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Thwarted Belongingness and Depressive Symptoms Among Older Adults: The Moderating Roles of Self-Warmth, Self-Coldness, and Place of Residence

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ABSTRACT

Objectives: This study investigated whether the relationship between thwarted belongingness and depressive symptoms was moderated by self-warmth and self-coldness and whether the moderating effects were conditional on place of residence (urban versus rural).

Methods: A sample of 236 Australian adults aged 65 to 97 years ($M = 73.63$, $SD = 6.53$) completed the Geriatric Depression Scale, Interpersonal Needs Questionnaire, and Self-Compassion Scale.

Results: The interaction between thwarted belongingness and self-warmth was significant for urban but not rural older adults. For urban older adults, the relationship between thwarted belongingness and depressive symptoms weakened as levels of self-warmth increased. The association between thwarted belongingness and depressive symptoms was significantly stronger for older adults living in rural areas than in urban areas. The relationship between thwarted belongingness and depressive symptoms strengthened as self-coldness levels increased.

Conclusions: Self-warmth is a protective factor for older adults living in urban areas and experiencing thwarted belongingness. Self-coldness is an additional risk factor for older adults experiencing thwarted belongingness.

Clinical Implications: Interventions focusing on increasing self-warmth among urban older adults and decreasing self-coldness among older adults might weaken the relationship between thwarted belongingness and depressive symptoms.

KEYWORDS



Depressive symptoms; older adults; rural; self-coldness; self-compassion; self-warmth; thwarted belongingness; urban

The global occurrence of Major Depressive Disorder in older adults is at least 13.3%, with Australia having the highest prevalence (20.1%; Abdoli et al., 2022). This statistic, however, fails to include older adults who are not diagnosed with depression but have depressive symptoms that can impact their quality of life. Laborde Lahoz et al. (2014) found that subsyndromal depression (13.8%) is just as prevalent as Major Depressive Disorder (13.7%) in older adults. A recent meta-analysis of 48 studies that included measures of depressive symptoms found the global prevalence of depression was 28.4% among older adults (Hu et al., 2022), indicating a significant public health concern.

Place of residence

Research has identified a range of sociodemographic risk factors for depressive symptoms among older adults. Being female, older age, unpartnered, living

in residential care, and having lower levels of education and fewer financial resources have been associated with higher levels of depression among older adults (see Silva et al., 2022 for a review). One relatively understudied sociodemographic risk factor is place of residence, that is, whether one lives in an urban or rural area. Purtle et al.'s (2019) extensive review of the topic indicates older adults in urban areas may experience more depression from poor sleep quality due to artificial light, exposure to crime, and a lack of feeling safe. In contrast, they also provide reasons why urban older adults might experience less depression: public transport and walkable streets could enable social connection and physical exercise. Others have argued that place of residence may impact many facets of an individual's life, such as access to services, the number of available services, the size of social networks, social participation and engagement, and the presence of opportunities in the community (Carver et al., 2018). A scoping review found evidence that older

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adults in some rural areas faced barriers to social participation in their communities (Carver et al., 2018). However, there were also opportunities for social participation through volunteering and membership in community organizations.

Studies that have investigated urban and rural differences in depressive symptoms have found inconsistent results, and this may be due to the different countries in which the research has been conducted. A recent meta-analysis of 18 studies investigating rural-urban differences in Major Depressive Disorder and clinically significant depressive symptoms among older adults aged 60 years and older found that the prevalence of depression did not differ significantly between urban (10.2%) and rural (10.7%) residents (Purtle et al., 2019). Further analyses indicated that among studies conducted with older adults from developed countries, depression was higher among urban older adults (16.0%) than rural older adults (11.8%). In contrast, in developing countries, depression was higher among rural older adults (9.6%) than urban older adults (7.5%).

Thwarted belongingness

In addition to sociodemographic variables being associated with depressive symptoms among older adults, the presence/absence and quality of social relationships have been implicated (e.g., social isolation, loneliness, and sense of belonging). Thwarted belongingness encapsulates these constructs to reflect when the fundamental need to belong (Baumeister & Leary, 1995) is unmet (Van Orden et al., 2010). Thwarted belongingness reflects two factors: loneliness (a disconnection from others) and the lack of reciprocal caring relationships (Van Orden et al., 2010). Thwarted belongingness is pertinent to older adults as they tend to shrink their social networks as they age, desiring quality over quantity (English & Carstensen, 2014). Further, when loss occurs amidst a small social network, older adults may be less inclined, or able, to create new relationships. An individual with decreased mobility or health (Qiu et al., 2020), increased functional impairment (Mournet et al., 2020), or living in a rural area (Carver et al., 2018) may not have the resources to create new social relationships. Therefore, an

environment for unmet belongingness develops and becomes a risk factor for depressive symptoms. Thwarted belongingness (Guidry & Cukrowicz, 2016; Mournet et al., 2020) and associated constructs such as loneliness, social isolation (Smith & Victor, 2019), and low levels of sense of belonging (McLaren, 2020) have been associated with depressive symptoms among older adults.

