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Original Article

Relations of Childhood Trauma and Emotional Dysregulation with Suicide Ideation and Suicidal Behaviour Severity in a Clinical Sample of Depressive Female Adolescents

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Abstract

Objective: This study aimed to explore the aspects of emotional dysregulation (ED) and childhood trauma (CT) which are associated with suicide ideation (SI) and suicidal behaviour (SB) severity in depressive female adolescents who previously attempted suicide.
Method: In this cross-sectional study, we evaluated SI and SB severity. The Columbia-Suicide Severity Rating Scale (C-SSRS) was administered to 80 depressive female patients who had suicide attempts within the last month. Current suicide ideation (C-SI) and total score (C-TS), lifetime- suicide ideation (L-SI), and total score (L-TS) were obtained with the C-SSRS. Patients were recruited from five different provinces in Turkey. Additionally, the patients completed the Difficulties in Emotion Regulation Scale (DERS), Childhood Trauma Questionnaire (CTQ), and Beck Depression Inventory (BDI). The Pearson correlation test and a multiple linear regression analysis were used to determine variables predictive of suicide scores.
Results: The results of multiple linear regression analysis indicated that the BDI and DERS - total scores explained 35% (adjusted R) of the variance in C-SI ((F (2;67) = 19.61, P < 0.001). C-TS was explained by 'BDI,' 'emotional neglect' and 'DERS impulse' (38% (adjusted R) (F (3;66) = 15.15, P < 0.001). L-SI was only associated with DERS strategies (explains 13% (adjusted R) of the variance in L-SI (F (1;68) = 10.411, P = 0.02). Concerning the C-SSRS L-TS, the DERS impulse and CTQ total accounted for 24% (adjusted R) of the variance (F (2;67) = 10.620, P < 0.001).
Conclusion: The results of our study suggest that adolescents who have experienced emotional neglect and depressive symptoms are more at risk for suicidal ideation and behaviour. In addition, depressed adolescents who show impulsive behaviours and restricted emotional strategies are also at risk. Identifying neglected depressed adolescents and teaching impulse control and effective emotional strategies is important for the prevention of suicidal behaviours and thoughts.

Key words: *Childhood Trauma; Emotion Regulation; Suicide Attempt; Suicide Prevention*

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Every year, approximately 800,000 people lose their lives due to suicide, accounting for 1.4% of all deaths. Unfortunately, suicide is one of the main causes of death worldwide for people between the ages of 15 to 29 years old (1). Suicide ideation (SI) is a risk factor for future suicide attempts, especially when suicide ideation involves a plan or high intention, it is more likely to end up with a suicide or suicide attempt (SA). SI and SA are considered antecedent stages before committing suicide (2). Therefore, it is essential to determine the risk factors and establish intervention programs according to these factors for this population.

Several psychiatric disorders have been linked to suicidal behaviour (3). For example, major depressive disorder is associated with SA and/or SI. SI and SA are frequently observed during depressive episodes and the suicide risk is estimated to be 15% (4–6). Even though the role of genetic, neurobiological, environmental, and psychological fac been demonstrated in explaining the correlation between depression and suicide attempts, the exact mechanism is not fully understood (7,8). Therefore, it is crucial to explore the exact psychological mechanisms to provide effective treatments for depressive suicidal adolescents.

Depression is also considered to be a risk factor for suicidal behavior (SB). Depressive children and adolescents are more likely to exhibit suicidal behaviour (9). However, not all individuals who engage in suicidal behaviour have depression, since there may be multiple factors in the aetiology of suicidal behaviour.

Understanding the characteristics that distinguish those cases with more serious SI and SA from less severe ones may reduce multiple and completed attempts. Childhood trauma (CT) and emotional dysregulation (ED) are among the risk factors for SB. The history of CT with non-adaptive emotional regulation strategies may lead to non-suicidal self-injury (11,12) and depression (13). Research evidence also indicates that exposure to sexual abuse is the most significant contributing factor for lifetime suicide attempts amongst adverse life events. A meta-analysis (2017) showed that, in addition to sexual abuse, physical abuse and neglect are also risk factors for possible suicide attempts (14). However, these factors are not generally sufficient for suicidal behaviour; rather they often act as precipitating factors in youths who have other risk factors. In this context, the role of adverse life events combined with vulnerability factors that increase the possibility of suicidal behaviour are considered in the stress-diathesis model (10).

