

Original Article

The Mediating Role of Social Disconnection in the Relation of Cognitive Flexibility with Suicidal Thoughts in Elderly

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Abstract

Suicidal thoughts are common in elderly, while few studies have been conducted on the psychological factors related to this issue. The present study aimed to examine the mediating role of social disconnection in the relation of cognitive flexibility with suicidal thoughts in the elderly. This research was a descriptive-correlational study. The population of this study included all elderly individuals in nursing homes in Ardabil City in 2024. Two hundred thirty-seven elderly individuals were selected using purposive sampling and participated in this study. To collect data, Dennis and Vander Wal Cognitive Flexibility Inventory, Beck et al.'s Suicidal Thoughts Scale, and Saito et al.'s the Social Disconnection Scale were used. The data was analyzed using structural equation modeling via the LISREL 8.8 software. The results of structural equation modeling showed that both cognitive flexibility and social disconnection had a significant direct effect on suicidal thoughts among the elderly. Furthermore, cognitive flexibility, through the mediation of social disconnection, had a significant indirect effect on suicidal thoughts ($p < 0.05$). Furthermore, the fitness indexes showed that the hypothesized model has good fitness based on data. These results reveal that the low cognitive flexibility can indirectly expose individuals to suicidal thoughts through the creation of social disconnection. Based on these results, increasing cognitive flexibility and social connection are suggested for preventing suicidal thoughts in elderly.

Keywords

Cognitive flexibility
Elderly
Suicidal thoughts
Social disconnection

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Introduction

In the current years, the continuous improvement of mental health standards, the rising level of public awareness, and the expanded access to healthcare and therapeutic services have collectively contributed to a significant increase in the elderly population. Researchers predict that by 2025, the proportion of Elderly in Iran will reach 11.3% of the total population (Mahdavi et al., 2024). This upward trend underscores the urgent need to revise and strengthen policies to enhance the quality of life and mental well-being of the aging population (Siraji et al., 2025). Psychological transformations during older ages are among the most defining features of this life stage. Among these, the experience of loneliness and social rejection stands out as a major challenge, often leading to diminished self-worth, a sense of uselessness within the family and society, and ultimately the

emergence of a nihilistic perspective on life. Such conditions can pave the way for profound despair and even Suicidal Thoughts, as a perceived escape from escalating psychological distress (Jang et al., 2024).

The high suicide rate among the elderly is an important global public health concern but has not received much attention (He et al., 2021). Suicidal thoughts are widely recognized as a critical precursor to suicide-related deaths, and thus, it remains a central concern in global public health discourse. Projections indicate that this will account for a more significant share of the global burden of disease in the future (Altwajiri et al., 2024). According to reports by the World Health Organization (WHO) (2023), mental health in old age is influenced not only by physical and social environments but also by the cumulative impact of past life experiences and stressors uniquely associated with aging. Exposure to adversity, decline in intrinsic capacity, diminished physical

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functioning, and disruptions in circadian rhythms can all contribute to psychological distress and depression (Zardi & Abdi, 2022). Elderly individuals are disproportionately exposed to distressing events such as bereavement, income reduction, or a loss of purpose following retirement. Despite their substantial presence in society, many elderly face ageism, which severely impacts their mental health, diminishes their sense of life satisfaction and heightens the risk of suicidal thoughts (Teo et al., 2023). According to the WHO's 2023 report, approximately one-quarter (27.2%) of all suicide-related deaths worldwide involve individuals aged 60 and above. A high level of cognitive flexibility is recognized as a significant protective factor against the emergence of suicidal thoughts and behaviors (Chang et al., 2024). Psychological flexibility refers to an individual's capacity to maintain emotional and behavioral balance when faced with stressful and challenging situations—a capacity that allows one to remain present, make use of available opportunities, and pursue growth and meaning without deviating from personal goals and values (Ong & Eustis, 2023). Cognitive flexibility, in particular, plays a key role in reducing maladaptive responses and enhancing emotional regulation (Mahmoudian et al., 2024). The importance of this psychological trait becomes especially evident when considered in the prevention of mental disorders and behavioral abnormalities, including suicidal thoughts. Recent studies have highlighted psychological flexibility as a protective construct that significantly reduces the risk of suicidal thoughts and behaviors (Haddadi et al., 2024). In line with these findings, Swarnalakshmi et al. (2025) explored the link between cognitive flexibility and Suicidal Thoughts. Their research demonstrated that following cognitive intervention sessions, during which participants' cognitive flexibility increased, the frequency of suicidal thoughts significantly declined. Flynn et al. (2024) further emphasized that this psychological trait functions as a shield against self-destructive tendencies in the general population.

