Early maladaptive schemas of emotional deprivation, social isolation, shame and abandonment are related to a history of suicide attempts among patients with major depressive disorders

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Abstract

Background: Patients with psychiatric disorders have an exceptionally high risk of completed or attempted suicide. This holds particularly true for patients with major depressive disorders. The aim of the present study was to explore whether patients with major depressive disorders (MDD) and a history of suicide attempts differed in their early maladaptive schemas from patients with MDD but without such a history or from healthy controls.
Method: Ninety participants took part in the study. Of these, 30 were patients with MDD who had made a recent suicide attempt; 30 were patients with MDD but no suicide attempts, and 30 were gender- and age-matched healthy controls. Participants completed questionnaires covering socio-demographic characteristics and the Young Schema Questionnaire (YSQ- RE2R) to assess early maladaptive schemas. Experts rated patients' MDD with the Montgomery–Asberg Depression Rating Scale.
Results: Patients did not differ in experts' ratings of symptoms of depression. Compared to healthy controls, patients with MDD recorded higher scores on maladaptive schemas such as recognition seeking, negativity/pessimism, and insufficient self-control. Compared to patients without suicide attempts and healthy controls, those who had made a suicide attempt had higher scores on dimensions such as failure, mistrust, emotional inhibition, social isolation, and abandonment/instability.
Conclusion: Compared to healthy controls, patients with MDD had more pronounced maladaptive schemas, but this was more marked in patients with a history of suicide attempts. The results suggest that suicide attempts and poorer psychological functioning are related.
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1. Introduction

Suicide is the act of deliberately taking one's own life [1], and seems to be unique to *Homo sapiens* [2]. The average international suicide rate in the general population is approximately 11 in 100,000 per annum (0.011%/year; [3,4]), and the reported ratio of attempts to completed suicides (A/S) is approximately 30–50 in 100,000 per annum [3]. As regard suicide in Iran, recent estimates have put prevalence rates at 5.3 per 100,000, with a higher rate for males (7 per 100,000) than for females (3.6 per 100,000; [5]). Suicide and suicidal behavior demand particular attention as they cause dramatic suffering for those who commit or attempt suicide and for those in their social worlds. Socio-economic and psychiatric explanations have been advanced for the complex phenomenon of suicide and suicidal behavior, but no neurophysiological correlates have so far been identified [6].

Among socio-economic explanations is the proposition that, at a macro-level, suicide and suicidal behavior may

increase during economic crises [7]. However, recent findings from Greece [8] have not supported this notion when factors such as psychiatric disorders and the social environment are taken into at account. Nonetheless, on a micro-level, economic hardship has been reported as one of several factors in attempted suicide in Iran [9].

Next, evidence from psychiatry points to a close association of suicide and suicidal behavior with psychiatric disorders [1,10], and specifically with major depressive disorders [11,12]. Further, Ajdacic-Gross [13] reported the following increases in suicide risk (compared to healthy controls): patients immediately following discharge, 200-fold increase; patients during stay in psychiatric hospitals, 50-fold increase; more than one psychiatric diagnose within the last 4 weeks, 90-fold increase; different psychiatric diagnoses, 10–25-fold increase. With respect to completed suicides, Arsenault-Lapierre et al. [10] reported in their meta-analysis the following: a) a mental disorder was diagnosed in 87% of the 3275 cases included in the studies, b) with respect to gender, diagnoses of substance-related problems, personality disorders, and childhood disorders were more common among male suicides, while affective disorders, including depressive disorders, were more common among female suicides. More specifically, suicide and suicidal behavior were associated with bipolar and unipolar mood disorders [1,14]. In the present study, we focused on major depressive disorders, as depression contributes most strongly to suicide attempts (population attributable risk (PAR) of 26.6%; [12,15,16]). In this view and most importantly, Pompili et al. [11] showed that, among patients with MDD, non-adherence was a significant predictor of negative outcomes such as high rates of recurrence/relapse and active suicidal ideation and suicidal behavior. A positive history of non-adherence has also been associated with both prior suicide attempts and active suicidal ideation. Improving adherence generally may prevent suicidal behaviors. We took this observation into account; in the present study we investigated inpatients under stable and supervised psychopharmacological treatment.

