Comparison of Non-suicidal Self-Injury and Suicide Attempts in Relation to Anger Rumination

ABSTRACT

Background: Angry rumination (AR) defined as thinking about the causes and consequences of anger by focusing on the feelings and experiences of anger can trigger suicide attempts and non-suicidal self-injury. The purpose of this study was to compare subjects with non-suicidal self-injury and subjects with suicide attempts in relation to anger rumination and also to determine if there is a relationship between anger rumination with non-suicidal self-injury and suicide attempts, and if so, to determine the direction of this relationship.

Methods: In this study, 42 subjects with suicide attempts and 42 subjects with non-suicidal self-injury were included. Sociodemographic Data Form, Beck Depression Inventory, and Anger Rumination Scale were applied to all participants, Suicide Behaviors Questionnaire to those with suicide attempts, and Inventory of Statements About Self-Injury to those with non-suicidal self-injury.

Results: Those with non-suicidal self-injury group had significantly higher thoughts of revenge (P = .038), angry afterthoughts (P = .047), and a higher total score of Anger Rumination Scale (P = .025) than those with suicide attempts group. The Beck Depression Inventory scores of suicide attempts group were significantly higher than those of non-suicidal self-injury group (P = .001). A positive and significant correlation was found between Suicide Behaviors Questionnaire and Anger Rumination Scale-total score (r = 0.322, P = .037) and Beck Depression Inventory score (r = 0.440, P = .004).

Conclusions: Individuals with non-suicidal self-injury have more anger rumination, angry afterthoughts, and revenge-related thoughts following anger experiences than individuals with suicide attempts. As the severity of suicidal behavior of individuals with suicide attempts increases, so does their anger rumination. Our study may shed light on a better understanding of non-suicidal self-injury and suicide attempts and even contribute to intervention programs for these behaviors.

Keywords: anger rumination, non-suicidal self-injury, rumination, suicide

Introduction

Angry rumination (AR) is defined as thinking about the causes and consequences of anger by focusing on the feelings and experiences of anger.1 It is a cognitive process that occurs repeatedly, continuously, and involuntarily after a suppressed experience of anger and involves processes such as anger memories, attention to experiences of anger, thinking about anger, and thoughts of revenge.1 Anger rumination is distinct from anger as an emotion and rumination as a cognitive process. Rumination is broader in that it involves the tendency to focus on negative moods rather than a specific emotion. At this point, AR is the person’s repetitive focus on feelings of anger, fantasies of revenge, and the causes and consequences of anger.1

Anger rumination and brooding rumination are considered subtypes of rumination.2 The subtypes of rumination predict different outcomes, including suicidal ideation and suicide attempts (SA). A recent meta-analysis in a range of samples (college students, community, inpatient, and outpatient samples) showed the cross-sectional relationships between brooding rumination

[Note: The rest of the text is not transcribed as it includes personal and institutional information, which should not be included in a natural text representation.]
and suicidal ideation and SA. Anger rumination may also pose multiple risks to SA. A suicide attempt can be defined as intentionally ending one’s life. Non-suicidal self-injury (NSSI) behavior is defined as an intentional injury to one’s body in the form of cutting, burning, scratching, hitting and is relatively more common than SA. It has also been reported that NSSI has an emotion-regulating function in addition to self-punishment and anxiety reduction. This function was demonstrated with the reduction of NSSI by improving emotion regulation as a result of dialectical behavioral therapy interventions. Although their association rates are high, there are behavioral and cognitive differences between NSSI and SA. Stanley et al. concluded in their study that individuals with NSSI who had attempted suicide at least once were more irritable and depressed than those without NSSI and that individuals with NSSI underestimated the fatality of the SA.

Examining the literature on suicide, we see that anger and impulsive behaviors play a role in SA. In recent years, attention has been drawn to the subdimensions of impulsivity, which is defined both as a cognitive function and behavior performed without adequate thought and leads to undesirable outcomes. One of these subdimensions, “intrusive,” is associated with uncontrolled and repetitive rumination. It is believed that dysfunctional cognitive mechanisms may increase suicide risk, and rumination is a high-risk factor that may lead to suicide. Considering that anger rumination triggers impulsive behavioral responses and tendencies, especially in the domain of aggression, Bushman et al. conducted an experimental study. In the study, subjects who perceived negative feedback from a non-existent person regarding their performance on an essay were asked to think of that person while punching the punching bag. As a result of the study, participants in the rumination condition showed more aggression and higher levels of anger toward the punching bag. Researchers have found that individuals use aggressive behavior as a way to regulate negative affect. Similarly, individuals who direct aggression and anger toward themselves may also have NSSI. Regardless of whether it is impulsive or planned, individuals with SA may direct their anger toward themselves.

