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Cannabis Use and Psychopathology: Self-Esteem and Anxiodepressive Disorders

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Abstract

Objective: Cannabis is the most widely used illicit substance in the world. The development of cannabis use disorder is often responsible for anxiety-depressive disorders. Dimensions such as self-esteem could therefore be considered as protective factors. The aim of our study was to evaluate the level of dependence, self-esteem, the presence of anxiety or depression in subjects consulting at the detoxification center of Sfax, Tunisia for cannabis withdrawal and to determine the interrelationships of these entities with the characteristics of addiction.

Material and methods: We conducted a cross-sectional study with a descriptive and analytical purpose. It was carried out within the Tunisian association for the fight against sexually transmitted diseases and AIDS (ATL MST SIDA) of Sfax, Tunisia, during the period extending between September 15, 2020 and October 1, 2021.Users have been assessed on the basis of a clinical information sheet and a set of psychometric tests exploring cannabis dependence (CAST), anxiety-depression (HADS) and self-esteem (RSES).

Results: For our study, we identified 38 patients for whom the median age was 26 years and the sex ratio (M/F) was 8.5. A total of 36 patients (94.7%) had problematic cannabis use at the time of the study. Anxiety and depression were respectively noted in 24 (63.2%) and 16 (42.1%) participants. Self-esteem was assessed as low in 14 subjects (36.8%). Anxiodepressive disorders were correlated with the advanced age at the onset of the medical care, with an antidepressant type desired effect, with the complications of consumption as well as with the use of other psychoactive substances. Associations have also been found between self-esteem and the high amount and daily frequency of cannabis use, an antidepressant-like desired effect, concentration and memory disorders, poor therapeutic compliance, consumption of other psychoactive substances as well as anxiodepressive disorders.

Conclusions: Faced with this psychological burden borne by heavy cannabis users, the authorities should consider preventive interventions from adolescence through the encouragement of community life and the learning of social skills.

Keywords: Cannabis; Addiction; Anxiety; Depression; Self-esteem; Hospital anxiety; Depression Scale; Cannabis Abuse screening test; Rosenberg self esteem scale

Introduction

Cannabis is the most widely used and sold illicit substance in the world [1,2]. The prevalence of its use is very high among young people aged 25 or younger [3].

Through July 2016, we estimated 3% to 5% of the world's population have tried a cannabis product, with mostly extra-medical use and outside of prescribed use limits [4]. In 2018, we estimated 3.8% of the world's population had ever used cannabis [5,6].

At the national level, according to the "MedSPAD" study carried out in 2017, focusing on adolescents aged 15 to 17, the consumption of cannabis at least once during their life concerned 3.8% of high school students. The frequency of this consumption was different depending on the region; it varied from 6.5% in Greater Tunis to 1.1% in the South-East.

Over the past decade, evidence has pointed to a role for endogenous cannabinoid in variety of psychiatric disorders. This system is the main target of delta-9-tetrahydrocannabinol (D9-THC), the major psychotomimetic phytocannabinoid [7]. The latter can, under certain conditions and at certain doses, exert anxiolytic, antidepressant and hypnotic effects. However, at higher doses, and as cannabis use disorder (CUD) develops, it can produce dysphoric reactions, increased rates of depression, anxiety, and suicidal behavior [2,3,8].

With regard to these risks, dimensions such as self-esteem could therefore be considered as protective factors [9]. Self-esteem has been shown to be associated with the initiation and continuation of cannabis use [8].

This constant increase in the consumption of cannabis among young people and the existence of sometimes severe mental disorders have led to the opening of specialized out-of-hospital addictology consultations whose objective is to offer medical care tailored to consumer patients and their families [10,11].

However, in reviewing the Tunisian literature on this topic, we notice a lack of studies about cannabis users consulting for withdrawal in addictology centers.

All these findings have motivated us to conduct this study whose

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objectives were to assess the level of dependence and self-esteem in subjects consulting at the detoxification center of Sfax for cannabis withdrawal, to screen them for anxiodepressive disorders and to determine the interrelations of these entities with the characteristics of addiction.

Material and Methods

Type and location of the study

We conducted a monocentric, cross-sectional, descriptive and analytical study, carried out within the detoxification center of Sfax, during the period extending between September 15, 2020 and October 1, 2021.

All of the users were examined in consultation by the same psychiatrist, who conducted the clinical interviews, validated the presence of CUD criteria [12] at the time of the first consultation and carried out the administration of all the questionnaires.