Research based on neurophysiological approaches to understanding suicidal behavior has not produced satisfactory prediction rates. Thus, while some researchers have claimed that dramatically lower cholesterol levels predict suicidal behavior, this has not been the case in other studies (see Shakeri et al. [17] for more detail; they concluded that most probably a broad variety of socio-demographic, social, physiological and psychological factors impact concomitantly and independently on suicidal behavior).

In the present study we focused on psychological dimensions to gain more insight into the cognitive–emotional processes that might underlie suicidal behavior. To this end, patients with major depressive disorders (MDD) and with or without a history of suicide attempts completed the Young Schema Questionnaire to assess early maladaptive schemas. More specifically, we anticipated that patients with such a history would be more focused on interpersonal relationship issues such as disconnection, rejection, inhibition, and abandonment, when compared either to patients without this history or to healthy controls. In this respect, Joiner et al. [18] and Bryan et al. [19] argue that, among other factors, interpersonal–psychological dimensions such as perceived burdensomeness (that is, the belief to be liability to other people), and thwarted belongingness (i.e., the belief that one does not belong to a social group, or to be unimportant and useless to other people) increase the risk of committing suicide. Likewise, O′Connor and Nock [12] concluded in their review that feelings of defeat, social rejection, entrapment, and humiliation, along with subjectively perceived low social support (all reflecting negative and stressful social relation and interactions) were particular contributors to increased risk of committing suicide. We took these observations into account and asked to what extent inpatients with major depressive disorders and with a recent history of suicide attempts might differ in their early maladaptive schemas, compared to inpatients with major depressive disorders but without any suicide attempts.

According to Beck's cognitive view of the emergence and maintenance of depression [20], mental concepts such as the assumptions, schemas, memories, beliefs, goals, expectations, hopes, plans, assignments and cognitive biases of persons influence their behavioral and emotional responses to the social environment [20]. Such mental concepts might be particularly biased in people with suicidal ideation and behavior, and this reasoning also draws on the concept of evolutionary psychology. According to De Catanzaro [21] and Joiner [18] people are more prone to suicide the less attached they feel to a social group (family, relatives, religious society, etc.), the more of a burden they feel to the social group, and the weaker they feel the prospects to be of becoming integrated within a social community. Thus, we would expect a higher salience of issues related to social interaction among patients with suicide attempt history than among those without (see also [22–24]).

According to Ball and Cecero [25], after becoming acute, early maladaptive schemas act as personality traits, and we expected greater prevalence of early maladaptive schemas in people suffering from MDD, and more so among those with a history of suicide attempts [25]. According to Young et al. [26], schemas that are foundations for later psychological disorders can be described as maladaptive. Early maladaptive schemas are self-defeating emotional and cognitive patterns established in childhood and repeated throughout life. Following Young et al. [26] and Arntz and Gitta [27], 18 maladaptive schemas are identified, and grouped into five schema domains as follows:

A: The first domain concerns disconnection/rejection and includes five schemas formed as a consequence of unmet needs such as security and empathy. These are abandonment/instability, mistrust/abuse, emotional deprivation, defectiveness/shame, and social isolation/alienation.

B: The second domain includes schemas centered on impaired autonomy/performance, schemas formed

in the context of families in which children's self-esteem is belittled and their autonomy undermined. These are: dependence/incompetence, vulnerability to harm or illness, enmeshment/undeveloped self, failure.

C: The third domain includes the schemas of entitlement/grandiosity, and insufficient self-control/self-discipline, which focus on lack of commitment, irresponsibility and lack of respects for others' rights or appreciation of limits.

D: With an emphasis on extreme attention to others' needs and emotions, the fourth domain is named other-directedness and includes three schemas: subjugation, self-sacrifice, and approval-seeking/recognition-seeking.

E: The fifth domain is hyper vigilance/inhibition. It includes four schemas: negativity/pessimism, emotional inhibition, unrelenting standards/hypercritical-ness, and punitiveness.