Emotional regulation is defined as identifying, accepting, and adjusting one's emotional and situational demands. Gratz and Roemer (2014) conceptualised a six-factor model of emotional dysregulation, which can be assessed via the Difficulties in Emotion Regulation Scale (DERS). The DERS measures difficulties with emotional regulation in six distinct dimensions involving nonacceptance of emotions, deficits in emotional awareness, lack of emotional clarity, difficulties in applying goal-directed behaviour, impulse control problems, and having challenges with emotional regulation strategies (15).

Researchers examining the link between suicidal behaviour and emotional regulation found that specific dimensions of the DERS were associated with suicidal symptoms. Hatkevich *et al*. revealed maladaptive emotional regulation, deficits in impulse control, and mood disorders were linked to suicide ideation in clinical samples (16). In addition, in a community sample, Rajappa *et al*. stated that multiple suicide attempters showed deficits in the nonacceptance of emotions and emotional regulation strategies compared to participants with no SI and past attempts. Morever, maladaptive emotional regulation strategies predicted suicide ideation after controlling for depressive symptoms (17). Another study found an association between suicide ideation and all six dimensions, except for Awareness (the second dimension), where Strategies (the sixth dimension) showed a robust relation (18).

Esposito *et al*. found that mood disorders differed among adolescents with single suicide attempts compared to those with multiple attempts. Furthermore, patients with SA for multiple times showed more dysregulated affect and poor impulse control (19). Additionally, for patients with multiple attempts, the act of attempting suicide itself may have a reinforcing effect as self-mutilative behaviour, increasing the possibility of engaging in another suicide attempt to regulate negative emotions later in life (19). To sum up, based on empirical research, nonacceptance, strategies, and difficulties in impulse control are amongst the prominent factors in adolescents with suicide ideation and suicide attempts.

It is difficult for children who are exposed to maltreatment in their families to learn which emotions are acceptable and appropriate. The ineffective interaction between children and their families may disrupt the development of effective emotional regulation capacities (20). Jiang et. al found ED as a mediator between emotional abuse and SB. They also indicated that ED was positively associated with SB (21). Similarly, the mediating role of emotional dysregulation was also shown in another study. They found that in patients with bipolar disorder who experience ED with a history of emotional abuse, depressive symptoms may play a significant role in suicide ideation (22).

Few studies have targeted the association between SI and SA severity, CT, and ED in depressive adolescents. This study aims to examine which types of CT and which aspects of ED are related to current and lifetime SI and SA severity. We assumed that nonacceptance of emotional responses, deficits in access to effective strategies, and difficulty in controlling impulsive behaviour would be associated with the severity of suicide scores measured by the Columbia-Suicide Severity Rating Scale (C-SSRS). In addition, we expected that sexual abuse, physical abuse, and emotional neglect

would be related to the subscales of the DERS and C-SSRS lifetime and current scores.

Materials and Methods

Participants

Participants in this study were recruited from Ankara City Hospital (n = 28), Diyarbakır Health Sciences University (SBU), Gazi Yaşargil Training and Research Hospital (n = 10), Dicle University (n = 10), Düzce University (n = 12), SBU Van Educational Hospital and Research Hospital (n = 22), Istanbul Kanuni Sultan Süleyman Training and Research Hospital (n = 9). The study included 80 young individuals aged between 12-18 years old applied to the child and adolescent psychiatry outpatient clinic between November 2019 and November 2020.

This study includes subjects who had attempted suicide in the last 30 days prior to the study with the diagnosis of major depressive disorder, atypical depressive disorder, persistent depressive disorder, or adjustment disorder with depressive symptoms that had applied to outpatient clinics or referred from the psychiatric emergency departments. The patients and their parents who expressed willingness and signed an informed consent were included in this study. On the other hand, those patients who had the diagnosis of neurodevelopmental disorders, bipolar disorder, substance abuse disorder, or schizophrenia were excluded from this study.

The Schedule for Affective Disorders and Schizophrenia for School-Aged Children, Present and Lifetime Version (K-SADS-PL) were administered to the subjects to verify psychiatric diagnoses and identify any comorbid psychiatric disorders. Then, all patients were evaluated with a set of questionnaires including the DERS, Childhood Trauma Questionnaire (CTQ), and Beck Depression Inventory (BDI). The C-SSRS was also applied to assess current and life-time SI and SA severity. Four sub-scores of the C-SSRS were calculated and used as outcome variables.

The study was approved by the Ethics Committee of the Ministry of Health University of Health Science Kanuni Sultan Suleyman Research and Training Hospital (KAEK/2020.07.120). Patients and their parents were informed about the study and written informed consent forms were obtained from all of them.

Sociodemographic Data Form

Sociodemographic information about children and their families were obtained with a sociodemographic form.

