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The relationship between suicidal ideation and cognitive distortions, failures, and flexibility in the geriatric population

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Abstract

We set out to examine how cognitive distortions, everyday cognitive lapses, and cognitive flexibility relate to suicidal thoughts and behaviors in later life. The study enrolled 101 adults aged 65 years and older drawn from the community and a psychiatry outpatient setting where evaluations unrelated to active illness were conducted. Participants completed a sociodemographic form, the Cognitive Distortions Scale (Ultra-Brief Form) (CDS-UBF), Cognitive Failures Questionnaire (CFQ), Cognitive Flexibility Scale (CFS), Suicidal Behaviors Questionnaire-Revised (SBQ-R) and Depression Anxiety Stress Scale-21 (DASS-21). Spearman correlation and stepwise binary logistic regression analyses were conducted using SPSS 29. Participants were grouped according to Suicidal Behaviors Questionnaire-Revised item 1 scores: those scoring ≥ 2 were considered at risk for suicidal behavior. Stepwise binary logistic regression was performed with suicidal behavior (yes/no) as the dependent variable and cognitive failures, cognitive flexibility, depression, anxiety, stress, age, educational level, marital status, presence of chronic illness, and specific cognitive distortions as candidate predictors. Significant positive correlations were found between suicidal behavior and specific cognitive distortions; magnification/minimization ($r=.354$), mind reading ($r=.344$), and overgeneralization ($r=.461$); as well as cognitive failures ($r=.438$). Cognitive flexibility was negatively correlated with suicidal behavior ($r=-.301$). Regression analysis revealed that total cognitive failure score ($B=0.037$, $p=0.009$), magnification/minimization ($B=0.632$, $p=0.030$), and overgeneralization ($B=0.683$, $p=0.018$) were independent predictors of suicidal behavior (Nagelkerke $R^2=0.365$). Cognitive distortions and failures appear to play a significant role in suicidal behavior among older adults, independent of mood symptoms. These findings support incorporating brief cognitive screening and targeted cognitive interventions into geriatric suicide-prevention practice.

Keywords: Suicidal ideation, aged, cognitive dysfunction

Introduction

Globally, Adults aged 65 years and older face a disproportionate burden of suicide compared with many younger groups [1]. In older adults, depression is known to significantly increase the risk of suicide by contributing to somatic, cognitive, and functional impairments, as well as increasing vulnerability to physical illnesses and suicidal behaviors [1]. However, research indicates that, in addition to depression, other factors may also contribute to increased suicidal tendencies among older individuals. At the same time, other contributors—such as loneliness, financial strain, and cognitive decline—also figure prominently in late-life suicidality [2]. In this context, cognitive processes such as distortions, failures, and reduced flexibility may interact with age-related stressors (e.g. bereavement, medical comorbidities, functional decline) to intensify hopelessness, perceived

burdensomeness, and entrapment, thereby increasing suicidal ideation in late life [2-4]. Emerging evidence indicates that suicidal behavior could be associated with discrete cognitive deficits—not only mood disturbance—so flexibility, distortions, and failures might warrant consideration in older adults.

In the literature on psychology, cognitive flexibility is defined as a multidimensional executive function that encompasses the awareness of alternative behavior, the willingness to engage in such behavior, and the self-efficacy to respond flexibly [5]. This construct denotes the capacity to flexibly adjust one's thinking and behavior as task or environmental demands shift. [6]. Higher levels of cognitive flexibility have been reported to predict lower levels of depressive symptoms and suicidal ideation during follow-up in psychiatric patients [7]; conversely, a lack of cognitive flexibility prospectively predicts increased

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suicidal ideation through mechanisms such as rumination and hopelessness [8]. These findings suggest that, in older adults who already face cumulative losses and health problems, diminished cognitive flexibility may hinder adaptive coping with late-life stressors and thereby contribute to elevated suicide risk.

Cognitive distortions are automatic and biased patterns of thinking that lead individuals to interpret reality in a systematically inaccurate or irrational manner [9]. These thought patterns contribute to the maintenance of negative emotions and the reinforcement of dysfunctional behavior, particularly in psychopathologies such as depression and anxiety [10]. Research indicates that individuals who have recently attempted suicide exhibit higher levels of cognitive distortions compared to psychiatric control groups, even after controlling for levels of depression and hopelessness [11,12]. In late life, such distortions may be especially detrimental because they can amplify interpretations of age-related changes (e.g. dependence, illness, social loss) as signs of worthlessness or being a burden, thus fostering suicidal ideation in older adults.

