

Early maladaptive schemas in substance use disorder: A case-control study

Les schémas précoces inadaptés dans les troubles addictifs: Etude cas-témoins

Sirine Laabidi, Ahlem Hajri, Abdenmour Karmous, Dhouha Bougacha, Amira Maamri, Emira Khelifa, Haifa Zalila

Outpatient and Emergency Department, Razi Hospital, Manouba - Tunis Faculty of Medicine, University of Tunis El Manar, Tunis, Tunisia

ABSTRACT

Introduction: Early maladaptive schemas have been increasingly implicated in the development of numerous psychopathological conditions. However, research examining their association with substance use disorders remains limited.

Aim: We aimed to identify and evaluate the activation levels of early maladaptive schemas in individuals diagnosed with a substance use disorder in comparison to a healthy control group.

Methods: We conducted a cross-sectional, analytic, and case-control study over four months (December 2023 - April 2024). Our investigation included 50 subjects with a substance use disorder who presented to the outpatient department or the Tanit Center of RAZI Hospital. Control subjects were recruited from the Manouba dispensary. The two groups were compared using Young Schemas Questionnaire scores.

Results: The mean age of patients was 33.7 years. The sex ratio was 3.17. The most frequently used substances were cannabis (74%) and alcohol (54%). Subjects diagnosed with a substance use disorder had significantly higher mean scores compared with controls for emotional deprivation ($p < 10^{-3}$), abandonment ($p < 10^{-3}$), distrust ($p < 10^{-3}$), social isolation ($p < 10^{-3}$), defectiveness ($p < 10^{-3}$), dependence ($p < 10^{-3}$), subjugation ($p < 10^{-3}$), emotional inhibition ($p < 10^{-3}$), insufficient self-control ($p < 10^{-3}$), as well as for the total score of Young's Short Form Schema Questionnaire ($p < 10^{-3}$).

Conclusion: The findings of this study highlight the link between maladaptive early schemas and substance use disorders, reinforcing the validity of the schema model. These results have important clinical implications, suggesting that therapeutic approaches that address and modify early maladaptive schemas may be effective in preventing and treating addiction.

Keywords: Early Maladaptive Schemas, Cognitions, Addiction, Substance Use Disorder, Psychological Vulnerability, Therapeutic Approaches

RÉSUMÉ

Introduction : Les schémas précoces inadaptés ont été de plus en plus reconnus comme le facteur cognitif qui sous-tend plusieurs troubles psychopathologiques. Toutefois, peu d'études ont investigué la relation entre ces schémas et le trouble de l'usage de substances.

Objectif : Identifier les schémas précoces inadaptés chez des sujets ayant un trouble de l'usage de substances et évaluer leur niveau d'activation en comparaison avec un groupe témoin.

Méthodes : Nous avons mené une étude transversale analytique de type cas-témoins durant une période de 4 mois (Décembre 2023 - Avril 2024). Notre enquête a porté sur 50 sujets ayant un trouble de l'usage de substances psychoactives suivis au service des consultations externes ou au centre Tanit de l'hôpital RAZI. Les sujets témoins ont été recrutés au dispensaire de la Manouba. Les deux groupes ont été comparés à l'aide du questionnaire abrégé des schémas de Young.

Résultats : L'âge moyen des patients était de 33,7 ans. Le sexe ratio était de 3,17. Les substances les plus fréquemment consommées étaient le cannabis (74%) et l'alcool (54%). Les sujets suivis pour un trouble de l'usage de substances avaient des scores moyens significativement plus élevés en comparaison avec les témoins pour les schémas carence affective ($p < 10^{-3}$), abandon ($p < 10^{-3}$), méfiance ($p < 10^{-3}$), isolement social ($p < 10^{-3}$), imperfection ($p < 10^{-3}$), dépendance ($p < 10^{-3}$), assujettissement ($p < 10^{-3}$), contrôle émotionnel à outrance ($p < 10^{-3}$), manque d'autocontrôle ($p < 10^{-3}$), ainsi que pour le score total du questionnaire abrégé des schémas de Young ($p < 10^{-3}$).