Research investigating whether levels of thwarted belongingness or associated variables such as loneliness vary according to place of residence among older adults is limited (Victor & Rikhartova, 2020). There is evidence indicating that levels of loneliness are similar for older adults residing in rural and urban areas (Burholt & Scharf, 2014; Victor & Rikhartova, 2020). A study of Canadians aged 45–85 years found that living in an urban area was associated with social isolation (Menec et al., 2019). The authors suggested this difference was likely explained by the high percentage of older adults living in urban areas with a low income and the existence of socioeconomically deprived neighborhoods in urban areas. When such factors were taken into account, living in an urban area was no longer associated with higher levels of social isolation. While levels of loneliness among older adults are similar, risk factors for loneliness may vary by place of residence. For example, the association between poor health and fewer social resources was stronger for older adults living in rural areas than in urban areas and the interaction between health and place of residence impacted loneliness (Burholt & Scharf, 2014).

Interaction between thwarted belongingness and place of residence

In their systematic review of risk and protective factors for depression among older adults, Worrall et al. (2020) noted that few studies examined interaction effects and they did not investigate place of residence as a moderator. Purtle et al.'s (2019) meta-analysis examined interactions between place of residence and factors related to social isolation. Results indicated that social isolation factors (e.g., living alone, not having close friends) were significantly and independently related to depression among older adults living in rural areas but not in urban areas. This finding was evident in studies

conducted in developed and developing countries. Based on these findings, thwarted belongingness may be associated with depressive symptoms only in rural older adults. This proposition has yet to be tested.

Self-compassion

Given the robust relationship between thwarted belongingness and associated variables with depression, we must identify protective factors that weaken the association. Recent studies have begun to consider self-compassion as a protective factor for depressive symptoms among older adults (e.g., Gao et al., 2023; Hodgetts et al., 2021). Self-compassion captures being kind to oneself when difficult circumstances arise (K. Neff, 2003). It involves treating oneself with the same care, compassion, and concern that we express toward those we care about when they experience hardships (K. Neff, 2003). K. Neff's (2003) self-compassion theory uses six elements to operationalize self-compassion. The elements are in pairs consisting of a positive and negative component (self-kindness and self-judgment, common humanity and isolation, and mindfulness and over-identification). The positive components of self-compassion are self-kindness (caring about and respecting oneself without judgment), common humanity (being aware that events happen to everyone and we are not alone in the world), and mindfulness (being able to view a difficult situation in the present moment in a rational way). The negative components of self-compassion are self-judgment (an individual judges themselves in a harsh way), isolation (an individual believes they are the only person experiencing a negative event), and over-identification (one concentrates on only negative aspects of a difficult situation disproportionately). A systematic review of three studies indicated that self-compassion was related to lower levels of depressive symptoms among older adults, with a medium to strong effect (Brown et al., 2019).

Most research has used the Self-Compassion Scale which was created on the premise of having one factor: self-compassion (K. Neff, 2003). Due to its bipolar-like conceptualization, contemporary researchers have argued that using the total score

of self-compassion may not be the most accurate indicator of self-compassion (Muris & Petrocchi, 2016). Evidence indicates the presence of two factors; self-warmth (incorporating self-kindness, common humanity, and mindfulness) and self-coldness (incorporating isolation, self-judgment, and over-identification; Brenner et al., 2017). Muris and Petrocchi (2016) investigated the positive and negative indicators of self-compassion and found that the self-coldness indicators were more strongly associated with psychopathology than the self-warmth indicators. Similarly, research among a community sample of adults indicated self-coldness was a stronger predictor of depressive symptoms cross-sectionally and longitudinally over 12 months (López et al., 2018). In addition, it has been argued that using the total score of the self-compassion scale would likely result in an inflated score of self-compassion (Muris & Petrocchi, 2016) thus indicating the importance of using the two-factors.

