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# Drug addiction and emotional dysregulation in young adults

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*Summary*

**Background:** It is widely acknowledged that drug addiction is characterized by emotional dysregulation. Relatively few studies in this field, however, have focused on early adulthood. **Aim:** The present study aims to assess emotional functioning in young adults (aged 18-24) with drug addiction who have already been admitted to residential treatment. **Methods:** A group of young drug addicts admitted to residential treatment (N=41) was compared with a group of young adults without Substance Use Disorder (N=27). A series of psychological self-report questionnaires on emotional functioning, Toronto Alexithymia Scale-20 item, Sensation Seeking Scale–VI, Emotional Quotient Inventory and Observer Alexithymia Scale were administered. Descriptive and nonparametric analyses (Pearson's chi square test, Mann-Whitney U test, and McNemar test) were performed. **Results:** High rates of alexithymia emerged from the administration of the observer scale, in contradiction with the self-report evaluation; also, past experiences related to sensation seeking and inadequate emotional intelligence abilities were identified as characteristics of this clinical group. **Conclusions:** Our results suggest that drug dependence in young adults is characterized by difficulties in emotional regulation, indicating the importance of specific and new treatment methodologies.

*Key Words:* Youths; drug addiction; alexithymia; emotional dysregulation

## 1. Introduction

Adolescence implies significant neurodevelopmental changes, with remarkable functional and structural alterations that involve cortical and subcortical brain areas. In particular, the process known as 'frontalization' takes place, meaning the development of the pre-frontal cortex and the consequential maturation of higher cognitive abilities and reinforcement of cognitive control over the emotional and behavioural responses initiated by the limbic structures [71, 81]. The "dual system" model highlights a substantial difference in the developmental trajectories of these two neurobiological systems: the socioemotional system, localized in the limbic and paralimbic areas, develops more rapidly than the cognitive control system, which fully develops only in early adulthood [89]. Given this asynchrony, adolescents face stronger bottom-up reward-related drives but, at the same time, they cannot rely on adequate regulation abilities, resulting in a vulnerability to impulsive and risk-taking behaviours, often in terms of experimenting and using substances, whether licit or illicit [85]. As a matter of fact, nowadays, Substance Use Disorders (SUD; [3]) in young people are a matter of increasing concern. Among patients undergoing drug addiction treatment, there is an increasing percentage of youths aged 18-24: one estimate published as recently as 2013 puts the percentage of addicted patients younger than 25 years at 27% [32]. Furthermore, the recent phenomenon of drug misuse shows peculiar characteristics of heightened risk, such as the widespread use of amphetamine-type stimulants and new psychoactive drugs [101] and the form of multi-

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ple consumption called polydrug use [31].

### *1.1. Emotional dysregulation in drug addiction*

Emotional regulation is a multidimensional construct, encompassing different abilities and processes that share the goal of maintaining and/or modifying the current or expected affective state, as regards its intensity, quality and duration. It includes both intentional and unintentional components, and both intrinsic and extrinsic processes, such as emotional awareness, identification and acceptance, the generation of new emotional experiences, the reinterpretation of distressing cognitions and flexible modulation of emotional responses in order to meet situational demands [108]. Emotional regulation undergoes specific developmental age-related changes from childhood to adulthood, when strategies become more flexible, coherent and adaptive. Emotional stability seems to be particularly low in adolescence (showing the most limited repertoire of emotional regulation strategies), but it has not yet become established in emerging adulthood, either [104]. Managing emotions adaptively is central for social adjustment and individual psychological well-being, and emotional dysregulation is related to the development and maintenance of various psychopathological conditions in children, adolescents and adults [108]. Emotional regulation failures are a well-recognized hallmark of drug addiction [17], with poor regulation abilities creating a predisposition to use drugs and to eventually develop an addictive disorder. Khantzian [48] was the first to propose that individuals rely on drugs as a means to alleviate aversive emotional states and to increase positive affects. This might be particularly true in adolescence and youth, when emotional regulation abilities are still developing and, therefore, are not yet properly mastered [85, 104].