Conclusion : Ce travail souligne l'association entre les schémas précoces inadaptés et le trouble de l'usage de substances et appuie ainsi la validité du modèle des schémas. Ce dernier peut être appliqué pour cibler et prévenir les comportements addictifs.

Mots clés : Cognition, Thérapie des schémas, Addiction, Drogues illicites, Vulnérabilité psychologique, Approche thérapeutique

Correspondance

Sirine Laabidi

Outpatient and Emergency Department, Razi Hospital, Manouba - Tunis Faculty of Medicine, University of Tunis El Manar, Tunis, Tunisia

Email: sirine.belguesmi@etudiant-fmt.utm.tn

INTRODUCTION

Substance Use Disorders (SUDs) are pervasive and alarming public health issues that affect individuals, families, and communities worldwide (1). The prevalence of SUDs is staggering, with millions of people across the globe grappling with the challenges of addiction (1). The United Nations Office on Drugs and Crime has estimated the number of drug abusers 15-64 years old at about 200 million people worldwide (1). Substance use is associated not only with negative health outcomes but also with societal problems (2). The economic, social, and personal costs of substance abusers are staggering (2). Treatment approaches provide benefits, although many individuals do not respond to treatment or experience relapse (3). Indeed, a meta-analysis of 8855 studies demonstrated that only 35% to 54% of individuals with SUDs achieve long-term remission (4). Thus, it is well established that continued research is needed to investigate the potential underlying factors contributing to the development and maintenance of this increasing global problem, as these factors could become the targets of substance use prevention or intervention programs among this population. SUDs are also notoriously challenging to treat due to their multifaceted nature and the complex interplay of several potential predisposing factors, which include biological factors (e.g., genetic predispositions), environmental factors (e.g., family, and social history), and psychological factors (e.g., personality traits) (5). Among psychological patterns, dysfunctional beliefs including early maladaptive schemas (EMSs) have been proposed to play a significant role in both developing and perpetuating substance use disorder (6).

First proposed by Beck, the concept of schemas has received extensive empirical attention in recent years, defined as "self-defeating emotional and cognitive patterns that begin early in life and repeat throughout life" (7). Early maladaptive schemas are believed to interfere with an individual's ability to meet their basic needs, especially emotional needs in childhood (8). According to Beck, "These schemas, which are conceptualized as longstanding patterns and traits, often develop as adaptive responses to toxic, traumatic experiences or overprotective behaviors, usually involving one's family of origin, primary caretakers, or school experiences, and continue to influence an individual's thoughts, emotions, and behaviors in an unhelpful way, long after the traumatic event has occurred" (9). Early maladaptive schemas influence how individuals encode, process, and respond to stimuli in their environment, how they form memories, and how they generate behavior, therefore they often form the core of self-concept and perception of the environment (10). All early schemas are thought to be pervasive and enduring and are reinforced and elaborated upon during adolescence and adulthood, rendering them highly resistant to change (10).

Findings showed that maladaptive schemas are increasingly being recognized as underlying correlates of several psychopathologies, particularly disorders that are chronic and resistant to change, such as substance abuse (11).

A growing body of research has begun to investigate the relation of early maladaptive schemas to substance abuse with research even demonstrating that substance abuse treatment that focuses on treating enduring, negative beliefs about oneself, others, and the world (i.e., early maladaptive schemas) may result in improved long-term outcomes (11).

Several studies have demonstrated that substance abusers report greater early maladaptive schema endorsement than non-clinical controls (11). However, data on the relationship between EMSs and SUD in African countries remain limited. To the best of our knowledge, our study is the first research to examine the relationship between EMSs and SUDs in Tunisia.

We aimed to compare EMS scores between patients with SUD and matched controls, in order to identify potential EMSs associated with SUD.

