Effects of Behavioral Activation and Self-Compassion on the Relationships Among Depression, Social Anxiety, and Social Isolation

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Social isolation is a global issue that has intensified since COVID-19 pandemic. Social isolation can be mitigated or exacerbated by various factors. This study examined the role of two core therapeutic process variables—behavioral activation and self-compassion—in the relationship between depression, social anxiety, and social isolation. Data were collected through an online survey of 300 adults using the Mental Health Screening Tool for Depressive Disorders, Liebowitz Social Anxiety Scale, Loneliness and Social Isolation Scale, Behavioral Activation for Depression Scale, and Self-Compassion Scale–Short Form. Pearson correlation, mediation analysis using structural equation modeling, and moderated mediation analysis using the PROCESS macro were conducted using R software. The results indicated that depression, social anxiety, and social isolation were strongly correlated. Furthermore, these variables showed moderate to strong correlations with therapeutic processes. Mediation analyses demonstrated that higher levels of behavioral activation and self-compassion significantly reduced the positive effects of depression and social anxiety on social isolation. Moreover, levels of self-compassion moderated the effect of depression on social isolation, which was mediated by decreased behavioral activation. These findings suggest that intervention strategies integrating behavioral activation and self-compassion may effectively prevent and alleviate social isolation within community settings.

Keywords: social isolation, depression, social anxiety, behavioral activation, self-compassion

Introduction

Social isolation refers to the inadequate quality and quantity of social relations with other people at different levels of human interaction (Zavaleta et al., 2014). A population-based adult cohort study found the prevalence of social isolation among adults to be 12.3% (Röhr et al., 2022). In South Korea, social isolation has become increasingly severe, with its rate rising from 27.7% in 2019 to 33.0% in 2023; the estimated number of socially isolated individuals has reached approximately 2.8 million (Bang, 2023; Statistics Korea, 2024).

Social isolation is associated with mental health issues such as depression and social anxiety. Reduced engagement in various activities and social withdrawal are core features of depression, and these symptoms often manifest as increased social isolation and diminished social connectedness (Cruwys et al., 2014; Wade & Kendler, 2000). Individuals experiencing depression often avoid social interactions due to their low self-esteem and lack of confidence; this exacerbates their feelings of loneliness and isolation (Prizeman et al., 2023). Moreover, depression is a potential antecedent of social isolation: Higher depressive symptoms predict in-

creased social isolation over time, demonstrating a significant long-term association (Luo, 2022; Zhang et al., 2023). Those with social anxiety often avoid social interactions due to the fear of negative evaluation and repeated experiences of rejection, which ultimately increases their social isolation (Alden & Taylor, 2004; O'Day et al., 2021). In addition to behavioral avoidance, social anxiety contributes to social isolation by reducing the size and frequency of individuals' social networks (Sun et al., 2024) and increasing their feelings of loneliness in everyday social situations (Oren-Yagoda et al., 2022).

Although social isolation among young adults has also emerged as a pressing social issue in South Korea (Kim, 2023), empirical studies on social isolation in the Korean context have primarily focused on older adults (Park et al., 2020). Some studies with young adult samples have identified associations between social isolation, depression, and social anxiety (Choi et al., 2022), but few have examined the psychological mechanisms or therapeutic processes through which these symptoms lead to social isolation. Globally, the evidence supporting the effectiveness of interventions aimed at reducing social isolation remains limited, and no clear empirical support has been identified (Fallavollita & Lyons, 2023; Lee et al., 2013; Poscia et al., 2018).

While historically evidence-based interventions have focused on symptom reduction through diagnosis-specific treatment protocols, contemporary approaches emphasize process-based interventions that target the mechanisms driving symptom change (Hayes & Hofmann, 2021; Hofmann & Hayes, 2019). Focusing on therapeutic processes rather than specific diagnoses can be particularly effective in cases with diagnostic heterogeneity, comorbid conditions, or individuals who fall below clinical thresholds but still need intervention, including those experiencing social isolation (Chou et al., 2011; Ong et al., 2020). In particular, process-based therapies commonly emphasize the activation of value-based behavior as a core therapeutic process (Hayes & Hofmann, 2017), which may function effectively in addressing social isolation. For example, behavioral activation techniques such as activity monitoring, goal setting, skill training, and addressing avoidance behaviors can be applied to daily self-care, health promotion, and social engagement. In addition to promoting smoking cessation and dietary improvements, behavioral activation is beneficial

for reducing social isolation and loneliness as well as depression and anxiety (Grasso et al., 2020; MacPherson et al., 2017; Pepin et al., 2021). Self-compassion is another therapeutic component that can be effective in alleviating social isolation and is commonly integrated into process-based therapies (Wilson et al., 2019). Self-compassion has been found to predict lower levels of loneliness (Akin, 2010) and has also functioned as a protective factor by significantly moderating the relationship between depression and loneliness, thereby buffering against their reciprocal interaction and exacerbation (Gao et al., 2024; Wang et al., 2023).