Study population

The patients in our sample were drawn from the list of subjects consulting at the headquarters of the Tunisian association of fight against sexually transmitted diseases and AIDS (ATL MST SIDA) within the framework of the specialized consultation of addictology, requesting a detoxification treatment for cannabis use.

Each participant was informed of the research project as part of the consultation and all the subjects gave their consent after being aware of the anonymity and the confidential nature of the data collected.

All patients who consulted the center for cannabis withdrawal, either as part of their first consultation or as part of any consultation, were included in our study. However, subjects who consulted for withdrawal from a substance other than cannabis, those who refused to participate in the study and patients who were hospitalized in a psychiatric ward or in another ward at the time of the survey were not included in the study. All subjects who did not complete the questionnaire were subsequently excluded.

Data collection

We used an information sheet that was filled out by the examiner after obtaining the oral consent of the patients. The sheet included the socio-demographic characteristics of the patients, the personal somatic, psychiatric, criminal records, suicide attempt (SA) history, as well as the history of the addiction, the modalities of its medical care and the treatment initiated.

We also used a set of psychometric assessment tests: the Cannabis Abuse Screening Test (CAST), the Hospital Anxiety and Depression Scale (HADS) and the Rosenberg Self Esteem Scale (RSES).

Cannabis abuse screening test (CAST): Cannabis dependence was assessed by the Cannabis Abuse Screening Test. This is a cannabis-specific tool designed to screen for "problematic" cannabis use over the past 12 months according to the diagnosis of Beck and Legleye (2008) and ICD-10 (International Statistical Classification of Diseases and Related Health Problems 10th Revision). It has been validated with adolescents and young adults [12,13]. It is a self-questionnaire composed of 6 questions, rated from 0 to 1, with a range of scores from 0 to 6. A score between 0 and 2 of positive answers represents "non-problematic use" and a higher score or equal to 3 a "problematic use" [14].

Hospital anxiety and depression scale (HADS): This scale has been used to screen for anxiety and depression. The French version we used has been validated by Untas et al. [15, 16].

It is a 14 items self-administered questionnaire, divided into 2 subscales of 7 items (Anxiety Scale or HADS-A; and Depression Scale or HADS-D).

Each item is rated on a scale of 0 to 3 according to the degree of severity of the symptoms. A score is generated for each of the two sub-scales and for the total score HADS (HADS-G). Thus, the global score varies from 0 to 42 and the sub-scores from 0 to 21.

For both anxiety and depression subscales, cut-off scores make it possible to distinguish: non-cases or those asymptomatic (score ≤ 7); probable or borderline cases (score 8-10); clearly or clinically symptomatic cases (score ≥ 11) [10,16], in which a score between 11 and 14 defines moderate anxiety/depression while a score ≥ 15 defines severe anxiety/depression [17,18].

Rosenberg self esteem scale (RSES): The RSES consists of 10 items assessing global self-esteem, with responses on a four-point scale; from strongly agree to strongly disagree. We used the French version validated by Vallières et al. [19].

Low self-esteem responses are "disagree" or "strongly disagree," rated at 1 and 0 on questions 1, 2, 4, 6, and 7 respectively. While high self-esteem responses are "agree" or "strongly agree," rated at 2 and 3 on questions 1,2,4,6, and 7 respectively. Questions 3, 5, 8, 9, and 10 are rated the opposite.

The scale ranges from 0 to 30. Scores between 15 and 25 are in the normal range. Scores below 15 suggest low self-esteem [20-22].

Statistical study

The data collected were entered and analyzed using the Statistical Package for Social Sciences (SPSS) computer software in its 23rd version.

The normality of the distribution was checked for each quantitative variable separately, based on the "Shapiro-Wilk" and "Kolmogorov-Smirnov" normality tests.

Categorical data are presented as frequencies and percentages. Continuous variables are presented as means and standard deviations or as medians and extreme values according to their distribution.

The comparison of two observed frequencies was made either by the "Chi-square" test or by the exact "Fischer" test.

The correlations were carried out either by the *Pearson's r* correlation test or by the *Spearman*'s test, according to the distribution of the parameters.

The level of significance was established at $p < 0.05$.

Results

For our study, we identified 38 patients.

Descriptive study

Sociodemographic data: The median age of our population was 26 years, with extremes of 17 and 42 years. The male sex was predominant (89.9%). All the socio-demographic data are shown in Table 1 (Table 1).

Personal history: Only 2 patients (5.3%) had somatic pathology such as human immunodeficiency virus (HIV) infection.

Table 1: Distribution of patients according to socio-demographic data.