METHODS

Sampling and data collection procedure

We conducted a cross-sectional, analytic, and case-control study over 4 months (December 2023 - April 2024). Inclusion criteria were: subjects with a substance use disorder according to DSM-V criteria, followed at the outpatient department or Tanit Center of RAZI Hospital. Exclusion criteria included patients who were: in remission, had a confirmed psychosis or severe mood disorder, had severe cognitive impairment that hindered their ability to complete the scales, or had refused to participate in the study. In parallel, a gender- and age-matched group of 50 healthy controls (HC) was enrolled. Control subjects with no substance use or psychiatric history were recruited from the Manouba dispensary and the two groups were compared for Young Schemas Questionnaire scores. All participants gave written informed consent under full awareness that their information would remain confidential. The study was approved by the local ethical committee.

Measures

Socio-demographic properties, such as age, gender, academic level, substance use, frequency, and duration of substance use, were collected through medical records.

We used the Young Schema Questionnaire-Short version (YSQ-SF) to assess 15 EMS. The psychometric properties of the YSQ have been supported in prior research in terms of internal consistency, factor structure, and convergent validity (12)(13). The Arabic version of YSQ-SF appears to be a reliable instrument with high internal consistency, to be used in the normal population. Previous findings showed that the YSQ short and long forms are quite compatible, with the same psychometric properties and both were reported to be appropriate for use in research and clinical settings (14).

YSQ-SF is a 75-item self-report questionnaire on a Likert Scale ranging from 1 = 'completely untrue of me' to 6 = 'describes me perfectly'. Each EMS consists of 5 items. The score obtained on the subscales varies between 5 and 30

and the total score ranges from 75 to 450. The activation of a given schema is assessed by identifying three or more items with high ratings (5 or 6) (14).

Data Analysis

The collected data were analyzed by SPSS-26 software. Descriptive statistics included frequencies, percentages, means, and standard deviations, as appropriate. Differences between groups were assessed with chi-squared for categorical variables or Fisher's exact test when one or more of the theoretical frequencies in the contingency table were less than 5 and t-tests were conducted to examine the differences between the substance-dependent and the control groups in terms of early maladaptive schemas. The Pearson correlation coefficient "r" was used to measure the association between two quantitative variables. In all cases, differences were considered to be significant when $p < 0.05$.

RESULTS

One hundred were enrolled in this study; 50 were patients with SUD and 50 were healthy controls. Socio-demographic characteristics of substance users and the control are presented in Table 1.

Table 1. Socio-demographic characteristics of substance users and the control subjects

		Patients	Healthy controls
Gender	Male	38(76%)	38(76%)
	Female	12(24%)	12(24%)
Education level	Primary education	13(26%)	10(20%)
	Secondary education	29(58%)	30(60%)
	Higher education	8(16%)	10(20%)
Occupation	Student	10(20%)	10(20%)
	Unemployed	21(42%)	17(34%)
	Worker	19(38%)	23(46%)
Marital status	Single	27(54%)	19(38%)
	Married	11(22%)	29(58%)
	Divorced/Widower	12(24%)	2(4%)

Seventy-eight percent of patients (78 %) were living with family or a partner.

More than half of our sample (56%) had high socioeconomic status; 22 % of them had middle socioeconomic status and 22% had low socioeconomic status.

Over half of our sample (56%, $n=27$) had a family history of substance use disorders. The average age of first use of psychoactive substances was 19.6 ± 4.14 years with extremes ranging from 13 to 29 years. Half of our sample consumed psychoactive substances for the first time before the age of 18.5. We found a cannabis use disorder in 37 cases (74%) and an alcohol use disorder in 27 cases (54%).

The most frequently consumed substance was cannabis (74%), followed by alcohol (54%), benzodiazepine (30%), opioid (28%), cocaine (22%), amphetamine (18%), and

other substances (34%). Polysubstance dependence was noted in 68% of patients.

A total of sixteen patients (32%), use only one psychoactive substance.

Only one patient had a desintoxication treatment at a specialized care facility (2%).

Over half of our sample had made at least one withdrawal attempt (54%, $n=28$), with the number of substance withdrawals ranging from 1 to 9 (mean = 2.71 ± 1.9). The prevalence of psychoactive substance use was moderate in 19 patients (38%) and severe in 31 patients (62%).

Results show that, in patients with SUDs, social isolation/alienation, emotional deprivation, abandonment/instability, Subjugation, and dependence/incompetence are prominently activated (table 2).

