0.19)	−0.10
Tertiary education or above	−0.49 (0.17)	−0.15**	−0.43 (0.19)	−0.11*	−0.89 (0.24)	−0.18**
Marital status (ref: married)	–	–	–	–	–	–
Single	0.14 (0.12)	0.04	0.10 (0.14)	0.02	0.04 (0.18)	0.01
Separated/divorced/widowed	0.05 (0.11)	0.02	0.13 (0.13)	0.04	0.13 (0.16)	0.03
Employment (ref: no)	−0.02 (0.13)	−0.01	0.22 (0.15)	0.05	0.09 (0.20)	0.02
Self or family member's mental illness history (ref: no)	−0.05 (0.10)	−0.02	−0.06 (0.12)	−0.02	−0.05 (0.15)	−0.01
Anxiety (GAD-7)	−0.01 (0.02)	−0.01	0.05 (0.02)	0.07	−0.01 (0.03)	−0.02
Symptoms of depression at baseline	−0.30 (0.12)	−0.09*	−0.04 (0.13)	−0.01	−0.37 (0.17)	−0.08
Myths of depression at baseline	0.41 (0.11)	0.14**	0.03 (0.12)	0.01	−0.07 (0.21)	−0.01
Facts about depression at baseline	0.09 (0.14)	0.02	−0.31 (0.16)	−0.07	0.24 (0.16)	0.05
Stereotype at baseline	−0.13 (0.03)	−0.15**	–	–	–	–
Prejudice at baseline	–	–	−0.03 (0.03)	−0.03	–	–
Discrimination at baseline	–	–	–	–	−0.07 (0.03)	−0.08
R^2	0.13		0.06		0.09	
F for R^2	7.83**		3.65**		5.66**	

Note: β, standardized coefficient; B, unstandardized coefficient; DSS-personal, personal stigma subscale of Depression Stigma Scale; GAD-7, Generalized Anxiety Disorder; KLLD, Knowledge of Late-Life Depression Scale; Residual change scores, unstandardized residual scores computed by regressing post-test scores on baseline scores; SE, standard error.
*$P < .05$.
**$P < .01$.

reducing stereotypes towards depression but not changing stigmatizing attitudes (i.e. prejudice) or behaviours (i.e. discrimination) in older adults.

The relationship between increasing knowledge about symptoms of depression and changes in stereotypes, prejudice, and discrimination followed a similar pattern to that of correcting myths. Knowledge about symptoms of depression was related to both stereotypes and discrimination, but its increase only contributed to the decrease in stereotypes. Knowledge about symptoms of depression includes insomnia, fatigue, and

loss of interest, which are essential for a diagnosis of depression (Davison et al. 2009; Karantzas et al. 2012). Equipped with this type of knowledge, older adults can recognize depression and differentiate the disease from persons per se (Wang and Lai 2008). The known enhances a sense of control over the uncertainty it creates, which in turn may encourage change in discriminatory behaviours and even provide help for those in need (Corrigan, Larson, and Kuwabara 2007; Muschetto and Siegel 2019; Foster and O'Mealey 2022). While improving knowledge about the symptoms of depression can raise awareness of depression as a disease and modify stereotypes towards older adults with depression, there may be a saturation point where the benefits of acquiring knowledge of symptoms reach a limit, resulting in a more restricted impact on prejudice and discrimination. Alternatively, collectivist culture might contribute to the attenuated effect of knowledge in reducing stigma because, in such cultures, people are more interdependent and have more straightforward ideas of what the norms are (Papadopoulos, Foster, and Caldwell 2013). Those who deviate from the norms are more likely to be identified and isolated, and gaining knowledge is less likely to change more deeply rooted cultural influences. Enhancing empathetic understanding through intergroup contact to reduce anxiety or fear caused by the perceptions of dissimilarity and threats appears more likely to minimize prejudice or discrimination (Paluck and Green 2009; Tausch and Hewstone 2010; Gloor and Puhl 2016).