One way that self-compassion might operate as a protective factor is by moderating the association between a risk and an outcome variable (Hollister-Wagner et al., 2001). A recent study investigated whether self-compassion weakened the relationship between loneliness and depressive symptoms among a sample of 323 older adults living in residential aged care (Gao et al., 2023). Results indicated that self-compassion moderated the effect of loneliness on depression. Specifically, loneliness was associated with depressive symptoms for older adults with low and average levels of self-compassion, but not with high levels of self-compassion. As the study used the total self-compassion score rather than the two-factor structure, the protective role of self-compassion may be overinflated. It is unknown whether self-warmth will weaken and self-coldness will strengthen the association between thwarted belongingness and depressive symptoms among older adults.

The present study

This present study aimed to investigate the differences between rural and urban living older adults on their levels of thwarted belongingness, self-warmth, self-coldness, and depressive symptoms. It also aimed to investigate whether self-warmth,

self-coldness, and place of residence moderated the relationship between thwarted belongingness and depressive symptoms among older adults. An exploratory aim was to explore whether the moderating effects of self-warmth and self-coldness were conditional on place of residence. It was hypothesized that self-warmth would weaken the relationship between thwarted belongingness and depressive symptoms and that self-coldness would strengthen the relationship between thwarted belongingness and depressive symptoms. It was also hypothesized that place of residence would moderate the association between thwarted belongingness and depressive symptoms, such that the relationship would be significant only for older adults living in rural areas.

Method

Participants

A total of 236 community-dwelling older adults living in Australia completed the survey. The participants were recruited both online and in a physical setting. Online, participants were recruited using a paid advertisement on Facebook along with Facebook posts shared in community groups, and via the snowball technique. Participants were recruited also through flyers that were placed in local cafes and libraries. Retirement villages were also contacted and visited to obtain participants, whereby surveys were left and later collected. All participants gave informed consent.

Measures

Demographic questions

The participants were asked about their age, country of residence, living arrangements, postcode, gender, sex, sexual orientation, relationship status, ethnicity, education level, employment status, volunteer engagement, income, and perceived health.

Geriatric depression scale (short form)

The Geriatric Depression Scale (Short Form) is a 15-item scale that measures depressive symptoms in older adults (Sheikh & Yesavage, 1986). Participants answered each question using a *yes* or

no response. Items 1, 5, 7, 11, and 13 were reverse scored before calculating a total score. Scores of ≥ 6 indicate a possibility of depression. The Geriatric Depression Scale in its short form has excellent internal consistency ($\alpha = .92$), and internal and external validity (Durmaz et al., 2018). The internal consistency of this scale in the present sample was excellent ($\alpha = .90$).

Interpersonal needs questionnaire

The Interpersonal Needs Questionnaire is a 15-item scale that measures thwarted belongingness and perceived burdensomeness (Van Orden et al., 2012). For each question, participants were asked to indicate how true a particular statement was for them. Response choices ranged from *not at all true for me* (1) to *very true for me* (7). Items 7, 8, 10, 13, 14, and 15 were reverse coded. Higher scores indicated higher levels of perceived burdensomeness and thwarted belongingness. For the present study, only the scores for thwarted belongingness were analyzed. Studies have found the scale to have concurrent and predictive validity among older adults, as well as excellent internal consistency ($\alpha = .93$; Van Orden et al., 2012). The internal consistency of this scale in the present sample was excellent ($\alpha = .94$).

Self-compassion scale

The Self-Compassion Scale is a 26-item scale that measures the presence of self-warmth and self-coldness (K. D. Neff, 2003). For each question, participants were asked to indicate how often they behaved in the stated manner. Response choices included *almost never* (1) to *almost always* (5). Scores were calculated for self-warmth and self-coldness, with higher scores indicating higher levels of each variable. High internal consistency has been shown in a sample of adults for self-warmth ($\alpha = .86$) and self-coldness ($\alpha = .90$) (López et al., 2018). The internal consistency of both subscales in the present sample was excellent (self-warmth $\alpha = .91$; self-coldness $\alpha = .94$).

Procedures

The study was approved by the Charles Sturt University Human Research Ethics Committee under protocol number H23607 to collect data for

two Honours student projects (first and third authors). The study comprised an online self-report survey on Qualtrics®, as well as a hardcopy survey. All participants initially read a participant information statement that described the study (that it was investigating the relationship between sleep, interpersonal needs, and well-being among older adults) and what participation would involve. Participants completing the online survey gave informed consent by selecting *yes* or *no* when prompted. Selecting *yes* took them to the survey. Participants completing the hard copy gave informed consent by completing the survey and returning it to the research team. Participants answered the demographic questions. They were then presented with the three scales (and the Insomnia Severity Index, Morin, 1993, which was used in the second study) in a randomized order.