The average number of activated EMS was 2.3, with a maximum of 13.

Half of our population had two or more activated EMSs. Emotional deprivation was the most frequent (32%), followed by Defectiveness (30%), and then Dependence/incompetence (22%) (table 2).

Table 2. Frequency of EMS activation in patients

Early maladaptive schemas	Prevalence of activation	N
Emotional deprivation	32%	16
Abandonment/ instability	26%	13
Mistrust/Abuse	18%	9
Social isolation	36%	18
Defectiveness	30%	15
Failure	2%	1
Dependence/ incompetence	22%	11
Vulnerability	4%	2
Enmeshment	8%	4
Subjugation	24%	12
Self-sacrifice	6%	3
Emotion inhibition	2%	1
Unrelenting standards	4%	2
Entitlement	0%	0
Insufficient self-control	16%	8

We compared the two groups on the 15 early maladaptive schemas using t-tests for each of the 15 schemas to determine which schemas significantly differed between the groups.

As displayed in Table 3, the groups significantly differed on 9 of the 15 early maladaptive schemas, with the clinical substance abuse group scoring higher than the non-clinical control group on the nine early maladaptive schemas: emotional deprivation, abandonment/instability, mistrust/abuse, social isolation, defectiveness, dependence/incompetence, subjugation, emotion inhibition, and insufficient self-control, as well as for the total YSQ-S2 score.

The non-clinical control group did not score significantly higher than the substance abuse group on any early maladaptive schema.

The two groups did not significantly differ on the early maladaptive schemas of failure, vulnerability, enmeshment, unrelenting standards, and self-sacrifice.

Table 3. Comparison of patients and healthy controls in terms of early maladaptive schemas

Schema	Patients (n = 50) M (SD)	Healthy controls (n= 50) M (SD)	P
Emotional deprivation	21,2 ± 6,7	9,7 ± 6	<10 ⁻³
Abandonment/ instability	19,2 ± 6,7	8 ± 5,1	<10 ⁻³
Mistrust/Abuse	20,2 ± 5,5	12,2 ± 4,5	<10 ⁻³
Social isolation	20,8 ± 6,1	10,2 ± 3,6	<10 ⁻³
Defectiveness	20,9 ± 5,9	9,4 ± 4,4	<10 ⁻³
Failure	15,6 ± 5,8	14,9 ± 5	0,52
Dependence/ incompetence	18,6 ± 6,1	8,1 ± 3,2	<10 ⁻³
Vulnerability	15,4 ± 5,8	14,2 ± 4,8	0,22
Enmeshment	11,6 ± 7,1	11,3 ± 3,7	0,79
Subjugation	17,3 ± 7,2	11,4 ± 4,8	<10 ⁻³
Self-sacrifice	13,5 ± 6,5	12,5 ± 4,7	0,38
Emotion inhibition	17,2 ± 3,9	10,3 ± 3,7	<10 ⁻³
Unrelenting standards	14,5 ± 5,5	13,7 ± 5,5	0,4
Entitlement	12,4 ± 4,6	12,7 ± 4,8	0,96
Insufficient self-control	18,5 ± 5,2	7 ± 2,8	<10 ⁻³
Total Score	256,9 ± 36,3	165,6 ± 24,2	<10 ⁻³

The analysis of the relationship between maladaptive schemas and sociodemographic characteristics among patients revealed a statistically significant association between a low education level and the activation of failure and vulnerability schemas. However, no relationship was found between age, gender, marital status, living arrangements, socioeconomic status, and other maladaptive schemas.

First-degree family history of substance abuse was associated with significantly higher scores for the abandonment schema ($p=0.02$).

Patients with remission history had significantly lower scores for the dependence schema, with a negative correlation between the number of withdrawals attempts and average dependence schema scores.

No relationship was found between maladaptive schemas and age of substance use initiation, polysubstance use, the number of substances the patient was dependent on, or the severity of the SUD.

Regarding the type of substances used, significant associations were observed between:

Alcohol use disorder and the activation level of the enmeshment schema.