Cognitive failures are everyday lapses in routine cognition and day-to-day performance. Although they do not consistently correlate with objective measures of cognitive performance (e.g., working memory, attention span, or executive function tasks), they may reflect an individual's real-life cognitive capacity as influenced by various factors (stress levels, sleep quality, mood disorders or environmental distractions.) [13]. Studies have shown that, particularly in major depressive disorder and other psychiatric conditions, the severity of suicidal ideation is associated with impairments in executive functions and overall neuropsychological performance, as well as with cognitive processes such as negative thinking patterns, impulsivity, and cognitive rigidity [3,4]. Among older adults, frequent cognitive failures may undermine a sense of autonomy and competence, potentially reinforcing feelings of helplessness and perceived burdensomeness that are closely linked to suicidal thoughts in this age group [2,3]. However, studies that investigate the impact of such cognitive processes on suicide risk in older adults are rather limited. Suicide in late life is a complex and multidimensional issue that can have serious consequences at both individual and societal levels. To our knowledge, no previous study has simultaneously examined cognitive distortions, everyday cognitive failures, and cognitive flexibility in relation to suicidal ideation in older adults, which represents a novel and integrative approach to late-life suicide risk. Accordingly, this study tested whether cognitive distortions, cognitive failures, and cognitive flexibility are associated with suicidal ideation in older adults, with the goal of informing cognitively focused assessment and prevention in geriatric care.

Material and Methods

Sample

We recruited individuals aged 65–90 years from two sources: (1) older adults who presented to the psychiatry outpatient clinic of Karabük Training and Research Hospital for non-disease-related

evaluations (e.g., assessments of mental competence, disability reports, driver's license evaluations) and (2) community-dwelling older adults living independently. In both settings, potential participants were informed about the study and were enrolled on a voluntary basis after providing written informed consent. Data were collected between July and October 2025.

All potential participants were screened by a board-certified psychiatrist using a clinical interview based on DSM-5 criteria and a review of their medical records to rule out any current major psychiatric disorder. A standardized structured diagnostic interview (e.g., SCID-5) was not used; instead, diagnoses were determined according to routine clinical assessment.

Using GPower 3.1 for binary logistic regression with medium effect size ($\approx OR\ 1.68$; $f^2 \approx .15$), $\alpha=.05$, and 80% power, the minimum required sample was 98; we therefore targeted ≥ 100 participants.

Inclusion and Exclusion Criteria

Individuals were considered eligible if they satisfied the following inclusion criteria:

- Being 65 years of age or older
- Being literate and possessing sufficient cognitive capacity to comprehend the questionnaires either independently or with the assistance of the researcher
- No history of psychotic disorders
- No current DSM-5 diagnosis of a major psychiatric disorder (e.g., schizophrenia, schizoaffective disorder, depressive disorder, anxiety disorder) as determined by clinical interview
- Providing written informed consent to participate in the study

The presence of subthreshold depressive, anxiety, or stress symptoms on the DASS-21 did not constitute an exclusion criterion, and individuals with a past psychiatric history in full remission were not excluded.

Conversely, individuals who met any of the following exclusion criteria were not included in the study:

- Diagnosed with moderate or severe dementia
- Currently experiencing an acute physical illness or medical instability (e.g., conditions requiring inpatient treatment)
- Possessing sensory impairments (e.g., significant visual or hearing loss) that would prevent participation in the assessment procedures
- Diagnosed with a substance-abuse or alcohol-use disorder
- Diagnosed a communication disorder or neurological condition (e.g., aphasia, severe neurological deficits following stroke) that would significantly interfere with the completion of the assessment tools

Ethical Approval

The protocol was approved by the Karabük university ethics committee (Approval No: 2025/2401); all procedures adhered to the Declaration of Helsinki.

Measures

Sociodemographic Data Form

A sociodemographic data form developed by the researchers was used to obtain information on the participants' basic characteristics. The form included questions regarding age, gender, marital status, educational level, occupational status, income level, cohabiting individuals, history of chronic illness, and whether the participant had previously received a psychiatric diagnosis.

Cognitive Flexibility Scale (CFS)

To index cognitive flexibility, participants completed the 12-item CFS. Responses are given on a six-point Likert format from 1 ("strongly disagree") to 6 ("strongly agree"). Items 2, 3, 5, and 10 are reverse scored. Total scores (12–72) increase with greater cognitive flexibility [14]. The Turkish validity and reliability study of the scale was conducted by Çelikkaleli in 2014 and the Cronbach alpha value was found to be 0.74 [15].

Cognitive Distortions Scale–Ultra-Brief Form (CDS–UBF)

Developed by Morrison et al. (2022), this scale includes five items, each corresponding to a specific cognitive distortion: magnification/minimization, overgeneralization, "should" statements, personalization, and mind reading. For each cognitive distortion, both frequency (ranging from "never [I never thought this way]" to "almost always [6–7 days in the past week]") and severity (ranging from "a little [up to 30%]" to "very much [over 70%]") are simultaneously assessed [16].

The validity and reliability study of the Cognitive Distortions Short Scale scale was conducted by Batmaz et al [17]. (batmaz ve ark)Its 5-item short form was examined by Morrison and colleagues in a series of samples that also included a Turkish outpatient sample, where it demonstrated good validation indices, and it has since been used in studies conducted in Turkey. [18].

In this study, only the CDS-UBF total frequency score was calculated and used in the analysis, and the severity dimension was not included in the analysis.

