

Factors Associated with Severe Addictions in Cannabis Users Undergoing Treatment at the National Center for the Integrated Care of Addictions in Dakar (Senegal)

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Abstract: The objective of this study is to examine the factors associated with severe addiction in cannabis users who are undergoing treatment at the national center for the integrated care of addictions in Dakar. A retrospective, descriptive and analytical study was conducted at the national center for the integrated care of addictions in Dakar. The study period was from 2015 to 2018. Patients were being treated for cannabis addiction. Data entry was done using Epi info7 software while analysis was done using SPSS version 22. A total of 273 patients were enrolled in our study. Factors associated with severe cannabis addiction were: being over 20 years of age with an ORaj=6.1 [2.4-15.6], being of Senegalese nationality with an ORaj=4.3 [1.1-17.9], having more than one child with an ORaj=3.8 [1.1-14.1], consuming cannabis 2 to 3 times a week or more with an ORaj=32.1 [3.9-100] and starting age of consumption less than or equal to 15 years with an ORaj=4.5 [1.8-11.8]. Factors associated with psychiatric disorders were: having an address other than Dakar center with an ORaj=2.8 [1.2-6.6], having an addiction problem in the family with an ORaj=3.9 [1.5-10.7], lack of professional activity with an ORaj=3, 6 [1.5-8.7], being treated by a specialist in addictology with an OR aj=5.1 [1.5-17.8] and finally having a history of psychiatric hospitalization with an OR aj=55.9 [19.6-158]. The factors associated with the severe addiction and psychiatric disorders found in this study should push health authorities to reflect on a new strategy to fight this pandemic that is cannabis use. The use of the media for mass and parental awareness is essential.

Keywords: Prevention, Addiction, Dependence, Drug, Cannabis, Senegal

1. Introduction

Addiction is defined in the Diagnosis Statistical Manual 5 (DSM-5) as increased tolerance, compulsive use, loss of control and continued use despite physical and psychological problems caused or exacerbated by the substance. This addiction can lead to psychiatric disorders, which result in changes in a person's thinking, mood or behaviour [1]. According to the United Nations Office on Drugs and Crime (UNODC), in 2016, cannabis was the most commonly used drug, with 192 million people using it at least once in the past year. Globally, the number of cannabis users continues to

grow and is estimated to have increased by about 16% between 2007 and 2016 [2].

The phenomenon of psychoactive substance abuse, particularly cannabis, is a reality in Senegal [3]. Data provided in the Independent Report of the West African Commission on Drugs for the period 2014-2017 show that cannabis is the most seized drug [4]. In 2014, cannabis was the most used drug (excluding alcohol) by drug addicts in Senegal with 95.2% of people in treatment but decreasing to 91% in 2016 and 89% in 2017. It was found that cannabis seizures over the four years are estimated at 4,620 kg in 2014, 1,345 kg in 2015, 10,768 kg in 2016 and 12,798 kg in 2017

[5]. Several studies have been conducted in Senegal related to the use of cannabis, alcohol and injecting drugs. However, none of these studies have focused on cannabis at NCIAD, the institution that serves as a national reference for addiction management. The objective of this work is to study the factors associated with severe addiction in cannabis users who are undergoing treatment at the national center for the integrated care of addictions in Dakar (NCIAD) from 2015 to 2018.

2. Study Setting

The Fann National University Hospital is located in the region of Dakar, the capital of Senegal. This hospital houses NCIAD, a unit of the Psychiatry Department. NCIAD is the first center in West Africa specializing in the comprehensive outpatient care of individuals dependent on psychoactive substances. NCIAD operates from Monday to Friday from 8 a.m. to 4 p.m. Consultations in addictology are offered every morning. Consultations with an infectious diseases doctor are also offered on Monday and Thursday mornings in order to detect and treat somatic pathologies. In addition, methadone and medication for the care of patients is dispensed Monday to Friday from 8 a.m. to 4 p.m., with take-home service on weekends. For patients who are stable, a take-home program has been in place since September 2016, initially for weekends and holidays. Since 2018, some patients (about a hundred) currently benefit from weekly home care [6].

3. Methodology

3.1. Type and Study Period

A retrospective, descriptive and analytical study covering the period between 2015 and 2018 was conducted.