A study that examined the frequency of alcohol use with AR found that the group with higher weekly alcohol use had higher AR scores. According to this study, alcohol use is a method of dealing with anger. Similarly, in a study conducted with individuals with borderline personality disorder (BPD), rumination was found to cause behavioral dysregulation leading to consequences such as substance use, overeating, NSSI, and suicide. Although SA and NSSI were not examined, a study showed that AR better predicted NSSI in BPD than other rumination types. Previous studies concluded that AR increases the risk for impulsive behaviors such as NSSI in individuals with BPD.

Although we think that feeling anger and repeatedly thinking about its causes and consequences can trigger SA and NSSI, we wonder if AR differs in these 2 different behaviors. The purpose of this study was to compare these 2 behaviors in relation to AR, considering that it may be an influential factor in SA and NSSI. As AR is associated with negative psychological outcomes, as well as to determine if there is a relationship between AR and NSSI and SA and, if present, to indicate the direction of that relationship. Although research on AR has improved, it is still insufficient. To the best of our knowledge, there are no studies comparing the 2 behaviors in relation to AR. Being able to detect the status of AR in these behaviors can make an excellent contribution to the treatments and intervention programs of both NSSI and SA.

Materials and Methods

Approval for the study was obtained from the Ethics Committee of Firat University for non-interventional research dated March 18, 2021, and numbered 2021/04-19. The study was conducted in accordance with the Declaration of Helsinki.

Sample Group

Klonsky et al. determined a frequency of NSSI in adults of 4%. The number of samples to be reached using the simple sampling method was set at a minimum of 42 with a 90% CI.

Patient Group

The study included 42 patients with SA and 42 patients with NSSI who attended the Psychiatry Department of Firat University Hospital, were inpatients or outpatients, and met the study criteria. The patients were then divided into 2 groups to evaluate the relationship of AR with NSSI group (consisted of subjects with only NSSI) and SA group (consisted of subjects with only SA).

Procedure

Written informed consent was obtained from all participants after the purpose and function of the study were explained to them in detail in the Psychiatry Department of Firat University Hospital. After obtaining consent, the Sociodemographic Data Form, Beck Depression Inventory (BDI), Anger Rumination Scale (ARS) in all participants, the Suicide Behaviors Questionnaire (SBQ) in those who had attempted suicide, and the Inventory of Statements About Self-Injury (ISAS) in those with self-injury behavior were used by the treating psychiatrist. Completion of the questionnaire took an average of 30-40 minutes.

Inclusion Criteria for the Study

1. Should be between 18 and 65 years of age,
2. Presence of self-injury behavior and SAs in the past 6 months,
3. Absence of any significant physical pathology or any neurological disease that would affect the distribution of existing psychiatric symptoms in the patient,
4. No history of alcohol or substance abuse or addiction in the past 6 months,
5. No mental retardation,
6. Patient signs a written informed consent form.

Scales Used in the Study

Sociodemographic and Clinical Data Form: A sociodemographic and clinical data form prepared by us was used in the cases keeping in mind the purpose of the study. This semi-structured questionnaire included sociodemographic data such as age, gender, marital status, educational status, occupation, place of residence, economic status.

MAIN POINTS

- Subjects with non-suicidal self-injury (NSSI) used more anger rumination than subjects with suicide attempts (SA).
- Subjects with NSSI had more angry afterthoughts and revenge fantasies after the anger experience than subjects with SA.
- The anger ruminations of individuals with SA increased with increasing severity of depressive symptoms.
and clinical data such as duration of psychiatric diagnosis, presence of psychiatric illness, and history of SAs in the family.

