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Examining the Mediating Effect of Resilience on Depression and Suicidal Ideation in Older Adults Living Alone

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ABSTRACT

Background: This study explores whether resilience mediates the effect of depression on suicidal ideation among older adults living alone. It aims to clarify the role of resilience as a psychological protective factor and provide foundational data for developing suicide prevention strategies tailored to this vulnerable population.

Methods: Eighty-four older adults aged 70–80 years, living alone and receiving specialized senior care services in three Korean localities, participated in the study. Depression was assessed using the Geriatric Depression Scale, suicidal ideation with the Scale for Suicidal Ideation, and resilience using the resilience subscale of the Psychological Capital Questionnaire. SPSS 28.0 was used to conduct descriptive statistics, correlation analysis, multiple regression analyses following the Baron and Kenny causal-steps approach, and the Sobel test to assess mediation effects.

Results: Depression was positively correlated with suicidal ideation (r=0.287, P<0.01) and negatively correlated with resilience (r=−0.315, P<0.01). Suicidal ideation also showed a significant negative correlation with resilience (r=−0.359, P<0.01). Multiple regression analyses following the Baron and Kenny causal-steps approach confirmed that resilience partially mediated the relationship between depression and suicidal ideation. The Sobel test supported this result (Z=2.042, P<0.05), indicating that resilience functions as a psychological buffer.

Conclusions: This study confirms the importance of resilience in reducing suicidal ideation among older adults living alone. The findings highlight the need for effective, multidimensional intervention strategies that enhance resilience, not only through psychological approaches but also through broader policy and environmental support.

Keywords: Psychological resilience, Depression, Suicide prevention, Protective factors, Aged

INTRODUCTION

South Korea has rapidly advanced to become the world's 13th-largest economy; however, it faces a serious social issue as the country with the highest suicide rate among Organisation for Economic Co-operation and Development (OECD) nations. According to Statistics Korea [1], the suicide rate in 2023 was 27.3 per 100,000 population, an increase of 2.2 from the previous year. Suicide remains the leading cause of death by external factors across all age groups aged 10 and above, highlighting the

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severity of the problem. Notably, the suicide rates are highest among those aged 80 and older (59.4 per 100,000) and those in their 70s (39.0 per 100,000), underscoring the growing suicide issue in the elderly population.

Among them, older adults living alone are considered a particularly vulnerable group to depression and suicide risk due to complex factors such as social isolation, chronic illness, and loneliness. According to the 2023 national survey on older adults [2] conducted by the Ministry of Health and Welfare, 2% of older adults living alone reported having experienced suicidal thoughts, which is four times higher than that of older adults living with a spouse (0.5%) and approximately 3.3 times higher than those living with children (0.6%). Loneliness accounted for the highest proportion of reasons for suicidal ideation (28.3%), and the prevalence of depressive symptoms (16.1%) was more than twice as high as that of older adults living with a spouse (7.8%). These findings indicate that older adults living alone constitute a high-risk group for suicide, drawing attention to the relationship between depression and suicidal ideation in this population.

However, not all experiences of depression lead to suicidal ideation. In the same survey, while 16.1% of older adults living alone reported experiencing depression, only 2.0% reported having suicidal thoughts. This suggests the presence of psychological protective factors that prevent the progression from depression to suicidal ideation, even when individuals are exposed to various stressors. Identifying such protective factors provides a crucial theoretical foundation for developing practical intervention strategies for suicide prevention.

Recently, resilience has attracted attention as one of the key psychological protective factors. Resilience refers to an individual's ability to respond flexibly and recover psychologically when faced with stress or adversity, potentially buffering the relationship between depression and suicide. Depression has been identified as a major predictor of suicidal ideation [3], while resilience has been reported as a protective factor that reduces suicidal thoughts [4]. Kwon [5] found a moderating effect of resilience in the relationship between depression and suicidal intent, and Kim [6] also reported a moderating effect of resilience in the relationship between loneliness and suicidal ideation among older adults living alone. These findings suggest that resilience may alter the intensity of suicidal responses under stressful circumstances.

