

# Determinants of Cannabis Use Among Psychotics in Kinshasa, Democratic Republic of the Congo: A cross-sectional study

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**Abstract:** *Background and aim:* The relationship between cannabis use and psychosis is well established, but the determinants of this use in psychotics in developing countries are lacking. The aim of this study is to identify the determinants of cannabis use among psychotics in Kinshasa, Democratic Republic of Congo. *Methods:* This cross-sectional and analytical study included 321 psychotics carried at the Neuropsychopathological Center of the University of Kinshasa out from January 1, 2018 to December 31, 2019. The variables of interest were socio-demographic parameters, cannabis use and diagnoses of psychosis. A logistic regression model identified the determinants of cannabis use. The threshold of statistical significance was  $p < 0.05$ . *Results:* The mean age of cannabis users was  $30.9 \pm 8.7$  years with a sex ratio of 12 M / 1F. They represented 37% of psychotics of which 51% were of no religion and 55% were schizophrenics, 77% had tobacco-alcohol co-use, 83% had high education level and 78% were single. The determinants of cannabis use were male (aOR=2.01, 95% CI: 1.27-3.18;  $P < 0.003$ ), not belonging to a religion (aOR: 2.43, 95% CI: 1.24-4.80;  $p = 0.010$ ), tobacco co-consumption (aOR=9.12 95% CI: 4.35-19.13;  $p < 0.001$ ), alcohol (aOR=4.39, 95% CI: 2.22-8.71;  $p < 0.001$ ) and schizophrenia (aOR=2.29 95% CI: 1.15-3, 19.13;  $P = 0.019$ ). *Conclusion:* The prevalence of cannabis use among psychotics was high. They were young male schizophrenics, without religion, single with co-consumption of tobacco and alcohol. The determinants were male gender, non-religious affiliation, tobacco-alcohol co-consumption and schizophrenia.

**Keywords:** Cannabis, Schizophrenia, Tobacco-alcohol Co-consumption

## 1. Introduction

The link between cannabis use and the development of psychosis is mentioned by numerous studies [1-7]. At a time when some countries are advocating the liberalization of recreational cannabis use [8, 9], it seems judicious to define the determinants of cannabis consumption among psychotics in order to identify the levers where the legislator can act to prevent the occurrence psychosis. The objective of this study

is to identify the determinants of cannabis use among psychotics in Kinshasa, Democratic Republic of the Congo (DRC).

## 2. Methods

### 2.1. Study Setting and Design

This is a cross-sectional and analytical study of 321 cases of psychotic patients hospitalized at the Neuropsychopathological Center of the University of Kinshasa.

pathological Center of the University of Kinshasa from January 1, 2017 to December 31, 2018.

## 2.2. Study Population

The study involved all records of hospitalized patients diagnosed with psychosis according to the DSM-IVTR (12). The inclusion criteria for the files were as follows: the subject must have been hospitalized in one of the four wards of the Neuropsychopathological Center of the University of Kinshasa, Department of Psychiatry; the file had to contain: the diagnosis of psychosis according to DSM-IVTR criteria (12), socio-demographic data (gender, age, educational level, marital status and religion), information on the concept of consumption of psychoactive substances, in particular cannabis, tobacco and alcohol. It should be noted that at Neuropsychopathological Center of the University of Kinshasa, the consumption of psychoactive substances, including cannabis, tobacco, alcohol and other psychoactive substances are systematically and actively researched in all patients.

## 2.3. Data Collection and Procedure

The literature review was used as a data collection technique. Thus, the data were collected using a data collection sheet comprising the variables operationally defined as follows: age (expressed in years and calculated from the date of birth and the date of entry into the Neuropsychopathological Center of the University of Kinshasa), gender (female, male), level of education (no schooling, primary, secondary and higher / university), religion / church affiliation (yes, no), marital status (single, and others: married / widower / divorced / common-law), consumption of cannabis (yes: consumes, no: abstinent) and other legal psychoactive substances including alcohol and tobacco (yes: consumes, no: abstinent) as well as the diagnosis psychosis according to the DSM-IVTR (brief psychotic disorder, schizophreniform disorder, schizophrenia, schizoaffective disorder, delusional disorder, unspecified psychotic disorder).

For data collection, four senior assistant physicians (second term) specializing in the Department of Psychiatry had been trained for this task. The data from each file was analyzed as the cases were identified and retained. A number was assigned to each completed form to ensure anonymity and confidentiality of data. At the end of each collection day, the completed data collection sheets were checked and validated by the principal investigator to ensure the quality of the data collected.

## 2.4. Statistical Analysis

Epi-Info version 6.04 and SPSS version 21.0 software were used for data entry and statistical analysis, respectively. Categorical variables are summarized by proportions and quantitative by measures of central tendency and dispersion. Pearson's chi-square and Fisher's exact tests were used to verify the association between cannabis use or not and other

qualitative variables in the study. While Student's t test made it possible to compare the means of continuous variables between psychotic cannabis users and non-users. Logistic regression identified factors independently associated with cannabis use in psychotics. A  $p$  value < 0.05 was considered to be the threshold of statistical significance.