Of the 275 participants who started the survey, 215 were undertaken online and 60 were undertaken in hard copy form. Of the 215 online participants, 176 completed the survey, indicating an 82% response rate. A total of 95 hard copies were distributed, of which 60 were returned. One of these was not completed, indicating a 62% response rate.

Data analysis

As there is an established association between particular sociodemographic variables with depressive symptoms among older adults, the demographic variables of age, gender, race, relationship status, living arrangements, income, and perceived health (Qiu et al., 2020) were controlled for when analyzing the data. The Modified Monash Model (Australian Government Department of Health, 2021) was used to categorize each participant's postcode as urban or rural. Using this system, participants categorized as "urban" resided in metropolitan areas, incorporating major cities and accounting for 70% of Australia's population. All other participants were categorized as "rural," as the relatively small sample size precluded using categories such as regional and remote.

Descriptive statistics were computed to describe the demographic data of the sample. Bivariate and partial correlations were computed between all measures to examine the relationships between

the independent, dependent, and moderating variables.

Using model three in the PROCESS macro version 4.2 (Hayes, 2022), the moderated moderation analysis was conducted using the SPSS program. The moderated moderation analyses were conducted to explore the association between thwarted belongingness and depressive symptoms with self-warmth or self-coldness, and place of residence as moderator variables. All scores used in the interaction terms were mean-centered. During the analyses 10,000 bootstrapping was utilized as well as 95% confidence intervals (CI). Statistical significance for interaction terms was determined by using CIs that did not contain a zero. Significant interactions were further analyzed using model one of the PROCESS macro (Hayes, 2022). For these interactions, simple slopes analyses were used to investigate significant conditional effects at one standard deviation below, at, and one standard deviation above the mean.

Results

Descriptive analyses

The sample consisted of 175 women (74.2%) and 61 men aged 65 to 97 years ($M = 73.63$; $SD = 6.53$). Most of the participants were White ($n = 228$, 96.6%) and heterosexual ($n = 211$, 89.4%). As seen in Table 1, approximately half

Table 1. Demographic characteristics of the sample.

Variable	<i>n</i>	%
Place of Residence		
Urban	128	54.2
Rural	108	45.8
Relationship Status		
Partnered	119	50.4
Unpartnered	117	49.6
Living Arrangements		
Lives alone	105	44.5
Lives with someone	131	55.5
Education		
Secondary School/Trade	121	51.3
University Degree	115	48.7
Income		
Not enough money	24	10.2
Just enough money	56	23.7
Enough money	129	54.7
More than enough money	27	11.4
Perceived Health		
Poor	13	5.5
Fair	42	17.8
Good	87	36.9
Very good	79	33.5
Excellent	15	6.3

of the participants were partnered, lived with someone, resided in an urban area, and had a university degree. Most reported they had enough or more than enough money to meet their basic needs, and perceived themselves to be in good/very good health.

Preliminary analyses

Among the sample, 54 (23%) participants had clinically significant levels of depression, scoring ≥ 6 on the Geriatric Depression Scale. A chi-square test for independence indicated no significant association between place of residence and clinically significant levels of depression, $\chi^2(1, N = 235) = 0.51, p = .48$.

Independent samples *t*-tests were computed to compare the scores on all variables for urban and rural living older adults. As seen in Table 2, there were no significant differences in scores between rural and urban residing older adults for depressive symptoms, thwarted belongingness, self-warmth, or self-coldness.

The results of the bivariate and partial correlations are presented in Table 3. The results of the partial correlations indicate that higher levels of self-coldness and thwarted belongingness were significantly related to higher levels of depressive symptoms. Higher levels of self-warmth were significantly associated with lower levels of depressive symptoms.

Moderated moderation models

Self-warmth model

Table 4 shows the results of the moderated moderation model investigating self-warmth and place of residence as moderators of the association between thwarted belongingness and depressive symptoms. The model accounted for 68% of the variance in depressive symptoms $R^2 = .678, F(13, 222) = 35.93, p < .001$. The three-way interaction between thwarted belongingness, self-warmth, and place of residence was significant. The interaction between thwarted belongingness and self-warmth was significant for urban residents, $B = -0.06, F(1, 222) = 13.16, p < .001$, but not for rural residents, $B = 0.01, F(1, 222) = 0.04, p = .847$. The interaction between thwarted belongingness and self-warmth predicting depressive symptoms can be seen in Figure 1. The simple slopes analysis indicated for older adults living in urban areas, increasing levels of thwarted belongingness were associated with increasing levels of depressive symptoms at low, $B = 0.20, t(118) = 10.70, p < .001, 95\% \text{ CI} = 0.16, 0.23$, average, $B = 0.14, t(118) = 8.07, p < .001, 95\% \text{ CI} = 0.11, 0.18$, and high, $B = 0.09, t(118) = 3.58, p < .001, 95\% \text{ CI} = 0.04, 0.14$, levels of self-warmth. The strength of the relationship between thwarted belongingness and depressive symptoms weakened as levels of self-warmth increased.

