



# Psychoactive substances and sport performance in adolescent and young adults from Meknes city, Morocco

**Said Lotfi<sup>1\*</sup>, Miloud Chakit<sup>2</sup>, Abdelkarim Elkhatir<sup>2</sup>, Driss Belghyti<sup>1</sup>**

1. Natural Resources and Sustainable Development Laboratory, Faculty of Sciences, Ibn Tofail University, Kenitra, Morocco.

2. Biology and Health Laboratory, Faculty of Sciences, Ibn Tofail University, Kenitra, Morocco.

## Abstract

The increasing use of performance-enhancing psychoactive substances among adolescents is becoming a prominent concern in public health, especially for academic and sports organizations, postsecondary institutions, and health authorities. This study aims to examine the correlation between psychoactive substances consumption and sport performance in a sample of adolescents and young adults from the province of Meknes, Morocco. A total of 302 individuals from the province of Meknes (Morocco) are participating in this study. A survey involving 302 adolescents and young adults (98 females and 204 males) aged 17 to 48 (mean age = 23 years) examined their sport performance. Structured individual interviews were conducted using a questionnaire designed specifically for the assessment of psychoactive substances (substances consumed, frequencies, addiction) used by individuals. Seventy-five percent of students reported using at least one non-alcoholic doping product in the past year to enhance physical performance. This includes alcohol (49.3%), cannabis (13.9%), maajoune (29.8%), heroine (1.0%), hallucinogens (5.0%) and amphetamine (1.0%). The study reveals that students engaged in league sports are more prone to consuming alcohol and cannabis compared to those not in league sports. Additionally, associations were observed between ethnolinguistic groups and the use of alcohol, cannabis, maajoune, as well as alcohol and cannabis combinations. The primary motivations cited for using these products are stress reduction and staying awake. This study shows that psychoactive substances consumption for the purpose of improving physical performance are very widespread in poor districts. Preventive measures should be implemented, specifically focusing on adolescents based on their socioeconomic and educational level characteristics.

**Keywords:** Drug consumption, alcohol, cannabis, sport performance, adolescents, Morocco

**Full length article** \*Corresponding Author, e-mail: [said.lotfi@uit.ac.ma](mailto:said.lotfi@uit.ac.ma)

## 1. Introduction

Sports practices are very widespread in our societies and contribute to the psychosocial development of those involved. Leading to undeniable health benefits, they are most often a source of individual and shared pleasures and emotions. However, it also seems that they can generate or be the consequence of psychological suffering [1]. The use of substances is therefore common among athletes, whether to improve performance or to decompress before or after major events. We propose, after having reported some definitions and epidemiological data, to present both the factors favoring the use of a psychoactive or doping substance in a sporting environment and the consequences of this use. Finally, we will discuss the measures to be implemented in terms of prevention [2]. A psychoactive substance is a substance that, when ingested or administered, alters mental processes, such

as cognitive functions, mood, or affect. Addictive behavior is defined by the repeated inability to control a behavior and the continuation of this behavior despite its negative consequences (physical, psychological, family, professional, social). Doping behavior is the use of a substance in the goal of overcoming a real or perceived obstacle for performance purposes [3]. The obstacle may be an exam, a job interview, a sporting competition. Doping is the use, during sporting competitions, of prohibited substances or methods included on a list established by the World Anti-Doping Agency. Conduct at risk consists of exposure to a non-negligible probability of injury or death, of harming one's personal future or of putting one's health or that of others at risk [4].

Psychoactive substances, usually described as "recreational", can be used to improve sports performance. Remember that at the beginning of the 20th century, Tour de

France cyclists sometimes drank a little champagne to give themselves a boost before a descent [3]. More recently, a survey carried out among STAPS (Sciences and Techniques of Physical and Sports Activities) students in several French universities showed that 13% of them had already used cannabis with the aim of improving their sporting performance [5]. In addition, competitions generate anxiety, and the use of drugs could sometimes appear as a remedy to relieve it, which would explain why, among young high-level athletes, those who participate in the most prestigious competitions are more inclined to consume tobacco and alcohol [6-8].