**Anger Rumination Scale (ARS):** It is a 19-item 4-point Likert scale developed by Sukhodolsky et al.1 The scale has 4 sub-dimensions: angry afterthoughts, thoughts of revenge, angry memories, and understanding of causes. The translation and adaptation studies of the scale into Turkish were conducted by Satıcı.14 The Cronbach alpha internal reliability coefficient of the scale was 0.93 for the subdimensions, 0.78 for the subscale angry afterthoughts, 0.73 for the subscale angry memories, 0.66 for the subscale thoughts of revenge, and 0.64 for the subscale understanding of causes.

**Inventory of Statements About Self-injury (ISAS):** It was developed by Klonisky and Glenn17 to measure the frequency and functions of intentional self-injury behavior without suicidal intent. The scale consists of 2 parts: behaviors and functions. In the first part, called behaviors, there are 12 self-injury behaviors, and it is necessary to indicate how often each behavior is performed in a lifetime. There are also 5 questions to examine the structural and descriptive properties of these behaviors. The internal reliability coefficient of Cronbach’s alpha for the first part of the scale is 0.84.17 The psychometric properties of the scale were investigated in Turkey by Bil dik et al.18 In the adapted scale, the internal reliability coefficient of Cronbach’s alpha for the first part is 0.79. The first part of the scale, the behavioral part, was used in the study.

**Suicide Behaviors Questionnaire (SBQ):** It was developed by Linehan et al.19 and its Turkish validity and reliability study was conducted by Bayam et al.20 The scale consists of 4 items: suicide plan and attempt, suicidal ideation, suicide threat, and suicide repetition. The lowest score that can be obtained with the scale is 0, and the highest score is 14. As the score increases, the severity of suicidal behavior also increases.20

**Beck Depression Inventory (BDI):** The scale developed by Beck et al21 consists of 21 items. It is of the 4-point Likert type. The total score that can be obtained from the scale ranges from 0 to 63. The cutoff value of the scale is 17. The validity and reliability study of the scale in Turkey was conducted by Hisli and the Cronbach’s alpha for BDI is 0.80.22

**Statistical Analysis:** Analyzes were performed using Statistical Package for the Social Sciences (SPSS) version 22.0 (IBM SPSS Corp.; Armonk, NY, USA). Descriptive data were reported in the study as n (%) values for categorical data and mean (SD) and median (25-75%) for continuous data. Chi-square analysis (Pearson chi-square) and Fisher’s exact chi-square were used to compare categorical variables between groups. Conformity of continuous variables to normal distribution was assessed using the Kolmogorov–Smirnov test. The t-test was used to compare variables conforming to the normal distribution between the 2 groups, and the Mann–Whitney U-test was used to compare the 2 groups not conforming to the normal distribution. When examining the relationship between continuous variables, the Pearson correlation test was used for those with normal distribution and the Spearman correlation test was used for those that did not have normal distribution. Logistic regression analysis was performed to measure the predictive power of the scale scores. Bonferroni correction was made when there are multiple comparisons for the same parameters. The statistical significance level in the analysis was taken as α = 0.05. Cohen’s d was used to demonstrate the effect size. Cohen’s d values were; very small: 0.01, small: 0.20, medium: 0.50, large: 0.80, very large: 1.20, huge: 2.0.

**Results**

A total of 84 patients, 42 with NSSI group and 42 with SA group, were included in the study. The mean age of NSSI group was 28.0 (SD=5.8) years and that of SA group was 30.2 (SD=6.7) years, and no statistically significant difference was observed between the 2 groups (P = .120). The rate of low economic status in NSSI group (21.4%) was significantly lower than the rate of low economic status in SA group (42.9%) (P = .035). The rate of psychiatric illness in NSSI group (78.6%) was significantly lower than that of SA group (100%) (P = .002). The median duration of psychiatric diagnosis in NSSI group was significantly lower than that of SA group (P = .006). The rate of SAs in the family was significantly lower in NSSI group (23.8%) than SA group (57.1%) (P = .002) (Table 1).

Of the NSSI group, 78.5% (33) met at least 1 diagnostic criterion for a psychiatric disorder, and some met more than 1. Of these patients, 72.7% (24) met diagnostic criteria for borderline and antisocial personality disorder, 54.5% (18) for depressive disorder, 9% (3) for post-traumatic stress disorder, and 3% (1) for anxiety disorder.