A significant two-way interaction was observed between thwarted belongingness and place of residence. Higher levels of thwarted belongingness

Table 2. Mean comparisons for each variable between urban and rural older adults.

Variable	Urban		Rural		<i>t</i> (233)	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Depressive Symptoms	3.19	3.76	3.86	4.00	-1.33	.195	.17
Thwarted Belongingness	22.94	13.65	24.41	12.88	-0.85	.446	.11
Self-Warmth	3.25	0.88	3.24	0.81	0.11	.917	.02
Self-Coldness	2.25	0.90	2.46	0.89	-1.82	.085	.24

Table 3. Correlations between variables.

Variable	1	2	3	4	5	<i>M</i>	<i>SD</i>
(1) Depressive Symptoms	-	-.47***	.63***	.75***	.09	3.49	3.88
(2) Self-Warmth	-.40***	-	-.50***	-.49***	-.01	3.25	0.85
(3) Self-Coldness	.56***	-.45***	-	.57***	.12	2.34	0.90
(4) Thwarted Belongingness	.67***	-.43*	.49***	-	.06	23.61	13.29
(5) Place of Residence ^a	-.01	.03	.08	-.02	-		

Note. Bivariate correlations are presented above the diagonal. Partial correlations controlling for age, gender, relationship status, income, perceived health, and living arrangements are presented below the diagonal.

^a1 = urban, 2 = rural.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Self-warmth and place of residence as moderators of the association between thwarted belongingness and depressive symptoms.

Variables	B	95% CI		p
		LL	UL	
Constant	4.66	-0.81	10.13	.095
Thwarted Belongingness	0.16	0.13	0.19	<.001
Self-Warmth	-0.48	-0.88	-0.08	.019
Place of Residence ^a	0.55	-0.12	1.22	.109
Thwarted Belongingness x Self-Warmth	-0.03	-0.6	0.0001	.051
Thwarted Belongingness x Place of Residence	0.06	0.01	0.12	.026
Self-Warmth x Place of Residence	1.27	0.47	2.08	.002
Thwarted Belongingness x Self-Warmth x Place of Residence	0.06	0.003	0.12	.041
Living Arrangements ^b	1.20	-0.03	2.43	.057
Age	-0.02	-0.06	0.03	.467
Gender ^c	0.49	-0.25	1.12	.194
Relationship Status ^d	1.50	0.27	2.73	.017
Income ^e	-0.59	-1.22	0.05	.071
Perceived Health ^f	-2.17	-2.94	-1.40	<.001

^a1 = urban, 2 = rural. ^b1 = lives alone, 2 = lives with someone. ^c1 = woman, 2 = man. ^d1 = partnered, 2 = unpartnered. ^e1 = not enough/just enough money, 2 = enough/more than enough money. ^f1 = poor/fair, 2 = good/very good/excellent.