Additionally, according to Fredrickson's broaden-and-build theory of positive emotions, positive emotions such as joy, interest, contentment, and love promote cognitive flexibility and resilience. Increased resilience, in turn, activates positive emotions, facilitating psychological recovery and adaptation [7-9]. From this perspective, resilience may function as a protective factor in the relationship between depression and suicidal ideation.

These recent research trends indicate an expansion in the understanding of suicide from a risk-factor-centered approach to one that emphasizes protective factors. However, in South Korea, studies focusing on protective factors among high-risk groups such as older adults living alone remain limited.

Meanwhile, previous studies on resilience have primarily reported its buffering effect, whereby resilience moderates the intensity of the response between depression and suicidal ideation. However, there is a lack of domestic research examining the mediating role of resilience in the relationship between depression and suicidal ideation among older adults living alone. Therefore, this study focuses on the possibility that resilience functions not merely as a moderator of effect strength but as an internal psychological mechanism operating in the process through which depression leads to suicidal ideation.

Accordingly, this study aims to gain a deeper understanding of the internal psychological mechanism of resilience by exploring whether depression influences resilience, which in turn acts as a mediating factor affecting suicidal ideation. Through this, the study seeks to elucidate the psychological mechanism of resilience influencing suicidal ideation among older adults living alone and to provide foundational data for the development of effective suicide prevention interventions based on resilience.

METHODS

Study design

This study employed a cross-sectional survey design to examine the impact of depression on suicidal ideation among older adults living alone and to explore the mediating role of resilience in this relationship.

Participants

The participants in this study were adults in their 70s and 80s who were living alone and registered with Senior Customized Care Service institutions in three local municipalities in South Korea. Based on statistical evidence that suicide rates are highest among individuals in their 70s and 80s across all age groups [1], this study conducted a survey targeting older adults within

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this age range. All participants were fully informed about the purpose of the study and voluntarily provided written consent to participate. The required sample size was calculated using G*Power 3.1 software to ensure the adequacy for hierarchical regression analysis. The parameters were set as an effect size of 0.15, a significance level (α) of 0.05, and statistical power (1–β) of 0.80, resulting in a minimum required sample size of 68. A total of 90 questionnaires were collected; after excluding six responses due to low response reliability, data from 84 participants were included in the final analysis.

Measures

Suicidal ideation

Suicidal ideation was assessed using the Scale for Suicidal Ideation developed by Beck et al. [10] and adapted into Korean by Shin et al. [11]. The scale comprises 19 items, each rated on a 3-point Likert scale. Total scores range from 0 to 38, with higher scores indicating greater suicidal ideation. Among adults, a score of 9 or above is generally interpreted as reflecting a heightened level of suicidal ideation compared to age-matched norms. The Scale for Suicidal Ideation was reported as Cronbach's α=0.87 in Shin et al.'s study [11] and 0.91 in the present study.

Depression

Depression was assessed using the Geriatric Depression Scale developed by Sheikh and Yesavage [12] and adapted into Korean by Park et al. [13]. The scale comprises of 15 items with dichotomous responses coded as "yes" (1 point) or "no" (0 points). Total scores range from 0 to 15, with higher scores reflecting greater depressive symptoms. A score of 6 or above is generally interpreted as indicative of clinically relevant depression. The Geriatric Depression Scale was reported as Cronbach's α=0.94 in Sheikh and Yesavage's study [12] and 0.61 in the present study.

Resilience

Resilience was assessed using the resilience subscale (5 items) of the Psychological Capital Questionnaire originally developed by Luthans et al. [14] and subsequently adapted and revised by Kwon [5]. The original scale questionnaire comprises four subscales: self-efficacy, hope, optimism, and resilience; however, this study employed only the resilience subscale in accordance with the research objectives. Items were rated on a 5-point Likert scale 1 (strongly disagree) to 5 (strongly agree), with total scores ranging from 5 to 25. Higher scores indicate a greater level of resilience. The reliability of the resilience subscale was reported as Cronbach's α=0.91 in Kwon's study [5] and 0.70 in the present study.