Several studies performed in our laboratory have shown the effect of natural products in animal behavior [9-15]. This current study attempts to measure the frequency of consumption of psychoactive substances in adolescents. In addition to the consumption of alcohol, tobacco, mixtures of alcohol and drugs or mixtures of alcohol and energy drinks, psychoactive products, whether over-the-counter, prescription or illicit drugs, were consumed for the purpose of improve physical performance. It is important to emphasize that the consumption of such produced by young Moroccan adults is poorly documented and poorly understood. The current study aims to determine the impact of drug consumption (alcohol, cannabis) in sport performance in a sample of adolescents from Meknes city (Morocco).

## 2. Materials and methods

### 2.1 Studied population

A total of 302 adolescents and young people (98 girls and 204 boys) (mean age = 23 years) from some districts of the province of Meknes (Morocco) were participated in this study.

### 2.2 Anthropometric characteristics

Participants' height was measured in a standing position using a vertical rod, and their weight was determined with a precision electronic personal scale. Body Mass Index (BMI) was then calculated as the weight-to-stature squared ratio. BMI, recognized by the WHO as a standard for evaluating corpulence, strongly correlates with total fat levels and growth. The study utilized International Obesity Task Force (IOTF) reference curves to assess adolescents' corpulence, emphasizing the importance of removing shoes during anthropometric measurements.

### 2.3 Psychoactive substances assessment

Structured individual interviews were conducted using a questionnaire designed specifically for the assessment of psychoactive substances (substances consumed, frequencies, addiction) used by adolescents.

### 2.4 Measure of sport performance

Aerobic fitness was assessed using the 20 m shuttle run test with 1-minute stages, a globally recognized method for evaluating adolescents' physical condition. Participants ran back and forth between two lines, synchronized with an increasing sound signal. The test started at 8.5 km/h, escalating by 0.5 km/h per minute, with the final level representing Maximum Aerobic Speed (MAS). The MAS, Lotfi et al., 2024

converted into linear running speed, was determined using an equation by Léger et al., 1993. VO<sub>2</sub>max (ml min<sup>-1</sup> kg<sup>-1</sup>) was calculated from an equation involving maximum speed, gender, and weight. Perceived exertion values were reported by all students immediately after exercise cessation. They were measured using "Rating Scale of Perceived Exertion" (RPE) [16], validated with adolescents. The latter assesses the sensation of dyspnea from 1 ("not at all") to 10 ("maximum"). These perceived exertion values were measured immediately after the end of the course test [17].

### 2.5 Statistical analysis

Descriptive statistics were calculated, including weighted frequency and proportions for categorical and weighted average variables, and standard deviations for continuous variables.