### *1.2. Alexitymia*

Alexithymia is a multidimensional construct, made up of emotional and cognitive components: difficulties in identifying and describing feelings, differentiating body sensations and feelings, lack of fantasy and an externally oriented cognitive style [67, 66]; overall, these characteristics reflect a deficit in the cognitive processing of emotions [35, 42, 58, 69, 92]. Interestingly, a distinction can be made between primary alexithymia, considered a personality trait arising out of early or genetic vulnerability, and secondary or organic alexithymia, which is viewed as a cognitive deficit that derives from mental illness or brain injury [63, 91]. Also, drugs, through their neurotoxic effects, may cause brain alterations that, in their turn, can lead to alexithymic traits. Although it is still controversial whether, in this circumstance, alexithymia has a primary or secondary nature and its role as a risk factor is still to be determined [18, 93, 95], it is quite common in SUDs [20, 27, 38, 54, 65, 70, 87, 98]. The role of alexithymic traits as a risk factor for SUDs can be explained as a consequence of immature self-awareness, scarse cognitive regulation of one's emotions [93], lack of cognitive representations of neurophysiological stimuli [47], and impulsivity, meaning failures in reflective and sophisticated cognitive processes of cognitive and emotional regulation, and engaging in substance use when experiencing heightened and disturbing affects [70, 84]. Difficulties in identifying and expressing emotions are also related to increased drug use in adolescents [99], while among young substance abusers, the prevalence of alexithymia is reported to range from 30 to 43.9% in individuals aged 15-24 – recorded at higher levels than in the general population [22, 29, 28, 82, 100].

### *1.3. Emotional intelligence*

Emotional intelligence (EI) is a multifaceted construct [90]; there are several explanatory models of emotional intelligence, among which the mental ability model highlights the association between emotions and cognition, defining it as the "ability to perceive accurately, appraise, and express emotions; the ability to access and/or generate feelings when they facilitate thoughts; the ability to understand emotions and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth" [62, 61]. Some models include both mental abilities and traditional personality traits, such as optimism and mood [9, 37]; it can therefore be assumed that emotional intelligence overlaps with both cognitive intelligence and personality traits [19, 102]. Low levels of EI are associated with maladjustment, including deviant behaviour, drug use, and behavioural addictions [12, 33, 50, 53, 76, 77]. The relationship between low EI and addictive disorders can be attributed to the inability to comprehend and manage negative effects [48, 97] or interpersonal problems [5], resulting in difficulties in understanding emotional causes and regulating affect at intrapersonal and interpersonal levels [16, 33]. In general, on one hand, low levels of EI contribute to the onset

of drug abuse [37, 53] and are recognized as a predictive factor for alcohol and drug-related problems [78, 83]; on the other hand, high levels predict favorable treatment outcomes, at various pre- and post-treatment levels. Similar findings emerge in studies focusing on adolescence, during which the development of several emotional capacities occurs: self-awareness of inner states, communicating emotions, appropriately perceiving and responding to others' emotions, regulating affect, adaptively coping with problems and maintaining a positive mood [10]. With young people in their teens and early twenties, lower emotional ability correlates with adolescent deviant behaviour [64] and with the use of drugs [10, 25, 49, 99], both licit, such as alcohol [99], and illicit. A review study [50] confirms this association for several types of substances and behavioural addictions; this study, in addition, pinpoints the capacities of regulating/decoding and differentiating emotions as the most prominent factors in SUDs.