The Cognitive Failures Questionnaire (CFQ)

CFQ, introduced by Broadbent and colleagues in 1982, evaluates everyday self-reported lapses in attention, memory, and motor behavior. The instrument includes 25 items scored on a five-point Likert scale (0 = never, 4 = always), with higher totals reflecting more frequent cognitive failures [19]. The Turkish validity and reliability of the scale was performed by Ekici et al. [20].

Suicidal Behaviors Questionnaire-Revised (SBQ-R)

Osman and colleagues (2001) developed the SBQ-R to evaluate

suicidal ideation across the lifetime and the prior year, prior suicide attempts, anticipated risk of future suicidality, and the likelihood of reporting these thoughts to others. This self-report scale consists of four items with varying response ranges, with the aim of determining the overall level of suicide risk. The original version of the SBQ-R demonstrated high internal consistency (Cronbach's $\alpha=0.80$) and good construct validity in both clinical and non-clinical samples [21].

The validity and reliability of the Turkish version of the suicidal behavior scale was performed by Bayam et al [22].

Originally developed and validated in mixed-age adult and student samples, the SBQ-R has since been widely applied in research with older adults, demonstrating good psychometric properties [23,24].

Depression Anxiety Stress Scale-21 Items (DASS-21)

DASS-21 Items is a self-report instrument developed to assess levels of depression, anxiety, and stress in individuals. Developed by Lovibond and Lovibond (1995), the scale consists of three subscales—depression, anxiety, and stress—each comprising seven items. Items are rated on a 4-point Likert scale ranging from 0 (never) to 3 (very often). Each subscale is evaluated separately, with higher scores indicating more severe psychological symptoms. The Turkish adaptation and psychometric evaluation of the DASS-21 were conducted by Sarıçam (2018), who concluded that the scale is a valid and reliable measurement tool [25].

Statistical Analysis

Data were processed with SPSS (IBM, v29). Descriptive statistics—means and standard deviations, as well as medians with observed minima and maxima—were computed for sociodemographic variables and for all scale scores. Normality was evaluated using Kolmogorov–Smirnov alongside skewness/kurtosis diagnostics. Given the non-normal distributions, analyses proceeded with nonparametric tests.

Further, the bivariate relationships among the study's main variables—cognitive distortions, cognitive failures, cognitive flexibility, and suicidal ideation—were examined using Spearman correlation analysis, and the results were visualized using a heatmap. To control for type I error due to multiple testing, we applied a Bonferroni correction across the correlations between suicidal behavior (SBQ-R) and the other variables ($\alpha=0.05/10=0.005$). Correlations with $p<0.005$ were considered statistically significant.

Subsequently, a stepwise binary logistic regression analysis was conducted to determine whether these cognitive variables predicted suicidal ideation. For the stepwise binary logistic regression analyses, suicidal behavior (at risk vs. not at risk) was entered as the dependent variable. Candidate predictors included variables that were either associated with suicidal behavior at $p<0.10$ in the bivariate analyses and/or considered clinically

relevant based on previous literature (cognitive failures, cognitive flexibility, cognitive distortions subscales, DASS-21 depression, anxiety, and stress scores, age, educational level, and presence of chronic illness). Given the relatively limited sample size in relation to the number of potential predictors and the exploratory aim of the study, a stepwise backward (likelihood ratio) method was chosen to obtain a parsimonious model while reducing the risk of overfitting. A stepwise backward (likelihood ratio) method was used with an entry criterion of $p < 0.05$ and a removal criterion of $p > 0.10$.

Before conducting the logistic regression, multicollinearity among the predictors (cognitive distortions, cognitive failures, DASS-21 subscales, and cognitive flexibility) was examined using variance inflation factors (VIFs) and tolerance values; all VIFs were below 1.13 to 7.95 and tolerance values were above 0.13 to 0.89, indicating no evidence of severe multicollinearity, although moderate intercorrelations among the DASS-21 subscales were expected conceptually. Model calibration was assessed using the Hosmer–Lemeshow goodness-of-fit test, which indicated adequate fit ($p = 0.158$).

Item 1 of the SBQ-R was previously categorized by Amini-Tehrani et al. (2019) into two groups: responses such as “never” and “brief thoughts” versus responses involving “a plan” or “an attempt” [26]. In line with this approach, individuals with a score of 2 or higher on Item 1 were classified as being “at risk for suicidal behavior” in the present study. Accordingly, participants were categorized into two groups: those at risk for suicidal behavior and those not at risk. We acknowledge that this dichotomization based on a single SBQ-R item represents a relatively crude indicator of suicidal risk and does not replace a more detailed clinical assessment of suicidality.

Since the data did not follow a normal distribution, the Mann–Whitney U test was used for between-group comparisons. Additionally, associations with categorical variables were analyzed using the Chi-square test. For group comparisons, effect sizes were also calculated (r for Mann–Whitney U tests and Cramer’s V for chi-square tests) to complement p values.