MDMA (3,4-methylenedioxymethamphetamine) use disorder and the vulnerability schema.

Buprenorphine use disorder and the vulnerability to danger schema.

Heroin use disorder and the imperfection schema.

Pregabalin use disorder and the mistrust/abuse schema.

Discussion

While research on the involvement of Early Maladaptive Schemas (EMS) in various psychopathological disorders is increasing, studies specifically focusing on their role in addiction remain limited. Case-control studies comparing EMS activation levels between individuals with substance use disorders (SUDs) and healthy controls are particularly uncommon. This study represents a significant contribution, as it constitutes the first investigation of the relationship between EMS and SUD in our country.

Several limitations should be considered. The small sample size and gender imbalance may limit the generalizability of the findings to the broader population. The lack of formal diagnostic assessments in the control group raises concerns about potential classification bias. Furthermore, the hospital-based recruitment strategy likely introduced selection bias, as the sample may not be representative of the general population with SUD.

It's important to note that high levels of EMS activation are also observed in other mental health conditions, such as mood disorders and personality disorders, which frequently co-occur with substance use disorder. This raises questions about the specificity of EMS as a risk factor for addiction (15,16).

Furthermore, given the high comorbidity of personality disorders and substance use disorders, and the origin of the schema concept within personality disorder research, the relevance of schemas in addiction may be partly explained by their association with personality traits.

Furthermore, studies have demonstrated that EMS activation levels can fluctuate in individuals with substance use disorders, suggesting that they may be influenced by the course of the addiction itself. Research by Berglund et al (17) demonstrated that long-term alcohol abuse can impact personality traits. Furthermore, studies have shown that EMS activation levels can fluctuate in individuals with alcohol and opioid dependence, with changes observed after withdrawal periods (18). These levels can change after withdrawal periods and may even reactivate during relapse, as observed in studies by Roper et al (19) and Hautekeete et al (20). These findings underscore the need for further research to fully elucidate the nature and directionality of the relationship between EMS and addiction, including the potential for bidirectional influences between these factors.

Our study found a strong association between substance use disorders (SUDs) and several maladaptive schemas, with the "Disconnection and Rejection" domain being particularly prominent. This included schemas such as Emotional Deprivation, Abandonment, Mistrust/Abuse, Social Isolation/Alienation, and Defectiveness/Shame.

Ball proposed that the experience of thoughts, feelings, and impulses associated with early maladaptive schemas is distressing for the individual and often generates a high level of negative affect and self-defeating consequences, thus the person develops some behavioral strategies to cope (21). However, these coping styles are generally highly dysfunctional and maladaptive, expressing a kind of avoiding behavior that can result in drug abuse as a

defense mechanism (22).

While the literature supports the relationship between addiction and early maladaptive schemas (EMS), the specific schemas implicated can vary across studies.

Brotchie et al (23) conducted a study investigating EMS activation levels in individuals with alcohol dependence, opioid dependence, and individual's dependent on both substances, compared to a control group. The study found significantly higher levels of dysfunctional core beliefs in all substance-dependent groups compared to the control group. However, specific schemas differed across groups, with individuals with alcohol use disorder, both alone and in combination with opioid dependence, showing significantly higher levels of Vulnerability to Harm, Subjugation, and Emotional Inhibition. Decouvelaere et al (24) employed a French-translated version of the YSQ to assess maladaptive schemas in a sample of alcohol-dependent patients compared to a healthy control group. The results revealed significantly higher levels of maladaptive schemas in the alcohol-dependent group across various domains, with notable elevations in schemas related to Insufficient Self-Control, Mistrust/Abuse, Subjugation, and Abandonment.

Roper et al (19) compared individuals with alcohol dependence to a control group and found significantly higher levels of 12 out of 15 Early Maladaptive Schemas (EMS) in the alcohol-dependent group. Following a brief period of abstinence and participation in a psychoeducational intervention, the alcohol-dependent group showed significant improvements in depression, anxiety, and 13 out of 15 EMS. These findings suggest that interventions may be effective in reducing the activation of maladaptive schemas in individuals with alcohol dependence. However, it is important to note that despite these improvements, the alcohol-dependent group still exhibited significantly higher levels of depression, anxiety, and EMS activation compared to the control group, highlighting the ongoing challenges faced by individuals in recovery.