Schedule for Affective Disorders and Schizophrenia for School-Aged Children, Present and Lifetime Version (K-SADS-PL)

The K-SADS-PL is a clinician-administered semi-structured interview employed to screen common diagnoses in children and adolescents (23). A study found that the K-SADS-PL is reliable and valid to use in the Turkish population (24). Clinicians gather information from both children and their parents to make a diagnosis. It exhibited fair to excellent validity and excellent test-retest reliability for a range of psychiatric disorders.

Difficulties in Emotion Regulation Scale (DERS)

The DERS was used to investigate the skills of modulating negative emotions (15). The scale contained 36 questions within six subscales: deficits in awareness of emotional responses (Awareness); deficits in clarity of emotional response (Clarity), nonacceptance of emotional response (Non-acceptance), deficits in using efficient strategies (Strategies), difficulties in managing impulsive behavior in the case of negative affect (Impulse), and difficulties in implementing goal-directed behavior in the case of negative affect (Goals). Saritas *et al.* conducted studies to investigate the validity and reliability of the DERS for Turkish patients (25). The six-factor structure of the DERS was confirmed by confirmatory factor analysis for adolescents. Effective internal consistency and concurrent validity were also demonstrated. With these findings, the DERS was concluded to be a valid measure for detecting emotional regulation difficulties in Turkish adolescents. A higher score in the DERS shows greater difficulties of emotional regulation.

The Columbia-Suicide Severity Rating Scale (C-SSRS)

The C-SSRS is a semi-structured, clinician-based interview that measures the severity and frequency of SI and SB (26). The clinician-administered version of the C-SSRS was used to assess SI within the last 30 days, SB in the past ninety days, and both SI and SB throughout the lifetime. The SI severity is graded from 1 to 5; if a patient denies SI, she/he receives a zero. The SI intensity scale consists of five items: frequency, duration, controllability, deterrents, and ideation reasons, which are rated ordinally. The SI intensity score is the sum total of these five items, ranging from 0-25. In addition, the behavioral scale consists of interrupted, aborted, and actual suicide attempts, preparatory behaviour for an SA, and non-suicidal self-injurious behaviours. The total number of each type of behavior is calculated, and the total number of episodes is also determined for each type. When determining the number of actual suicide attempts, medical harm or actual lethality is recorded. If actual lethality is ranked zero, potential lethality is evaluated between zero to two. Additionally, the number of attempts was categorized into three groups: “zero” for no attempts, “one” for one or two attempts, and “two” for three or more attempts. In the case of NSSI and/or preparatory behaviour each recieved 1 point. With this calculation, the C-SSRS total score has a possible range of 0–42 (27). Kilincaslan *et al.* conducted the validity and reliability study for Turkish patients. The internal consistency of the C-SSRS was shown with ordinal alpha values of 0.89 and 0.91 for recent and lifetime scores, respectively. For inter-rater reliability, weighted kappa values for recent and lifetime most severe suicide ideation were 0.92 and 0.88, respectively (28). In this study, lifetime- suicide ideation (L-SI), current suicide ideation (C-SI), lifetime-total score (L-TS), and current-total score (C-TS) were evaluated.

Childhood Trauma Questionnaire (CTQ)

Bernstein and colleagues developed this self-report scale to evaluate traumas and neglect retrospectively during childhood and adolescence. Sexual abuse (items 19, 20, 22, 23, and 26), emotional neglect (items 4, 6, 12, 18, and 27), physical abuse (items 8, 9, 10, 14, and 16), physical neglect (items 1, 3, 5, 15, and 28), and emotional abuse (items 2, 7, 13, 17, and 24) subscores are separately evaluated. The items 4, 6, 12, 15, 18, and 27 are scored inversely (29). For each subscale, cut-off values define the occurrence of that type of trauma (cut-off ≥ 5 for physical abuse and sexual abuse; cut-off ≥ 7 for emotional abuse; cut-off ≥ 12 for emotional neglect; cut-off ≥ 7 for physical neglect; cut-off ≥ 35 for total score). The reliability and validation was shown in the Turkish population. The Cronbach's alpha value for internal consistency was 0.93. The test-retest reliability was also excellent. The construct validity of the scale was also supported through comparisons between three study groups with graded differences in trauma histories and an evaluation of the consistency with the qualitative reports of childhood trauma by CTQ (30).