Result

As in the study by Amini-Tehrani et al. (2019), two groups were created based on responses to Item 1 of the SBQ-R when evaluating suicidal behavior [26]. Accordingly, participants who scored “2 or above” were classified as being at high risk for suicidal behavior, while those who scored lower were categorized as being at low risk. First, the sociodemographic variables were compared between these two groups. Then, a stepwise binary logistic regression analysis was conducted to identify the psychological variables that predicted suicidal behavior.

No significant differences were found between the groups in terms of age, gender, marital status, educational level, history of chronic illness, or cohabitation status ($p > 0.05$). The age distribution was similar in both groups, with median ages of 68

and 69.5 years, respectively. Variables such as gender distribution and educational level were also statistically comparable between the groups. Although some variables appeared numerically imbalanced (e.g., educational level, living arrangement), the corresponding effect sizes were small (age: $r = 0.09$; Cramer’s V for categorical variables ranged from 0.05 to 0.24, all < 0.25), indicating no meaningful group differences. These findings indicate that individuals at high and low risk for suicidal behavior were homogeneous in terms of basic sociodemographic characteristics. The sociodemographic characteristics of the participants are presented in Table 1.

According to the results of the Mann–Whitney U test, scores on the cognitive distortion subscales of magnification/minimization ($p < 0.001$), mind reading ($p < 0.001$), and overgeneralization ($p < 0.001$) were significantly higher in the group at risk for suicidal behavior. While personalization ($p = 0.169$) did not show a significant difference, the “should” statements subscale ($p = 0.045$) differed significantly between the groups. In addition, the total score of the CFQ ($p < 0.001$) was significantly higher in the risk group. Among the DASS-21 subscales, levels of depression ($p < 0.001$), anxiety ($p = 0.002$), and stress ($p < 0.001$) were also significantly elevated in the high-risk group. In contrast, no significant difference was observed between the two groups in terms of cognitive flexibility scores ($p = 0.231$). These findings are presented in Table 2.

This heatmap visualizes the Spearman correlation coefficients among cognitive distortions (magnification/minimization, mind reading, overgeneralization, personalization, and “should” statements), psychological symptoms (depression, anxiety, stress), cognitive failures, cognitive flexibility, and suicidal behavior (SBQ-R). Warmer colors indicate stronger positive correlations, while cooler colors represent weaker or negative relationships.

Notably, suicidal behavior (SBQ-R) revealed significant positive correlations with magnification/minimization ($r = 0.354$, $p < 0.001$), mind reading ($r = 0.344$, $p < 0.001$), and overgeneralization ($r = 0.461$, $p < 0.001$). This suggests that certain cognitive distortions may be important risk factors for suicide among older adults. In addition, there was a significant positive correlation between cognitive failures and suicidal behavior ($r = 0.438$, $p < 0.001$). In contrast, cognitive flexibility showed significant negative correlations with suicidal behavior ($r = -0.301$, $p = 0.002$), depression, and stress, thereby indicating its potential role as a protective factor. These correlations remained significant after Bonferroni correction ($\alpha = 0.005$). The findings are illustrated in Figure 1.

In the stepwise binary logistic regression analysis, the initial model included cognitive failures, cognitive flexibility, depression, anxiety, stress, age, educational level, marital status, and the presence of chronic illness. At each step, variables that did not make a statistically significant contribution were excluded from the model. In the final model, only total cognitive failure score

and the cognitive distortions of magnification/minimization and overgeneralization remained as significant predictors.

In the final model (Step 12), the total cognitive failure score (B=0.037, p=0.009, Exp(B)=1.038), magnification/minimization (B=0.632, p=0.030, Exp(B)=1.881), and overgeneralization (B=0.683, p=0.018, Exp(B)=1.980) were found to be significantly associated with suicidal behavior. These findings indicate that these variables are independent predictors of suicidal behavior.

The Hosmer–Lemeshow test indicated adequate calibration of the final model ($\chi^2(8)=11.85$, $p=0.158$). In the final logistic regression model, overall classification accuracy improved from 52.5% in the null model to 76.2%, indicating that the cognitive variables substantially enhanced discrimination between older adults at risk vs. not at risk for suicidal behavior. The explanatory power of the final model was calculated as Nagelkerke $R^2=0.365$. Model 12 is presented in Table 3.

Table 1. Sociodemographic characteristics of geriatric individuals with and without risk of suicidal behavior according to the SBQ-R scale

Varia	Group at Risk for Suicidal Behavior (n=53)	Group Not at Risk for Suicidal Behavior (n=48)	p
Age (median, Min-Max)	68 (65-81)	69.50 (65-81)	0.344 ^a
Sex (n)			
Female	28	19	0.183 ^b
Male	25	29	
Marital Status (n)			
Single	1	4	0.121 ^c
Married	23	21	
Widowed	26	16	
Divorced/Separated	3	7	
Educational Level(n)			
Primary School	30	20	0.462 ^c
Middle School	7	7	
High School	3	3	
University	13	18	
History of Chronic Illness (n)			
Absent	12	18	0.103 ^b
Present	41	30	
Living Arrangement(n)			
Alone	21	11	0.155 ^b
With Spouse	21	20	
With Children	8	9	
Other	3	8	