Studies have shown that early maladaptive schemas play pivotal roles in addiction [28–30], obsessive/compulsive disorder [31,32], PTSD [33–36], and depression and anxiety [37]. However, while there are at least three different studies examining early maladaptive schemas and suicidal behavior among patients with BPD [38,39] and borderline personality disorders [40], to the best of our knowledge no research has yet looked at patients with MDD and suicidal behavior. We believe such research could contribute to improvements in counseling and prevention and could decrease the risk of suicidal behavior. Specifically, counseling might focus on strengthening patients' social skills and interactional behavior; Brand et al. [41] showed that, among patients with environment-related complaints, poor interaction was related to psychiatric complaints. Furthermore, Jahangard et al. [42] showed that training emotional intelligence was feasible and had the effect of reducing symptoms of depression and raising social skills among patients with borderline personality disorders.

The following hypotheses were formulated. First, following Akbarian et al. [33], Ahmadian et al. [43], Beck [20], and others, we expected that, compared to healthy controls, patients with major depressive disorders would have higher scores for early maladaptive schemas. Second, following De Catanzaro [21], Joiner et al. [18], and Arsenault-Lepierre et al. [10], O'Connor and Nock [12], and Bryan et al. [16] we anticipated that, compared to healthy controls and to patients with MDD but with no history of suicide attempts, patients with MDD and a history of suicide attempts would have higher scores for early maladaptive schemas.

2. Method

2.1. Procedure

Inpatients of the Sina and Farshchian Hospitals (Hamadan, Iran) with major depressive disorders were approached to participate in the present cross-sectional study. Healthy age- and gender-matched controls were also recruited. All eligible participants were informed about the aims of the study, and the voluntary basis of participation. Once written informed consent was signed, participants completed questionnaires covering socio-demographic variables, the Beck Depression Inventory (see below) and the Young Schema Questionnaire (YSQ- RE2R; see below) to assess early maladaptive schemas. Experts conducted a psychiatric interview to diagnose major depressive disorders according to the DSM 5, and rated patients' major depressive disorders with the Montgomery–Asberg Depression Rating Scale. The ethics committee of the Hamadan University of Medical Sciences (Hamadan, Iran) approved the study, which was performed in accordance with the rules laid down in the Declaration of Helsinki.

2.2. Samples

2.2.1. Patients with major depressive disorders

Inpatients with major depressive disorders and with or without a history of suicide attempts were enrolled in the study. Inclusion criteria were: 1. age between 18 and 50 years; 2. diagnosis of a major depressive disorder, as ascertained by a trained psychiatrist or clinical psychologist, and based on a structured clinical interview for psychiatric disorders (M.I.N.I.; Mini Neuropsychiatric Interview [44] based on the DSM 5; we note that the core symptoms of major depressive disorders have not changed from the DSM-IV to the DSM 5); 3. current stable and continuous treatment with a standard antidepressant; 4. willing and able to participate in the study; 5. written informed consent. Further, to be enrolled in the group of patients without suicide attempts: never made a suicide attempt in her/his life. Next, to be enrolled in the group of patients with suicide attempts: made a suicide attempt within the last three to six weeks. Exclusion criteria were: 1. not meeting the inclusion criteria; specifically, reporting a suicide attempt more than six weeks ago; 2. further psychiatric comorbidities, specifically symptoms of depression as a result of substance abuse, persistent depressive disorders, disruptive mood dysregulation disorders, bereavement, posttraumatic stress disorders (PTSD), and anxiety disorders; features of psychotic disorders; 3. current state of suicidal behavior.

2.2.2. Suicide attempts

A patient was assigned to the group of patients with a history of suicide attempts (SAH-MDD), if the following criteria were met: 1. meeting the inclusion and exclusion criteria as described above; 2. suicide attempted between three to six weeks earlier, as reported by the patient and as confirmed by medical records.

Correspondingly, a patient was assigned to the group of patients without a history of suicide attempts (N-SAH-MDD), if she/he reported no such attempts during her/his lifetime, and if no suicide attempts were mentioned in the medical records. As examples, if a patient had never attempted suicide and met

Table 1
Statistical indices (descriptive and inferential statistics) for socio-demographic information, illness-related data and values of self-reported (BDI) and experts' reported (MADRS) symptoms of depression, separately for the three groups: Patients with major depressive disorders and a history of suicide attempts [SAH-MDD]; patients with major depressive disorders without a history of suicide attempts [N-SAH-MDD], and healthy controls [HC].