Recent research indicates a potential therapeutic association between behavioral activation and self-compassion. Adie et al. (2021) reported that individuals with higher levels of self-compassion were more likely to engage in consistent activity planning and goal-directed behavior, indicating higher levels of behavioral activation. Conversely, engaging more frequently in value-based activities has been associated with higher levels of self-compassion (Takagaki et al., 2021). These may suggest that multiple therapeutic processes interact during interventions rather than operating in isolation.

Based on previous research, the present study aims to explore the relationships between social isolation, depression, social anxiety, and two therapeutic processes (behavioral activation and self-compassion) to identify effective intervention strategies for alleviating social isolation within a broad community population. Based on the reviewed literature, the study proposes the following hypotheses: 1) Significant correlations will be observed between social isolation, depression, social anxiety, behavioral activation, and self-compassion. 2) Behavioral activation and self-compassion will mediate the relationship between social isolation and both depression and social anxiety, with behavioral activation exhibiting a stronger mediating effect than self-compassion. 3) Self-compassion will significantly moderate the effect of depression and social anxiety on social isolation through behavioral activation.

Methods

Participants

Data were collected from 300 participants through an online survey administered by the Southernpost. Given that socially isolated

individuals may feel uncomfortable interacting with researchers in person, an online survey method was employed. Eligibility criteria included: (1) being over 18 years of age and (2) being capable of completing an online survey. Exclusion criteria included: (1) not being fluent in Korean and (2) being unable to sustain attention throughout the survey. An equal number of participants were selected from the following age brackets to minimize sampling bias related to age distribution: 20s, 30s, 40s, and 50 years or older. All participants voluntarily participated in the study and provided written informed consent for their research participation and the use of personal information. The entire study process was approved by the Institutional Review Board of the affiliated institution prior to data collection.

Measures

Depression The Mental Health Screening Tool for Depressive Disorders is a self-report measure designed to screen for major depressive disorder, facilitating early intervention in primary care settings. Developed using item response theory and data from Korean populations, it has demonstrated equal or superior diagnostic accuracy compared to traditional depression scales, including the PHQ-9, CES-D, and BDI-II (Park et al., 2022). It comprises 12 items assessing symptoms related to the diagnostic criteria for major depressive disorder listed in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. The items are rated using a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Higher scores indicate greater depressive severity, with a cutoff score of 17. It showed high internal consistency in a Korean validation study (Park et al., 2022; Cronbach's $\alpha = .94$). Similarly, the internal consistency in the current study was .94.

Social Anxiety The Liebowitz Social Anxiety Scale is a self-report measure developed by Liebowitz (1987) to assess social anxiety by evaluating situations that provoke social fear and avoidance. It comprises 24 items measuring the level of fear and avoidance experienced in various social interactions and performance situations. Responses are rated on a 4-point Likert scale ranging from 0 (*fear: none/avoidance: never*) to 3 (*fear: severe/avoidance: usually*). Higher scores indicate greater social anxiety and avoidance, with a cutoff score of 60 (Mennin et al., 2002). This study used the validated Korean version, which has demonstrated high internal

consistency (Yu et al., 2007; Cronbach's $\alpha = .90–.93$). In the current study, both the fear and avoidance subscales showed an internal consistency of .96.

Social Isolation The Loneliness and Social Isolation Scale is a self-report measure developed by Hwang et al. (2021) to assess social isolation. It comprises six items measuring three factors: social support, social network, and loneliness. Responses are rated on a 4-point Likert scale ranging from 0 (*Social support: extremely/loneliness: never/social network: more than seven people or one hour*) to 3 (*Social support: never/loneliness: extremely/social network: none*), with higher scores indicating greater loneliness and social isolation. The scale demonstrated adequate internal consistency in a validation study (Hwang et al., 2021; Cronbach's $\alpha = .77$), and the internal consistency in the current study was .84.