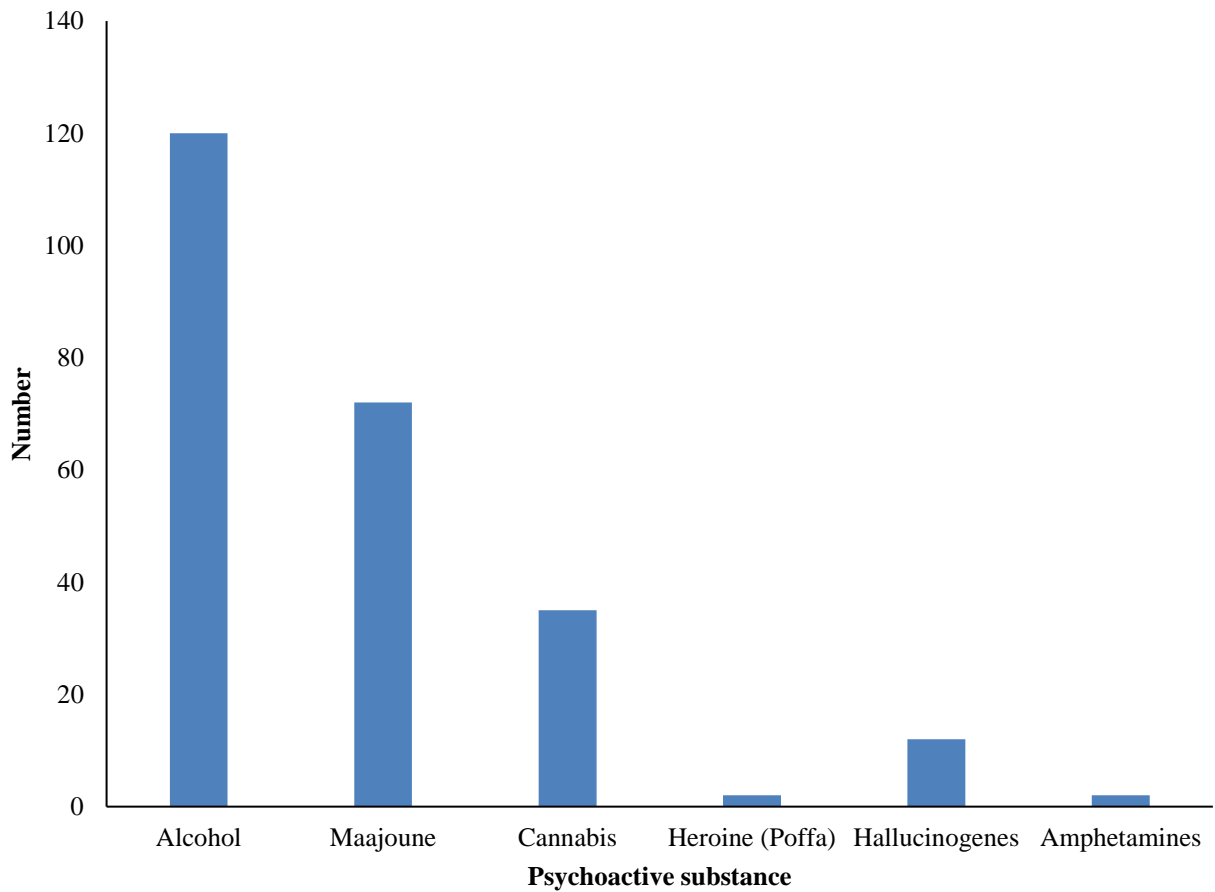
## 3. Results and Discussions

The majority of participants was males (67.5%) under the age of 20 years (34.8%). 61.6 of interviewed were single and having a study level higher than high school (66.9%) (table1). When we are interested in the types of psychosis substances that have been consumed at least once during their life, we see (figure 2) that more than 48% of adolescents and young adults have consumed alcohol, 30% have consumed maajoune, 4.9% of participants say they have already used hallucinogens; and 2% say they have taken heroine or amphetamines. The consumption of psychotropic substances other than alcohol and cannabis would therefore be more common among the population studied. The results obtained show that the average age of adolescents presents a statistically significant difference according to sex ( $p < 0.001$ ). This current study attempts to measure the frequency of consumption of psychoactive substances in adolescents. In addition to the consumption of alcohol, tobacco, mixtures of alcohol and drugs or mixtures of alcohol and energy drinks, psychoactive products, whether over-the-counter, prescription or illicit drugs, were consumed for the purpose of improve physical performance. It is important to emphasize that the consumption of such produced by young Canadian adults is poorly documented and poorly understood [18,19]. The current study aims to determine the impact of drug consumption (alcohol, cannabis) in sport performance in a sample of adolescents from Meknes city (Morocco). The results show a positive correlation between drugs and physical exercise intensity.