General characteristics

This study included five general characteristic variables—sex, age, educational level, health status, and income level—that have been reported in previous studies to influence suicidal behavior among older adults living alone [2].

Data collection

Data was collected between January 2 and January 31, 2025, from 84 older adults aged 70 to 80 years who live alone and voluntarily consented to participate in the study. Participants were recruited from specialized service providers affiliated with three local municipalities in South Korea.

Data analysis

Data was analyzed using IBM SPSS Statistics for Windows, Version 28.0. The following statistical procedures were employed:

1) Descriptive statistics (means and standard deviations) were calculated to assess levels of depression, suicidal ideation, and resilience among the participants.
2) Independent t-tests and one-way ANOVA were used to examine differences in key variables according to general characteristics.
3) Pearson correlation analysis was performed to explore the relationships among the main variables.
4) Multiple regression analyses following the Baron and Kenny causal-steps approach analysis and the Sobel test were performed to verify the mediating effect of resilience in the relationship between depression and suicidal ideation.

Ethical consideration

Prior to data collection, ethical approval for this study was obtained from the Institutional Review Board (IRB) of Gachon University, with which the researcher is affiliated (IRB Approval No.: 1044396-202410-HR-175-01). All research procedures were conducted in accordance with established ethical standards for human subjects research.

RESULTS

General characteristics of participants

The general characteristics of the 84 participants in this study are as follows. The majority were female, accounting for 82.1% (n=69), while males comprised 17.9% (n=15). In terms of age, 64.3% (n=54) were in their 70s, and 35.7% (n=30) were in their 80s, indicating a higher proportion of participants in their 70s. Regarding educational background, the largest groups were those with no formal education and those who had completed elementary school, each accounting for 32.1% (n=27), suggesting that the participants generally had low educational attainment. Regarding perceived health status, 69.0% (n=58) reported their health as "poor." For monthly income, the most frequently reported range was between 400,000 and 800,000 KRW, cited by 66.7% (n=56) of participants (Table 1).

Differences in depression and suicidal ideation according to general characteristics

An analysis of depression scores by participants' sociodemographic characteristics revealed no statistically significant differences by sex (t=0.349, *P*=0.728), age group (t=0.746, *P*=0.458), education level (F=1.305, *P*=0.275), perceived health status (F=2.205, *P*=0.117), or monthly income (F=1.928, *P*=0.152) (Table 1).

Similarly, suicidal ideation did not differ significantly by sex (t=1.759, *P*=0.082), age group (F=1.107, *P*=0.296), education level (F=1.018, *P*=0.403), perceived health status (F=0.201, *P*=0.818), or monthly income (F=1.747, *P*=0.181). These findings suggest that the sociodemographic variables examined in this study were not significantly associated with differences in depression or suicidal ideation among older adults living alone (Table 1).

Levels and correlations among depression, suicidal ideation, and resilience

The mean scores for the main variables were as follows: depression, 9.33±2.44; suicidal ideation, 13.06±7.73; and resilience, 15.52±3.88 (Table 2). Pearson correlation analysis revealed a significant positive correlation between depression and suicidal ideation (r=0.287, *P*<0.01), as well as significant negative correlations between depression and resilience (r=−0.315, *P*<0.01) and between suicidal ideation and resilience (r=−0.359, *P*<0.01) (Table 2). These results indicate that higher levels of depression are associated with increased suicidal ideation and lower resilience, while higher resilience is associated with lower suicidal ideation.