### *1.4. Sensation Seeking*

Adolescence is distinguished by reward-related behaviours, including enhanced interactions with peers and risk-taking experiences [15, 86, 88], because the brain's socioemotional system undergoes marked developmental change. A fundamental neurodevelopmental mechanism is the increase of dopaminergic activity in the prefrontal cortex (PFC), with important implications for the reward system, whose circuits overlap with social information processing circuitry (such as social judgments) [81]. As a consequence, adolescents are highly sensitive to peers' influence regarding risk-taking behaviours, which occur especially in the context of the peer group. Secondly, according to the "dual system model" [89], adolescents' behaviour seems to be guided mainly by affective evaluations, even in taking risky decisions. That is the reason why, even though a specific behaviour may be evaluated as dangerous (as a matter of fact, adolescents are as good as adults at evaluating risks), the associated social information can promote a positive affect that makes adolescents judge it as less risky. Moreover, because of the age factor, adolescents respond differently to rewarding stimuli (such as drugs) that exert an enhanced rewarding effect [30, 89], according to a non-linear trajectory that tends to diminish towards adulthood [45]. In this sense, a teen might use drugs to achieve an internal reward, by the regulation of emotions and changing mood, and/or an external reward, such as social approval [21]. Sensation seeking is a personality trait strictly connected with the vulnerability of adolescents towards reward-related behaviour; it is centred on the seeking of varied, novel, complex and intense sensations and experiences, and the willingness to take physical, social, legal and financial risks for the sake of those kinds of experience [105]. Results show that sensation-seeking levels are not stable, and rise during adolescence [57]. Sensation seeking correlates positively with multiple problematic and high risk behaviours, ranging from deviant behaviour, shoplifting, aggression, and unprotected sex to the misuse of legal and illegal drugs, even in adolescence and youth [1, 4, 8, 39, 59, 68, 79, 106]. More specifically, sensation seeking seems to be crucial in the early phases of experimentation with legal and illegal substances, and may lead the subject to polydrug use in the constant search for new experiences; it has also been suggested that seekers of 'highs'/strong sensations tend to prefer stimulant drugs, in order to pursue activities and stimulations and to defeat their proneness to boredom [44]. Consequently, it is not surprising that in early adolescence sensation seeking plays a predictive role not only for drug use itself [23, 75], but for later social maladjustment, too [106]. In specifically discussing teens and young people, studies reported intense sensation seeking associated with substance use and abuse.

Among college students, sensation seeking emerged as the most effective and powerful predictor of substance misuse; it has also been indicated as one of the most important motives for taking drugs [46]. According to a large-scale study on adolescents (aged 13–18), 80% presented elevated levels of sensation seeking [60]. The high frequencies reported for sensation seeking in young adulthood can be explained as being due to the adoption of a biosocial model [80]. Quite recently, in 2013, a direct association between risk taking and white matter integrity has been attested in substance-abusing youths, with frontolimbic matter integrity proving to be a strong predictor of risky behaviours [45].

The present study has the aim of evaluating the main characteristics of drug-addicted young adults' emotional functioning and its possible dysregulation, with respect to alexithymia, sensation seeking and emotional intelligence.

## 2. Methods

### 2.1. Sample

Sixty-eight subjects, aged 18-24, were recruited in a residential Therapeutic Community for Substance Use Disorders, and in high schools and colleges in Italy. The sample comprised a clinical group (N=41) and a comparison group (N=27).

The clinical group adopted the following inclusion criteria; participants should: a) meet the DSM-IV-TR [2] criteria for Substance Use Disorder; b) be referred and admitted to the residential treatment community for less than 3 months. 54% of the sample were males and the mean age was 21 years (± 2.1). Most of the participants were unemployed. Many young inpatients (48.8 %) reported that one or both of their parents had suffered or were still suffering from a past or current Substance Use Disorder (SUD). It is worth noting that a high percentage (54%) had experienced potentially traumatic experiences in their past (such as maltreatment, sexual or physical abuse). At the start of the study, subjects in the clinical group had been abstinent from drugs for an average of 3 months. The control group was selected by matching subjects on the basis of socioeconomic and demographic characteristics. Moreover, the comparison group did not report any diagnosis of SUDs or current drug use. The control group included 38% males and 62% females, and their mean age was 20 (±1.8).

### 2.2. Instruments

A psychological assessment procedure was administered individually to each participant; the time taken was usually one hour.

The 20-item Alexithymia Scale (TAS-20; [13]). Developed by Bagby, Parker and Taylor [6], it has become the most widely used assessment tool for alexithymia. It is a self-report scale made up of 20 items that must be rated from 1 (strongly disagree) to 5 (strongly agree); the sum of these items generates a total score and scores for three subscales. The scale, in fact, has a three-interrelated-factor solution and aims to capture all the most important clinical features of the disorder: Difficulty in identifying feelings (F1), Difficulty in describing feelings (F2) and Concrete thinking (F3). The total score is compared with cut-off scores that categorize respondents into alexithymic (≥60), borderline (≤51 and ≥60) and non-alexithymic. The scale has been evaluated as a reliable and valid measure of the alexithymia construct [7, 13, 51, 73, 74, 94]. The psychometric properties of the TAS-20 have been verified in a sample of substance abusers, resulting in a reliable and valid measure, with the exception of the third cognitive subscales [20, 96]. In studies targeting adolescents and young adults with drug-related problems, the administration of TAS-20 showed that 35.6-40.6% of subjects presented alexithymic traits, more than in the normative group [28, 29].