Another significant factor contributing to the increased risk of suicidal thoughts is the phenomenon of social disconnection—a concept referring to the absence of emotional, physical, and social ties with others (Saito et al., 2024). Social disconnection encompasses multiple structural and functional dimensions. Structurally, it is assessed through indicators such as an individual's living arrangements, the size of their social networks, and the frequency of their social interactions. In contrast, the functional dimension focuses on the subjective evaluation of the quality and meaningfulness of one's social relationships (Barrenetxea et al., 2022). Among the elderly, the loss of social connections has been linked to a range of negative outcomes, including cognitive decline, an increased risk of dementia, depression, physical disability, and even higher mortality rates (Donovan, 2020). Mohamadi et al. (2024) noted that a lack of social support—essentially a form of social disconnection—can lead to emotional dysregulation (Mikaeili et al., 2023). In line with this, Saito et al. (2024) found that the Elderly

experiencing social disconnection exhibited a modestly increased risk of suicide.

Furthermore, a study by Cui et al. (2022) reported that elderly individuals who experienced elevated levels of suicidal thoughts often suffered from disruptions or breakdowns in their social relationships—a finding that underscores the detrimental role of social disconnection in the emergence of suicidal thoughts. This conclusion was corroborated by Gill et al. (2023), who demonstrated that the greater the level of social connectedness among the elderly, and the lesser the degree of social disconnection, the lower the incidence of suicidal thoughts. Moreover, a bidirectional relationship has been observed between social disconnection and cognitive flexibility. In a study Cai and Qi (2023), lower levels of cognitive flexibility were found to contribute to social isolation and reduced interpersonal interaction, which in turn heightened the risk of suicidal thoughts. Similarly, Roth (2022) reported that elderly with cognitive impairments and reduced cognitive flexibility tend to experience higher levels of social disconnection.

Given the growing elderly population and the rising prevalence of psychological difficulties in later life, identifying both protective and risk factors for suicidal thoughts has become increasingly important. Research has shown that cognitive flexibility can play a significant role in reducing suicidal thoughts, while social disconnection has been identified as a critical risk factor in this context. However, there remains a notable gap in the literature regarding the mediating mechanisms through which cognitive flexibility affects suicidal thoughts, particularly among the elderly. Investigating the mediating role of social disconnection in this relationship could offer deeper insights into the psychological pathways that influence mental health in the elderly. Such insights could, in turn, inform the development of targeted interventions aimed at preventing suicidal thoughts and behaviors within this vulnerable population. Therefore, the present study aimed to examine the mediating role of social disconnection in the relationship between cognitive flexibility and suicidal thoughts, in the elderly.

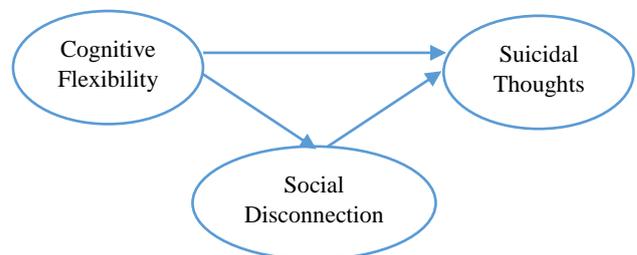


Figure 1. Conceptual Model of the Study

Method

Participants

The method of this present study is descriptive-correlational, and in terms of its objective, it is classified as basic research. The population consisted of all elderly residing in care centers in Ardabil city (with a total provincial population of approximately 136,000). For

structural equation modeling involving two to four latent variables, it is recommended that researchers plan for a minimum sample size of 100 to 200 participants. Using smaller samples may result in non-convergence, inaccurate results, or low precision in parameter estimates, particularly in the standard errors (Houman, 2005). Therefore, accounting for potential attrition, a total of 237 elderly individuals were selected using purposive sampling and participated in this study.