	Number=38
Age	26 years (17-42)
Sex ratio (M/F)	8.5
Men	34 (89.9%)
Women	4 (10.1%)
Geographic origin	
Urban	38 (100%)
Rural	0 (0%)
Way of life	
Alone	4 (10.5%)
With family	34 (89.5%)
Marital status	
Single	30 (78.9%)
Married	4 (10.5%)
Divorced	2 (5.3%)
Widower	2 (5.3%)
Educational level	
Primary	6 (15.8%)
Secondary	22 (57.9%)
Superior	10 (26.3%)
Professional status	
Active	18 (47.4%)
Inactive	16 (42.1%)
Student	4 (10.5%)
Quantitative variables are represented as median (and minimum-maximum). Categorical data are represented as number (and percentage).	

More than a quarter of our patients, i.e. 10 subjects (26.3%), had a psychiatric history such as depression (2 cases; 5.3%), psychotic disorder induced by cannabis (4 cases; 10.5%) and psychopathic-type personality disorder (4 cases; 10.5%). The median age of onset of the disorders was 21 years (minimum=19, maximum=29).

One-fifth of the subjects (8 cases; 21.1%) had a history of psychiatric hospitalization at a median frequency of 1.5. The reasons for hospitalization were withdrawal treatment (2 cases; 5.3%), cannabis psychosis (4 cases; 10.5%) and SA (2 cases; 5.3%).

Among our patients, 10 subjects (26.3%) had already attempted suicide, once (8 cases; 21.1%), or 3 times (2 cases; 5.3%). In two subjects (5.3%), a SA would have occurred as a result of cannabis use.

As for criminal history, 12 participants (31.6%) had a history of arrest; once for 10 subjects (26.3%) and 4 times for 2 subjects (5.3%). On the other hand, 6 people (15.8%) had been imprisoned. The cause of this history was the use of cannabis in 14 cases (87.5% of these participants).

History of addiction:

Consumption characteristics: In our series, the median age of onset of cannabis use was 17 years, with extremes ranging from 12 to 30 years.

The mode of consumption was in a group for 16 patients (41.1%), alone for 14 patients (36.8%), or both for the remaining 8 (21.1%).

The frequency of use in the last 6 months was most often daily (26 cases; 68.5%). The same number of patients (4 cases; 10.5%) described consumption once or twice a week, 3 or 4 times a week and once or twice a month.

The median amount consumed over the past 6 months was 4 joints/day, ranging from a low of 3 to a high of 10.

The factors favoring cannabis consumption were represented by stress/anxiety in 34 patients (89.5%), the festive atmosphere in 14 subjects (36.8%) and depressive states in 14 patients (36.8 %).

Through their consumption, the users reported the search for a soothing, de-stressing, anxiolytic (36 cases; 94.7%), euphoric (24 cases; 63.2%), sedative (22 cases; 57.9%), and thymic, intellectual and sensory exhilarating type of effect (14 cases; 36.8%). Other expectations were represented by the destigmatizing (14 cases; 36.8%) and antidepressant (12 cases; 31.6%) effects.

Acute and chronic complications: ***The same number of patients (26 subjects; 68.4%) described a loss of control over consumption and a phenomenon of tolerance to the use of this substance. While 24 subjects (63.2%) reported the feeling of craving.***

Withdrawal symptoms on stopping consumption were irritability (28 cases; 73.9%), headaches (16 cases; 42.1%), concentration disorders (2 cases; 5.3%) and insomnia (2 cases; 5.3%).

The predominant sign of cannabis intoxication was euphoria in 26 patients (68.4%) and psychotic symptoms such as delusion and/or hallucinations in 6 patients (15.8%).

One-fifth of consumers; i.e. 8 subjects (21.1%), reported a history of overdose or acute intoxication in the form of cannabis psychosis.

Chronic complications were equally represented by concentration disorders, memory disorders, amotivational syndrome (24 cases; 63.2%) and social disintegration (20 cases; 52.6%).

Other psychoactive substances consumed: The other substances used by our population at the time of the study were represented by tobacco, alcohol, opiates (tramadol, heroin and buprenorphine or subutex®) and psychostimulants (cocaine, amphetamines, ecstasy and trihexyphenidyl or parkizol®) (Table 2).

Care at the center: The median age of onset of medical care was 25 years with extremes of 17 and 41 years.

Two-thirds of the subjects; i.e. 26 patients (68.4%) consulted at the center at the request of the family and one-third (14 patients; 31.6%) by their own boss.