Beck Depression Inventory (BDI)

The BDI, developed by Beck *et al*. (1996) (31), consists of 21 items evaluating depressive symptoms. Each item is graded on a 4-point Likert scale, and the total score has a possible range of 0 to 63. The Turkish adaptation was conducted by Hisli (32). The reliability of the BDI was examined with item analysis and half splitting techniques, and correlation coefficients of 0.80 and 0.74 were found, respectively. The validity score was also found to be 0.50. These scores were in concordance with other studies (32).

Statistics

Descriptive statistics and group statistics were conducted to analyze the data. Normality tests were used to assess the distribution of variables. Having examined trauma presence with CTQ cut-off points, the Mann-Whitney U test was utilized to detect the relation with the C-SSRS scores. The Spearman correlation test was employed to calculate correlations among the variables. Furthermore, a multiple linear regression analysis was used to evaluate predictive variables for suicide scores. The analysis demonstrated a linear relationship between variables and C-SSRS scores. None of the predictor variables were highly correlated with each other. Regressions with the backward elimination method were carried out to specify important predictors for the suicide scores.

Results

Tables 1 presents the participants' demographics, clinical factors like primary diagnosis and comorbidities, and the mean or median scores, standard deviations, and interquartile ranges of the study scales. The mean age of the participants was 15.48 ± 1.48. The most frequent primary diagnosis (83.8% (n = 67)) was major depressive disorder. Moreover, at least 37.5% (n = 30) of the participants had one comorbid diagnosis.

The presence of trauma, including general, sexual and physical abuse, emotional neglect and physical neglect, was assessed with a cut-off point. They were then examined to detect if significant relations existed with the DERS and C-SRRS. Independent sample t-test and Mann-Whitney U test did not reveal any significant relations between the CTQ total score and any C-SRRS subscales. Additionally, there was no relationship between the CTQ and DERS subscales. The presence of sexual and physical abuse was significantly related to the C-SRRS C-SI (Z = -2.018, P = 0.04) (Z = 2.452, P = 0.014). The presence of emotional neglect was related to the C-SSRS C-TS (Z = -2.005, P = 0.045).

Table 1. Demographic Characteristics and Scales Scores of Participants with Depressive Disorders

Age (Mean (SD))	15.48 (1.48)
The number of family members (Median (IQR))	5.0 (2.0)
Age of parents	
Mother (Median (IQR))	40.0 (8.0)
Father (Median (IQR))	45.0 (9.0)
Education levels of parents	
Mother (Median (IQR))	6.0 (7.0)
Father (Median (IQR))	11.0 (7.0)
Income per capita (Median (IQR))	8.035 (7.150)
School dropouts (% (n))	13.8 (11)
The living area	
Urban (% (n))	12.5 (10)
City center (% (n))	87.5 (70)
Diagnosis	
Chronic depressive disorder (% (n))	3.8 (3)
Major depressive disorder (% (n))	83.8 (67)
Atypical depression (% (n))	1.3 (1)
Adjustment disorder (% (n))	11.3 (9)
Comorbidity (% (n))	69 (86.3)
Anxiety disorder (% (n))	13.8 (11)
OCD (% (n))	5.0 (4)
Eating disorder (% (n))	1.3 (1)

ADHD (% (n))	6.3 (5)
ODD (% (n))	2.5 (2)
CD (% (n))	3.8 (3)
PTSD (% (n))	2.5 (2)
Dissociative Disorder (% (n))	1.3 (1)
Gender Dysphoria (% (n))	1.3 (1)
BDI (Mean(SD))	35.4 (10.3)
CTQ	
Total score (range 25-86) (Mean(SD)) / (% (n))	47.2 (16.4) / 71.3 (57)
Physical abuse (range 5-25) (Median(IQR)) / (% (n))	5.0 (3.0) / 81.3 (65)
Sexual abuse (range 5-25) (Median(IQR)) / (% (n))	5.0 (4.0) / 82.5 (66)
Emotional abuse (range 5-25) (Median(IQR)) / (% (n))	10.0 (10.0) / 68.8 (55)
Emotional neglect (range 5-25) (Median(IQR)) / (% (n))	15.0 (10.0) / 62.5 (50)
Physical neglect (range 5-25) (Median(IQR)) / (% (n))	8.0 (5.0) / 56.3 (45)
DERS	
Total score (Mean (SD)	121.4 (22.5)
Non-acceptance (Median (IQR))	14.5 (10.2)
Goals (Median (IQR))	21.0 (7.0)
Impulse (Mean (SD))	22.4 (5.1)
Awareness (Mean (SD))	18.5 (4.5)
Strategies (Median (IQR))	30.5 (12.0)
Clarity (Mean (SD))	15.5 (7.2)

SD = Standard Deviation; IQR = Interquartile Range; ADHD = Attention Deficit and Hyperactivity Disorder; ODD = Oppositional Defiant Disorder; CD = Conduct Disorder; OCD = Obsessive Compulsive Disorder; BDI = Beck Depression Inventory; CTQ = Childhood Trauma Questionnaire. DERS = Difficulties in Emotion Regulation Scale. For Physical Abuse and Sexual Abuse %(n) > Cutoff ≥ 5; for Emotional Abuse % (n) > Cutoff ≥ 7; for Emotional Neglect % (n) > Cutoff ≥ 12; for Physical Neglect % (n) > Cutoff ≥ 7; for Total Score %(n) ≥ 35.