Totally, 100% (42) of the SA group met at least 1 diagnostic criterion for a psychiatric disorder and some met more than 1. Of these patients, 95.2% (40) met diagnostic criteria for depressive disorder, 19% (8) for borderline and antisocial personality disorder, 9.5% (4) for gambling disorder, 7.1% (3) for dysthymic disorder, and 4.7% (2) for bipolar disorder depressive episode.

The scores for thoughts of revenge (P = .038) and angry afterthoughts (P = .047), as well as the ARS total score (P = .025), were significantly higher in NSSI group than in SA group. The BDI score of SA group was significantly higher than the BDI score of NSSI group (P = .001) (Table 2).

In the logistic regression analysis, only the BDI was found to be significant in estimating the patient group (odds ratio = 1.156 (95% CI 1.080-1.237), P < .001).

Twenty-six (61.9%) of the NSSI group committed NSSI within 1 hour or less of the onset of the urge to harm themselves and 16 (38.1%) within 1-3 hours. Twenty-eight (66.7%) of the NSSI group reported that they wanted to terminate NSSI.

There were no significant differences between self-injury behaviors by ARS scores (P > .005 following Bonferroni correction) (Table 3).

In the correlation analysis of SA group, it was observed that there was a positive and significant correlation between SBQ score and ARS total score (r = 0.322, P = .037) and BDI score (r = 0.440, P = .004) (Figure 1).

There was a negative correlation between the duration of psychiatric diagnosis and angry afterthoughts and a positive correlation between the duration of psychiatric diagnosis and BDI. Again, a positive and significant correlation was observed between thoughts of revenge and angry afterthoughts, angry memories, and the ARS total score. There was a positive and significant association between understanding of causes and angry afterthoughts, angry memories, and the ARS-total score. Of note was the discovery of a positive and significant correlation between angry afterthoughts and the angry
memories and the ARS total score. Finally, there was a positive and significant correlation between angry memories and ARS total score and ARS total score and BDI (Table 4).

There was no significant difference between genders in terms of scale scores (P > .05) (Table 5).

### Table 1. Comparison of the Groups According to Various Parameters

| Parameter                        | NSSI Group | SA Group | P*     |
|----------------------------------|------------|----------|--------|
| **Age, mean (SD)**               | n (%)      | n (%)    |        |
| Gender                           |            |          |        |
| Female                           | 28.0 (5.8) | 30.2 (6.7)| .120** |
| Male                             | 21 (50.0)  | 20 (47.6)| .827   |
| Marital status                   |            |          |        |
| Single                           | 21 (50.0)  | 23 (54.8)| .662   |
| Married                          | 21 (50.0)  | 19 (45.2)|        |
| Education status                 |            |          |        |
| Middle school and below          | 17 (40.5)  | 20 (47.6)| .510   |
| High school and above            | 25 (59.5)  | 22 (52.4)|        |
| Place of residence               |            |          |        |
| Village/town                     | 15 (35.7)  | 15 (35.7)| 1.000  |
| City                             | 27 (64.3)  | 27 (64.3)|        |
| Economical status                |            |          |        |
| Low                              | 9 (21.4)   | 18 (42.9)| .035   |
| Middle                           | 33 (78.6)  | 24 (57.1)|        |
| Working status                   |            |          |        |
| Working                          | 15 (35.7)  | 15 (35.7)| 1.000  |
| Not working                      | 27 (64.3)  | 27 (64.3)|        |
| Organic disease                  |            |          |        |
| Yes                              | 6 (14.3)   | 7 (16.7) | .763   |
| No                               | 36 (85.7)  | 35 (83.3)|        |
| Presence of psychiatric illness  |            |          |        |
| Yes                              | 33 (78.6)  | 42 (100.0)| .002  |
| No                               | 9 (21.4)   | 0 (.0)   |        |
| Duration of psychiatric diagnosis (month), median (IQR) | 5 (3-7) | 7 (4-18) | .006*** |