In our series, 34 patients (89.5%) were put on psychotropic treatment such as mood-stabilizer (8 cases; 21.1%), antipsychotic (15 cases; 39.5%), antidepressant (11 cases; 28.9%) or anxiolytic (12 cases; 31.6%). On the other hand, 14 subjects (36.8%) had already received a psychotropic treatment before the beginning of the medical care.

Follow-up was described as regular and treatment compliance as good by 26 (68.4%) and 22 (57.9%) subjects, respectively.

The treatment of cannabis dependence was effective with total withdrawal in 12 cases, i.e. in 31.6% of subjects. This weaning was partial in 16 patients (42.1%). On the other hand, 6 patients (15.8%) continued to use cannabis and 4 patients (10.5%) were at the very beginning of treatment.

Table 2: Other psychoactive substances consumed by cannabis users.

Substance consumed	**Number of cases (frequency)**
Tobacco	32 (89.5%)
Alcohol	20 (52.6%)
Ecstasy	14 (36.8%)
Cocaine/amphetamines	4 (10.5%)
Heroin/buprenorphine (subutex®)	4 (10.5%)
Trihexyphenidyl (Parkizol®)	4 (10.5%)

The longest median duration of abstinence was 1 month with a minimum of 0 and a maximum of 6 months.

Psychometric assessment:

Cannabis dependence (CAST scale): The distribution of scores according to the CAST scale showed that 36 users (94.7%) had problematic cannabis use at the time of the study.

Anxiety and depression (HADS scale): The median HADS global score (HADS-G) was 19 with a minimum of 12 and a maximum of 33. The median anxiety score on the HADS-A subscale was 12, with scores ranging from 5 to 17. Two-thirds of the subjects (24 cases; 63.2%) had a score greater than or equal to 11 , defining symptomatic anxiety.

The median HADS-D subscale depression score was 7, with ranges of 3 and 19. Based on a depression threshold score of 11, 16 patients (42.1%) had symptomatic depression (Figure 1).

Self-esteem (RSES scale): The mean self-esteem score was 17.7 ± 7.8.The distribution of scores showed that 14 patients (36.8%) had a score below the threshold value of 15, below which self-esteem is considered low.Analytical study

Cannabis addiction : Problematic cannabis use according to the CAST scale was statistically correlated with stress/anxiety-induced use (p=0.009), an anxiolytic-type desired effect (p=0.001), tobacco consumption (p=0.021), as well as a longer period of abstinence (p=0.034).

Anxiety-depressive disorders

Anxiety-depression and consumption characteristics: In our series, anxiety was significantly correlated with a sedative-like desired effect (p = 0.005). While depression was associated with an antidepressant-like desired effect (p < 0.001).

Anxiety-depression and consumption complications : In our population, several complications of cannabis use were significantly associated with anxiety and depressive disorders (Table 3).

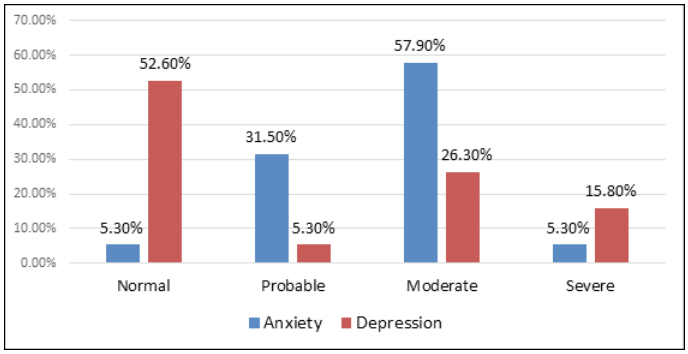

Figure 1: Levels of anxiety and depression according to the HADS scale.

Table 3: Anxiety-depression and complications of consumption.

Complication	Anxiety	Depression
History of overdose	p=0.43	p=0.42
Loss of control over consumption	p=0.29	**p = 0.031**
Feeling of craving	**p = 0.048**	p=0.19
Phenomenon of tolerance	**p = 0.014**	**p = 0.031**
Concentration disorders	**p = 0.048**	**p = 0.008**
Memory disorders	p=0.55	**p = 0.008**
Social disintegration	p = 0.28	p=0.65
Amotivational syndrome	p = 1	p=0.48

Anxiety-depression and other products consumed: Among all substances used, anxiety was statistically correlated with ecstasy use. While depression was significantly associated with the consumption of tobacco (p=0.03), alcohol (p=0.019), ecstasy (p=0.005), heroin/buprenorphine (p=0.025) as well as trihexyphenidyl use (p=0.025).

Anxiety-depression and addiction management: Advanced age at onset of the addiction management was significantly correlated with anxiety (p=0.021) and depression (p=0.011).