3.2. Study Population

The study population consisted of all the patients treated for cannabis use at NCIAD from 2015 to 2018. Any patient followed at NCIAD for cannabis use with an archived medical record from 2015 to 2018 was included in our study. Patients with incomplete or poorly maintained records were not included in our study.

3.3. Recruitment

A comprehensive recruitment of patient records meeting the inclusion criteria was conducted.

3.4. Data Collection Tool and Technique

A data collection form was prepared based on the objectives of the study. It was used to collect information on:

Socio-demographic characteristics: age, sex, marital status, entourage, childhood, education, professional situation, patient support, family life.

Past experience of cannabis users: childhood difficulties, time spent abroad, addiction among siblings, drug use abroad,

history and period of incarceration.

Clinical characteristics: frequency of use, mean age of first use of cannabis, mean duration of use, number of joints per day.

A review of cannabis-using patients' records was conducted.

The presence of one of the DSM V criteria (Table 1) in a patient was rated as 1 and its absence as 0.

Absence of addiction: DSM score < 2

Mild addiction: 2 DSM score or 3

Moderate addiction: if DSM score equals 4 or 5

Severe addiction: if DSM score is 6 or higher.

Table 1. DSM5 Criteria.

| DSM5 Criteria |
|---|
| Missed professional or personal obligations |
| Use in hazardous situations |
| Interpersonal problems |
| Tolerance |
| Weaning |
| Larger quantities |
| Weaning fails |
| Lost time |
| Discontinued operations |
| Physical or psychological problems |
| Desire of use |

3.5. Data Entry and Analysis

Data entry was done using Epi info7 software and analysis with SPSS version 22. The latter consisted of two parts: a descriptive part and an analytical part.

The descriptive part made it possible to calculate frequencies for the qualitative variables. The means along with their standard deviation, extremes, mode and median were determined for the quantitative variables. The analytical part included bivariate and multivariate analysis. The analytical part allowed to cross-tabulate the variables with severe cannabis addiction and the occurrence of psychiatric pathology as dependent variables. The Chi II or Fisher tests were used according to their condition of applicability, the test was significant when the P value was less than 0.05. Variables whose P value was less than 0.25 in the bivariate analysis were selected and introduced into the model using the stepwise method of simple logistic regression [7, 8]. The adjusted odds ratio (ORaj) surrounded by its confidence interval was calculated. The Hosmer and Lemeshaw test allows us to justify the adequacy of the model.

4. Ethical Considerations

This study was authorized by the head of the Psychiatry Department, chairman of the NCIAD management committee. The data was collected anonymously and kept confidential, i.e. only those responsible for the study would have access to it.

5. Results

At the end of the recruitment process, 273 files were enrolled during the period from 2015 to 2018.

5.1. Descriptive Results

5.1.1. Socio-demographic Characteristics

The age of our study population ranged from 15 to 64 years of age. The mean age was 28.1 ± 9.8 years. More than half (52.4%) of our study population was between 20 and 29 years of age. The study population was predominantly male at 96.7%. The sex ratio was 29.3. The majority (85.3%) of the patients were single. Almost all patients were educated representing 98.2% of the study population. They were unemployed in 25.5% of cases. The majority of the patients were dependent on a third party, i.e. 68.1%. Almost all patients (89.7%) were staying with their families. The majority of patients did not have children 83.9%.

5.1.2. Background of Cannabis Users

Almost half of our study population had no problems as a child, amounting to 48%. A total of 53 patients (19.4%) had

addiction problems amongst their siblings. A total of 141 patients (51.6%) had some kind of experience living abroad. Among them, 48.9% used drugs abroad. Patients had a history of incarceration in 21.6% of cases. 94.1% of the patients had been incarcerated while addicted to cannabis. The majority of patients (77.3%) had never had addiction management.

5.1.3. Cannabis Use

The mean age of first use is 17.4 ± 3.6 years, with extremes of 7 and 32 years. More than half of cannabis users (57.9%) had started using before the age of 18. The mean duration of use was 10.8 ± 9.1 years, with extremes of 0.5 and 44 years. More than half of the patients (63.9%) had been using cannabis for more than 5 years. The mean number of cannabis joints per day was 6.6 ± 5.8 joints with extremes of 0 and 65 joints/day. The majority of patients used cannabis with another product. The combination of cannabis + tobacco was the most common, accounting for 54.2% of our study population (Table 2). Of the patients, 77.4% used cannabis daily.