| History of previous psychiatric treatment | Yes | 27 | 64.3 | 22 | 52.4 | .268 |
| No                                           | 15 | 35.7 | 20 | 47.6 |          |
| Psychiatric treatment in the family           | Yes | 16 | 38.1 | 20 | 47.6 | .378 |
| No                                           | 26 | 61.9 | 22 | 52.4 |          |
| History of suicide attempts in the family     | Yes | 10 | 23.8 | 24 | 57.1 | .002 |
| No                                           | 32 | 76.2 | 18 | 42.9 |          |
| History of SIB**** in the family              | Yes | 12 | 28.6 | 10 | 23.8 | .620 |
| No                                           | 30 | 71.4 | 32 | 76.2 |          |
| Smoking                                       | Yes | 25 | 59.5 | 22 | 52.4 | .510 |
| No                                           | 17 | 40.5 | 20 | 47.6 |          |
| Alcohol/substance                             | Yes | 19 | 45.2 | 19 | 45.2 | 1.000 |
| No                                           | 23 | 54.8 | 23 | 54.8 |          |

*Chi-square analysis; “t-test in independent groups” “Mann–Whitney U test is done; ****Self-injury behavior. IQR, interquartile range; SD, standard deviation; NSSI, non-suicidal self-injury; SA, suicide attempts.*

### Table 2. Comparison of Scale Scores According to Groups

|          | NSSI Group | SA Group | Effect Size | P*     |
|----------|------------|----------|-------------|--------|
|          | Mean (SD)  | Mean (SD)|             |        |
| Thoughts of revenge | 9.6 (3.2) | 8.4 (2.2) | 0.460 | .038   |
| Understanding of causes | 12.5 (3.8) | 11.8 (3.4) | 0.192 | .383   |
| Angry afterthoughts | 17.2 (4.3) | 15.3 (4.2) | 0.439 | .047   |
| Anger memories | 10.8 (3.7) | 9.4 (3.1) | 0.404 | .068   |
| ARS total score | 50.1 (11.3) | 45.3 (8.0) | 0.498 | .025   |
| BDI      | 23.5 (8.0) | 33.1 (14.2) | -0.829 | <.001  |

* t-test was performed on independent groups. BDI, Beck Depression Inventory; ARS, Anger Rumination Scale; SD, standard deviation; NSSI, non-suicidal self-injury; SA, suicide attempts.

**Discussion**

In our study, AR total scores, thoughts of revenge, and angry afterthoughts subscores of subjects with NSSI were significantly higher than those of subjects with SA. This tells us that NSSI group used more anger rumination than SA group and had more angry afterthoughts and revenge fantasies after the anger experience.

The repetition of thoughts about anger, which is a negative emotion in anger rumination, can affect the NSSI. Anger rumination may prevent the subjects from getting rid of the negative feelings toward the person at whom the thoughts of revenge are directed and this may trigger their NSSI behavior by directing the revenge feelings and anger toward themselves. These individuals may express their anger as NSSI and try to escape the negative feelings in this way. When these individuals remember bad events or people with negative experiences in the past, they may try to reduce their anger by hurting themselves. The most validated function of the NSSI continues to be seen in the regulation of negative emotional states and cognitions. Maintaining anger-related thoughts further increases anger. It has been reported that individuals with NSSI have difficulty...
exhibiting goal-directed behaviors and controlling impulsive behaviors following negative emotions. Second, according to the experience-avoidance model of NSSI, these behaviors are considered to indicate conscious avoidance of unwanted thoughts through thought suppression. For example, when anger is not resolved or perceived, it leads to a desire for revenge. Therefore, individuals who engage in AR focus on mentally rehearsing possible acts of revenge.

A study conducted with university students found that individuals with higher revenge scores had more ruminative thoughts and negative emotions. The study by Denson et al concluded that anger rumination occurs at 5 levels: cognitive, neurobiological, emotional, executive control, and behavioral. Although rumination occurs at the cognitive level, it governs emotional response, executive control, and aggression. According to this model, anger rumination may influence NSSI and/or SA behavior following an anger-triggering event.
event. As mentioned earlier, our results showed that individuals with NSSI were more likely to harbor thoughts of revenge and anger compared to SA. Another reason for this difference could be that the SAs in the study were impulsive subjects. Our study did not ask about the nature of the suicides of the SAs. However, it is known that individuals are more prone to impulsive SAs when they experience anger. For these individuals, anger may manifest as SA in an unexpected, sudden, and impulsive manner before angry afterthoughts can become intense. However, it should be noted that the NSSI group predominantly met the diagnostic criteria for antisocial and borderline personality disorder, while the SA group mostly satisfied the diagnostic criteria for depressive disorder. Hence, it should be kept in mind that personality disorders and depressive disorders may also differ by AR.