Self esteem:

Self-esteem and consumption characteristics : In our series, low self-esteem was statistically associated with a higher amount of cannabis use (p=0.023) as well as with a frequency of daily consumption (p=0.001) during the last 6 months.

In addition, low self-esteem was correlated with an antidepressant-like desired effect (p=0.014), while good self-esteem was correlated with a desired effect of the thymic, intellectual or sensory exalting type (p=0.028) or destigmatizing type (p=0.028).

Self-esteem and complications of substance use : Low self-esteem was statistically linked to chronic complications, such as concentration disorders (p=0.028) or memory disorders (p<0.001).

Self-esteem and other products used: Self-esteem was found to be significantly lower in subjects consuming heroin or buprenorphine (p=0.014) or trihexyphenidyl (p=0.014).

Self-esteem and management of addiction: Low self-esteem was also correlated with poor medication compliance (p=0.016).

Self-esteem and anxiety-depressive disorders: Correlations between HADS and RSES scores are represented in Table 4 (Table 4).

Table 4: Correlations between anxiety-depression and self-esteem scores.

Correlated scores	p	r
HADS-G and RSES	**0.008**	-0.42
HADS-A and RSES	0.35	-0.15
HADS-D and RSES	**0.001**	-0.49

Discussion

Descriptive study

Cannabis addiction: Based on the CAST scale, 94.7% of users had, in the last 12 months, a problematic use of cannabis or a CUD according to DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) [12]. In this manual, the diagnostic criteria for CUD have been revised to combine criteria for dependence and abuse into a single disorder [12,23,24].

In parallel to our findings, in detoxification centers in France, the vast majority of users are dependent (82%) and abusers (9 to 10%) of cannabis in the last 12 months [25,26]. In fact, cannabis is considered among the psychotropic drugs with a high risk of abuse. Cannabis dependence develops through a double phenomenon of positive and negative reinforcement; by stimulating the limbic system, associated in particular with sensations of pleasure and well-being (positive reinforcement) [11] and by helping to soothe distress and relieve psychic tensions (negative reinforcement) [3,27-31].

Anxiety and depression: In the present study, the median HADS anxiety and depression scores were 12 and 7, respectively. According to this scale, 63.2% of consumers suffered from anxiety and 42.1% from depression.

Indeed, cannabis use, and particularly chronic cannabis use, is associated with increased rates of depression and anxiety [29-31], even when participants have no known history of mental illness [8,16,32-43]. This association has been confirmed by cross-sectional studies [44], hence the importance of looking for these disorders in subjects consulting for withdrawal [26, 44-47].

However, the figures found in our work differ from those found in other studies conducted on patients consulting for withdrawal. Thus, these consultants in France present, according to the HADS score, anxiety and depressive disorders in 59% and 28% of cases, respectively [26].

Depression and addictive disorder are two entities that seem to be closely related. According to Ehrenberg (1998), "addiction is a way to fight depression; it abrades conflicts through compulsive behavior. If depression is the story of an untraceable subject, addiction is the nostalgia of a lost subject" [34]. Indeed, we find very often in these young people unable to free themselves from their compulsive consumption, a depressive background [11,34].

The high percentages of anxiety and depressive disorders observed in our work could be based on several hypotheses.

1/ Firstly, there is "**reverse causality**" or a bidirectional relationship between the use of cannabis and these two pathological entities.

On the one hand, developmental patterns suggest an internalizing pathway to substance use, whereby adolescents use psychoactive substances (PAS) to relieve negative states such as anxiety and depression and to deal with ruminative worries, supporting a negative reinforcement hypothesis of cannabis use as a means of relieving psychic tension. "*Internalizing symptoms*" are considered important triggers for substance use initiation. This phenomenon is called "*self-medication*" [27,28,31,35]. This is why people with anxiety report high rates of cannabis use [8,29] and affective disorders in adolescence trigger early cannabis use [36,37]. Use here takes on a self-therapeutic character [11].

On the other hand, cannabis use increases vulnerability to anxiety and depression in an indirect way by altering psychosocial functioning (school, academic and professional failures) and by increasing reactivity to stress [3,27,28,33]. Thus, evidence from longitudinal studies or case-control studies attests that cannabis use increased the risk of developing subsequent anxiety and depression. This risk is greater the earlier, more frequent and more persistent the use [28,36,38].