Behavioral Activation The Behavioral Activation for Depression Scale (BADS) is a self-report measure developed by Kanter et al. (2007) to assess the levels of activation and avoidance. It comprises 25 items across four subscales: activation, avoidance/rumination, work/school impairment, and social impairment. Responses are rated on a 7-point Likert scale ranging from 0 (*Not at all*) to 6 (*Completely*). This study used the Korean version validated by Oh et al. (2017), which demonstrated high internal consistency (Cronbach's $\alpha = .84$). The internal consistency in the current study was .89. In this study, the total score of the BADS was utilized to evaluate overall behavioral activation, encompassing both increased activation and decreased avoidance.

Self-Compassion The Self-Compassion Scale–Short Form is a 12-item self-report measure developed by Raes et al. (2011) as a validated short version of the original 26-item Self-Compassion Scale (Neff, 2003). It assesses six components of self-compassion, with three positively framed subscales (self-kindness, common humanity, and mindfulness) and three negatively framed subscales (isolation, over-identification, and self-judgment). The total score is calculated by summing all 12 items, with negatively framed items reverse-scored. Responses are rated on a 5-point Likert scale ranging from 1 (*Almost never*) to 5 (*Almost always*), with higher scores indicating greater self-compassion. The scale demonstrated high internal consistency (Cronbach's $\alpha = .87$); $\alpha = .85$ in the current study.

Statistical Analysis

All data analyses were conducted using R software (ver. 4.3.2; R Core Team, 2023). Descriptive statistical analyses were performed, followed by Pearson correlation analyses to examine the relationships between variables to test Hypothesis 1. Pearson correlation coefficients were interpreted as follows (Cohen, 2013): .1: small, .3: moderate, and .5: large. Structural equation modeling (SEM) was used to examine indirect and conditional effects among treatment process variables based on a theoretical framework. A mediation analysis was conducted to examine whether behavioral activation and self-compassion mediate the effects of depression and social anxiety on social isolation (Hypothesis 2). This analysis was performed using the lavaan package (Rosseel, 2012), with the maximum likelihood estimation method. Finally, a moderated media-

tion model was established to examine whether behavioral activation mediates the effects of depression and social anxiety on social isolation (Hypothesis 3). Additionally, the moderating effect of self-compassion on the relationship between behavioral activation and social isolation was analyzed. The PROCESS macro by Hayes (2022) was used to explore moderated mediation effects. All mediation and moderated mediation analyses were performed using the bootstrapping method (Shrout & Bolger, 2002) with 5,000 bootstrap samples and a 95% confidence interval.

Results

Demographic Characteristics

The demographic characteristics of the participants are presented in Table 1. The total sample size was 300, with no missing data. The mean age was 40.65 years ($SD = 11.8$), with an equal age distribution of 25%, as 75 participants were included in each of the four age groups. The sample included an equal number of male and female participants, with 150 individuals (50%) in each group. Most participants were employed full-time (66.7%, $n = 200$) and held a bachelor's degree (59.3%, $n = 178$). Nearly half had never married (49.3%, $n = 148$). Household size varied, with most living in households of three to four members (59.3%, $n = 178$), including themselves.

Descriptive Statistics and Correlation Analysis

The descriptive statistics and correlation analysis results for variables are presented in Table 2. Normality was assessed using skew-

Table 1. Baseline Demographics of Participants

Baseline demographics	N (%)
Age, M (SD)	40.65 (11.8)
Sex	
Male	150 (50.0)
Female	150 (50.0)
Employment	
Unemployed	33 (11.0)
Retired	3 (1.0)
Student	18 (6.0)
Homemaker	13 (4.3)
Part-time Employed	33 (11.0)
Full-time Employed	200 (66.7)
Marital Status	
Never married	148 (49.3)
Married	134 (44.7)
Divorced	14 (4.7)
Widowed	2 (0.7)
Others	2 (0.7)
Education	
High school (≤ 12 years)	40 (13.3)
College Bachelor's degree (≤ 14 years)	50 (16.7)
University Bachelor's degree (≤ 16 years)	178 (59.3)
Higher Education (> 16 years)	32 (10.7)
Household size	
Single-person household	55 (18.3)
Two-person households	44 (14.7)
Three-person households	83 (27.7)
Four-person households	95 (31.7)
Five-person households	17 (5.7)
More than six-person households	6 (2.0)