The Observer Alexithymia Scale (OAS; [40]). An observational measure of alexithymia is fundamental in order to overcome a limit of self-report tools for this construct, because self-report questionnaires require respondents to report on a capacity they may lack because of the low rates of self-awareness they have on this problem [52, 56, 103]. The OAS is a 33-item observational scale, to be completed by a subject's relative or acquaintance (in the specific case of this study it was administered to individual psychotherapists). Items are rated on a 4-point scale and tap five alexithymic features: Distant (being unskilled in intrapersonal and interpersonal issues), Uninsightful, Somatizing, Humourless and Rigid. The scale revealed good psychometric characteristics [28, 40, 41, 96]. OAS was not administered to subjects in the comparison group, given the fact that no caregiver figure or close adult acquaintance was included in data collection.

Bar-on Emotional Intelligence Inventory (EQ-i; [34, 9]). EQ-i is a self-report tool designed to evaluate emotional intelligence based on Bar-On's model [9]; the instrument was developed from a conceptualization of EI as a combination of abilities, competences and skills that include emotional awareness, impulse control, problem solving, optimism and interpersonal relationships [9]. In fact, the inventory identifies 5 major factors or scales (Intrapersonal, Interpersonal, Adaptability, Stress Management, General Mood) and 15 subscales. 133 assertions are rated on a 5-point scale from 1 ("it never or rarely applies to me") to 5 ("it very often or always applies to me"). It gives an overall total score, referred to as Emotional Quotient, and a score for each composite scale and subscale. Interestingly, empirical evidence proved that EQ-i is a reliable measure [26], and its results can serve as a predictor of drug use [11] and an adequate measure of treatment efficacy.

Sensation Seeking Scale – form VI (SSS-VI). Since its introduction, this tool has been considered the standard measure for sensation-seeking traits. It is a self-report questionnaire comprising separate scales, with the aim of independently evaluating actual and

**Table 1.** Cronbach's alpha for total scales and subscales

| Test | |
|---|---|
| TAS-20 total | .801 |
| Identifying emotion (F1) | .825 |
| Communicating emotion (F2) | .728 |
| Concrete thinking (F3) | .517* |
| | |
| OAS total | .866 |
| Distant (D) | .771 |
| Uninsightful (U) | .838 |
| Somatizing (S) | .826 |
| Humourless* (H) | .484* |
| Rigid (R) | .649 |
| | |
| SSS-VI | |
| Experience Adventure (ETAS) | .750 |
| Experience Disinhibition (EDIS) | .940 |
| Intention Adventure (ITAS) | .862 |
| Intention Disinhibition (IDIS) | .920 |
| | |
| EQ-i total | .962 |
| Intrapersonal (RA) | .930 |
| Interpersonal (ER) | .870 |
| Adaptability (AD) | .841 |
| Stress Management (SM) | .816 |
| General mood (GM) | .845 |

Note: *Excluded from further analysis.

desired experiences for two sensation-seeking factors, namely: Thrill and Adventure experiences, and Disinhibition experiences [36, 105]. The instrument includes a first part, with 80 items describing disinhibition together with thrill and adventure experiences referred to in the respondent's past, called Experiences of Thrill and Adventures (ETAS) and Experiences of Disinhibition (EDIS), respectively. The respondent has to indicate if he/she has actually engaged in the activity described, that is, if he/she never did it, did it once, or did it more than once. In Part II the same items are presented but now the subject has to indicate if he/she would engage in the activity in the future, reporting if it is something that he/she is not willing to do, something he/she thinks about but does not intend to do, or something he/she will do if there is an opportunity. In Part II as in Part I, items are differentiated into the disinhibition and thrill/adventure domains, namely Intentions of Thrill and Adventure (ITAS) and Intentions of Disinhibition (IDIS). The scale shows good psychometric characteristics. The comparison group only completed the first part of the questionnaire.

The collection of sociodemographic data occurred according to the standard protocol adopted by the Therapeutic Community at admission and using an ad hoc interview format. If necessary, data were integrated and/or confirmed by information reported by outpatient mental health services that referred the patient to the facility.