The correlations among the variables are showed in Table 2. The study examined the correlations between the sociodemographic variables such as age and the income per capita and C-SSRS scores. The income per capita was the only parameter that weakly correlated with the C-SSRS L-SI score (rho = -0.257, P = 0.022). The bivariate analysis indicated that the positive correlations were found between the BDI and C-SSRS L-SI, C-SI, and C-TS; the DERS-total and C-SSRS C-SI, C-TS; the DERS impulse and C-SSRS C-SI, C-TS; the DERS-strategy and the C-SSRS C-SI, L-TS, C-TS; the DERS-aware and C-SSRS C-SI, C-TS, resulting in a medium effect size. Moreover, positive correlations yielding a weak effect size were detected between the DERS-total and C-SSRS L-SI, L-TS; the DERS-impulse and C-SSRS L-SI, L-TS; the DERS strategy and C-SSRS L-SI; the DERS nonacceptance and C-SSRS C-SI, C-TS; the DERS clarity and C-SSRS C-SI, C-TS; the CTQ-total and C-SSRS L-TS.

Bivariate results were employed to evaluate further associations between suicide severity and depression severity, trauma, and emotional dysregulation dimensions. Specifically, to examine the unique associations of the C-SSRS subscales with BDI scores, CTQ and DERS subscale scores, a multiple regression analysis was performed separately with the C-SSR C-SI, L-SI, C-TS and L-TS scores as the dependent variable. The independednt variables included the BDI score and those CTQ and DERS subscale scores that were associated with the C-SSRS subscale scores (emotional neglect of CTQ; total, impulse, aware, strategy, nonacceptance, goals and clarity subscales of DERS). Sexual and physical abuse, and emotional neglect subscales of CTQ related to C-SSRS C-SI and C-SSRS C-TS were also included in multiple regression analysis, respectively.

The results of descending multiple linear regression analyses for the C-SSRS scores are presented in Table 3. They revealed that the model that best fits the C-SSRS C-SI explanation includes the BDI and DERS-total score. These predictors explain 35% (adjusted R) of the variance in C-SSRS C-SI (F (2;67) = 19.61, P < 0.001). Concerning the C-SSRS C-TS, the predictor variables are 'BDI,' 'emotional neglect' and 'DERS impulse' which together explain 38% (adjusted R) of the variance in C-SSRS C-TS (F (3;66) = 15.15, P < 0.001). In the regression with the C-SSRS L-SI as the dependent variable, only the DERS-strategies appeared as a significant factor. The predictor explains 13% (adjusted R) of the variance in the C-SSRS L-SI (F (1;68) = 10.411, P = 0.02). Furthermore, concerning the C-SSRS L-TS, the predictor variables are the DERS impulse and CTQ total which together explain 24% (adjusted R) of the variance (F (2;67) = 10.620, P > 0.001).

Table 2. Correlations among the Columbia-Suicide Severity Rating Scale, Childhood Trauma Questionnaire (CTQ), and Difficulties in Emotion Regulation Scale in a Clinical Sample of Depressive Female Adolescents