Instrument

Cognitive Flexibility Inventory (CFI):

This questionnaire was developed by Dennis and Vander Wal (2010). It consists of 20 items and includes the following subscales: perceived control, perceived alternatives, and perceived justification of behavior. Items are rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items 2, 4, 7, 9, 11, and 17 are reverse-scored. The total score ranges from 20 to 140, with higher scores indicating greater cognitive flexibility and vice versa. In the original study by Dennis and Vander Wal (2010), the CFI demonstrated a concurrent validity of -0.39 with the Beck Depression Inventory-II (BDI-II), and a convergent validity of 0.75 with Martin and Rubin's Cognitive Flexibility Scale. In an Iranian adaptation, Shareh et al. (Soltani et al. 2013) reported a test-retest reliability coefficient of 0.71 and a Cronbach's alpha of 0.90 for the total scale. In their study, Cronbach's alphas for the subscales of alternatives, control, and justification for human behavior were reported as 0.72, 0.55, and 0.57, respectively. In the present study, the overall reliability of the CFI, as measured by Cronbach's alpha, was found to be 0.90.

Beck Scale for Suicidal Thoughts (BSSI):

The Beck Scale for suicidal thoughts, (BSSI) was developed by Beck et al. (1979) and comprises 19 items, each scaled on a 3-point scale ranging from 0 to 2. Thus, the total score can range from 0 to 38. The scale includes three components: *desire for death* (items 1–5; score range: 0–10), *passive suicidal thoughts*, (items 6–9; score range: 0–8), and *active suicidal thoughts*, (items 10–19; score range: 0–20). The first five items serve as screening questions, indicating the presence or absence of passive or active suicidal thoughts, for example, if a respondent scores between 0 and 5 on these initial items, there is typically no need to continue—unless the score includes a nonzero response to item 5, in which case the remaining 14 items should be completed and assessed. The Cronbach's alpha coefficients of this scale was reported satisfactory (>0.8) (Esfahani et al., 2015).

Beck and Steer (1991) reported the reliability of this scale using Cronbach's alpha coefficient, which ranged from 0.87 to 0.97. Using the test-retest method, they reported a reliability coefficient of 0.54. Additionally, the internal consistency of the scale, as measured by Cronbach's alpha, was reported to be 0.89, and the inter-rater reliability was reported to be 0.83. In Iran, Anisi et al.

(2005) reported a Cronbach's alpha of 0.95. They also found the BSSI to correlate strongly with standardized depression and suicidality tests, with coefficients of 0.90 for inpatient populations and 0.94 for outpatients. In the present study, the reliability of the BSSI, as measured by Cronbach's alpha, was 0.80.

Social Disconnection Questionnaire:

This questionnaire, designed by Saito et al. (2024), consists of 9 items aimed to assess social disconnection. The questionnaire includes three components: individual dining, lack of social support, lack of participation in social activities, and lack of contact with friends. Responses are rated on a 5-point Likert scale (1 = Never to 5 = Always). The total score range for this scale is 9 to 45. To determine whether an individual experiences social disconnection, the average score is used as a threshold. Scores lower than the mean of 27 indicate high social disconnection, while scores higher than this suggest low social disconnection. Saito et al. (2024) reported a Cronbach's alpha of 0.62 for the scale, indicating a moderate level of reliability. They also found a strong correlation ($r = 0.95$) between social disconnection and depression, suggesting excellent validity. In this study, the content validity of the questionnaire was confirmed through a back-translation process, which was approved by three professors from the psychology department. The reliability of the questionnaire, measured by Cronbach's alpha, was found to be 0.86 in this study.