### *2.3. Data analysis*

Data were analysed using Statistical Package for the Social Sciences (SPSS) 21.0. Descriptive statistics and nonparametric tests (Pearson's chi square test, Mann-Whitney U test, and McNemar test) were applied. As a preliminary analysis, Cronbach's alpha coefficient was used to assess the reliability of the questionnaires (EQ-I, TAS-20, OAS, SSS-VI) (Table 1).

## 3. Results

The total scale of each instrument showed from good to very good reliability ($.801 \leq \alpha \geq .962$); all the subscales included in TAS-20, OAS, EQ-i and also SSS-VI demonstrated levels ranging from acceptable

to very good (.649 ≤ α ≥ .940), with only two exceptions: the Concrete Thinking scale in TAS-20 and the Humourless scale in OAS, which were excluded from further analysis.

### *3.1. Emotional functioning*

With respect to alexithymia, using the score of 60 as cut-off for the TAS-20, a dichotomous variable was computed to indicate the presence or absence of alexithymia. As regards the clinical group, 61% (N=25) of subjects reported no alexithymic traits of clinical significance (Table 2). The observed frequencies on the TAS-20 subscales showed that 58.5% of young inpatients had scores with 1 standard deviation above the mean on the Difficulty in Identifying Emotions (F1) scale, while the other scale, Difficulty in Describing Feelings (F2), showed considerably lower percentages, with an overall value of 34.1%. As regards the OAS measure, the adoption of categorical variables made it clear that alexithymia is a distinctive trait of a high proportion of drug-addicted youth (82.9%), according to their psychotherapists. From a descriptive point of view, critical results (more than 1 standard deviation above the mean) were detected on the Distant (D) and Insightful (U) scales, with rates of 78% and 70.7%, respectively [Table 3].

In order to compare the self-report measure of alexithymia (TAS-20), which was administered to patients, with the observational assessment (OAS), which was administered to individual psychotherapists, the nonparametric McNemar's test was used, highlighting a significant difference in paired proportions, with clinicians reporting higher percentages of alexithymic individuals [McNemar test, p=0.000].

When the presence/absence of alexithymic traits were considered dichotomously, very few young people without SUDs attributed to themselves any alexithymic traits (7.4%). The chi square test revealed a significant difference between the two groups, indicating that a higher rate of young people with SUDs showed clinically significant Difficulty in Identifying Emotions ($\chi^2 = 5.460$, p = .025) and, more in general, were categorized as alexithymic on the TAS-20 total score ($\chi^2 = 8.361$, p = .005). Similar results emerged when the Mann-Whitney U Test was applied; both concerning the ability to comprehend one's affective states (Difficulty in Identifying Emotions scale; z = -3.452, p = .001) and the overall alexithymic traits (TAS-20 total scale; z = -3.055, p = .002) young non-addicts ascribed to themselves fewer emotional problems. In both cases, results remained significant for the Bonferroni correction (p=.05/2=.025).

As regards emotional intelligence, observing the frequency distribution obtained on the EQ-i, 70.8% young drug-addicts showed Stress Management competence below average, and 65.9% on the General Mood scale. It is worth noting that only a small por-

**Table 2.** Alexithymic traits

| Scale | Drug addicts | | | Non-drug | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Alexithymic | | | Alexithymic | | Chi squared test | | Mann-Whitney test | |
| | M (SD) | % (N) | | M (SD) | % (N) | | $\chi2$ | p | Z | p |
| TAS-20 total | 55.8 (13.2) | 39.0 (16) | | 46.63 (9.39) | 7.4% (2) | | 8.361 | .005 | -3.452 | .001 |
| F1 (identifying) | 20.9 (6.3) | 58.8 (24) | | 15.04 (5.93) | 29.6% (8) | | 5.460 | .025 | -3.055 | .002 |
| F2 (communicating) | 15.2 (5.2) | 34.1 (14) | | 12.59 (4.38) | 22.2% (6) | | | | | |
| | | | | | | | | | | |
| OAS total | 52.1 (11.2) | 82.9 (34) | | - | - | | - | - | - | - |
| Distant (D) | 17.3 (4.2) | 78.0 (32) | | - | - | | - | - | - | - |
| Uninsightful (U) | 16.1 (4.5) | 70.7 (29) | | - | - | | - | - | - | - |
| Somatizing (S) | 3.9 (3.3) | 7.3 (3) | | - | - | | - | - | - | - |
| Rigid (R) | 7.3 (2.8) | 53.7 (22) | | - | - | | - | - | - | - |