	1	2	3	4	5	6	7	8	9
1. C-SSRS,L-SI	1.000								
2. C-SSRS,C-SI	0.497** < 0.001	1.000							
3. C-SSRS,L-TS	0.956** < 0.001	0.452** < 0.001	1.000						
4. C-SSRS,C-TS	0.508** < 0.001	0.969 < 0.001	0.525** < 0.001	1.000					
5. BDI	0.304* 0.009	0.475** < 0.001	0.290* 0.01	0.482** < 0.001	1.000				
6. CTQ total score	0.154 0.18	0.083 0.48	0.235* 0.04	0.146 0.21	0.225 0.05	1.000			
7. CTQ sexual abuse	0.107 0.36	-.072 0.53	0.194 0.09	0.011 0.92	0.057 0.62	0.649** < 0.001	1.000		
8. CTQ emotional abuse	0.146 0.21	0.028 0.81	0.198 0.08	0.063 0.59	0.251* 0.03	0.793** < 0.001	0.365** 0.001	1.000	
9. CTQ physical abuse	-0.005 0.96	-0.034 0.77	0.068 0.56	0.011 0.92	0.038 0.74	0.749** < 0.001	0.476** < 0.001	0.554** < 0.001	1.000
10. CTQ physical neglect	0.072 0.54	0.069 0.55	0.157 0.17	0.128 0.27	0.086 0.46	0.633 < 0.001	0.487** < 0.001	0.315** 0.006	0.427** < 0.001
11. CTQ emotional neglect	0.149 0.20	0.249* 0.03	0.187 0.10	0.290* 0.01	0.286* 0.01	0.617** < 0.001	0.154 0.18	0.363** 0.001	0.367** 0.001
12. DERS total score	0.258* 0.03	0.478* < 0.001	0.287* 0.01	0.502** < 0.001	0.455** < 0.001	0.242* 0.04	0.152 0.21	0.230 0.05	0.046 0.70
13. DERS nonacceptance	0.129 0.28	0.240* 0.04	0.152 0.21	0.260* 0.03	0.367** 0.002	0.199 0.09	0.085 0.48	0.257* 0.03	0.058 0.63
14. DERS goals	0.164 0.17	0.248* 0.03	0.167 0.16	0.249* 0.03	0.232 0.05	-0.039 0.74	-0.086 0.48	-0.051 0.67	-0.161 0.18
15. DERS impulse	0.258* 0.03	0.417** < 0.001	0.296* 0.01	0.433** < 0.001	0.245* 0.04	0.010 0.93	0.026 0.83	0.059 0.62	-0.052 0.67
16. DERS aware	0.131 0.28	0.387** 0.001	0.131 0.28	0.408** < 0.001	0.280* 0.01	0.180 0.13	0.186 0.12	0.004 0.97	-0.006 0.96
17. DERS strategy	0.286* 0.01	0.349** 0.003	0.314** 0.008	0.386** 0.001	0.446** < 0.001	0.239* 0.04	0.147 0.22	0.265* 0.02	0.103 0.39
18. DERS clarity	0.145 0.23	0.257* 0.03	0.156 0.19	0.264* 0.02	0.251* 0.03	0.202 0.09	0.139 0.25	0.108 0.37	0.019 0.87

Table 2. Continued

	10	11	12	13	14	15	16	17	18
1. C-SSRS,L-SI									
2. C-SSRS,C-SI									
3. C-SSRS,L-TS									
4. C-SSRS,C-TS									
5. BDI									
6. CTQ total score									
7. CTQ sexual abuse									
8. CTQ emotional abuse									
9. CTQ physical abuse									
10. CTQ physical neglect	1.000								
11. CTQ emotional neglect	0.360** 0.002	1.000							
12. DERS total score	0.151 0.21	0.241* 0.04	1.000						
13. DERS nonacceptance	0.047 0.70	0.155 0.19	0.739** < 0.001	1.000					
14. DERS goals	0.060 0.62	0.100 0.40	0.553** < 0.001	0.211 0.08	1.000				
15. DERS impulse	0.139 0.25	-0.006 0.96	0.673** < 0.001	0.371** 0.002	0.433** < 0.001	1.000			
16. DERS aware	0.187 0.12	0.149 0.21	0.448** < 0.001	0.159 0.18	0.144 0.23	0.153 0.20	1.000		
17. DERS strategy	0.063 0.60	0.253* 0.03	0.773** < 0.001	0.510** < 0.001	0.438** < 0.001	0.495** < 0.001	0.174 0.15	1.000	
18. DERS clarity	0.255* 0.03	0.177 0.14	0.458** < 0.001	0.320** 0.007	0.029 0.81	0.167 0.16	0.417** < 0.001	0.119 0.32	1.000

C-SSRS, L-SI = Columbia-Suicide Severity Rating Scale, Total Score of Lifetime Suicide Ideation; C-SSRS, C-SI = Columbia-Suicide Severity Rating Scale, Total Score of Current Suicide Ideation; C-SSRS, L-TS = Columbia-Suicide Severity Rating Scale, Lifetime-Total Score; C-SSRS, C-TS = Columbia-Suicide Severity Rating Scale, Current-Total Score; BDI = Beck Depression Inventory; CTQ = Childhood Trauma Questionnaire; DERS = Difficulties in Emotion Regulation Scale

Table 3. Results of Multiple Linear Regression Analysis to Predict the Columbia-Suicide Severity Rating Scale Scores in a Clinical Sample of Depressive Female Adolescents