Table 2. Means, SDs, and correlations of key variables (n=84)

Variable	Mean±SD	Depression	Suicidal ideation	Resilience
Depression	9.33±2.44	1		
Suicidal ideation	13.06±7.73	0.287**	1	
Resilience	15.52±3.88	−0.315**	−0.359**	1

SD, standard deviation.
**P<0.01.

Table 1. General characteristics of participants (n=84)

Characteristic	Category	n (%)	Depression		Suicidal ideation	
			t	*P*	t	*P*
Sex	Male	15 (17.9)	0.349	0.728	1.759	0.082
	Female	69 (82.1)				
Age (yr)	70s group	54 (64.3)	0.746	0.458	1.107	0.296
	80s group	30 (35.7)				
Education level	No formal education (illiterate)	27 (32.1)	1.305	0.275	1.018	0.403
	Elementary school graduate	27 (32.1)				
	Middle school graduate	12 (14.3)				
	High school graduate	14 (16.7)				
	College graduate or higher	4 (4.8)				
Perceived health status	Poor health	58 (69.0)	2.205	0.117	0.201	0.818
	Fair health	17 (20.2)				
	Good health	9 (10.7)				
Income (won)	Under 400,000	11 (13.1)	1.928	0.152	1.747	0.181
	From 400,000 to 800,000	56 (66.7)				
	80,000 or more	17 (20.2)				
Total		84 (100)				

The sum of the percentages does not equal 100% because of rounding.

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Mediating effect of resilience on the relationship between depression and suicidal ideation

To examine the mediating effect of resilience on the relationship between depression and suicidal ideation among older adults, this study employed the hierarchical regression approach proposed by Baron and Kenny [15]. The statistical significance of the mediating effect was further verified using the Sobel test.

The mediation analysis followed Baron and Kenny's three-step procedure. In the first step, the effect of the independent variable (depression) on the mediating variable (resilience) was tested. In the second step, the effect of depression on the dependent variable (suicidal ideation) was examined. In the third step, both depression and resilience were simultaneously entered into the regression model to assess their respective effects on suicidal ideation, thereby determining whether resilience mediated the relationship between depression and suicidal ideation.

In the first step of the mediation analysis, depression had a significant negative effect on resilience (t=–3.005, P<0.01), accounting for 8.8% of the variance in resilience. The model was statistically significant (F (1, 82)=9.031, P<0.01). In the second step, depression exhibited a significant positive effect on suicidal ideation (t=2.713, P<0.01), explaining 7.1% of the variance. This model was also statistically significant (F (1, 82)=7.358, P<0.01). In the third step, when both depression and resilience were entered simultaneously into the regression model, resilience demonstrated a significant negative effect on suicidal ideation (t=–2.781, P<0.01), while the effect of depression on suicidal ideation was reduced to marginal significance (t=1.802, P<0.05). The Sobel test further confirmed the significance of the mediating effect, yielding a Z-value of 2.042 (P<0.05). These findings indicate that resilience partially mediates the relationship between depression and suicidal ideation (Table 3, Fig. 1).

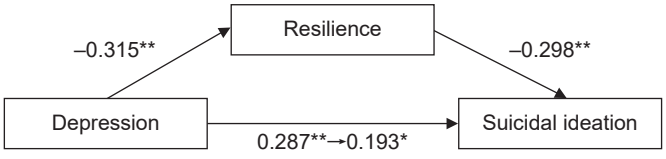
DISCUSSION

The main purpose of this study was to explore whether resilience mediates the relationship between depression and suicidal ideation among older adults living alone. The main findings are discussed as follows.

First, an analysis of participants' demographic characteristics revealed that the majority were female (82.1%, n=69), with the most represented age group being those in their 70s (64.3%). Regarding educational attainment, illiteracy and elementary school education were the most prevalent, each comprising 32.1% of the sample, followed by middle school, high school, and college graduates in descending order.