Procedure

This study was approved by the Ethics Committee of the University of Mohaghegh Ardabili with the ethical code IR.UMA.REC.1403.081. The inclusion criteria for the study were: individuals aged 60 and above (as per the definition of elderly in Iran), the ability to comprehend and respond to questionnaires, written consent to participate in the study, residence in elder care facilities, and a minimum ability to understand the questions in the questionnaire. The exclusion criteria were: having severe cognitive disorders or dementia, a history of severe psychiatric disorders such as active psychosis type I bipolar disorder, or schizophrenia (based on medical records or caregiver reports), the using psychiatric medications, participation in similar psychological interventions during the study, and severe physical disabilities that would prevent active participation in completing the instruments or the interview process. Ultimately, after data collection, structural equation modeling was used for data analysis, and the analysis was performed using SPSS 23 and Lisrel 8.8 software. A total of 237 elderly participants, with a mean age of 68.89 years ($SD = 12.5$), ranging from 65 to 86 years, participated in this study. Among the 237 participants, 54% (128 individuals) were female and 46% (109 individuals) were male. In terms of education: 20.7% (49 individuals) were literate, 17.7% (42 individuals) had primary school education, 16.5% (39 individuals) had secondary school education, 26.2% (62 individuals) had a

high school diploma, and 19% (45 individuals) had a university degree.

Results

Two hundred and thirty-seven Elderly participated in this study, with a mean age of 68.89 years (SD = 5.12), ranging from 65 to 86 years. Among the participants, 54%

(128 individuals) were women and 46% (109 individuals) were men. Regarding educational attainment, 20.7% (49 individuals) were literate without formal schooling, 17.7% (42 individuals) had completed primary education, 16.5% (39 individuals) had attended middle school, 26.2% (62 individuals) held a high school diploma, and 19% (45 individuals) had pursued higher education.

Table 1. Description of the Study Variables

Variable		Mean	Standard Deviation	Skewness	Kurtosis
Suicidal Thoughts	Desire for death	4.46	2.14	-0.19	-0.41
	Passive suicidal thoughts	3.65	1.98	-0.10	-0.79
	Active suicidal thoughts	6.10	2.89	0.49	0.37
	Total Score	14.20	5.41	0.08	0.34
Cognitive Flexibility	Perception of Multiple Alternatives	37.76	11.81	0.18	-0.92
	Perceived Controllability	27.93	7.16	0.43	-0.36
	Perceived Justification of Behavior	7.41	2.52	0.45	-0.21
	Total Score	73.11	18.49	0.16	-0.80
Social Disconnection	Lack of Family Support	7.40	1.79	-0.35	-0.53
	Lack of Friend Support	7.30	1.82	-0.82	0.57
	Lack of Spousal Support	7.17	1.80	-0.47	-0.21
	Feeling of Loneliness	10.64	2.37	-0.75	0.38
	Total Score	32.51	6.38	-0.61	0.22

Table 1 shows the mean and standard deviation of the variables of suicidal ideation, cognitive flexibility, and social disengagement. According to the results obtained, the observed skewness value for the research variables is in the range (3, -3); that is, in terms of skewness, the

variables of suicidal ideation, cognitive flexibility, and social disengagement are normal and their distribution is symmetrical. Also, their elasticity value is in the range (3, -3); this indicates that the distribution of the research variables has normal elasticity.

Table 2. Correlation Matrix of the Study Variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Suicidal Thoughts	1									
2. Perception of Alternatives	-0.46**	1								
3. Perceived Controllability	-0.29**	0.57**	1							
4. Perceived Justification	-0.37**	0.53**	0.45**	1						
5. Cognitive Flexibility (Total)	-0.46**	0.73**	0.61**	0.55**	1					
6. Lack of Family Support	0.47**	-0.36**	-0.31**	-0.25**	-0.39**	1				
7. Lack of Friend Support	0.51**	-0.32**	-0.35**	-0.24**	-0.37**	0.65**	1			
8. Lack of Spousal Support	0.52**	-0.38**	-0.35**	-0.29**	-0.42**	0.53**	0.60**	1		
9. Feeling of Loneliness	0.51**	-0.34**	-0.25**	-0.24**	-0.35**	0.54**	0.46**	0.61**	1	
10. Social Disconnection (Total)	0.61**	-0.43**	-0.38**	-0.31**	-0.46**	0.71**	0.70**	0.72**	0.73**	1

The results presented in Table 2 indicate a significant negative correlation between suicidal thoughts and cognitive flexibility ($r = -0.46, p < .01$) at the 99% confidence level, and a significant positive correlation between suicidal thoughts and social disconnection ($r = 0.61, p < .01$). Additionally, a significant negative correlation was found between social disconnection and cognitive flexibility ($r = -0.46, p < .01$).