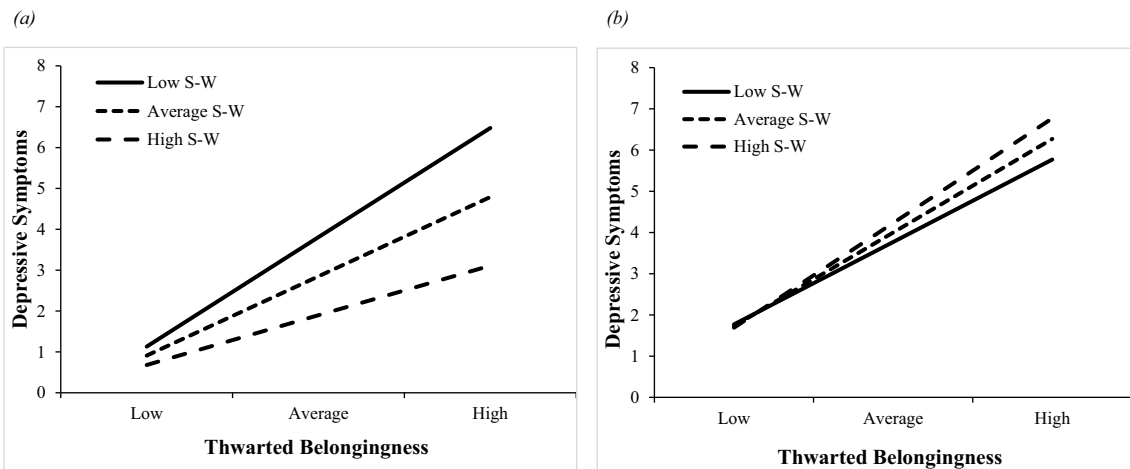


Figure 1. Interaction between thwarted belongingness and self-warmth (S-W) predicting depressive symptoms for older adults residing in (a) urban and (b) rural Australia.

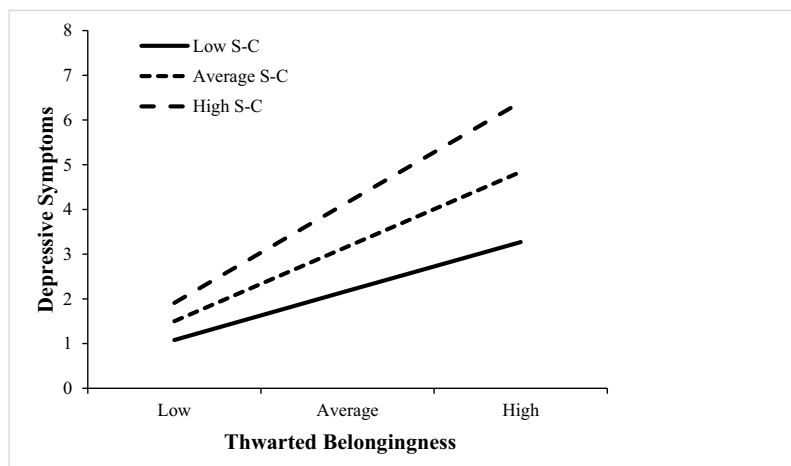


Figure 2. Interaction between thwarted belongingness and self-coldness (S-C) predicting depressive symptoms.

were associated with higher levels of depressive symptoms for those living in an urban area, $B = 0.13$, $t(222) = 7.00$, $p < .001$, 95% CI = 0.09, 0.17, and in a rural area, $B = 0.19$, $t(222) = 9.13$, $p < .001$, 95% CI = 0.15, 0.23, however the association was significantly stronger for older adults living in a rural area.

A significant two-way interaction was observed between self-warmth and place of residence. Increasing levels of self-warmth were associated with decreasing levels of depressive symptoms only for older adults living in an urban area, $B = -1.06$, $t(222) = -4.12$, $p < .001$, 95% CI = -1.57, -0.55. The relationship was not significant for those living in a rural area, $B = 0.21$, $t(222) = 0.66$, $p = .508$, 95% CI = -0.42, 0.84.

From Table 4, it can be seen that higher levels of thwarted belongingness, lower levels of self-warmth, being unpartnered, and lower levels of perceived health were associated with higher levels of depressive symptoms.

Self-coldness model

Table 5 shows the results of the moderated moderation model investigating self-coldness and place of residence as moderators of the association between thwarted belongingness and depressive symptoms. The self-coldness model accounted for 71% of the variance in depressive symptoms $R^2 = .712$, $F(13, 222) = 42.15$, $p < .001$. The three-way interaction between thwarted belongingness, self-coldness, and place of residence was not significant.

A significant two-way interaction between thwarted belongingness and self-coldness was observed, indicating that self-coldness moderated the relationship between thwarted belongingness and depressive symptoms. The interaction is shown in Figure 2. Thwarted belongingness was associated with depressive symptoms for older adults with low, $B = 0.08$, $t(222) = 4.36$, $p < .001$, 95% CI = 0.05, 0.12, average, $B = 0.13$, $t(222) = 9.01$, $p < .001$, 95% CI = 0.10, 0.15, and high, $B = 0.17$, $t(222) = 10.92$, $p < .001$, 95% CI = 0.14, 0.20, levels of self-coldness. The relationship between thwarted belongingness and depressive symptoms strengthened as levels of self-coldness increased.

From Table 5, it can be seen that higher levels of thwarted belongingness, higher levels of self-coldness, being unpartnered, living with someone, having a lower income, and having lower perceived health were associated with higher levels of depressive symptoms.