**Table 3.** Emotional intelligence (EQ-I) and Sensation seeking (SSS-VI)

| | Drug addicts | | Non-drug | | Chi squared test | | Mann- Whitney test | |
|---|---|---|---|---|---|---|---|---|
| | M (SD) | Low % (N) | M (SD) | Low % (N) | χ2 | p | z | p |
| EQ-i | 87.1 (18.64) | 61.0 (25) | 109.67 (15.24) | 11.1 (3) | 16.712 | .000 | -4.541 | .000 |
| Intrapersonal (RA) | 87.1 (16.0) | 61.0 (25) | 99.11 (15.22) | 25.9 (7) | | | -3.144 | .002 |
| Interpersonal (ER) | 103.39(22.4) | 26.8 (11) | 119.26 (14.46) | 3.7 (1) | | | -3.043 | .002 |
| Adaptability (AD) | 88.71 (15.7) | 51.2 (21) | 95.63 (16.70) | 44.4 (12) | | | | |
| Stress Management (SM) | 82.4 (13.5) | 73.2 (30) | 96.52 (14.19) | 29.6 (8) | 12.512 | .001 | -3.737 | .000 |
| General mood (GM) | 86.6 (17.1) | 65.9 (27) | 101.74 (14.30) | 14.8 (4) | 16.418 | .000 | -3.466 | .001 |
| | | | | | | | | |
| | M (SD) | High % (N) | M (SD) | High % (N) | | | | |
| SSS-VI | | | | | | | | |
| Experience Adventure (ETAS) | 23.9 (4.9) | 48.8 (20) | 19.46 (3.54) | 16.7 (4) | 6.703 | .016 | -3.654 | .000 |
| Experience Disinhibition (EDIS) | 99.3 (12.4) | 82.9 (34) | 13.42 (14.32) | 29.2 (7) | 17.186 | .000 | -5.637 | .000 |
| Total experience | | 87.8 (36) | | 33.3 (9) | | | | |
| Intention Adventure (ITAS) | 42.9 (8.66) | 31.7 (13) | - | - | - | - | - | - |
| Intention Disinhibition (IDIS) | 84.3 (16.64) | 17.1 (7) | - | - | - | - | - | - |

Source: World Drug Report 2013.

tion of inpatients ascribed to themselves difficulties in the interpersonal domain. Still, overall emotional intelligence turned out to be below the normative range for 61% participants of the clinical group, as illustrated in table 3. Conversely, only a small proportion of non-addicted youngsters (11.1%) reported an insufficient emotional quotient. For all the subscales, less than 30% of non-clinical subjects reached an insufficient level of emotional abilities. The rates of individuals with low emotional competences were compared in the two samples, with the Pearson's chi square test adjusted for multiple comparisons. On two scales, Stress Management ($\chi^2$ = 12.518, p = .001) and General Mood ($\chi^2$ = 16.418, p = .000), and on the overall Emotional Quotient ($\chi^2$ = 16.712, p = .000) the group of drug addicts revealed higher frequencies of subjects with emotional problems. Conversely, the Mann-Whitney U Test and the Bonferroni correction (p=.05/5=.010) attested lower emotional competences among inpatients on the Intrapersonal (z = -3.144, p = .002), Interpersonal (z = -3.043, p = .002), Stress Management (z = -3.737, p = .000) and General Mood (z = -3.466, p = .001) subscales, together with the total Emotional Quotient (z = -4.541, p = .000).

Results in table 3 point out that the majority of participants (87.8%) showed high levels of sensation seeking (more than 1 standard deviation above the mean), having engaged in the past in at least one type of risky behaviour, in terms of adventure (ETAS) and/or disinhibition (EDIS) experiences. In greater detail, 42.8% of participants reported a number of past experiences of thrill and adventure (ETAS), but even more subjects, as many as 82.9%, reported a high number of experiences of disinhibition (EDIS). Most of these individuals did not show any significant intention to get involved either in adventure (ITAS) or disinhibition (IDIS) experiences in the future. In the control sample, lower percentages of individuals reported past experiences of Thrill and Adventure (16.7%) and Disinhibition (29.2%). The difference in frequency distributions and scores between the two groups was confirmed both for ETAS ($\chi^2$ = 6.703, p = .016) (z =

-3.654, p = .000) and EDIS ($\chi^2$ = 17.786, p = .000) (z = -5.637, p = .000) factors, respectively. Results remained significant when adjusted for multiple comparisons.