In the current study, no significant difference was found between NSSI group and SA group on scores for the understanding of causes and anger memories, which are subdimensions of ARS. In other words, individuals with NSSI do not differ from individuals with SA on thinking something happened that did not happen related to the understanding of causes and anger experience.

Rumination is a negative coping strategy with behavioral and emotional consequences. Individuals who use rumination extensively show more psychological symptoms than individuals who do not. It has been suggested that repetitive negative thoughts are associated with depressed mood and depression. In the study, SA group had a higher mean BDI score of 33.1 than NSSI group and these individuals had severe depressive symptoms. A positive correlation was found between BDI score and ARS total score and anger memories, and between ARS total score and SBQ score. The ARs of individuals with SA increased with increasing severity of depressive symptoms. A recent study showed that brooding rumination was associated with suicidal ideation but not with SA. Interestingly, another study found no significant association between AR and suicidal ideation or SA. The researchers attributed this to the fact that AR is a specific type of rumination and to the sample group. Other researchers see shame, one of the most critical factors in suicide, as a stronger emotion than anger and mention that focusing on anger can suppress shame compared to focusing on depressive thoughts. The reason for the different results in different studies might be the multiple risk factor structure in SA. In our study, there was no difference in AR regarding SA and suicidal ideation in SBQ.

Moreover, in our study, those who cut, bit, and scratched in NSSI had a higher tendency to have angry afterthoughts than those who did not. This finding raises the question of whether angry afterthoughts influence NSSI behavior. Further research is needed to understand the role of AR in both NSSI and suicide-related outcomes.

**Limitations of the Study**

The study’s cross-sectional design and small sample size prevented us from generalizing the findings beyond our current sample. In addition, our data were based on self-report, although the scales were created in the presence of a psychiatrist to prevent participants from providing random responses. The absence of a control group to explore differences in AR by NNSI or SA behaviors may be considered as another limitation of our study. Moreover, all SA patients and 78.6% of NSSIs in our sample met diagnostic criteria for at least 1 psychiatric disorder. High comorbidity may have overshadowed our results.

**Conclusion**

It was determined that AR is higher in individuals with NSSI than in individuals with SA. Individuals with NSSI were more likely to experience or think anger-related thoughts and thoughts of revenge following their anger experience than individuals with SA. As the severity of suicidal behavior in individuals with SA increases, AR increases. Our research is the only study comparing AR between.

---

**Table 4. Comparison of Scale Scores According to Duration of Psychiatric Diagnosis**

| Duration of Psychiatric Diagnosis (Month) | 1 | 2 | 3 | 4 | 5 |
|------------------------------------------|---|---|---|---|---|
| **1. Thoughts of revenge**              | -227 |   |   |   |   |
| **2. Understanding of causes**          | -3.101 | .087 |   |   |   |
| **3. Angry afterthoughts**              | -254 | .338 | .292 |   |   |
| **4. Anger memories**                   | .026 | .500 | .316 | .432 |   |
| **5. ARS total score**                  | -1.182 | .626 | .616 | .775 | .769 |
| **BDI**                                 | .279 | .119 | .119 | .166 | .463 | .302 |
|                                          | .015 | .280 | .280 | .131 | <.001 | .005 |

**Table 5. Comparison of the Scale Scores of the Patients by Gender**

|                          | Female | Male | P*  |
|--------------------------|--------|------|-----|
| **Thoughts of revenge**  | 9.2 (2.8) | 8.8 (2.9) | .561 |
| **Understanding of causes** | 12.3 (3.6) | 12.0 (3.6) | .734 |
| **Angry afterthoughts**  | 16.5 (4.3) | 16.0 (4.4) | .593 |
| **Anger memories**       | 10.4 (3.5) | 9.8 (3.4) | .451 |
| **ARS total score**      | 48.6 (10.5) | 46.8 (9.5) | .414 |
| **BDI**                  | 30.0 (14.1) | 26.7 (10.6) | .236 |

* t-test was performed on independent groups. BDI, Beck Depression Inventory; ARS, Anger Rumination Scale; SD, standard deviation.
NSSI and SA. NSSI and suicidal behavior are multifaceted and complex phenomena that cannot be explained in a single way. Our findings demonstrate the importance of focusing on AR for both NSSI and SA. Our study may shed light on future studies to better understand both NSSI and SA and even contribute to intervention programs for these behaviors.