2/ Secondly, the "***confusional effect of intoxication***" deserves to be researched:

A dose-dependent biphasic action of the cannabis-anxiety relationship has been observed in the animal literature, with low doses of cannabis appearing to have an anxiolytic effect and higher doses inducing an anxious state [39,40]. Hence, contrary to the belief of its users, evidence suggests that cannabis can potentially worsen, rather than improve, symptoms of anxiety and depression, especially at high doses [8,28,41]. Cannabis use can induce acute anxiety states (panic attack type), sometimes aggravated by distorted body sensations [3,36]. The evolution is spontaneously favorable with the elimination of the toxic and favored by the reinsurance [36].

3/ In addition, some authors speak of a **genetic hypothesis**:

Direct factors linking depression to cannabis use include a genetic predisposition to both conditions and biological mechanisms that alter neurochemical activities in the brain [33,42]. THC interacts with genetic vulnerability and possibly other environmental risk factors and affects serotonin and other neurotransmitters over the long term in ways that cause symptoms of anxiety and depression in susceptible individuals [16,39]. This is consistent with preclinical evidence regarding the role of the endocannabinoid system in both the behavioral effects of cannabis and in the regulation of depressive mood states [40]. Additionally, it has been suggested that cannabis use during brain development results in neurobiological alterations that may increase vulnerability to severe depression, for example, through impaired cognitive function [36].

4/ Finally, the apparent relationship between cannabis use and major depressive disorder could be explained by associations between this use and bipolar disorder. This latter is often misdiagnosed as a an early-stage major depressive disorder at the onset and is associated with high rates of drug abuse [42].

Self esteem : The term "self-esteem" is generally used to refer to an individual's subjective evaluation of him or herself, including a sense of self-worth [9,43]. Self-esteem increases the level of personal safety and is described as an essential feature of mental health and a protective factor against risky behavior [47,44]. Building self-esteem is an important developmental process that evolves during adolescence through continuous interaction with the environment, culminating in the development of psychological resources [9,45].

According to our findings, more than a third of the patients (36.8%) had a self-esteem considered low according to the RSES scale. This result is expected since the link between the low self-esteem and cannabis use has been established by several cross-sectional and longitudinal studies [8,27,46]. Self-esteem is in fact an important psychopathological variable related to cannabis use [20].

Several possible explanations for this association could be put forward.

Indeed, in young patients, low self-esteem would have multiple origins very well described by the therapists who underline the difficult passage from adolescence to adulthood where the difficulty of assuming one's self alone, the loss of the family bond, the revelation of sexual attractions and the difficulty of approaching them, school failures and the devaluation associated with them, the search for conflict with the educational environment as proof of autonomy. Added to this is the anxiety-provoking family context, disadvantaged socio-cultural backgrounds and drug use by peers. All of these factors, combined together, could increase vulnerability to PAS use in adolescents as a means of coping with or escaping negative feelings associated with low self-esteem, especially since these subjects are easily influenced by peer pressure [9,11]. This explains the fact that "resilience" is associated with higher self-esteem and lower risk of risky behaviors in adolescents [47].

In addition, adolescents whose experiences have led to feelings of self-rejection, lose motivation to conform to conventional group norms, turn to delinquent behavior and engage in risky behaviors valued and considered appropriate in these deviant groups [43].

Analytical study

Cannabis addiction: In our series, CUD was statistically associated with consumption favored by stress or anxiety, as well as with an anxiolytic-like desired effect. However, no association was observed with anxiety according to the HADS-A scale.

The literature has shown that a range of psychopathological conditions, including anxiety, as well as the degree of their comorbidities, are significantly associated with cannabis use and progression to CUD

[42]. In addition, anxiety comorbidity is all the more frequent when the subjects are dependent on cannabis [26].

The relationship between early and frequent cannabis use and symptoms of anxiety is even independent of individual or environment, genetic family history, and use of other illicit drugs, according to cross-sectional studies [3,8,48]. In contrast, adolescents with high initial levels of cannabis use exhibited more persistent self-reported anxiety over time, compared to those with less frequent use or with longer periods of abstinence [3,41].

More specifically, social anxiety may also be associated with cannabis dependence and problems with cannabis use in young adults [29,30].

In addition, studies have found that reducing cannabis use in people treated for CUD is associated with improved anxiety symptoms [16,28].

Furthermore, according to our results, CUD was significantly correlated with tobacco consumption. This could be explained by the fact that cannabis is frequently smoked in combination with tobacco. Similarly, the authors pointed out that the use of cigarettes and other tobacco products increases the likelihood of daily cannabis use [27,48] and contributes to the development of symptoms of cannabis dependence [24].

In the present study, problematic cannabis use was significantly associated with a longer period of abstinence. In this sense, some studies have found an association between the amount of cannabis smoked, the feeling of effectiveness of the prescribed treatment and the cannabis cessation [10].