Discussion

This study sought to investigate whether self-warmth, self-coldness, and place of residence moderated the relationship between thwarted belongingness and depressive symptoms among older adults, and whether the moderating effects of self-warmth and self-coldness were conditional on place of residence. Preliminary analyses indicated no significant differences between rural and urban living older adults on the variables of interest. As hypothesized,

Table 5. Self-coldness and place of residence as moderators of the association between thwarted belongingness and depressive symptoms.

Variables	B	95%		p
		LL	UL	
Constant	3.72	-1.46	8.91	.159
Thwarted Belongingness	0.12	0.10	0.15	<.001
Self-Coldness	1.23	0.74	1.51	<.001
Place of Residence ^a	0.15	-0.49	0.79	.650
Thwarted Belongingness x Self-Coldness	0.05	0.02	0.07	<.001
Thwarted Belongingness x Place of Residence	0.03	-0.03	0.08	.354
Self-Coldness x Place of Residence	-0.36	-1.14	0.42	.361
Thwarted Belongingness x Self-Coldness x Place of Residence	-0.004	-0.05	0.04	.858
Living Arrangements ^b	1.20	0.04	2.35	.043
Age	-0.004	-0.05	0.04	.866
Gender ^c	0.46	-0.26	1.17	.208
Relationship Status ^d	1.44	0.29	2.60	.015
Income ^e	-0.67	-1.28	-0.06	.032
Perceived Health	-2.12	-2.85	-1.38	<.001

^a1 = urban, 2 = rural. ^b1 = lives alone, 2 = lives with someone. ^c1 = woman, 2 = man. ^d1 = partnered, 2 = unpartnered. ^e1 = not enough/just enough money, 2 = enough/more than enough money. ^f1 = poor/fair, 2 = good/very good/excellent.
* $p < .05$. ** $p < .01$. *** $p < .001$.

self-warmth and self-coldness moderated the association between thwarted belongingness and depressive symptoms. Further, the moderating effect of self-warmth was conditional on place of residence, but the moderating effect of self-coldness was not. Place of residence moderated the relationship between thwarted belongingness and depressive symptoms. The relationship between thwarted belongingness and depressive symptoms was significantly stronger for older adults living in rural areas compared with urban areas, which did not support the hypothesis that the association would be significant only for older adults residing in rural areas.

Comparisons between rural and urban older adults

The results yielded no significant differences in levels of thwarted belongingness, self-warmth, self-coldness, or depressive symptoms between older adults living in rural or urban settings. The findings were inconsistent with the results of a meta-analysis indicating that in developed countries, urban-living older adults experience higher levels of depressive symptoms than rural-living older adults (Purtle et al., 2019). The results were consistent with the few studies that have investigated loneliness among rural and urban living older adults (Burholt & Scharf, 2014; Victor & Rikhartova, 2020). We are unaware of previous studies investigating rural-urban differences in self-warmth and self-coldness among older adults. While differences in variables were not demonstrated, results indicated that the association between some variables varied according to place of residence, a finding consistent with Burholt and Scharf (2014).

The moderating roles of self-warmth, self-coldness, and place of residence

The relationship between thwarted belongingness and depressive symptoms was significant for older adults living in rural and urban areas, however, the relationship was significantly stronger for those residing in rural areas. This finding varies from the results of a meta-analysis that demonstrated that social isolation factors, such as living alone and not having close friends, were significantly related to depressive symptoms only for older adults living in rural areas (Purtle et al., 2019). The findings from the current study

indicate that for older Australians, unmet belongingness needs are a risk factor for depressive symptoms regardless of where one lives, however, they are particularly concerning for those living in rural areas. Older adults residing in rural areas experience a disparity in the available services (Carver et al., 2018), for example, rural areas have limited options for public transport. Older adults who cannot drive are therefore restricted on where they might go, or who they might see. This restriction might prevent them from connecting with the networks they may have established, thus creating an environment for unmet belongingness needs to develop.

Self-warmth moderated the association between thwarted belongingness and depressive symptoms only for older adults who lived in urban areas. Consistent with Gao et al. (2023), self-warmth acted as a protective factor by weakening the association between thwarted belongingness and depressive symptoms among older adults living in urban areas. In contrast, self-warmth did not moderate the association between thwarted belongingness and depressive symptoms for older Australians living in rural areas. The construct of self-warmth may not act as a protective factor for older rural-dwelling adults due to its incompatibility with stoicism, a characteristic evident in rural Australian adults (Judd et al., 2006). The three components of stoicism, lack of emotional involvement, lack of emotional expression, and maintaining emotional control (Wagstaff & Rowledge, 1995) may limit the ability to tap into self-warmth (i.e., to be kind to oneself, to see their struggles as part of the human experience, to be mindful) when experiencing unmet belongingness needs. As this is the first study to investigate whether the moderating effects of self-warmth are conditional on place of residence, it is important to see if this finding is replicated in future research.