**Ethics Committee Approval:** Ethics committee approval was received from the Ethics Committee of Firat University (March 18, 2021, 2021/04-19).

**Informed Consent:** Written informed consent was obtained from all participants who participated in this study.

**Peer Review:** Externally peer-reviewed.

**Author Contributions:** Concept - K.K.A., Y.S., K.O.; Design - K.K.A., Y.S., A.M.; Supervision - K.K.A., Y.S.; Resource - Materials - K.K.A., Y.S., K.O., A.M.; Data Collection and/or Processing - K.K.A., KO; Analysis and/or Interpretation - K.K.A., Y.S., K.O.; Literature Search - K.K.A.; Writing - K.K.A., K.O.; Critical Reviews - K.K.A., Y.S., K.O.

**Conflict of Interest:** The authors have no conflict of interest to declare.

**Financial Disclosure:** The authors declared that this study has received no financial support.

**References**

1. Sukhodolsky DG, Golub A, Cromwell EN. Development and validation of the anger rumination scale. *Pers Individ Dif*. 2001;31(5):689-700. [CrossRef]
2. Rogers ML, Joiner TE. Rumination, suicidal ideation, and suicide attempts: a meta-analytic review. *Rev Gen Psychol*. 2017;21(2):132-142. [CrossRef]
3. Baca-Garcia E, Diaz-Sastre C, Garcia Resa E, et al. Suicide attempts and impulsivity. *Eur Arch Psychiatry Clin Neurosci*. 2005;255(2):152-156. [CrossRef]
4. Braus AM, Gutierrez PM. Differences in non-suicidal self-injury and suicide attempts in adolescents. *J Youth Adolesc.* 2010;39(3):233-242. [CrossRef]
5. Edmondson AJ, Brennan CA, House AO. Non-suicidal reasons for self-harm: a systematic review of self-reported accounts. *J Affect Disord.* 2016;191:109-117. [CrossRef]
6. Stanley B, Gameroff MJ, Michalsen V, Mann JJ. Are suicide attempters who self-mutilate a unique population? *Am J Psychiatry*. 2001;158(3):427-432. [CrossRef]
7. Linehan MM. *DBT Skills Training Manual*. New York: Guildford Press; 2015.
8. Rebetez MML, Rochat L, Barsics C, Van der Linden M. Procrastination as a self-regulation failure: the role of impulsivity and intrusive thoughts. *Psychol Rep*. 2018;121(1):26-41. [CrossRef]
9. Selby EA, Joiner TE. Cascades of emotion: the emergence of borderline personality disorder from emotional and behavioral dysregulation. *Rev Gen Psychol*. 2009;13(3):219. [CrossRef]
10. Bushman BJ. Does venting anger feed or extinguish the flame? Catharsis, rumination, distraction, anger, and aggressive responding. *Pers Soc Psychol Bull*. 2002;28(6):724-731. [CrossRef]
11. Favazza AR. *Bodies under Siege: Self-Mutilation and Body Modification in Culture and Psychiatry*. Baltimore: JHU Press; 1996.
12. Şahin NH, Ömür A, Basm CN. Prediction of suicide probability by anger, impulsivity and inadequacy in problem solving skills. *Turk J Psychol*. 2008;23(2):79-88.
13. Ciesla JA, Dickson KS, Anderson NL, Neal DJ. Negative repetitive thought and college drinking: angry rumination, depressive rumination, co-rumination and worry. *Cognit Ther Res*. 2011;35(2):142-150. [CrossRef]
14. Peters JR, Eisenlohr-Moul TA, Upton BT, Talavera NA, Folsom JJ, Baer RA. Characteristics of repetitive thought associated with borderline personality features: a multimodal investigation of ruminative content and style. *J Psychopathol Behav Assess*. 2017;39(3):456-466. [CrossRef]