^a: Mann- Whitney U Testi, ^b: Pearson Chi- Square, ^c: Chi- Square test (Likelihood Ratio test was used because more than 20% of the expected frequencies were less than 5)

Table 2. Comparison of cognitive characteristics and psychological parameters between geriatric individuals with and without risk of suicidal behavior according to the SBQ-R scale

Variables	Group at Risk for Suicidal Behavior (n=53)	Group Not at Risk for Suicidal Behavior (n=48)	p
Cognitive Distortions Scale (CDS), (median, min–max)			
Magnification/Minimization	1.0 (0.00-3.00)	0.0 (0.00-2.00)	<0.001
Mind Reading	1.0 (0.00-3.00)	0.0 (0.00-2.00)	<0.001
Overgeneralization	1.0 (0.00-2.00)	0.0 (0.00-3.00)	<0.001
Personalization	1.0 (0.00-2.00)	0.0 (0.00-2.00)	0.169
Should Statements	1.0 (0.00-3.00)	1.0 (0.00-3.00)	0.045
Cognitive Failures Questionnaire (CFQ), (Median, min–max)	39.00 (12.00- 95.00)	24.50 (0.00- 73.00)	<0.001
Cognitive Flexibility Scale (CFS), (Median, min–max)	43.00 (29.00- 62.00)	48.00 (32.00- 69.00)	0.231
DASS-21 (Median, min-max)			
Depression	6.00 (0.00-21.00)	2.00 (0.00-14.00)	<0.001
Anxiety	6.00 (1.00- 19.00)	4.00 (0.00-14.00)	0.002
Stress	6.00 (0.00- 19.00)	3.50 (0.00- 13.00)	<0.001

Possible score ranges – Cognitive Distortions Scale subscales: 0–3; CFQ: 0–100; CFS: 12–72; DASS-21 Depression/Anxiety/Stress: 0–21. DASS-21: Depression, Anxiety, and Stress Scale. Mann–Whitney U test was used. *p<0.05, p<0.001