The findings also supported the moderating effect of self-coldness on the association between thwarted belongingness and depressive symptoms; this moderating effect was not conditional on place of residence. For older Australian adults, self-coldness acts as an additional risk factor, strengthening the association between thwarted belongingness and depressive symptoms. For this sample, being judgmental of themselves, seeing their painful experiences in isolation, and over-identifying

with them exacerbated the adverse mental health outcomes associated with having unmet belongingness needs. Older adults with thwarted belongingness and average or high levels of self-coldness were more likely to experience higher levels of depressive symptoms than older adults with thwarted belongingness and lower levels of self-coldness.

Implications and future research

The results suggest that increasing self-warmth among urban-dwelling older adults and reducing self-coldness among older adults regardless of where they live may improve the mental health of older adults who experience thwarted belongingness. Preliminary evidence indicated the Mindful Self-Compassion Program is effective at increasing self-compassion and decreasing depressive symptoms, with benefits sustained at 6-month and 1-year follow-ups among adults (K. D. Neff & Germer, 2013). More recent research also supports the efficacy of the program in healthcare professionals (Delaney & Soundy, 2018; K. D. Neff et al., 2020), adults with chronic pain (Torrijos-Zarcero et al., 2021), and adult cancer patients (Brooker et al., 2020). These trials have examined self-compassion as a total score, so it is unknown whether the intervention specifically increases self-warmth and reduces self-coldness. Further, the samples were adults, rather than older adults, although the mean age of Brooker et al.'s (2020) sample was 62.93 years ($SD = 14.04$).

The findings also add to the literature by showing that thwarted belongingness is more strongly related to depressive symptoms for older rural-dwelling adults than their urban-dwelling peers. Healthcare professionals working with rural older adults need to be mindful of this pervasive risk factor for depressive symptoms among older adults. Further, with findings from this study showing that self-warmth does not weaken the association between thwarted belongingness and depressive symptoms among older rural-dwelling adults, there is a need to identify protective factors that weaken this relationship for this population.

Limitations

One limitation of the study is that the sample was not representative of the Australian population.

Most of the sample was White (96.6% compared to the Australian population of 82.4%; Australian Bureau of Statistics, 2018). This sample was highly educated (48.7% had a university degree compared with 23.4% of older adults; Australian Bureau of Statistics, 2018). The majority of the sample reported having enough/more than enough money to meet their needs and that they were in good to very good physical health. The findings are limited to older Australians with these socially advantaged demographic characteristics. These demographics likely reflect that the sample was predominately recruited online. For example, higher levels of education are associated with technology use among older adults (Vroman et al., 2015). Although opportunities were created for older adults to participate through a hard-copy survey, only 25% of the sample used this method. Future research needs to ensure the recruitment of a more diverse sample of older adults to increase the generalizability of the findings. A further limitation is that we did not record the type of accommodation the participants resided in and whether there were differences between rural and urban-dwelling older adults. For example, some participants were recruited from retirement villages, where older adults live independently but are typically offered social activities. The type of accommodation may be a contextual factor that differed by place of residence and impacted the findings.

Conclusion

The present study investigated the moderating effects of self-warmth, self-coldness, and place of residence on the relationship between thwarted belongingness and depressive symptoms among a sample of older Australian adults. The findings indicate that self-warmth plays a protective role for older adults living in urban locations by weakening the association between thwarted belongingness and depressive symptoms. Self-coldness acts as an additional risk factor for older adults, independent of their place of residence, by strengthening the association between thwarted belongingness and depressive symptoms. Thwarted belongingness was more strongly related to depressive symptoms for older adults residing in rural areas. Interventions that increase self-warmth and reduce

self-coldness may reduce depressive symptoms among urban residents who experience thwarted belongingness. Decreasing self-coldness may assist older adults living in rural areas who experience thwarted belongingness. There is a need to identify protective factors that weaken the association between thwarted belongingness and depressive symptoms among older adults who live in rural areas.

Clinical implications

- Interventions focusing on increasing self-warmth might weaken the relationship between thwarted belongingness and depressive symptoms among urban older adults.
- Interventions focusing on decreasing self-coldness among older adults irrespective of place of residence might weaken the relationship between thwarted belongingness and depressive symptoms.

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Data availability of statement

The dataset supporting the conclusions of this article is available upon reasonable request.

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