In terms of perceived health status, 69.0% of participants rated their health as "poor," and the most frequently reported monthly income was between 400,000 and 800,000 KRW (66.7%). These findings suggest that the older adults living alone in this study were characterized by low levels of education, poor perceived health, and financial hardship. Moreover, the average scores for depression and suicidal ideation were 9.33±2.44 and 13.06±7.73, respectively, both exceeding the clinical cutoff points for risk (≥6 for depression and ≥9 for suicidal ideation). These results indicate that this population is at elevated risk for both depression and suicidal ideation, potentially influenced by intersecting factors such as limited educational attainment, health vulnerability, and economic deprivation—findings that align with prior research [2].

Second, the analysis of differences in depression and suicidal ideation by demographic characteristics revealed no statistically significant differences across any of the examined variables,



*P<0.05, **P<0.01
Direct effect: effect=0.287**
Indirect effect (via resilience): effect=0.193*

Fig. 1. Mediating effect of resilience on depression and suicidal ideation in older adults living alone.

Table 3. Mediating effect of resilience on the influence of depression on suicidal ideation

	Independent variable	Dependent variable	B	SE	β	t	F (P)	R^2	Adj. R^2
Step 1	Depression	Resilience	–0.503	0.167	–0.315	–3.005	9.031**	0.099	0.088
Step 2	Depression	Suicidal ideation	0.910	0.335	0.287	2.713	7.358**	0.082	0.071
Step 3	Depression	Suicidal ideation	0.612	0.340	0.193	1.802	7.847**	0.016	0.014
	Resilience		–0.592	0.213	–0.298	–2.781			

Adj., adjusted; SE, standard error.
**P<0.01, Sobel test statistic: 2.042, P<0.05.

including sex, age group, educational level, perceived health status, and income. This finding suggests that, among older adults living alone aged 70 and above, the levels of depression and suicidal ideation may be more strongly influenced by psychological rather than demographic factors [16]. These findings imply that while demographic background should be considered in interventions addressing depression and suicidal ideation among elderly living alone, interventions focusing primarily on intrapersonal psychological resources—such as resilience—and psychosocial factors may be more effective.

Third, correlation analysis among the key variables demonstrated that depression was significantly positively correlated with suicidal ideation (r=0.287, $P<0.01$) and significantly negatively correlated with resilience (r=–0.315, $P<0.01$). These results indicate that higher levels of depression are associated with increased suicidal ideation and lower levels of resilience. Furthermore, suicidal ideation was significantly negatively correlated with resilience (r=–0.359, $P<0.01$), suggesting that individuals with greater resilience tend to report lower levels of suicidal ideation.

These findings support the conceptualization of resilience as a protective psychological resource that mitigates the adverse effects of depression and suicidal ideation among older adults living alone. They underscore the potential value of resilience-enhancing interventions in suicide prevention efforts within this population.

Lastly, the analysis of the mediating effect of resilience on the relationship between depression and suicidal ideation among older adults living alone confirmed that resilience partially mediates this relationship. This finding suggests that depression influences suicidal ideation indirectly through the psychological resource of resilience, rather than exerting a direct effect. These findings are consistent with previous studies [17] that reported a negative association between resilience and suicidal ideation, as well as evidence indicating that ego-resilience significantly impacts suicidal ideation [4,6,18].

On the other hand, Kwon [5] reported that resilience functions as a moderator in the relationship between depression and suicidal ideation among older adults, which differs functionally from the mediating effect identified in this study. This discrepancy can be understood by distinguishing between buffering effects and indirect effects, which represent distinct functional pathways. Nevertheless, both perspectives underscore resilience as a psychological protective factor. In this study, resilience was identified as a mediating mechanism that attenuates the pathway through which depression leads to suicidal ideation. This finding contrasts with the pathway in which hopelessness elevates suicide risk [16] and further underscores resilience as a critical psychological resource for suicide prevention. Relatedly, Cross [19] defined resilience as the emotional recovery capacity that protects against suicide risk by enabling individuals to withstand and recover from stressful situations. Furthermore, Cha and Lee [18] reported that problem-solving ability, a component of resilience, plays a role in reducing suicidal ideation. These findings reaffirm that resilience is a key psychological resource that alleviates suicide risk.