Table 2. Results of the Descriptive Statistics and Correlation Analysis

	1	2	3	4	5
1. MHS:D	-				
2. LSAS	.59**	-			
3. LSIS	.58**	.56**	-		
4. BADS	-.69**	-.67**	-.71**	-	
5. SCS-SF	-.54**	-.54**	-.64**	.73**	-
Mean	12.13	49.76	7.64	93.65	39.27
SD	11.55	29.88	3.69	25.96	8.05
Skewness	1.15	0.22	0.2	-0.45	-0.36
Kurtosis	0.5	-0.68	-0.47	-0.3	0.3

MHS:D = Mental Health Screening Tool for Depressive Disorders; LSAS = Liebowitz Social Anxiety Scale; LSIS = Loneliness and Social Isolation Scale; BADS = Behavioral Activation for Depression Scale; SCS-SF = Self-Compassion Scale-Short Form.
**p < .01.

ness, kurtosis values, and Q–Q plots. All data met the normality criteria suggested by West et al. (1995; skewness < 2, kurtosis < 7), and the Q–Q plots indicated a distribution close to a straight line, confirming normality. Pearson correlation analysis was conducted to test Hypothesis 1; statistically significant correlations were found between all variables (all $p < .05$). Depression, social anxiety, and social isolation showed strong positive correlations ($r = .56$ to .59); behavioral activation and self-compassion were also strongly correlated ($r = .73$). Additionally, depression, social anxiety, and social isolation exhibited strong negative correlations with behavioral activation and self-compassion ($r = -.54$ to $-.71$).

Mediation Analysis

To test Hypothesis 2, the mediating effects of behavioral activation and self-compassion were examined in the relationship between depression, social anxiety, and social isolation (Table 3). Prior to conducting the mediation analysis, multicollinearity was assessed, and the variance inflation factor values for all regression equations were in the range of 1, suggesting minimal concern for multicol-

linearity (James et al., 2013). Both behavioral activation and self-compassion significantly mediated the relationship between depression and social isolation, thereby providing support for Hypothesis 2. These findings suggest that enhancements in behavioral activation and self-compassion may weaken the positive association between depressive symptoms and social isolation. The mediation effect of behavioral activation ($\beta = .44$, $p < .001$) was stronger than that of self-compassion ($\beta = .26$, $p < .001$). Moreover, in the mediation model of behavioral activation, the direct effect of depression on social isolation was not statistically significant ($p = .059$), indicating full mediation. Similarly, behavioral activation and self-compassion significantly mediated the relationship between social anxiety and social isolation, thus supporting Hypothesis 2. These results indicate that increases in behavioral activation and self-compassion may lower the positive association between social anxiety and social isolation. The mediation effect of behavioral activation ($\beta = .41$, $p < .001$) was greater than that of self-compassion ($\beta = .26$, $p < .001$), which is consistent with the results for depression.

Table 3. *The Result of Mediation Analysis*

Path	B	SE	Z	95% CI		p-value	β
				LLCI	ULCI		
Depression→BA	-1.56	.11	-14.03	-1.76	-1.32	< .001***	-.69
BA→Social Isolation	-.09	.01	-9.65	-.11	-.07	< .001***	-.63
Depression→Social Isolation	.04	.02	1.89	-.00	.08	.059	.12
Indirect Effect	.14	.02	8.02	.11	.18	< .001***	.44
Total Effect	.18	.02	10.29	.14	.21	< .001***	.56
Depression→SC	-.38	.04	-9.49	-.46	-.30	< .001***	-.54
SC→Social Isolation	-.22	.03	-8.90	-.27	-.17	< .001***	-.48
Depression→Social Isolation	.10	.02	5.20	.06	.13	< .001***	.30
Indirect Effect	.08	.01	6.79	.06	.11	< .001***	.26
Total Effect	.18	.02	10.31	.14	.21	< .001***	.56
Social Anxiety→BA	-.58	.04	-16.20	-.65	-.51	< .001***	-.67
BA→Social Isolation	-.09	.01	-9.65	-.11	-.07	< .001***	-.61
Social Anxiety→Social Isolation	.02	.01	2.58	.01	.03	< .010*	.15
Indirect Effect	.05	.01	8.11	.04	.06	< .001***	.41
Total Effect	.07	.01	12.24	.06	.08	< .001***	.56
Social Anxiety→SC	-.15	.01	-10.32	-.17	-.12	< .001***	-.54
SC→Social Isolation	-.22	.03	-8.89	-.27	-.17	< .001***	-.48
Social Anxiety→Social Isolation	.04	.01	6.21	.03	.05	< .001***	.31
Indirect Effect	.03	.01	6.83	.02	.04	< .001***	.26
Total Effect	.07	.01	12.69	.06	.08	< .001***	.56