Table 2. Distribution of patients according to drug use.

| Substance used | Total | Pourcentage (%) |
|--|-------|-----------------|
| Cannabis + Tabacco | 148 | 54,2 |
| Cannabis + Alcohol + Tabacco | 72 | 26,4 |
| Cannabis | 32 | 11,7 |
| Cannabis + Alcohol | 4 | 1,5 |
| Cannabis + Benzodiazepine + Tabacco | 2 | 0,7 |
| Cannabis + Tabacco + Alcohol + Glue and solvents | 2 | 0,7 |
| Cannabis + Alcohol + glue and solvents + Tabacco | 1 | 0,4 |
| Cannabis + Alcohol + Tabacco + Amphetamine | 1 | 0,4 |
| Cannabis + Alcohol + Tabacco + Barbituriques | 1 | 0,4 |
| Cannabis + Barbituriques | 1 | 0,4 |
| Cannabis + Benzodiazepine | 1 | 0,4 |
| Cannabis + Cocaine + Alcohol + Tabacco | 1 | 0,4 |
| Cannabis + Glue and solvents + Alcohol | 1 | 0,4 |
| Cannabis + Crack + Alcohol + Tabacco | 1 | 0,4 |
| Cannabis + Heroin + Crack+ Benzodiazepine | 1 | 0,4 |
| Cannabis + Tabacco + Alcohol + Barbituriques | 1 | 0,4 |
| Cannabis + Tabacco + Crack | 1 | 0,4 |
| Cannabis + Tabacco + Crack + Alcohol | 1 | 0,4 |
| Cannabis + Tabacco + Heroin + Alcohol | 1 | 0,4 |
| Total | 273 | 100,0 |

5.1.4. Clinical Characteristics

The main reasons why patients sought care were: because of their families (72.9%), health facilities that referred them (19.8%), and themselves (16.1%). Almost all patients (98.9%) were treated as outpatients, 3 patients (1.1%) were hospitalized. Regarding the type of requests, 77% opted for treatment to quit, reduction of consumption (14%), a health check-up (5%), detoxification (3%) and substitution treatment (1%). Almost all the patients presented a severe cannabis addiction, i.e. a proportion of 76.3% (table 3). The majority of our study population (85.3%) had not quit cannabis. A total of 88 patients (32.2%) had psychiatric disorders. More than $\frac{3}{4}$ of these 78.4% had psychotic and delusional disorders (Table 4).

Table 3. Distribution of cannabis users by type of addiction.

| Types of addiction | Total | % |
|--------------------|-------|-----|
| No addiction | 4 | 2% |
| Mild addiction | 16 | 6% |
| Moderate addiction | 44 | 16% |
| Severe addiction | 208 | 76% |
| Total | 273 | 100 |

5.2. Analytical Results

5.2.1. Factors Associated with Severe Cannabis Addiction

Factors associated with severe cannabis addiction were: being over 20 years of age with an ORaj=6.1 [2.4-15.6], having more than 1 child with an ORaj=3.8 [1.1-14.1], having a frequency of use greater than or equal to 2-3 times a

week with an ORaj=32.1 [3.9-100] and having an age of first use less than or equal to 15 years with an ORaj=4.5 [1.8-11.8] (Table 5).

Table 4. Distribution of Patients by Psychiatric Disorders.

| Types of psychiatric disorders | Total | % |
|------------------------------------|-------|------|
| Psychotic and delusional disorders | 69 | 78,4 |
| Anxiety and depressive disorders | 9 | 10,2 |
| Personality disorders | 5 | 5,7 |
| Eating disorders | 1 | 1,1 |
| Others | 4 | 4,5 |
| Total | 88 | 100 |

5.2.2. Factors Associated with Psychiatric Disorders

Factors associated with psychiatric disorders were: having an address other than Dakar center with an ORaj 2,8 [1,2-6,6], having an addiction problem amongst siblings with an ORaj 3,9 [1,5-10,7], lack of professional activity with an ORaj 3, 6 [1.5-8.7], having a history of addiction management with an ORaj 5.1 [1.5-17.8] and finally having a history of psychiatric hospitalization with an ORaj 55.9 [19.6-158] (Table 6).