## 4. Discussion

The present study supplies preliminary evidence that drug addiction in youths may be associated with emotional dysregulation. To our knowledge, apart from the studies by Dorard and colleagues [28, 29], this is one of the few studies on alexithymia in drug-dependent youths in which self-reports and observational measures have been compared. According to the observational assessment, a high proportion of addicted youths revealed clinical levels of alexithymia, especially in terms of poor insightfulness and distant attitudes towards feelings and relationships. A substantial proportion of alexithymic individuals was detected by previous studies on drug-abusing adolescents [28, 29]. The self-report measures of alexithymia attested, however, that only a small proportion of inpatients attributed alexithymic traits to themselves, and the comparison between self-reporting and observational results indicated that young drug-dependent inpatients were scarcely aware of their difficulties in handling inner states. The present data are in line with the lack of correspondence between OAS and TAS-20 scores that was observed in a previous study [28], so supporting the need for observational measures to overcome the limits inherent in self-reports on critical topics that respondents might underestimate [52, 56, 103]. Speaking from a clinical perspective, the important finding of a lack of self-awareness about one's own emotional problems might be attributable to the fact that, at the time of assessment, inpatients were at the very beginning of their treatment programme, when they were still partly unaware of their condition and its potential causes.

Unfortunately, the third TAS-20 factor (Concrete Thinking) did not reach a sufficient level of reliability, in a way similar to previous studies on substance abusers [20, 96]. According to the hypothesis of La Ferlita and colleagues [51], this result may be due to the likelihood that young adults, as well as adolescents, might struggle in making a cognitive appraisal of affective stimulus.

Emotional dysregulation further implies lower levels of emotional intelligence for drug addicts than their non-addicted counterparts; the difficulties to be faced are quite pervasive and involve several factors, especially Stress Management (which refers to difficulties in managing stressful and emotionally activating situations, regulating affects and controlling impulsive behaviours) and General Mood (having to struggle to establish and maintain a positive affective state characterized by an optimistic attitude and by the capacity to feel content with oneself, others, and life in general). In addition, drug abusers showed lower Intrapersonal (concerning self-awareness and self-expression) and Interpersonal (concerning social awareness and interpersonal relationships) competence.

Thirdly, it is possible to assume that drug experimentation and abuse had first occurred in the broader context of a search for adventure and disinhibition experiences during adolescence, given the high levels of sensation seeking attested by most inpatients, compared with young people without SUDs. The lack of any intention to engage in this kind of behaviour in the future may otherwise be interpreted as an index of motivation to change (given the fact that participants are inpatients in a therapeutic community) or else, as an attitude of denial that underestimates actual intentions.

Problems with emotional functioning tend to contribute to delineating a clinical profile of remarkable severity that constitutes a potential obstacle to treatment and a possible risk factor for relapse, given the individual's poor ability to handle emotions and exert adequate cognitive control over disinhibited behaviours, especially in stressful situations. Alexithymia, like other defective socioemotional skills [33, 43], can be considered an obstacle to substance abuse treatment efficacy, because it implies poor treatment outcomes, attendance, therapeutic alliance and a high relapsing rate, presumably because of the low interest in introspection and reflective abilities that alexithymia implies [7, 20, 55, 95].

This study has some limitations. First, the small size of the samples does not allow results to be generalized. Second, it was not possible to establish a temporal link between drug misuse and emotional dysfunction, nor can it be ruled out that drug addiction may have impaired emotional functioning in our sample.

## 5. Conclusions

Our results suggest that drug dependence in young adults is characterized by difficulties in emotional regulation, indicating the importance of specific and new treatment methodologies.

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*Conflict of interest*

Authors state no conflict of interest.

*Ethics*

Authors confirm that the submitted study was conducted according to the WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects. All patients gave their informed consent to the anonymous use of their clinical data for independent studies.

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