In the present study, structural equation modeling (SEM) was employed to examine the relationship between cognitive

flexibility and suicidal thoughts among the Elderly, with social disconnection considered as a mediating variable.

Based on the model fit indices, the Comparative Fit Index (CFI) was 0.93, the Normed Fit Index (NFI) was 0.92, and the Goodness-of-Fit Index (GFI) was 0.86. The chi-square to degrees of freedom ratio (χ^2/df) was 2.18, and the Root Mean Square Error of Approximation (RMSEA) was 0.071. Given these results, it can be concluded that the research model demonstrates an acceptable level of fit and statistical significance.

Table 3. Direct Effects

Predictor Variable	Outcome Variable	Path Coefficient (β)	T-value	Standard Error	Significance
Cognitive Flexibility 	Suicidal Thoughts in the Elderly	-0.17	-2.91	0.069	$p < .001$
Cognitive Flexibility 	Social Disconnection	-0.46	-7.09	0.024	$p < .001$
Social Disconnection 	Suicidal Thoughts in the Elderly	0.55	8.36	0.019	$p < .001$

According to Table 3, the direct effects of cognitive flexibility and social disconnection on suicidal thoughts

in the elderly are statistically significant at the 99% confidence level. To examine the indirect effect of

cognitive flexibility on suicidal thoughts through the mediating role of social disconnection, the Sobel test was employed. Additionally, the Variance Accounted For

(VAF) statistic was used to determine the magnitude of the indirect effect through the mediator. The results of these analyses are presented in Table 4.