	Study conditions			Statistics
	SAH-MDD	N-SAH-MDD	HC	
N	30	30	30	
Gender (female/male)	21/9	19/11	18/12	$X^2(N = 90, df = 1) = 0.98, p > 0.6$
	M (SD)	M (SD)	M (SD)	
Age (years)	45.34 (8.94)	44.73 (7.34)	45.40 (4.87)	$F(2, 87) = 0.29, p > 0.7$
BDI (self-rating)	37.60 (7.23)	38.93 (5.80)	2.85 (0.871)	$F(2, 87) = 19.34, p < 0.001$
MADRS (experts' ratings)	36.43 (6.45)	37.00 (9.02)	1.90 (0.74)	$F(2, 87) = 25.34, p < 0.001$
Duration of current episode (months)	2.45 (1.45)	1.98 (0.99)	-	$t(58) = 0.67, p = 0.65$
Number of episodes	3.45 (2.13)	3.00 (3.12)	-	$t(58) = 0.54, p = 0.71$
Antidepressants (number of participants) citalopram, escitalopram, venlafaxine, mirtazapine, trazodone, fluoxetine, trimipramine, moclobemide)	9/9/4/2/3/1/2/0	6/7/6/3/3/2/2/1	-	$X^2(N = 60, df = 7) = 0.02, p = .98$

BDI = Beck Depression Inventory; MADRS = Montgomery–Asberg Depression Rating Scale.

all inclusion and exclusion criteria, she or he was assigned to the group of N-SAH-MDD. If a patient had made a suicide attempt in the last three to six weeks, she or he was assigned to the group of SAH-MDD. If a patient had made a suicide attempt but more than six weeks ago, she or he was not enrolled in the present study. In all, 189 patients were approached to achieve the target sample sizes of 30 patients per condition (2 × 30 = 60 patients; 31.74%).

2.2.3. Healthy controls

In parallel, a gender- and age-matched group of healthy controls (HC) was enrolled. A trained psychiatrist performed the psychiatric interview (M.I.N.I.; Mini Neuropsychiatric Interview), [44] to ensure that the controls had no signs of psychopathology. Inclusion and exclusion criteria were: 1. age between 18 and 50 years; 2. no signs of psychopathology, as ascertained by a psychiatric interview; 3. regular full-time or at least 50% employment; 4. no shift-working; 5. no intake of sleep- or mood-altering substances; 6. written informed consent.

Participants' socio-demographic and illness-related information are reported in Table 1.

The three groups did not differ as regard mean age or gender distribution; the two patient groups did not differ as regard symptoms of depression (self-rating: BDI; experts' ratings: MADRS), the duration of the current depressive episode, or number of previous depressive episodes.

2.2.4. Tools

2.2.4.1. Depression; self-rating Beck depression inventory (BDI).
Patients completed the Farsi version of the BDI [45] (for psychometric properties of the Farsi version: Ghassemzadeh et al. [46]). The questionnaire consists of 21 items and addresses dimensions such as depressive mood, loss of appetite, sleep disorders, suicidality and similar.

Each question has a set of at least four possible responses, ordered in intensity; e.g. 'sadness': 0 = 'I do not feel sad'; 1 = 'I feel sad'; 2 = 'I am sad all the time and I can't snap out of it'; 3 = 'I am so sad or unhappy that I can't stand it.' Higher scores reflecting greater severity of depressive symptoms (Cronbach's alpha = .85).

2.2.4.2. Experts' ratings of depression: Montgomery–Asberg Depression Rating Scale.
Experts rated patients' symptoms of depression with the Montgomery–Asberg Depression Rating Scale (MADRS; original: [47]; Farsi validation: Ahmadpanah et al., [48]). The 10 items forming this scale assess the following symptoms: 1. apparent sadness; 2. reported sadness; 3. inner tension; 4. reduced sleep; 5. reduced appetite; 6. concentration difficulties; 7. lassitude; 8. inability to feel; 9. pessimistic thoughts; 10. suicidal thoughts. Ratings are on a 6-point Likert scale ranging from 0 (= not at all) to 6 (= definitely), with higher scores reflecting more severe symptoms of depression (Cronbach's alpha = .89). Categorization was made as follows [47,48]: 0–6 points: no depression; 7–19 points: mild depression; 20–34 points: moderate depression; > 34 points: severe depression.