Table 5. Factors associated with severe cannabis addiction.

| Factors associated with severe cannabis addiction | Modèle final ORaj [IC à 95%] |
|---|---------------------------------|
| Age range | |
| <20 years old | 1 |
| ≥20 years | 6,1[2,4-15,6] |
| Number of children | |
| 0 children | 1 |
| ≥1 child | 3,8[1,1-14,1] |
| Frequency of consumption | |
| < 2 to 3 times a week | 1 |
| ≥2 3 times a week | 32,1[3,9-100] |
| Age of first use | |
| ≤15 years | 4,5[1,8-11,8] |
| >15 years old | 1 |

Table 6. Factors associated with psychiatric disorders in cannabis users.

| Factors associated with psychiatric disorders | Final model OR aj [IC à 95%] |
|---|---------------------------------|
| Address | |
| Dakar | 1 |
| Outside Dakar | 2,8[1,2-6,6] |
| Addiction problem amongst siblings | |
| Yes | 3,9[1,5-10,7] |
| No | 1 |
| Lack of professional activity | |
| Yes | 1 |
| No | 3,6[1,5-8,7] |
| Addiction therapy | |
| Yes | 5,1[1,5-17,8] |
| No | 1 |
| History of psychiatric hospitalization | |
| Yes | 55,9[19,6-158] |
| No | 1 |

6. Discussion

6.1. Study Limitations

A socio-anthropological survey would have allowed a

better understanding of the factors associated with severe addiction and psychiatric disorders. Despite this limitation, the results obtained allowed us to make the following observations.

6.2. Factors Associated with Severe Cannabis Addiction

Our study showed that all women had severe cannabis addiction compared to 75.5% of men. This severe addiction was more common in patients who were older than 20 years. Single patients were less severely addicted to cannabis. Those with children however were more likely to be severely addicted to cannabis. Addiction was also associated with regular cannabis use at a frequency ≥ 2 -3/week. Those who had started using cannabis early, at an age younger than 15 years were more likely to be severely dependent on cannabis. The risk of addiction also depended on the duration of use. In fact, after 10 years of use, individuals become dependent on cannabis.

Our results are supported by the studies of Rioux et al. [9], which highlight the age of first use of cannabis and the occurrence of addiction symptoms in boys of low socioeconomic status (N=1030) who were followed from 6 to 28 years of age. In this study, for reported cannabis first use between 13 and 17 years of age, the onset of addiction symptoms was observed from the age of 28 years. However, the chances of developing addiction symptoms at age 28 were reduced by 31% for each year of later onset of cannabis use (OR=0.69) [9].

This susceptibility to addiction is seen in patients with an average age of 15 years. The mean age of the subjects is also a factor that impacts the percentage of addiction. For example, in France, according to a study conducted on the prevalence of cannabis use among 60,000 young people with an average age of 15.3 years, more than 25% of 18-25 year olds report use during the year and 39% of adolescents had already smoked cannabis by the age of 17. Cannabis initiation remains slightly earlier in boys than in girls (15.2 years vs. 15.4 years). Also, one in four 17-year-olds who have used cannabis in the past year present a high risk of cannabis addiction (24.9%). The proportion of users in the year potentially at risk is higher among boys than girls, 29.1% and 19.5% respectively [10].

Although cannabis abuse and addiction are more prevalent among men [11], men were twice as likely to use cannabis [12], this proportion of women with severe addiction cannot be taken into account because the female population of our study (N=08) does not allow us to conclude that all women using cannabis are severely addicted. Also, the fact that young people over the age of 20 are more affected by this severe addiction is the result of a societal policy that leaves young adolescents stranded. Difficulties at school, lack of employment and income, legal issues, and easy access to psychotropic substances are all important challenges faced by Senegalese youth.

Research tends to show that vulnerability to addiction is most likely to occur when there is an imbalance in the systems regulating pleasure and suffering. Thus, addiction can occur after a series of stressful events (family conflict,

separation, divorce, professional change, loss, emotional stress) [13]. Thus, according to a Canadian study, being male, born in Canada and not being in a relationship are demographic characteristics associated with a higher likelihood of cannabis use [14].