	Non-Standardized Coefficient		Standardized Coefficients	t	P
	B	SD	Beta		
C-SSRS C-SI					
(Constant)	-12.643	4.761		-2.656	0.010
BDI	0.284	0.099	0.328	2.870	0.005
DERS-total	0.144	0.045	0.366	3.196	0.002
C-SSRS C-TS					
(Constant)	-11.274	4.618		-2.441	0.017
BDI	0.308	0.093	0.344	3.305	0.002
Emotional neglect	0.313	0.149	0.209	2.104	0.039
DERS-impulse	0.644	0.178	0.360	3.610	0.001
C-SSRS L-SI					
(Constant)	14.088	2.972		4.740	0.000
DERS-strategy	0.321	0.099	0.364	3.227	0.002
C-SSRS L-TS					
(Constant)	7.899	4.265		1.852	0.068
DERS-impulse	0.507	0.156	0.346	3.251	0.002
CTQ-total	0.159	0.051	0.331	3.108	0.003

C-SSRS, L-SI = Columbia-Suicide Severity Rating Scale, Total Score of Lifetime Suicide Ideation; C-SSRS, C-SI = Columbia-Suicide Severity Rating Scale, Total Score of Current Suicide Ideation; C-SSRS, L-TS = Columbia-Suicide Severity Rating Scale, ifetime-Total Score; C-SSRS, C-TS = Columbia-Suicide Severity Rating Scale, Current-Total Score; BDI = Beck Depression Inventory; CTQ = Childhood Trauma Questionnaire; DERS = Difficulties in Emotion Regulation Scale

Discussion

The present study sought to explore the association between ED, CT, and suicidal thoughts and behaviours among depressive adolescents who had committed suicide within the past 30 days prior to the study. The present study showed that higher BDI scores, childhood emotional neglect, the DERS impulse and strategy subscale were linked to suicide scores.

Suicidality is a transdiagnostic concept resulting from the interaction of various contributing factors (34). Our regression analysis revealed significant relations between the BDI scores and current C-SSRS scores. These results align with former evidence showing that teenagers with psychiatric disorders have a 3-to-12-fold increased risk for suicide (35). Especially, suicidal recurrence has the strongest association with mood disorders, including major depression and dysthymia (36). A study assessing risk factors for suicide behaviour reported that the youths with moderate to severe depression had a 3.8 times higher risk than the adolescents with mild depression (37). Although depression is a decisive factor associated with SI and SA, not all cases present this problem (38). Instead, SB results from the interaction of various multiple factors (10).

To predict which adolescents are likely to experience more persistent, severe, intensive suicide ideation or have more severe, lethal, and repeated suicidal behaviour would help to establish prevention and intervention measures. In the current study, difficulties in emotional regulation and childhood traumas have also been explored concerning suicide ideation and attempt severity to clarify other related factors other than depression severity. The C-SSRS current SI score had significant relations with the DERS total score. No specific dimension of the DERS was found to be associated. On the other hand, the C-SSRS lifetime SI had only significant associations with the DERS strategy. The results demonstrating a relation between the severity of suicide ideation and perceived limited emotional regulation strategies are consistent with suicide theories and previous research. According to the