Contrary to our counterintuition, not all gains in factual information about depression produce lower personal stigma in older adults. While correcting myths and understanding symptoms were associated with reduced stereotypes, increased knowledge of facts could lead to heightened prejudice. The facts about late-life depression in this study focused on the uniqueness of late-life depression, such as 'somatic presentation of depression in older adults', 'depression is a common mental health issue for older adults living in long-term care facilities', and 'underdetection of depression in older adults'. Awareness of these facts, which could induce worries and perceived threats in older adults, is significantly associated with prejudice (Greenaway et al. 2014). The impact of facts about depression on personal stigma in older adults may rely on the subjective interpretations affected by their values, experiences, and contexts. In addition to simply increasing the amount of factual information about depression, the way in which these facts are interpreted is crucial. The interpretation of these facts can shape individuals' beliefs and may contribute to the formation of stereotypes about depression (Doll et al. 2022). Therefore, emphasizing the importance of guiding the interpretation of factual information should be a key focus of literacy education. Understanding somatic presentations, underdetection, and the prevalence of late-life depression in care homes should not be seen as

indicating significant hidden risks for the public. Instead, this knowledge can serve as a signal for older individuals to seek help and support.

The ambassador training programme, which was adapted from the older adult version of MHFA, has the potential to tackle the challenges and concerns of reducing personal stigma towards late-life depression in older adults. Individuals who were older or received less education had more personal stigma, which could be attributed to their lack of knowledge; females and those with higher levels of anxiety who easily sensed threats tended to hold a more stigmatizing attitude or behaviour towards depression (Dinos et al. 2004; Griffiths, Christensen, and Jorm 2008; Holzinger et al. 2012). Age and education were the most important demographic factors associated with stigma reduction. The customized programme highlighted age-appropriate messaging in mental health training and adapted the content to suit the specific context, such as age and culture, and to enhance its relevance for older adults. Through interactive elements and experiential learning (Farrer et al. 2008; Brijnath et al. 2016), literacy education can become more accessible and easily understood by older individuals. Both content adaptation and engagement design in training delivery potentially improve literacy outcomes.

Implications

Older adults benefited from a community-based training programme to improve their mental health literacy and reduce stigma. The programme shows great potential to be scaled up and the possibility of involving more older adults in establishing a mental-health-friendly community. Instead of comprehensiveness, content relevancy is essential for mental health literacy education targeting older adults. A better understanding of knowledge type about depression and its relationships with stigma reduction can deliver the training efficiently to older adults rather than overwhelm them with an overload of information.

The categorization of knowledge about depression provides a framework for rethinking the rationale of knowledge gains, and the study findings may inform the direction of education of older adults on depression literacy. Increased knowledge about the symptoms and myths of depression could be emphasized to reduce the stereotypes. The acquisition of knowledge about symptoms of depression may enhance their capability to recognize depression and their sense of control. Identifying the myths and correcting those misperceptions replace the wrong perceptions with the right ones in older adults' minds. For older adults with a good knowledge of symptoms and who entertain no myths about depression, educators may not focus on helping them gain more facts about depression but pay attention to their interpretations of these facts. Pessimistic interpretations of the

facts may make them worried or fearful. Last but not least, educators need to acknowledge the limitations of knowledge acquisition in inducing empathetic understanding to reduce prejudice and discriminatory behaviours.

Limitations

This study had several limitations. First, participants were recruited for a local ambassador training programme to promote mental wellness, so they were better educated and had a higher awareness of stigma than older adults in general. Second, the study adopted a pre-and-post-test to examine the effectiveness of literacy education as participants engaged in learning from practice after the training. Future research may employ a follow-up design to investigate the sustained effects of such literacy education programmes. Third, as participants may have given favourable responses to questions, a self-administered questionnaire was administered to minimize social desirability bias. Fourth, we did not collect data on participants' socioeconomic status, a known factor related to personal stigma; future research may consider a more comprehensive list of covariates. Last, stigma is a culture- and context-specific construct, and all participants were older Chinese living in Hong Kong, a relatively well-developed area. Therefore, generalizing the study results to less well-educated or less socioeconomically advantaged populations or less well-developed contexts requires caution.

Conclusions

This study examined the relationship between improving depression literacy and reducing personal stigma in older adults through a perspective of knowledge type. Education programmes can engage older adults better and improve their depression literacy when the content is tailored and highly relevant for them. Increasing the volume of knowledge about symptoms, correcting misconceptions, and constructively interpreting the facts are three approaches in depression literacy education for older adults that may improve intervention effectiveness and promote their mental wellness.

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Supplementary data

Supplementary data is available at *British Journal of Social Work* online.

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Data availability

Data are available if the request is reasonable.

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