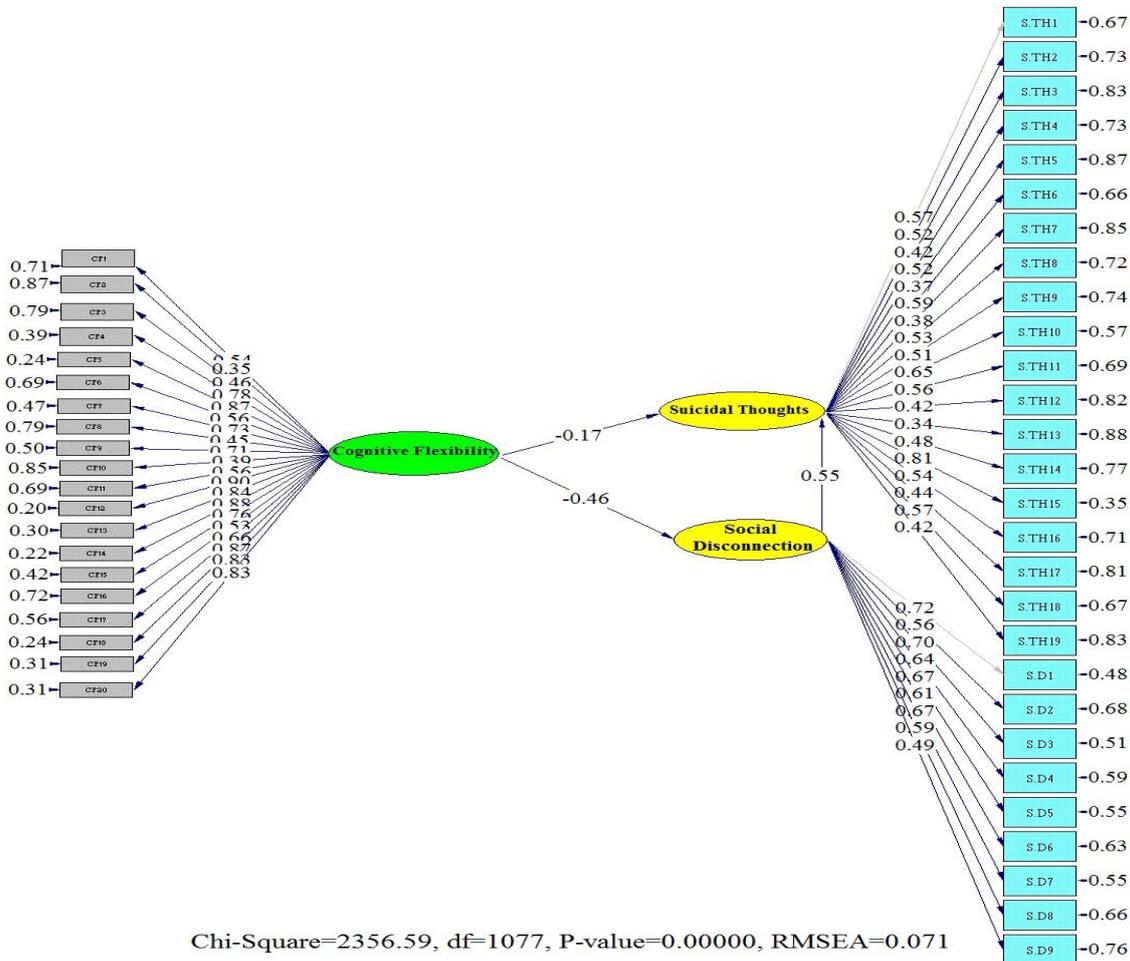


Figure 2. Testing the Research Model (in Standardized Form)

Table 4. Results of Indirect Effects Analysis

Research Hypothesis	T-Sobel	Standardized Path Coefficient	VAF Statistic	Test Result
Cognitive Flexibility → Social Disconnection → Suicidal Thoughts in the Elderly	16.635	0.253	0.598	Supported

Given that the T-value for the indirect effect (Sobel test) falls outside the ± 1.96 range, the indirect effect of cognitive flexibility on suicidal thoughts in the elderly is statistically significant. Therefore, in addition to its direct effect, cognitive flexibility also exerts an indirect influence on suicidal thoughts through social disconnection. Based on the obtained VAF statistic, it can be concluded that approximately 59.8% of the effect of cognitive flexibility on suicidal thoughts in the elderly is mediated through social disconnection.

Discussion

Based on the aim of this study, which was to examine the mediating role of social disengagement in the relationship between cognitive flexibility and suicidal thoughts in the elderly, the first hypothesis of the present study was that cognitive flexibility has a direct effect on suicidal thoughts in the elderly. After the analysis, this hypothesis was

confirmed. These results align with the findings of Swarnalakshmi et al., (2025), Chang et al., (2024), Haddadi et al., (2024), and Flynn et al., (2024).

To explain these findings, it can be stated that cognitive flexibility, as the mental ability to reconsider beliefs, adapt to changing situations, and choose diverse responses to life challenges, is one of the fundamental components of mental health, especially in old age. As individuals age and face crises such as retirement, decreased physical functioning, and loss of social roles, and intimate relationships, the likelihood of experiencing despair, meaninglessness, and suicidal thoughts increases. In this context, elderly individuals with higher cognitive flexibility, by utilizing multifaceted perspectives and meaningful mental reconstruction abilities, are capable of offering more adaptive and different interpretations of life's challenging events. When faced with psychological distress, instead of sinking into helplessness, they tend to

pursue realistic and hopeful paths. Therefore, it can be concluded that cognitive flexibility, by directly preventing suicidal thoughts, acts as a psychological shield that protects the elderly mind against the intrusion of lethal thoughts (Turk et al., 2024).

The second hypothesis of the present study was that social disengagement has a direct effect on suicidal thoughts in the elderly. After the analyses, this hypothesis was also confirmed. These results are in line with the findings of Saito et al. (2024), Gill et al. (2023), and Cui et al. (2022). To explain these findings, it can be stated that social disconnection, defined as the absence of meaningful emotional and social relationships with others, is recognized as one of the significant factors contributing to psychological crises in old age. Due to increasing social distances, the loss of family members, and physical limitations, elderly individuals may experience feelings of isolation and rejection. This situation not only affects their quality of life but can also lead to the emergence of suicidal thoughts. Research has shown that the lack of supportive social networks and meaningful connections, especially in the Elderly, significantly increases the risk of depression and suicidal thoughts. In this context, social disconnection can directly act as a critical factor in the onset and intensification of suicidal thoughts in the elderly. The absence of supportive relationships strengthens feelings of meaninglessness and lack of control over life, ultimately leading to hopelessness and suicidal thoughts (Lutz et al., 2021).