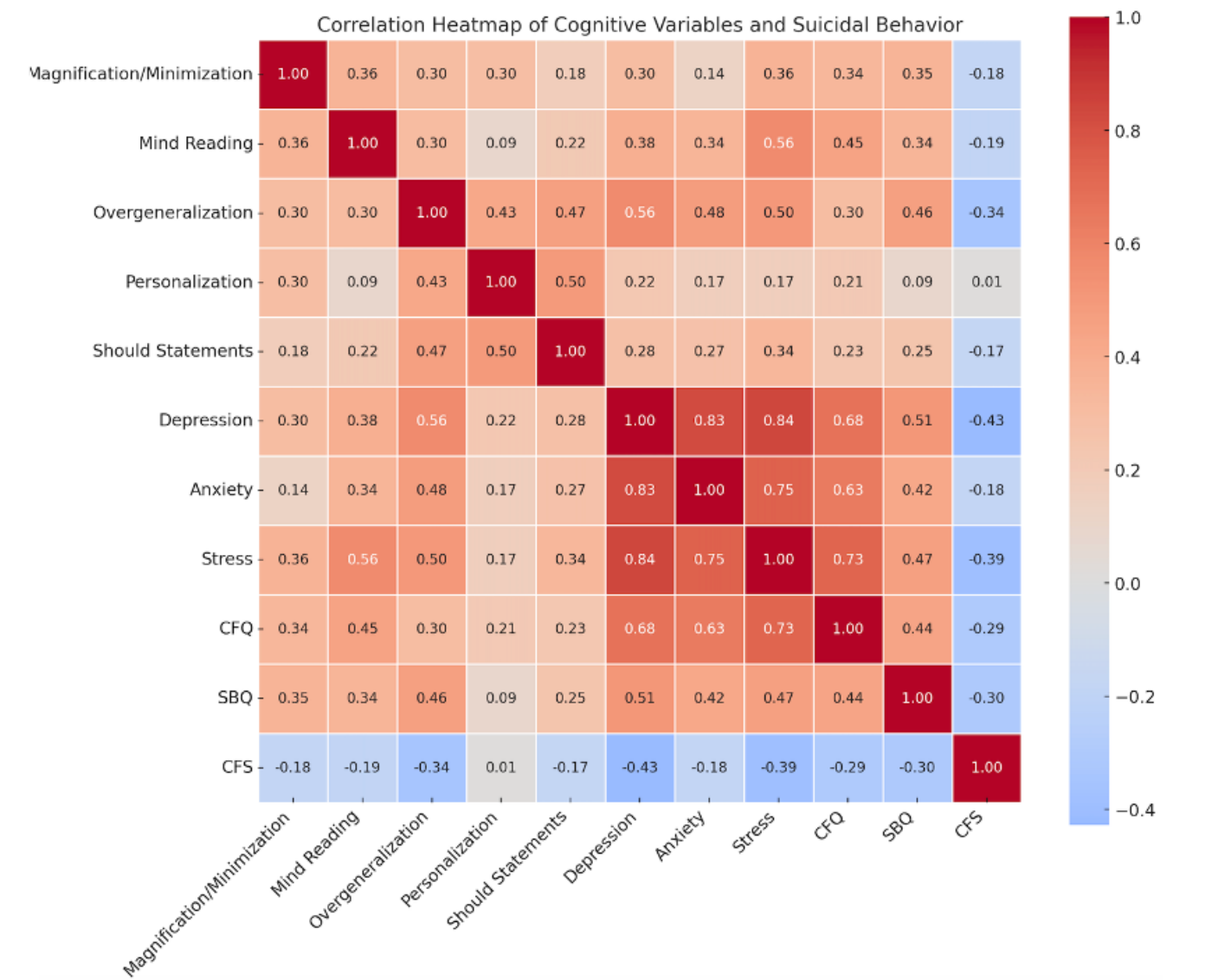


Figure 1. Correlation heatmap of cognitive distortions and psychological variables. Warmer colors indicate stronger positive correlations; cooler tones indicate weaker or negative correlations. CFQ: Cognitive failures questionnaire; SBQ: Suicidal behaviors questionnaire-revised, CFS: Cognitive flexibility scale. Spearman correlation coefficients are shown. Bonferroni correction was applied for correlations with SBQ-R ($\alpha=0.005$)

Table 3. Logistic regression results (Step 12) showing the effect of cognitive failures and cognitive distortions on suicidal behavior

Predictor Variables	B	SE	Wald	p	Exp(B)	95% CI (Lower – Upper)
CFQ (Total Scores)	0.037	0.014	6.875	0.009 **	1.038	1.009 – 1.067
Magnification/ Minimization	0.632	0.291	4.718	0.030 *	1.881	1.064 – 3.324
Overgeneralization	0.683	0.290	5.551	0.018 *	1.980	1.127 – 3.479
Constant	-2.109	0.533	15.688	<0.001 **	0.121	0.043 – 0.336

CDQ: Cognitive distortions questionnaire; B: Unstandardized regression coefficient; SE: Standard error; Wald: Wald chi-square test statistic; Exp(B): Odds ratio; 95% CI (Lower – Upper) = 95% confidence interval for Exp(B); *p<0.05, **p<0.001

Discussion

The findings of this study indicated that cognitive distortions and failures are significantly associated with suicidal behavior in older adults. Specifically, our results revealed that older individuals at risk for suicidal behavior more frequently engaged

in cognitive distortions, such as magnification/minimization, overgeneralization, and mind reading. Correlation and regression findings indicated associations between suicidal behavior and the cognitive distortions of magnification/minimization and overgeneralization. Previous studies have revealed that cognitive

distortions remain significant contributors to suicidal behavior even after controlling for symptoms of depression and anxiety [11]. Similarly, in our study, we found that these two cognitive distortions continued to predict suicidal behavior even after controlling for variables commonly associated with suicide, such as age, gender, marital status, depression, anxiety, and stress.

From a clinical perspective, this finding suggests that older adults may be at risk for suicide not only due to mood disorders or life circumstances but also because of the manner in which they interpret events. In late life, older individuals often face multiple stressors, such as physical illnesses, functional decline, social isolation, and the loss of loved ones. Interpreting such difficulties through distorted cognitive processes—such as magnification/minimization or overgeneralization—may increase feelings of hopelessness and trigger suicidal thoughts and behaviors among them. Therefore, relying solely on depression screening may be insufficient when assessing suicide risk in the geriatric population. In the present study, depressive, anxiety, and stress symptoms (DASS-21) showed robust bivariate associations with suicidal behavior, but they did not remain significant predictors once cognitive distortions and cognitive failures were entered into the multivariable model. One likely explanation is that our sample was restricted to older adults without a current DSM-5 diagnosis of major depressive or anxiety disorders, which may have limited the range and severity of mood symptoms and reduced their independent predictive power. In addition, mood symptoms and maladaptive cognitions share substantial variance; when considered simultaneously, cognitive distortions and everyday cognitive failures may capture the more proximal cognitive processes through which emotional distress translates into suicidal ideation. A more comprehensive assessment that also includes cognitive distortions and subjective cognitive difficulties (as indexed by the CFQ) may therefore be necessary to adequately identify older adults at elevated risk for suicidal behavior.

In our study, older adults at risk for suicidal behavior exhibited significantly higher levels of cognitive failures. These failures primarily reflect subjective weaknesses in cognitive performance, such as distractibility, forgetfulness, and lapses in attention experienced in daily life [13]. Moreover, age-related cognitive slowing and declines in attention and concentration abilities may contribute to an increased frequency of such failures in older individuals. The literature suggests that such cognitive impairments may negatively affect one's self-perception [27], thus leading to increased hopelessness, feelings of inadequacy, and—indirectly—suicidal ideation [28]. Within this framework, the findings of our study suggest that everyday cognitive failures may be associated with an increased risk of suicidal behavior in older individuals. This highlights the importance of systematically assessing subjective perceptions of cognitive performance and complaints related to attention and memory functions in clinical practice, particularly in relation to suicide risk.