2.2.4.3. Young schema questionnaire.
The Young Schema Questionnaire – Long Form [49] (Farsi validation: [50]) consists of 232 items and assesses 18 different schemas across five schema domains (see Table 2 and Introduction). Answers are given on 6-point Likert scales with the anchor points 1 (= not at all true) to 6 (= completely true); higher total scores reflect more marked early maladaptive schemas (Cronbach's alphas from 0.83 to 0.89).

2.2.4.4. Medications.
All participants in the two patient groups were receiving treatment with antidepressants (citalopram; escitalopram; venlafaxine, mirtazapine,

Table 2
Results from one-way SA-MDD Analysis of Variances (ANOVAs) and Bonferroni post-hoc for comparison of primary maladaptive schemas, separately by patients with MDD disorders and suicide attempts (SA-MDD; n = 30), patients with MDD disorders without suicide attempts (N-SA-MDD; n = 30), and healthy controls (HC; n = 30).

Early maladaptive schema	Group	Mean (SD)	F (df = 2, 87)	Group comparisons with Bonferroni–Holm corrections for p-values
A disconnection/rejection				
Abandonment/Instability	SA-MDD	24.27 (2.63)	52.34***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	20.67 (2.33)		SA-MDD > N- SA-MDD
	HC	11.40 (2.53)		
Mistrust/Abuse	SA-MDD	23.43 (5.80)	54.23***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	18.43 (5.64)		SA-MDD > N- SA-MDD
	HC	10.60 (3.84)		
Emotional deprivation	SA-MDD	24.83 (2.76)	139.54***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	22.27 (2.94)		SA-MDD > N- SA-MDD
	HC	9.37 (3.83)		
Defectiveness/Shame	SA-MDD	24.47 (2.82)	61.50***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	20.77 (6.11)		SA-MDD > N- SA-MDD
	HC	7.73 (1.94)		
Social isolation/alienation	SA-MDD	24.40 (2.34)	80.14***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	20.40 (3.56)		SA-MDD > N- SA-MDD
	HC	7.07 (2.41)		
B Impaired autonomy/performance				
Dependence/Incompetence	SA-MDD	23.27 (3.63)	52.34***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	20.67 (2.33)		SA-MDD > N- SA-MDD
	HC	11.40 (3.53)		
Vulnerability to harm and illness	SA-MDD	23.43 (3.81)	57.23**	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	18.43 (3.65)		SA-MDD > N- SA-MDD
	HC	10.60 (3.84)		
Enmeshment/Undeveloped self	SA-MDD	21.41 (6.34)	80.14***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	21.40 (5.56)		
	HC	7.07 (2.41)		
Failure	SA-MDD	24.83 (3.76)	139.54***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	21.27 (3.94)		SA-MDD > N- SA-MDD
	HC	9.34 (3.83)		
C Entitlement/Grandiosity				
Entitlement/Grandiosity	SA-MDD	18.40 (3.73)	20.61***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	18.67 (4.29)		
	HC	13.17 (3.12)		
Insufficient self-control/self-discipline	SA-MDD	20.33 (4.92)	38.43***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	21.07 (4.68)		
	HC	12.07 (3.51)		
D Other directedness				
Subjugation	SA-MDD	16.90 (4.24)	33.85***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	17.63 (4.88)		
	HC	9.43 (3.59)		
Self-sacrifice	SA-MDD	15.43 (5.19)	6.71**	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	16.53 (4.96)		
	HC	12.20 (4.06)		
Approval seeking/Recognition seeking		23.77 (4.11)	97.34***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	22.43 (4.58)		
	HC	14.03 (3.89)		
E Hyper vigilance/Inhibition				
Negativity/Pessimism	SA-MDD	20.71 (4.76)	56.87***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	19.76 (5.78)		
	HC	7.89 (1.96)		
Emotional inhibition	SA-MDD	21.24 (4.56)	78.32***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	18.47 (4.90)		SA-MDD > N- SA-MDD
	HC	8.21 (4.26)		
Unrelenting standards/hyper criticalness	SA-MDD	19.37 (4.71)	18.27***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	20.23 (3.70)		

Table 2 (continued)

Early maladaptive schema	Group	Mean (SD)	F (df = 2, 87)	Group comparisons with Bonferroni–Holm corrections for p-values
Punitiveness	HC	14.13 (4.22)		
	SA-MDD	24.47 (3.82)	61.50***	SA-MDD; N-SA-MDD > HC
	N-SA-MDD	20.77 (2.10)		SA-MDD > N- SA-MDD
	HC	7.73 (1.95)		

**P ≤ 0.01; ***P ≤ 0.001.

trazodone, fluoxetine, trimipramine, moclobemide) at therapeutic and stable dosages.