Anxiety-depressive disorders:

Anxiety-depression and consumption characteristics: In our study, anxiety was significantly correlated with a sedative-like desired effect and depression with an antidepressant-like desired effect. Markus [42] has pointed out that cannabidiol or CBD, one of the main promising compounds in herbal cannabis, has an anxiolytic effect comparable even to the effect of diazepam and ipsapirone.

Anxiety-depression and consumption complications : According to our findings, anxiety was significantly correlated with the feeling of craving, with tolerance, as well as with concentration disorders. While depression was associated with the loss of control over consumption, the phenomenon of tolerance, as well as concentration and memory disorders.

Indeed, the psychologically weakened subject, unable to overcome his suffering, engages in addiction and suffers from its consequences. In the context of self-medication, and with the repetition of the substance use, the subject does not realize that it maintains the problem; he consumes to reduce his suffering, while the PAS induces psychic disorders. He denies the fact that it is harmful to his health, that it has major consequences on his environment and that when he is in the dependence stage, it deprives him of his freedom [35].

The associations mentioned above can also be based on the awareness of addiction and its repercussions, which affects psychosocial functioning and therefore leads to anxiety-depressive decompensations. In addition, anxiety and depressive disorders are very much observed in cannabis addicts [26] who very often report a feeling of craving, a loss of control as well as a phenomenon of tolerance. In addition, these disorders are well known for their effect on concentration and memory [12]. This effect, combined with that of cannabis, could aggravate the cognitive impact.

Anxiety-depression and other products used: In addition to cannabis, the presence of anxiety was significantly correlated with ecstasy use, while that of depression was associated with the consumption of several other PAS (tobacco, alcohol, esctsy, heroin and trihexyphenidyl).

As for cannabis, it is very likely that all of these associations are based on the self-medication hypothesis, postulating that psychologically vulnerable subjects use substances to alleviate anxiety and depressive symptoms [27,28,45]. In addition, other drugs could be responsible, especially in association with cannabis, for the same mental health disorders, and in particular anxiety and depressive disorders [48]. The literature shows that in case of polydrug use, the risk of mood disorders is higher in patients whose main drug is cannabis compared to other illicit drugs [25].

Anxiety-depression and addiction management: Advanced age at onset of the addiction management was significantly correlated with anxiety and depression. As previously reported, significant positive associations between cannabis use in adolescence and later development of anxiety and depressive disorders have been suggested by several longitudinal studies [5,8,16], which may lead patients to seek help with cannabis withdrawal at a relatively advanced age.

Self esteem

Self-esteem and consumption characteristics: According to our findings, low self-esteem was statistically correlated with a higher amount of cannabis use and frequency of daily use over the past six months. In this sense, studies have highlighted that self-esteem is associated with the initiation and continuation of cannabis use [47] and increases the likelihood of daily cannabis use [8,27].

In addition, low self-esteem was associated in our patients with an antidepressant-like desired effect. The relationship between depression and low self-esteem will be better detailed later.

On the other hand, good self-esteem was significantly correlated with a desired effect of the thymic, intellectual or sensory exalting type or of the destigmatizing type. These associations may be partly due to the fact that adolescents with high self-esteem are more popular, more likely to initiate new social contacts and to rate their friendships as being of better quality than individuals having low self-esteem [9]. This could bring them back to look for effects of the substance on social integration and mood elevation.

Self-esteem and complications of substance use: In our series, low self-esteem was also linked to concentration and memory impairment. This could be based on the decrease in social performance, personal merit and sense of competence in subjects suffering from cognitive deficits, causing them to weaken their self-esteem [49].

Self-esteem and other products used: In our patients, self-esteem was also found to be low in subjects using heroin, buprenorphine or trihexyphenidyl.

Several studies have reported a link between low self-esteem and the consumption of PAS which would allow the individual to fit into certain social groups or help him counter the negative emotions generated by experiences of rejection and neglect responsible for compromised self-esteem development [9,45]. In addition, low self-esteem most often leads, especially in boys, to externalizing problems such as the consumption of PAS [31].

Self-esteem and other products used: In our patients, self-esteem was also found to be low in subjects using heroin, subutex or parkizol.

Several studies have reported a link between low self-esteem and the use of PAS, which may allow the individual to fit into certain social groups or help counteract the negative emotions generated by experiences of rejection and neglect responsible for compromised self-esteem development [9,45]. In addition, low self-esteem most often leads, especially in boys, to externalizing problems such as substance abuse [31].