In a study by Jordan et al. (2020), it was found that passive

suicidal ideation among patients in the geriatric age group was associated with impairments in cognitive flexibility [29]. Similarly, our study also revealed a statistically significant negative relationship between cognitive flexibility and the risk of suicidal behavior in the geriatric population. It is well established that cognitive flexibility tends to decline with age [30], and such a decline may further contribute to an increased risk of suicidal behavior in older individuals. Therefore, the literature emphasizes the need for further research to examine the relationship between cognitive flexibility and suicidal behavior in greater depth.

This study makes a significant contribution to the literature by specifically examining the relationship among cognitive distortions, cognitive failures, cognitive flexibility, and suicidal behavior within the geriatric population. Demonstrating the association of specific cognitive distortions—particularly magnification/minimization and overgeneralization—with suicidal behavior through both correlation and stepwise logistic regression analyses supports the statistical robustness of the findings. Moreover, by exploring the link between subjective cognitive failures and suicidal behavior, this study offers an initial and hypothesis-generating perspective on understanding suicide in older adults. In this regard, the study suggests that it may be useful for clinicians to consider interventions not only at the level of psychiatric diagnoses but also at the level of cognitive processes, although this requires confirmation in future intervention studies. For example, approaches such as cognitive restructuring targeting maladaptive beliefs related to perceived cognitive failures and problem-solving therapy to enhance coping with stressful life events could be explored as potential strategies rather than being viewed as evidence-based recommendations at this stage. Beyond the social and psychological determinants of suicidal behavior, the findings emphasize the importance of cognitive processes, which tend to decline in older age. In this way, the study provides a meaningful contribution to the existing body of knowledge on how cognitive factors are associated with suicidal behavior in later life, without implying a direct causal pathway.

This work is not without limitations; the cross-sectional design prevents us from inferring cause–effect links among the variables. The direction of the association between suicidal behavior and cognitive distortions or failures was established only at a correlational level. Additionally, since suicidal behavior was classified based on a single item from the SBQ-R, the lack of a more detailed clinical evaluation may have limited diagnostic precision. Also the SBQ-R, a brief self-report instrument that was not specifically designed or validated for geriatric populations. Therefore, some age-related aspects of suicidality in older adults (e.g., passive death wishes, health-related preoccupations, or communication difficulties) may not have been fully captured, and the self-report format may have led to underreporting among participants with sensory impairments, cognitive decline, or low literacy. Variables such as cognitive failures and cognitive flexibility were assessed solely through self-report measures; the

absence of neuropsychological testing prevented an objective evaluation of cognitive performance, which is particularly important in older adults.

Although; some methodological considerations should be noted. Regression models that include interrelated cognitive and emotional variables may be sensitive to multicollinearity and unstable variable selection. In the present study, we examined multicollinearity using VIF and tolerance values and found no evidence of severe multicollinearity, and we assessed model calibration with the Hosmer–Lemeshow test, which indicated adequate fit. Nevertheless, future research should consider alternative modelling strategies—such as hierarchical entry of cognitive and mood variables, and bootstrapped estimation and calibration procedures—to more rigorously evaluate model stability and predictive accuracy in this field.

Lastly, both the relatively limited sample size and single-geographic recruitment reduce the extent to which the findings can be generalized. Despite these limitations, the study remains noteworthy and informative for its focus on cognitive processes in explaining suicidal behavior among the geriatric population.

Conclusion

This study revealed significant associations between suicidal behavior and cognitive distortions and failures among older adults, thereby indicating that suicidal behavior among the elderly should be evaluated not only in the context of psychiatric diagnoses or mood disorders but also based on how individuals perceive and interpret life events. Specifically, distorted thinking patterns such as magnification/minimization and overgeneralization, along with subjective cognitive failures, were shown to be independent risk factors for suicidal behavior. These findings highlight the importance of targeted psychoeducational and therapeutic interventions—such as cognitive restructuring—in preventive mental health practices for the elderly. Prospective longitudinal research incorporating neuropsychological evaluations may clarify the causal nature of these associations and inform broader interventions to prevent suicidal behavior in older adults.

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Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

The study received ethical approval from the Karabük university ethics committee (Approval No: 2025/2401) (Approval Date: 28.07.2025).