Meanwhile, recent studies have expanded the concept of resilience beyond individual internal traits to a more multidimensional, system-wide capacity for recovery. Peeters et al. [20] redefined resilience as the ability of a system to recover and adapt after exposure to stressors and proposed understanding it from a multilevel (systemic) perspective. Specifically, to support resilience in older adults with cognitive decline, they emphasized the need for integrated strategies at the macro level, including organizational, policy, and community resources, going beyond psychological and cognitive interventions. This perspective suggests that interventions aimed at enhancing resilience should extend beyond simple individual-centered approaches to more practical and feasible multidimensional strategies.

Therefore, given that resilience was identified as a significant mediating variable in the relationship between depression and suicidal ideation among older adults aged 70 and above living alone, the development of integrated intervention strategies at both micro and macro levels is warranted to enhance resilience in this population. For physically and economically vulnerable older adults living alone, individual psychological counseling or cognitive training alone may be insufficient to effectively strengthen resilience. Accordingly, a multidimensional, community-based approach should be implemented in parallel to address the complex and interrelated factors contributing to suicide risk.

Based on the above discussion, the following recommendations are proposed. First, resilience has been identified as a key psychological protective factor that buffers the effects of depression and suicidal ideation among older adults aged 70 and above who are at risk of dying alone. Future research should focus on developing and evaluating multidimensional intervention strategies aimed at enhancing resilience in this population. It is particularly essential to design integrated approaches that extend beyond individual-level interventions to encompass

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community-based and policy-level strategies, thereby addressing the broader structural and social determinants of mental health and suicide risk. At the micro level, employing positive psychology and cognitive-behavioral strategies may enhance cognitive, emotional, and behavioral coping abilities in response to stressful situations, thereby strengthening resilience. This suggests that individual-level interventions focusing on psychological resources can play a pivotal role in suicide prevention among older adults living alone. At the macro level, more realistic policies are needed at the national level to ensure that older adults living alone can lead safe lives within their communities. Housing, health, and welfare policies are crucial, as are economic policies that can guarantee basic living standards. Building on these, we must establish a social structure that ensures adequate care within the community.

Second, this study focused on older adults aged 70 and above living alone who were receiving the government's specialized tailored care services—an identified high-risk group characterized by elevated levels of depression and suicidal ideation.

Therefore, psychological protective factors such as resilience identified in this study can serve as foundational data for evaluating the effectiveness of future specialized services and for developing related programs aimed at high-risk older adults living alone.

Meanwhile, this study has several limitations. First, the sample was limited to recipients of the national specialized care services in three selected local government areas, which restricts the generalizability of the findings.

Additionally, due to practical challenges in recruiting older adults living alone, data collection was conducted over a relatively short period. These factors necessitate caution in interpreting the results. Future research should consider expanding the survey area nationwide and allocating sufficient time to include samples with more diverse characteristics and backgrounds, thereby enhancing the reliability and validity of the study. Lastly, this study tested the mediating effect of resilience on depression and suicidal ideation among older adults based on a limited sample size (n=87). However, it is necessary to further examine the moderated mediating effect of resilience on depression and suicidal ideation in later life, taking into account potential moderators not identified in this study, and to verify these effects through longitudinal research that captures changes over time.

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AUTHOR CONTRIBUTIONS

Dr. Hee Jung KIM had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. All authors reviewed this manuscript and agreed to individual contributions.

Conceptualization: all authors. Methodology: all authors. Investigation: all authors. Data curation: all authors. Formal analysis: all authors. Writing–original draft: HYK and HJK. Writing–review & editing: HJK.

CONFLICTS OF INTEREST

No existing or potential conflict of interest relevant to this article was reported.

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DATA AVAILABILITY

The data presented in this study are available upon reasonable request from the corresponding author.

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