2.3. Statistical analysis

A series of one-way ANOVAs (three groups: SAH-MDD; N-SAH-MDD; HC) was performed to calculate differences on socio-demographic dimensions (age) and with respect to symptoms of depression (BDI, MADRS). A X^2-test was performed to calculate gender distribution between the three groups. Next, t-tests (two groups: SAH-MDD; N-SAH-MDD) were performed to calculate differences in the duration of the current episode and in the number of depressive episodes.

A series of multivariate ANOVAs (three groups: SAH-MDD; N-SAH-MDD; HC) was performed to calculate differences in early maladaptive schemas. Post-hoc analyses were performed with Bonferroni-Holm corrections for p-values. The statistics was performed with SPSS® 24.0 (IBM Corporation, Armonk NY, USA) for Apple MacIntosh®.

3. Results

3.1. Differences in early maladaptive schemas between patients with major depressive disorders (MDD) and healthy controls (HC)

Table 2 reports all descriptive and inferential statistical indices; accordingly, statistical indices are not reported in the text. The pattern of results is as follows: compared to healthy controls, patients with major depressive disorders had significantly higher scores for early maladaptive schemas.

3.2. Differences in early maladaptive schemas between patients with major depressive disorders with suicide attempts history (SAH-MDD) and without suicide attempts history (N-SAH-MDD), and healthy controls (HC)

Again, Table 2 reports all descriptive and inferential statistical indices; accordingly, statistical indices are not reported in the text.

Compared the to the other two groups, patients with MDD and suicide attempt history had higher scores on all five dimensions of the early maladaptive schema domain disconnection/rejection (abandonment/instability; mistrust/abuse; emotional deprivation; defectiveness/shame, and social isolation/alienation), on three out of four dimensions of the domain Impaired autonomy (dependence/incompetence; vulnerability to harm and illness,

and failure), and on three out of four dimensions of the domain hyper vigilance/inhibition (emotional inhibition, unrelenting standards/hyper criticalness, and punitiveness).

For the domains of entitlement/grandiosity and other directedness, patients with MDD and a suicide attempt history did not have higher (or lower) scores than the patients with MDD without a suicide history or the healthy controls.

4. Discussion

The key findings of the present study were that, compared to healthy controls, patients with major depressive disorders had higher scores for early maladaptive schemas. Further, a history of suicide attempts was associated with higher scores for early maladaptive schemas in the key domains of disconnection/rejection, impaired autonomy, and hypervigilant/inhibition. The present pattern of results adds to the current literature in showing that suicide attempts among patients with MDD are associated with psychological factors, and more precisely with early maladaptive schemas understood as dysfunctional concepts related to social interaction.

Two hypotheses were formulated and these are now considered in turn.

Our first hypothesis was that patients with MDD would have higher scores for early maladaptive schemas than healthy controls, and this was fully confirmed. In this respect the present results are consistent with findings for patients with addiction disorders [28–30], PTSD [33,43], and for those with obsessive–compulsive disorders [31,32]. However, the present study expands upon previous findings in that this pattern of results related to patients with severe major depressive disorders as indicated by the BDI (self-rating) scores and the MADRS (experts' ratings).

Our second hypothesis was that patients with a history of suicide attempts would score higher for early maladaptive schemas than patients without such a history and higher than healthy controls, and again this was confirmed. Accordingly, to our knowledge, the present study is the very first to demonstrate a relation between poor early maladaptive schemas and suicide attempts.

To explain this pattern of results, we draw upon Young et al.'s [26] observation that emotional deprivation is probably the most common schema in clinical situations [26], and patients with this schema often feel alone, frustrated and sad. Likewise, individuals with such schemas do not expect other people to notice, support or nurture them.