BA = Behavioral Activation; SC = Self-Compassion.
*$p < .05$, ***$p < .001$.*

Table 4. The Conditional Effect of Behavioral Activation Based on the Level of Self-compassion

Independent variable	Dependent variable	Moderator	Indirect effect	*SE*	95% CI	
					LLCI	ULCI
Depression	Social Isolation	Self-compassion				
		-1 SD	.09	.02	.05	.13
		Mean	.10	.02	.07	.14
		+1 SD	.11	.02	.08	.15

LLCI = Lower limit within the 95% confidence interval; ULCI = Upper limit within the 95% confidence interval of the bootstrap indirect effect.

Moderated Mediation Analysis

To test Hypothesis 3, we examined the moderated mediation effect of self-compassion in a model in which behavioral activation mediates the relationship between depression, social anxiety, and social isolation. The moderated mediation model aimed to assess whether self-compassion moderates the effect of behavioral activation (mediator) on social isolation (dependent variable), thereby investigating the interaction between therapeutic process variables in predicting social isolation. The results indicated a significant moderated mediation effect in the model in which behavioral activation mediated the relationship between depression and social isolation (Table 4, Figure 1). Specifically, as a moderator, self-compassion did not include zero within the 95% confidence interval at the mean and ±1 SD levels, and the interaction term (behavioral activation × self-compassion) had a statistically significant effect on social isolation ($p = .048$). These findings suggest that in the pathway through which depression affects social isolation, the influence of behavioral activation on social isolation is moderated by the level of self-compassion. However, self-compassion did not significantly moderate the mediation effect of behavioral activation on the relationship between social anxiety and social isolation. The 95% confidence interval at the mean and ±1 SD levels included zero, and the interaction term (behavioral activation × self-compassion) was not statistically significant ($p = .140$). Accordingly, Hypothesis 3 was partially supported.

Discussion

This study examined the association between depression, social anxiety, and social isolation. Moreover, it investigated the role of therapeutic processes as potential protective factors in the pathway linking depression and social anxiety to social isolation. To achieve
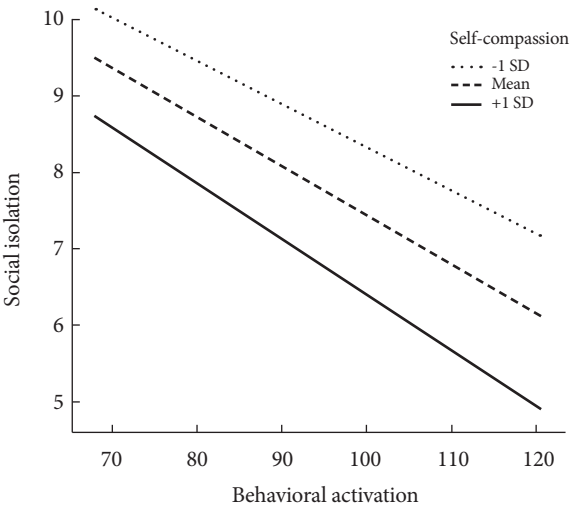

Figure 1. The moderating effect of self-compassion in the mediation model of behavioral activation between depression and social isolation.

this, the study determined the relationships between social isolation, depression, social anxiety, and two key therapeutic process variables—behavioral activation and self-compassion.

The main findings of the study are as follows. Correlation analyses found significant relationships between social isolation, social anxiety, depression, and therapeutic process variables, supporting Hypothesis 1. Specifically, strong positive correlations were observed between social isolation, depression, and social anxiety, indicating that higher levels of social isolation were associated with greater depression and social anxiety. This finding aligns with those of previous studies suggesting that symptoms of depression and social anxiety are linked to reduced social interactions and networks (Elmer & Stadtfeld, 2020; Eres et al., 2023). Conversely, behavioral activation and self-compassion showed negative correlations with depression, social anxiety, and social isolation. These findings are consistent with prior research, which indicates that individuals with depression exhibit lower levels of behavioral acti-

vation and reward expectancy and tend to avoid social interactions (Carvalho & Hopko, 2011; Hopko et al., 2003), and that higher levels of depression and social anxiety are associated with lower levels of self-compassion and mindfulness (Makadi & Koszycki, 2020).