## 2.5. Ethical Considerations

The data were collected anonymously and confidentially. The privacy and confidentiality of the respondents were safeguarded. The three fundamental principles of ethics were respected at the time of the study, namely: the principle of respect for the person, that of beneficence, and that of justice. The protocol for this research study was conducted in accordance with the Declaration of Helsinki.

# 3. Results

## 3.1. Socio-demographics Characteristics of the Study

Table 1 showed that the mean age was  $33.1 \pm 10.8$  years with a sex ratio of 2H / 1F, 80% were of high educational level, 65% were single and 58% did not belong to any religion. Forty-three percent co-consumed tobacco and 30% alcohol. Moreover, this table shows that schizophrenia was the most frequent psychosis (44.2%) (table 1).

*Table 1. General characteristics of the study population.*

Variable	N=320	%
Age		
Mean age $\pm$ standard deviation (years)	33.1 $\pm$ 10.8	
Gender		
Male	202	62.9
Female	119	37.1
Educational level		
Primary	63	19.6
Secondary / university	258	80.4
Marital status		
Single	210	65.4
Married / common-law	111	34.6
Religion		
Yes	186	57.9
No	135	42.1
Alcohol consumption		
Yes	139	43.3
No		
Tobacco consumption		
Yes	97	30.2
No		
Type of psychosis		
Schizophrenia	142	44.2
Brief psychotic disorder	101	31.5
Schizophreniform disorder	57	17.8
Disorganized disorder	21	6.5
Cannabis use		
No	200	62.6
Yes	120	37.4

## 3.2. Factors Associated with Cannabis Use

In Table 2 we could note that the associated factors were young age, male sex, celibacy, not belonging to the region,

schizophrenia and the co-consumption of tobacco and alcohol ( $p < 0.05$ ).

**Table 2.** Factors associated with cannabis use.

Variables	Over all n=320 (%)	Cannabis use n=120 (%)	No Cannabis use n=200 (%)	P
Mean age $\pm$ SD (years)	33.1 $\pm$ 10.8	30.9 $\pm$ 8.7	34.4 $\pm$ 11.7	0.031
Gender				<0.001
Male	202 (62.9)	111 (92.5)	91 (45.3)	
Female	119 (37.1)	9 (7.5)	110 (54.7)	
Educational level				0.277
Primary	63 (19.6)	21 (17.5)	42 (20.9)	
Secondary / university	258 (80.4)	99 (82.5)	159 (79.1)	
Marital status				<0.001
Single	210 (65.4)	94 (78.3)	116 (57.7)	
Others (married. Widowed. Divorced)	111 (34.6)	26 (21.7)	85 (42.3)	
Religion				0.010
Yes	186 (57.9)	59 (49.2)	127 (63.2)	
No	135 (42.1)	61 (50.8)	74 (36.8)	
Co-consumption of SPA				
Alcohol	139 (43.3)	92 (76.7)	47 (23.4)	<0.001
Tobacco	97 (30.2)	79 (65.8)	18 (9.0)	<0.001
Types of psychosis				
Schizophrenia	142 (44.2)	66 (55.0)	76 (37.8)	0.004
Brief psychotic disorder	101 (31.5)	31 (25.8)	70 (34.8)	0.120
Schizophreniform disorder	57 (17.8)	19 (15.8)	38 (18.9)	0.581
Disorganized disorder	21 (6.5)	4 (3.3)	17 (7.5)	0.362

### 3.3. Determinants of Cannabis Use

As shown in Table 3, in univariate analysis, the factors significantly associated with cannabis use are: male sex, non-religious affiliation, alcohol and tobacco use, and schizophrenia. After adjustment, male gender, non-religious practice, alcohol and tobacco use, and schizophrenia emerged

as independent determinants of cannabis use among psychotics. The measurement of the strength of association shows that the male sex ( $p < 0.001$ ), the absence of the practice of religion ( $p = 0.010$ ), the consumption of alcohol ( $p < 0.001$ ), tobacco ( $p < 0.001$ ) and schizophrenia ( $p = 0.019$ ) respectively multiply the risk of using cannabis by 6, 2, 4, 9 and 2 times more.