15. Klonsky ED, Oltmanns TF, Turkermeir E. Deliberate self-harm in a non-clinical population: prevalence and psychological correlates. *Am J Psychiatry*. 2003;160(8):1501-1508. [CrossRef]
16. Satıcı SA. Anger Rumination Scale: psychometric properties of the Turkish version. *Anatol J Psychiatry*. 2014;15(4):328-334. [CrossRef]
17. Klonsky ED, Olinio TM. Identifying clinically distinct subgroups of self-injurers among young adults: a latent class analysis. *J Consult Clin Psychol*. 2008;76(1):22-27. [CrossRef]
18. Bildik T, Somer O, Kabuçuçu Başay B, Başay Ö, Özbaran B. The validity and reliability of the Turkish version of the inventory of statements about self-injury. *Turk Psikiyatri Derg*. 2013;24(1):49-57. [CrossRef]
19. Linehan MM, Nielsen SL. Assessment of suicide ideation and parasuicide: hopelessness and social desirability. *J Consult Clin Psychol*. 1981;49(5):773-775. [CrossRef]
20. Bayam G, Dilbaz N, Bitlis V, Holat H, Tuzer T, Ölçüyllüve Güve-nilirlik Çalışmasi. *Kız Derg*. 1995;3:223-225.
21. Beck AT, Ward C, Mendelson M, Mock J, Erbaugh J. Beck depression inventory (BDI). *Arch Gen Psychiatry*. 1961;46(6):561-571.
22. Hsi L. A validity and reliability study of Beck depression inventory in a university student sample. *J Psychol*. 1989;73:13-
23. Andover MS, Morris BW. Expanding and clarifying the role of emotion regulation in non-suicidal self-injury. *Can J Psychiatry*. 2014;59(11):569-575. [CrossRef]
24. Karagöz B, Dağ İ. The relationship between childhood maltreatment and emotional dysregulation in self-mutilation: an investigation among substance dependent patients. *Arch Neuropsychi.* 2015;52:8-14.
25. Chapman AL, Gratz KL, Brown MZ. Solving the puzzle of deliberate self-harm: the experiential avoidance model. *Behav Res Ther*. 2006;44(3):371-394. [CrossRef]
26. McCullough ME, Bellah CG, Kilpatrick SD, Johnson JL. Vengefulness: relations with forgiveness, rumination, well- being and the big five. *Pers Soc Psychol Bull*. 2001;27(5):601-610. [CrossRef]
27. Denson TF. The multiple systems model of angry rumination. *Pers Soc Psychol Rev*. 2013;17(2):103-123. [CrossRef]
28. Simon OR, Swann AC, Powell KE, Potter LB, Kresnow MJ, O’Carroll PW. Characteristics of impulsive suicide attempts and attempters. *Suicide Life Threat Behav*. 2001;32(1):49-59. [CrossRef]
29. de Jong-Meyer R, Beck B, Riede K. Relationships between rumination, worry, intolerance of uncertainty and metacognitive beliefs. *Pers Individ Dif*. 2009;46(4):547-551. [CrossRef]
30. Cho GW, Waite EE, Ammerman BA, Dixon-Gordon KL. Testing the influence of brooding and anger rumination on the association between suicidal outcomes and BPD features in undergraduate students. *Arch Suicide Res*. 2020:1-14. [CrossRef]
31. Law KC, Chapman AL. Borderline personality features as a potential moderator of the effect of anger and depressive rumination on shame, self-blame, and self-forgiveness. *J Behav Exp Psychiatry*. 2015;46:27-34. [CrossRef]
32. Glassman LH, Weierich MR, Hooley JM, Deliberto TL, Nock MK. KChild maltreatment, non-suicidal self-injury, and the mediating role of self-critical. *Behav Res Ther*. 2007;45(10):2483-2490. [CrossRef]
33. Judd MD. Fluid vulnerability theory: a cognitive approach to understanding the process of acute and chronic suicide risk. In: Ellis PT, ed. *Cognition and Suicide: Theory, Research and Therapy*. Washington DC: American Psychological Association; 2006:355-368.