Testing of Hypothesis 2 indicated that behavioral activation and self-compassion significantly mediated the relationship between social isolation, depression, and social anxiety. In particular, the mediating effect of behavioral activation was stronger than that of self-compassion, and behavioral activation fully mediated the pathway from depression to social isolation, supporting Hypothesis 2. This finding emphasizes the importance of behavioral activation in preventing depression and social anxiety from leading to social isolation. Behavioral activation may help reduce anhedonia and social withdrawal, core features of depression (American Psychiatric Association, 2022), and by enhancing social connectedness, it may mitigate the relationship between social isolation and depression. The therapeutic process of behavioral activation can also be effectively applied to increasing social connectedness and decreasing depression and loneliness among older adults (Pepin et al., 2021). Similarly, behavioral activation therapy for social anxiety reduces fear and avoidance in social situations, thereby improving both social anxiety and depression (Zanjani et al., 2018). Self-compassion partially mediated the pathways from depression and social anxiety, respectively, to social isolation. In addition to alleviating negative emotions, this approach facilitates the continued use of adaptive emotion regulation strategies, such as cognitive reappraisal and acceptance (Diedrich et al., 2014; Neff, 2003). The concept of common humanity, a key component of self-compassion, emphasizes that suffering is a shared human experience, which can help reduce feelings of isolation (Neff, 2016). These findings suggest that behavioral activation and self-compassion may function as a transdiagnostic intervention effective for psychiatric conditions such as depression and social anxiety, as well as social isolation.

The results of testing Hypothesis 3 revealed a significant moderating effect of self-compassion on the pathway from depression to social isolation via reduced behavioral activation, but not on the pathway from social anxiety to social isolation. This finding indicates that while behavioral activation significantly mediates the

impact of depression on social isolation, the interaction of self-compassion with behavioral activation is crucial in influencing social isolation. Self-compassion helps reduce avoidance behaviors and can motivate individuals to persist in value-based goal activities, even when facing initial difficulties or setbacks in behavioral activation therapy (Adie et al., 2021; Leary et al., 2007). Therefore, although behavioral activation alone prevents depression from leading to social isolation, incorporating self-compassion may further enhance the effectiveness of both preventive and therapeutic interventions. In the model in which behavioral activation mediated the effect of social anxiety on social isolation, the moderating effect of self-compassion was not significant. These findings suggest that the interaction between behavioral activation and self-compassion may operate differently for depression and social anxiety. The impact of self-compassion on social anxiety may vary depending on the level of comorbid depression or the type of social anxiety (e.g., social interaction vs. performance anxiety) (McBride et al., 2022). Therefore, further research is needed to examine the differential role of self-compassion in depression and social anxiety.

The limitations of this study and suggested future research directions are as follows. First, as this study used cross-sectional data from an online survey, future research should incorporate longitudinal data collection and analysis. In particular, future studies should investigate the application of therapeutic process variables in treatment settings to determine their mediating effects more specifically. Second, the study focused on specific therapeutic process variables—behavioral activation and self-compassion—and did not explore other potential variables. Further research should investigate additional therapeutic processes, such as cognitive reappraisal and defusion, to develop a broader range of strategies for addressing social isolation. Finally, as this study was conducted with a general community sample, future research should be expanded to clinical populations. Given that the study aimed to examine the role of therapeutic process variables in preventing the transition from depression and social anxiety to social isolation among community-dwelling individuals, data were collected from a nonclinical population. While the present results suggest the potential benefits of behavioral activation and self-compassion in community-based interventions for social isolation, additional re-

search is needed to evaluate their effectiveness in clinical populations before applying these approaches in clinical practice.

In conclusion, this study examined the roles of behavioral activation and self-compassion in preventing depression and social anxiety from leading to social isolation within a broad community population. The findings of this study may contribute to the development of effective intervention strategies for those at risk of isolation due to psychological challenges, such as depression and social anxiety.

Author contributions statement

Y. Yang, a graduate student at Korea University, conceptualized the study, collected and analyzed data, and led the manuscript preparation. Y-S. Kim, also a graduate student at Korea University, contributed to data collection and analysis. K-H. Choi, a professor at Korea University, supervised the research process. All authors provided critical feedback, participated in manuscript preparation, and approved the final submission.

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