They feel emotionally deprived, and may feel that they do not receive enough affection and warmth, attention, support or strong emotional reaction. They may feel that there is no one who understands them. These patients may feel that they are completely alone in the world. They may feel cheated of love, invisible, and empty. Typically, these patients often do not express their desire for love, affection or emotional needs to significant others. Their interactions suggest that they do not need warmth or affection. Since these patients do not expect emotional support, they do not ask for it and consequently usually do not receive it. As a result of these emotions and behaviors, depression is inevitable and, depending on the severity and durability of the schema, there is the possibility of suicide attempts. The present findings are consistent with those of Stopa and Waters [51], who investigated the effect of mood on responses to the Young Schema Questionnaire. They showed that the severity of the emotional deprivation schema increased after induction of depressed mood. This reaction suggests that while emotional deprivation causes depression, the intensity of a depressed mood increases the severity of this schema.

We found, more specifically, that among patients with MDD and a history of suicide attempts the schemas of emotional and social detachment were particularly pronounced. Not surprisingly, this group also had high scores for domains such as disconnection/rejection, impaired autonomy/performance and hyper vigilance/inhibition. We regard this pattern of results as consistent with concepts derived from evolutionary psychology. Specifically, De Catanzaro [21] argued that the odds of suicidal behavior increase in inverse proportion to feelings of being attached to a social group (family, relatives, religious community, etc.), and in direct proportion to feelings of being a burden to the social group and of having little prospect of integration within a community. Consistent with this view, Bryan and Rudd [16] observed that the odds of suicide attempts increase with increasing hopelessness, which is in turn negatively associated with the presence of social support and hopefulness. Or to put it more briefly, perceived social support is associated with a lower risk of suicide attempts. Along the same lines, Joiner's interpersonal–psychological theory of suicide [18,19] proposes that dimensions such as perceived burdensomeness (that is, the belief one is a liability to other people), and thwarted belongingness (i.e., the belief that one does not belong to a social group, or that one is unimportant and useless to other people) increases the risk of committing suicide. Similarly, O′Connor and Nock [12] reported in their review that feelings of defeat, social rejection, entrapment, and humiliation, along with subjectively perceived low social support (all of these reflecting negative and stressful social relation and interactions) appear to be at the root of increased risk of committing suicide. We believe that the dimensions of perceived burdensomeness, thwarted belongingness, feelings of defeat, social rejection, entrapment, and humiliation, do match with the present

results, as patients with MDD and with a suicide attempt within the last three to six weeks also recorded higher scores on schemas related to interpersonal issues such a social detachment and social isolation/alienation.

Despite the novelty of the findings, several limitations warrant against their overgeneralization. First, the exploratory and cross-sectional design precludes any inferences about causal relationships. This holds particularly true as regard the association between early maladaptive schemas and symptoms of depression. Even if on a theoretical level schemas are assumed to be trait-like cognitive–emotional constructs producing symptoms of depression, influence in the opposite direction is also possible. Second, latent and unassessed psychological and physiological factors might have biased two or more dimensions in the same or opposite directions. Specifically, in addition to early maladaptive schemas understood as dysfunctional orientations to social interaction, personality traits such as impulsivity and perfectionism, and dysfunctional cognitive information processing styles such as cognitive rigidity, rumination, thought suppression and autobiographical memory bias [12] might be important, but unassessed confounders. Third, information on the characteristics of the most recent suicide attempt, along with the number of previous suicide attempts, history of attempted and completed suicides by family members, peers and others in their social environments is missing. Such information might have shed more light on the association between suicide characteristics and early maladaptive schemas. Fourth and related to this point, it would have been useful to know whether specific circumstances or adverse events had triggered the suicide attempt. On this point, O′Connor and Knock [12] showed that impulsivity as a result of a particularly adverse event was an often observed correlate of suicide attempts. Fifth, no psychophysiological were assessed, though previous studies have not shown biomarkers to be reliable predictors of suicidal behavior.

5. Conclusions

The present pattern of results suggests that, compared to healthy controls, higher scores for early maladaptive schemas are characteristic of patients with major depressive disorders. Further, this is particularly true for such patients who also have a history of suicide attempts. We propose that counseling and psychotherapy with patients with MDD should focus more directly on improving patients' social skills and reducing their withdrawal from social interaction.

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