The third hypothesis of the present study was that cognitive flexibility has a direct effect on social disconnection in the elderly, and the findings confirmed this hypothesis. The results align with the findings of Cai and Qi (2023) and Roth (2022).

To explain these findings, it can be stated that cognitive flexibility, as one of the essential psychological capacities, plays a determining role in how individuals interact with their surrounding environment, particularly in old age. This ability helps individuals understand different perspectives and adopt alternative solutions when facing complex, changing, and sometimes stressful situations. In elderly individuals, this ability can play a significant role in maintaining the continuity and quality of social relationships. Cognitive flexibility increases adaptability to social, familial, and physical changes associated with aging, thus preventing isolation and gradual withdrawal from social interactions. Therefore, the more cognitively flexible an elderly individual is, the lower the likelihood of social disconnection, and their sense of belonging and social participation is preserved. Hence, it can be concluded that cognitive flexibility directly influences the reduction of social disconnection in the elderly (Cai & Qi, 2023).

The fourth hypothesis of the present study was that cognitive flexibility, in addition to its direct effect, also indirectly influences suicidal thoughts in the elderly through social disconnection.

To explain the hypothesis regarding the mediating role of social disconnection in the relationship between cognitive flexibility and suicidal thoughts, it can be stated that low

cognitive flexibility reduces an individual's ability to cope with stressful situations and social challenges. Individuals with lower cognitive flexibility typically have less capacity to understand and accept new or complex situations, and they may exhibit negative reactions to their psychological and social circumstances. This lack of flexibility can lead to increased communication problems, isolation, and ultimately social disconnection. Social disconnection, as a mediating factor, influences feelings of loneliness and the individual's withdrawal from others, which exacerbates psychological problems and negative thoughts. When a person is isolated from their community and has fewer social connections, feelings of worthlessness and loneliness are reinforced, which can lead to suicidal thoughts. In other words, the reduction in cognitive flexibility, through the creation of social disconnection, can provide a basis for the emergence of suicidal thoughts and behaviors. Therefore, this hypothesis states that social disconnection, as a mediating pathway, facilitates the negative effects of low cognitive flexibility on suicidal thoughts. Individuals were indirectly affected by social disconnection are at a higher risk of experiencing suicidal thoughts. In this model, social disconnection plays an essential role, not only as an independent factor but also as a mediating variable that intensifies the negative effects of low cognitive flexibility.

This study faced some limitations, such as non-random sampling and the use of self-report tools, which reduced the ability to fully trust the results. Additionally, structural equation modeling (SEM), due to its reliance on correlational data, cannot determine causal relationships with high certainty, and it is influenced by omitted variables and the need for an adequate sample size. In SEM, since cross-sectional data is often used, changes in these relationships over time are not well established. For more precise conclusions, it is recommended to combine structural equation modeling with longitudinal studies or experimental methods. Therefore, future research should aim for more accurate sampling methods and explore other factors related to the onset and increase of suicidal thoughts in the elderly. Given the role and significance of the elderly in society, it is suggested that future studies examine the factors influencing their mental health in more detail. Furthermore, efforts could be made in eldercare centers to focus on preventative measures and the reduction of suicidal thoughts through counseling and group therapy sessions.

Conclusion

Low cognitive flexibility can indirectly expose individuals to suicidal thoughts through social disconnection. The reduction in an individual's ability to cope with social and psychological situations leads to social isolation, which in turn strengthens negative feelings such as loneliness, worthlessness, and helplessness. These factors can lay the groundwork for the emergence of suicidal thoughts. Therefore, improving cognitive flexibility and reducing social disconnection is of great importance in preventing suicidal thoughts in the elderly and other vulnerable groups, especially in therapeutic and social settings.

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Disclosure Statement

No potential conflict of interest was reported by the Authors.

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