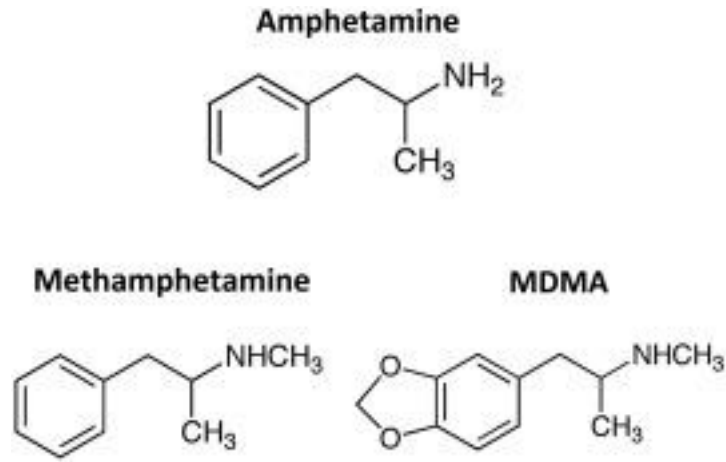
The intensity of sports practice can be measured in several ways (by duration, level of commitment and competition, etc.) [4,16]. In this exploratory approach, we will restrict ourselves to the average weekly duration over the current year. From the point of view of the use of psychoactive substances, we legitimately, when possible, asked the observer over the last 12 months to keep the period proposed for sport in the questionnaire. This was possible for cannabis, alcohol, and drunkenness [20-25]. For inhalants, prevalence over the past 12 months was too low, so we returned to lifetime prevalence. For tobacco as for beer, wine and strong alcohol, only the prevalence over the last 30 days was asked of the students.

**Table 1.** Demographic characteristics of participants.

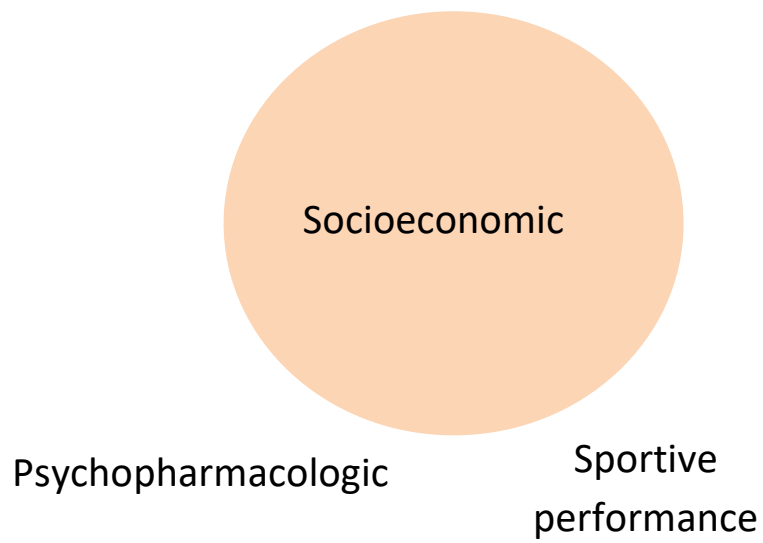
		Number	Percentage (%)
Gender	Female	98	32.5
	Male	204	67.5
Age classes (years)	< 20	105	34.8
	21-30	99	32.8
	31-40	98	32.4
Family situation	Single	186	61.6
	Married	30	9.9
	divorced	86	28.5
Level study	Analphabet	37	12 .2
	primary	63	20.9
	Middle school and higher	202	66.9
Professional activity	Without work	98	32.4
	work	204	67.6