Self-esteem and management of addiction: According to our results, low self-esteem was significantly associated with poor medication adherence.

There is a relationship between self-esteem and the ability to adapt to change. Thus, an individual who has low self-esteem will adopt inappropriate behavior, recognized as such by those around him, which may reinforce his feeling of incapacity, his low self-esteem and induce a tendency to social withdrawal [49].

Studies of this dimension in cannabis-dependent adolescents point to low self-esteem as a negative predictor of treatment outcome in these subjects [9]. Patients reporting lower confidence in their ability to resist cannabis had a lower probability of abstinence, more days of use and a greater amount used [50].

Self-esteem and anxiety-depressive disorders: In our patients, the self-esteem score was associated with the HADS-G and HADS-D scores.

Low self-esteem may play an important role in the development of a range of psychosocial problems, such as depression, anxiety, high-risk behaviours and substance use [9,47,51]. In fact, low self-esteem is included in the DSM-5 criteria for a major depressive episode [12]. It is indeed quite likely that a deficit in self-esteem makes the adolescent more vulnerable to the development of anxiety symptoms, and that in other adolescents, negative affectivity precipitates a decrease in self-esteem [9]. The use of the substance would thus aim to regulate the stress generated by interpersonal situations and the lack of confidence in one's social skills [51].

Hence, the low levels of self-esteem observed in young cannabis addicts are not specifically associated with the etiology of cannabis dependence, but are mainly explained by the intensity of depressive and anxious symptomatologies that are known to be high in this young addicted population [9,51].

This interest in grouping together depression and self-esteem in addicts is not new: Sandor Rato, as early as 1933, described people suffering from "anxious depression" and who needed euphoriants to maintain self-esteem and narcissism in an artificial way [34]. The literature has shown that self-esteem has a significant effect on various life factors investigated (professional success, satisfaction at work and in relationships, health, positive and negative affectivity), which explains the drop in self-esteem in depressed subjects suffering from socio-professional dysfunction [9].

According to Guelfi, "a depressive tendency often underlies drug addiction: a lack of self-esteem, flaws in the organization of narcissism can lead some subjects to seek in drugs an artificial and rapid means of restoring the self, or even of megalomaniac triumph" [34].

Strengths and limitations of the study

Our study has several strengths. To the present state of our knowledge, this is the first Tunisian study which was interested in subjects consuming cannabis consulting for withdrawal. Then, all interview methods used internationally recognized and validated questionnaires, which are therefore appropriate and useful tools for this group of patients. Finally, our survey allowed us to explore several psychopathological parameters in cannabis-dependent subjects simultaneously, as well as their possible interrelationships in order to understand in depth the intrapsychic life of these patients, which will help clinicians to guarantee a better management of their addiction.

However, our work has a number of limitations. Due to the circumstances of the Coronavirus, the number of subjects consulting for withdrawal has decreased, hence the modest size of the clinical sample. In addition, the participants in the clinical group were consultants for cannabis dependence. This clinical status may have contributed to increasing the expression of certain psychological dimensions, which limits the possibility of generalizing our conclusions to other cannabis users.

Conclusion

Although cannabis use constitutes a relatively common risky behavior among youth, there is no doubt that its excessive consumption must be taken into account and give rise to strategies for progressive assistance with abstinence in drug detoxification centers.

Through this study, we were able to reveal that the vast majority of Tunisian cannabis users consulting for withdrawal, suffered from a high level of dependence. The rates of anxiety and depressive disorders in this population seem to be non-negligible, with lack of self-esteem in many of these users. All these psychopathological dimensions were intimately linked to certain characteristics and complications of consumption, to the use of other PAS as well as to specific characteristics of the addiction management. Importantly, we also highlighted the significance of the correlation between self-esteem and anxiety-depressive disorders. Overall, all of our findings were consistent with those of other studies which underline the frequency of these psychopathological disturbances in cannabis-dependent patients presenting for withdrawal in other detoxification centers, with causal relationships and often interrelated mechanisms.

The results of the present study have important clinical implications. Given that the vast majority of young cannabis users are not interested in receiving treatment for their cannabis use, authorities should consider identifying heavy cannabis users for preventive interventions aimed at reducing the risk of anxiety-depressive disorders. Furthermore, raising adolescents' self-esteem, for example by encouraging community involvement and learning social skills, will help protect them from engaging in risky behaviors by teaching them to cope with emerging peer pressure and social environment regarding cannabis use and other forms of risky behavior. Longitudinal studies would be needed to learn about the evolution of these disorders after the end of the treatment and the achievement of complete withdrawal.

Conflict of interest

None

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