escape theory of suicide, when individuals are overwhelmed by a negative affect and feel unable to find any coping mechanisms, they might consider suicide as an escape (39). Furthermore, the Cry of Pain model suggests that suicidal behaviour is a reaction to stressful situations by individuals who feel hopeless and defeated (40). A recent study also found that the interaction between high emotional reactivity and poor problem-solving skills were associated with probable suicide attempts in youths (41). Another study also stated that inadequate access to effective ER strategies was the most relevant feature in predicting SI at 2-3 years of follow-up (42). Moreover, Weinberg and Klonsky (2009) revealed that the Strategies subscale of the DERS showed the strongest correlation with suicide ideation, followed by Impulse, Nonacceptance, Clarity, and Goals (18). Hatkevich *et al*. (2019) also reported that limited DERS strategies were linked to an increased probability of SI in the past year. The DERS strategies' cut-off point was determined for the ROC curve on past-year SI was 22.5 (16). In concordance with previous research, our study showed only an association between the DERS strategies and C-SSRS SI severity. This finding might demonstrate that when considering the severity of suicide ideation, DERS strategies remain the most significant contributing factor to focus on for prevention and treatment strategies. We found that the current and lifetime C-SSRS total score, which was measured by considering all factors such as non-suicidal self-injurious behaviour, preparatory behaviour for an SA, the actual or potential lethality of the attempt, and the number of SA, was found to be associated with the DERS impulse, unlike the C-SSRS SI score. This outcome contrasts with that of Rajappa *et al*. (2012), where no significant differences in the Impulse subscale were found amongst ideators, single attempters, and multiple attempters (17). Similarly, Hatkevich *et al*. showed in a regression that the lifetime SA was only related to past-year suicide ideation, and no other DERS scales were statistically significant (16). Nevertheless, there were some supportive studies for our results. In a study in which single and multiple suicide attempters were compared, multiple attempters exhibited disorders characterized by poor impulse control (19). Additonally, a longitudinal community sample study reported that impulsivity and aggression, as reported by teachers, were related to SA in female adolescents (43). Impulsivity is also considered a risk factor for suicidality via indirect ways (44). According to Joiner's interpersonal-psychological model of suicide, engaging in self-harm is an acquired ability. This ability may be acquired after experiencing painful and provocative events such as sexual abuse and aggressive behaviour (45). Related to this model, Bender *et al*. found that, regarding suicide, impulsivity had an indirect relationship with acquired capability, with the mediation of painful and provocative events (44). The result of our study suggests that impulsivity may serve as a critical target for intervention during adolescence, especially in females. Childhood and adolescence impulsivity/aggression did not predict a diagnosis of major depressive disorder by young adulthood (43). Suicide prevention programs in schools usually target depressive symptomatology (46) , which may not be sufficient for effective management.

In our study, in addition to the impulse subscale being significantly associated with the C-SSRS TS, emotional neglect and the total score of CTQ were significantly predictive of the C-SSRS current and lifetime total scores, respectively. Similar to ours, a recent clinical study reported that in the case of a CT, individuals with bipolar disorder type II and major depressive disorder had greater emotional neglect compared to bipolar disorder type I (47). Emotional neglect is characterized by a pervasive insufficient relationship with the caregiver (48) and has been associated with HPA axis dysregulation (49). A meta-analysis also reported that childhood neglect increases the risk of suicide attempts by 1.95-fold (50). Moreover, frequent exposures to childhood neglect was strongly associated with SB compared to rare exposures to neglect (51). In our study, besides emotional neglect, high BDI scores and emotional dysregulation were also associated with the C-SSRS current TS. One could predict from the research that experiencing emotional neglect can cause depressive symptoms and adversely affect emotional regulation, contributing to suicidality.

This study may have some implications. The findings suggest that depressive youths who have attempted suicide with a high perception of CT and ED may be at a higher risk for more severe and persistent SI and SB. Thus, patients with depressive disorders should be screened for the history of childhood traumas especially for emotional neglect and emotional dysregulation problems. Moreover, this study suggests that specific aspects of difficulties in emotional regulation, presence of childhood traumas, and depressive symptoms are associated with the severity and frequency of SI and SB. By developing better emotional regulation skills in individuals with depression who also have childhood trauma, serious suicide attempts may be prevented. Generally, our findings indicate that deficits in both emotional regulation strategies and controlling impulsive behavior when experiencing negative affect, relative to other DERS dimensions, may be targets of practical therapeutic interventions.

Limitations

This research has some limitations that should be acknowledged. First, although diagnostic and suicidal interviews were made, information on childhood traumas and emotional dysregulation were collected by self-reported questionnaires which may have introduced recall bias. Second, examining factors related to suicide ideation and behaviour through a cross-sectional design does not allow to predict variables over time. Therefore, it is not possible to establish cause-and-effect relationship among variables. Future longitudinal studies are needed to verify the results of this research. Moreover, the data on

emotional dysregulation was obtained within 30 days following an attempted suicide. Thus, we were unable to evaluate emotional dysregulation concurrently with an attempt. Lastly, the generalisability of our findings is limited by the study's focus on female adolescents with depressive disorders. For this reason, future studies should replicate the results in less homogenous samples.

Conclusion

The present study provides valuable information on evaluating a multidimensional approach to emotional dysregulation, the perception of CT, and its connections with the severity of SI and SB in depressive female adolescents. To the best of our knowledge, this is the first study in which suicidal behaviour is assessed according to their severity levels using a structured scale. The results highlight particular targets for intervention, such as improving emotional regulation by facilitating effective emotional regulation strategies and the control of impulsivity, which may prevent suicide ideation and suicidal behaviour in youths. Moreovor, in clinical and community settings, identifying individuals who are at risk or exposed to maltreatment and neglect and providing them with effective emotional regulation skills may prevent them from developing suicidal behaviour.

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Conflict of Interest

None.

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