**Table 3.** Determinants of cannabis use by psychotic patients in univariate and multivariate analysis.

Independants factors	p	Unadjusted OR (IC95%)	p	Adjusted OR (IC95%)
Gender				
Female		1		1
Male	<0.001	14.91 (7.16-31.06)	<0.001	6.35 (2.74-14.70)
Religion				
Oui		1		1
Non	0.014	1.77 (1.12-2.81)	0.010	2.43 (1.24-4.80)
Alcohol use				
No		1		1
Yes	<0.001	10.76 (6.31-18.37)	<0.001	4.40 (2.22-8.71)
Tobacco use				
No		1		1
Yes	<0.001	19.59 (10.60-36.19)	<0.001	9.12 (4.35-19.13)
Schizophrenia				
No		1		1
Yes	0.003	2.01 (1.27-3.18)	0.019	2.29 (1.15-4.59)

## 4. Discussion

The subjects of this study were young adult, single, highly educated men who did not belong to any religion. This socio-demographic profile is described in the literature [11-18]. These socio-demographic characteristics constitute factors of vulnerability for these subjects [19]. Adulthood for Congolese men is a period of great vulnerability linked to fulfillment of social roles relating to the production of goods [20]. Celibacy, high education and non-belonging to a

religion may reflect a lack of integration into social networks capable of offering social support in the event of distress (20-23). In addition, the subjects of this study had poly-consumption associated cannabis-tobacco-alcohol. This association is the most commonly reported in many cannabis studies [11-15]. It can be used concomitantly [24] or simultaneously [5]. Schizophrenia is the most common psychosis in the subjects of this study, as other studies have shown [11-15, 18]. This finding supports that of studies that report cannabis to be a risk factor for development. schizophrenia [1-3, 18].

A frequency of cannabis use of 37% was found in this study. This frequency is similar to that reported by Gues Ch. Et al. (2003) in Tunisia [15] and by Rodriuez-Jiménez R. et al. (2008) in Iran [16], but it is lower than those noted in previous studies carried out in rural and urban Congolese areas (If this frequency reflects the extent of current consumption and can serve as a reference in monitoring the evolution of cannabis use among psychotics in Kinshasa, the disparity noted could be the witness of a weak recourse to modern health structures linked in particular to socio-cultural [26] and economic [27] factors. In this study, young age, male gender, non-religious affiliation, celibacy, multiple cannabis-tobacco-alcohol use, and schizophrenia were associated with cannabis use. Several studies have reported similar observations regarding the association of young age, male gender, celibacy, multiple cannabis / tobacco / alcohol use, and schizophrenia [11-15, 18] with cannabis use. To our knowledge, non-religious affiliation as a factor associated with psychosis in cannabis users has not been reported in the literature. In the present study, the determinants of use were male sex, non-religious affiliation, multiple cannabis / tobacco / alcohol use, and schizophrenia. In the DRC, men are more exposed to stress due to the expectations of the community in relation to their role in the production of goods, while women are protected by society, which prepares them for the management of goods produced by men [20]. Thus, the role of not belonging to a religion in the consumption of cannabis can be understood as an absence of recourse to a group to regulate behavior, of social support in the event of distress [21, 22] and of help for 'stopping or reducing consumption [23]. Poly-drug use involving cannabis / tobacco / alcohol is an observation usually found in studies on cannabis [11-15]. Consumption of cannabis is almost always associated with that of tobacco to facilitate combustion which aids the transformation of non-psychoactive-9-tetrahydrocannabinolic acid into  $\Delta$ -9-tetrahydrocannabinolic [28], the main psychoactive substance in cannabis and thus prolong and increase the effects of cannabis [29]. However, several hypotheses are put forward to understand this association, in particular that of the footbridge [30], that of the inverted footbridge [31], that of a shared genetic, environmental and social vulnerability [32] and a common route of administration [33]. In the combination of cannabis and alcohol, CB1 receptors contribute to the motivational and enhancing properties of ethanol while chronic ethanol consumption alters the expression of the endocannabinoid system and that of the CB1 receptors [25]. The schizophrenia found as a determinant in this study is consistent with the observation of many other studies [18, 34-36]. Furthermore, this result gives comfort to studies which report that cannabis use is very common in schizophrenics and that the relationship between cannabis and bidirectional schizophrenia [18, 35-39]. Schizophrenics are more likely to use cannabis.

## 5. Limitations and Strengths of the Study

This study has certain limitations. These limitations are linked firstly to the data collection technique used which was a documentary review. This technique leads to several biases,

namely the information bias due to the fact of non-standardization in the measurement of variables as well as the reliability of certain measurements. This technique also exposes to selection bias as there are patient charts which sometimes lack data on certain variables of interest. Second, the limitations are related to the type of study that was cross-sectional. Cross-sectional studies cannot establish the time sequence between exposure and disease.

Beyond these limits, this study is among the first to have identified the factors associated with cannabis use among psychotics and thus drew the attention of healthcare providers to systematically research cannabis use among psychotics in general. and schizophrenics, in particular, and to develop supportive actions integrating cannabis addiction and psychosis.

## 6. Conclusion

Cannabis consumption among psychotics is high, particularly among young schizophrenic males, without religion, single with co-consumption of tobacco-alcohol. The determinants are the male sex, not belonging to a religion, the co-consumption of tobacco and alcohol and schizophrenia. These data suggest the systematic identification of cannabis use in any psychotic and the relevance of large-scale prospective studies to better elucidate the contextual elements of the relationship between cannabis use and psychosis.

## Authors' Contribution

All authors contributed to data analysis, drafting or revising the article, have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

## Conflict of Interest

The authors declare no conflicts of interest for this work.

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