References

1. Fiske A, Wetherell JL, Gatz M. Depression in older adults. *Annu Rev Clin Psychol.* 2009;5:363–89.
2. Chattun MR, Amdanee N, Zhang X, Yao Z. Suicidality in the geriatric population. *Asian J Psychiatr.* 2022;75:103213.
3. Pu S, Setoyama S, Noda T. Association between cognitive deficits and suicidal ideation in patients with major depressive disorder. *Sci Rep.* 2017;7:11637.
4. Rutter SB, Cipriani N, Smith EC, et al. Neurocognition and the Suicidal Process. In: Dwivedi Y (ed). *Behavioral Neurobiology of Suicide and Self Harm.* 1st edition. Springer. 2020;117–53.
5. Martins JT, Goncalves J. Cognitive flexibility and the work context: an integrative literature review. *Psicol Teor Prat.* 2022;24:1–12.
6. Walwanis MM, Ponto SJ. Clarifying cognitive flexibility from a self-regulatory perspective. In: Schmorow DD, Fidopiastis CM (eds). *Augmented Cognition. Lecture Notes in Computer Science*, Vol. 11580. Cham: Springer. 2019;11580:631–43.
7. Novak LA, Carter SP, LaCroix JM, et al. Cognitive flexibility and suicide risk indicators among psychiatric inpatients. *Psychiatry Res.* 2022;313:114594.
8. Miranda R, Valderrama J, Tsypes A, et al. Cognitive inflexibility and suicidal ideation: mediating role of brooding and hopelessness. *Psychiatry Res.* 2013;210:174–81.
9. Beck AT. *Depression: clinical, experimental, and theoretical aspects.* New York, Harper & Row. 1967.
10. Jaffri AB, Mukhtar SA, Rizvi SZH. Indigenous mental health perspective in cognitive distortions: a cross-sectional study of coping strategies, cognitive distortions and depression in university students. *Nat Nurture J Psychol.* 2021;1:45–54.
11. Jager-Hyman S, Cunningham A, Wenzel A, et al. Cognitive distortions and suicide attempts. *Cogn Ther Res.* 2014;38:369–74.
12. Fazakas DeHoog LL, Rnic K, Dozois DJA. A cognitive distortions and deficits model of suicide ideation. *Europe's J Psychol.* 2017;13:178–93.
13. Carrigan N, Barkus E. Cognitive failures in daily life: healthy populations. *Neurosci Biobehav Rev.* 2016;63:29–42.
14. Martin MM, Rubin RB. A new measure of cognitive flexibility. *Psychol Rep.* 1995;76:623–6.
15. Çelikkaleli Ö. Validity and reliability of the cognitive flexibility scale. *Educ Sci.* 2014;39:339–46.
16. Morrison AS, Potter CM, Carper MM, et al. Cognitive distortions questionnaire: psychometric properties. *Int J Cogn Ther.* 2015;8:287–305.
17. Batmaz S, Kocbiyik S, Yuncu OA. Turkish version of the cognitive distortions questionnaire: psychometric properties. *Depress Res Treat.* 2015;2015:1–7.
18. Morrison AS, Ustun B, Horenstein A, et al. Optimized short-forms of the cognitive distortions questionnaire. *J Anxiety Disord.* 2022;92:102624.
19. Broadbent DE, Cooper PF, FitzGerald P, Parkes KR. The cognitive failures questionnaire and its correlates. *Br J Clin Psychol.* 1982;21:1–16.
20. Ekici G, Uysal SA, Altuntaş O. The validity and reliability of cognitive failures questionnaire in university students. *Fizyoter Rehabil.* 2016;27:55–60.
21. Osman A, Bagge CL, Gutierrez PM, et al. The suicidal behaviors questionnaire-revised (SBQ-R): Validation with clinical and nonclinical samples. *Assessment.* 2001;8:443–54.
22. Bayam G, Dilbaz N, Bitlis V, et al. Relationship between suicidal behavior and depression, hopelessness, and suicidal ideation: Validity and reliability study of the suicide behavior scale. *Kriz Dergisi.* 1995;3:223–5.
23. Halder S, Manot S. Identifying suicidal risk and its association with depression in the elderly population. *J Geriatr Ment Health.* 2020;7:29–32.
24. Zia B, Heisel MJ, Peckham SB, Rosen S. A psychometric assessment of

- the suicidal behaviors questionnaire (SBQ-5) and geriatric suicide ideation scale-screen (GSIS-Screen) in middle-aged and older men. *Clin Gerontol.* 2020;43:46–60.
25. Sariçam H. The psychometric properties of the Turkish version of Depression Anxiety Stress Scale-21 (DASS-21) in health. *J Cogn Behav Psychother Res.* 2018;7:19–30.
 26. Amini-Tehrani M, Nasiri M, Jalali T, et al. Validation and psychometric properties of suicide behaviors questionnaire-revised (SBQ-R) in Iran. *Asian J Psychiatr.* 2019;48:101856.
 27. Koenigsberg A, Belau MH, Ascone L, et al. Subjective cognitive decline is associated with health-related quality of life in the middle-aged to elderly population. *J Alzheimers Dis.* 2023;91:427–36.
 28. O'Rourke N, Sixsmith A, Kirshner G, Osher Y. Perceived cognitive failures and quality of life for older adults with bipolar disorder. *J Affect Disord.* 2021;287:433–40.
 29. Koenigsberg A, Belau MH, Ascone L, et al. Subjective cognitive decline is associated with health-related quality of life in the middle-aged to elderly population. *J Alzheimers Dis.* 2023;91:427–36.
 30. Jordan JT, Chick CF, Rolle CE, et al. Neurocognitive markers of passive suicidal ideation in late-life depression. *Int Psychogeriatr.* 2020;32:1–10.