6.3. Factors Associated with Psychiatric Disorders in Cannabis Users

Factors associated with psychiatric disorders in our study were, patients who were not working and those who had an addiction problem among their siblings. This category also comprised patients with a history of addiction management and those with a history of psychiatric hospitalization. Our study showed that 51.9% of patients who were not working had psychiatric disorders. The establishment of a direct link between professional inactivity and psychiatric disorders related to cannabis use is very common in the literature. There is an undeniable association between cannabis use and psychosis. For example, in schizophrenic patients, cannabis use exacerbates psychotic symptoms, increases the risk of violence, promotes relapse, increases the frequency of hospitalization, decreases treatment compliance, and promotes resistance to antipsychotic treatment [15]. In fact, any professional activity requires a degree of participation and is carried out under regulated working conditions. This conflicts with the presence of a psychiatric disorder in subjects in active service. A study conducted in France on the overall prevalence of psychoactive substance use shows that nearly one employee in four (23.3% in men, 24.1% in women) uses at least one substance that can affect his or her vigilance and/or behavior at work. Men use more cannabis and alcohol than women, who prefer benzodiazepines and amphetamines [16]. A Canadian study found that people in the arts, culture, sports and recreation, retail and services, trade, natural resources, manufacturing and utilities sectors use cannabis more frequently than those in healthcare professions [17]. The absence of employment is explained by the fact that most cannabis users with psychiatric disorders are young adults over the age of 20, the majority of whom are in school. For example, one study showed that subjects who had smoked cannabis were about twice as likely to develop psychotic disorders later in life as those who had abstained from smoking. The dose-dependent risk is higher when cannabis use began before the age of 15 and in subjects with a family history of psychotic disorders [18]. Concerning our study, it showed that patients with addiction problems among their siblings were 4 times more likely to have psychiatric disorders. Substance abuse within the family increases the likelihood that youth will be directly exposed to and have access to substances. Substance abuse disrupts behaviour and social support, making the family environment stressful [19]. Replication of negative parental or sibling attitudes and behaviours is a risk factor for youth [20]. For example, maternal use of alcohol, tobacco and illegal substances has been linked to cannabis and other substance use disorders in young adults [21]. In 2012, almost 30% of Canadian students aged 15 to 17 reported that a family

member had an emotional, mental health or substance use problem, and more than 25% reported being "very much" or "somewhat" affected by this situation [22]. The results from our study show that patients who had a history of addiction management were 5.1 times more likely to develop psychiatric disorders. Also, patients with a history of psychiatric hospitalization were 56 times more likely to develop psychiatric disorders. Cannabis addiction is an aggravating factor in all psychiatric pathologies. Its use remains problematic especially in vulnerable subjects (adolescents, predisposed subjects). Several meta-analysis studies have shown this duality between "psychiatric disorders and cannabis use" [23]. Acute cannabis use leads to disruption of the hypothalamic-pituitary axis and alteration of normal neurological development via the endocannabinoid system, thus aggravating psychotic symptoms, namely delusions, hallucinations and disorganized thinking [24]. It increases the risk of hetero-aggressive and self-aggressive acts, and reduces or even eliminates the therapeutic effect of antipsychotic drugs [25]. Cannabis also has an effect on the long-term evolution of psychosis, with more frequent and early relapses. The long-term prognosis for cannabis abuse is that it increases the risk of progression to chronicity and behavioural disorders with criminal acts [26]. The study conducted in France to determine the characteristics of cannabis users in a general medical practice found that cannabis smokers had more psychiatric co-morbidities than non-smokers. Hence the interest for the general practitioner to ask his patients about cannabis in order to detect cannabis-related disorders at an early stage and give them specific care [27].

7. Conclusion

The consumption of cannabis, an illicit drug, is a reality of our society. It is a widespread psychoactive substance, which is extensively used and whose consumption is increasing. The evolution of its use, especially at younger and younger ages, with an attitude of trivialization, is particularly striking. It is important to make families aware of the risks involved, particularly the criminal sanctions associated with cannabis use. This action should be coupled with efforts to digitalize patient records and the involvement of caregivers and families in the treatment of patients in order to increase the chances of adherence to the rehabilitation process.

Competing Interests

The authors declare no conflict of interest. This research received no external funding.

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