In a study by Ryan C. Shorey et al (18), a sample of 180 young adult women receiving treatment for substance abuse was compared to a control group of 284 female college students. Using the long version of the Young Schema Questionnaire (YSQ-L3), the researchers assessed the presence of Early Maladaptive Schemas (EMS) in both groups. The findings revealed significantly higher levels of EMS activation across 16 out of the 18 assessed schemas in the substance abuse group compared to the control group. Brummett et al (25) conducted a study investigating the relationship between attachment styles and early maladaptive schemas (EMS) in a sample of outpatients receiving Methadone treatment. The findings of this study have important clinical implications, as they highlight a significant association between anxious attachment and the severity of dependence, as well as elevated levels of EMS related to Imperfection, Dependence, and Insufficient Self-Control. These findings suggest that addressing attachment-related issues and addressing these specific schemas may be crucial for improving treatment outcomes for individuals with opioid use disorder.

Bojed&Nikmanesh (22) investigated the relationship

between Early Maladaptive Schemas (EMS) and addiction potential in a sample of 260 students using the Addiction Potential Scale (APS) and the short version of the Young Schema Questionnaire (YSQ-SF). The study found significant positive correlations between all five EMS domains and addiction potential. Regression analysis further revealed that the "Disconnection and Rejection" and "Impaired Autonomy and Performance" domains were the most significant predictors of addiction potential in this student population.

Briet et al (26) examined the relationship between alcohol use and Early Maladaptive Schemas (EMS) in a sample of 200 adolescents. The study found that adolescents with heavy alcohol use exhibited significantly higher levels of activation on several EMS domains, including Abandonment, Imperfection, Vulnerability, Emotional Inhibition, Entitlement, and Insufficient Self-Control, compared to adolescents who drank occasionally or not at all. These findings suggest that specific schemas may be particularly relevant to the development of problematic alcohol use in adolescents.

Grebot E et al (27) conducted a study investigating the relationship between cannabis use and Early Maladaptive Schemas (EMS) in a student population. The study found that cannabis-dependent students demonstrated significantly higher levels of activation on the "Dependence" and "Insufficient Self-Control/Self-Discipline" schemas compared to students with abusive cannabis use, non-problematic cannabis use, and non-users. In none of the reviewed studies did control groups exhibit higher levels of Early Maladaptive Schemas (EMS) compared to clinical groups.

While studies consistently point to the importance of schemas related to Abandonment, Emotional Deprivation, and Insufficient Self-Control in substance use disorders (SUD), there is variability in findings regarding other EMS. This variability may be attributed to differences in study populations, including age, gender, and the presence of comorbid mental health conditions, as well as variations in the specific assessment tools utilized.

A 2023 meta-analysis concluded that among the various domains of Early Maladaptive Schemas (EMS), "Disconnection/Rejection," "Impaired Autonomy and Performance," and "Impaired Limits" were most strongly associated with the development and maintenance of substance use disorders (11).

Recommendations

This study emphasizes the importance of schema-focused interventions in the treatment of SUD. Our findings, consistent with previous research, demonstrate that early maladaptive schemas play a significant role in the development and maintenance of substance use disorders. These results support the clinical recommendations of Ball and Young suggesting that therapeutic approaches should integrate schema-focused techniques, such as cognitive restructuring and experiential therapies, alongside relapse prevention strategies, to effectively address the underlying psychological factors contributing to addiction (28). Further research with larger sample sizes is necessary. Participant selection should consider factors such as the

type of substance used and the presence of comorbid personality disorders to control for potential confounding variables and more accurately determine the relationship between maladaptive schemas and substance use disorders.

Additionally, future research should delve deeper into the role of cognitive processes, such as schema avoidance and compensation.

Crucially, longitudinal studies examining EMSs in abstinent individuals over extended periods are essential for understanding relapse patterns and vulnerability, paving the way for more robust relapse prevention strategies.

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