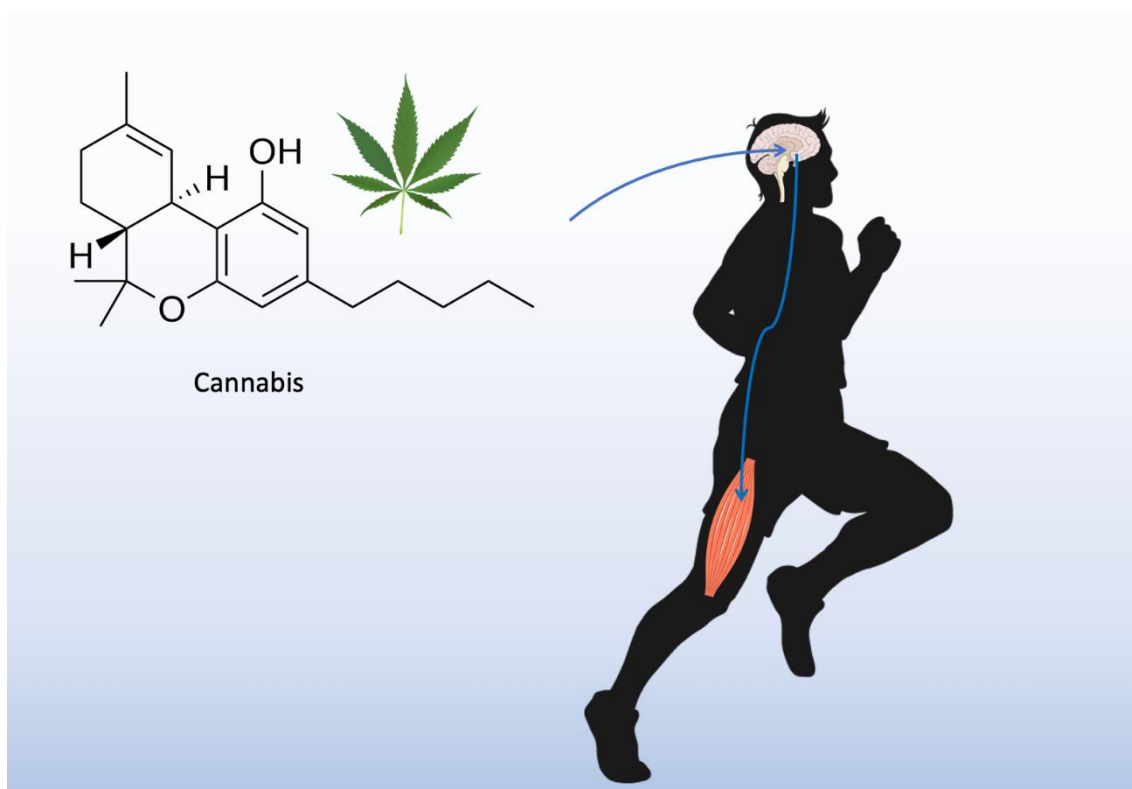
**Figure 1.** Distribution of types of psychoactive substances according to the proportion of participants.



**Figure 2.** Cannabis components



**Figure 3.** Determinant factors of interaction psychoactive substances-sportive performance



**Figure 4.** Effects of cannabis in brain function and sport performance.

A first way of relating weekly sports practice and the use of a psychoactive product consists of detailing the average duration of practice according to the levels of use. The curves that we obtain are quite erratic, and do not show a clear trend. At most, we can distinguish an increase in consumption with the weekly duration for inhaled products and for the three types of alcohol. The prevalence of consumption of psychoactive products among students, whether alcohol, cannabis, tobacco and energy drinks, are very high. This finding confirms the conclusions of other studies showing that the prevalence of use of these substances is much higher among young adults, including undergraduate students, than in other age groups of [26]. These young people are also at greater risk of consuming mixtures of alcohol and energy drinks [27].

At this time little research has examined the relationship between psychoactive substances and sport performance. The motivations for consuming doping products as put forward by the participants depend on the products used. As noted in other studies, performance enhancing drugs are often used to combat physical fatigue, stay awake, reduce stress, spend long hours studying, get good grades on exams, and improve concentration [28-33]. Different studies performed in animal models have shown dimorphism responses on the behavior and brain functions according to environment factors (figure3) [34-37]. The study's conclusion of a consistent and significant relationship between fitness and academic achievement was based on the fact that there were more statistically significant correlations than there were not [38,39].

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A psychoactive substance is a substance that, when ingested or administered, alters mental processes, such as cognitive functions, mood, or affect. Addictive behavior is defined by the repeated inability to control a behavior and the continuation of this behavior despite its negative consequences (physical, psychological, family, professional, social) (figure 4) [40,41]. One review of research that concluded a positive relationship between physical and mental skills expressed concern that reviewed studies did not demonstrate causality. Most reviewed studies used correlation designs. Reviewed experimental studies had design weaknesses [42-44]. One study with an experimental design in that the independent variable was manipulated did not use random assignment or matching to control for preexisting group differences. Another experimental study employed random assignment but failed to find a statistically significant difference in academic achievement between experimental and control subjects [45,46].

#### 4. Conclusions

This study supports other research which demonstrates that consumption psychoactive substances for the purpose of improving physical performance are very widespread in poor districts. Even more so, cannabis, being now legalized and easily accessible, adolescents seem to trivialize its consumption and the harmful effects on their health. These results require thinking more about the responsibility of organizations and city councils with regard to the health of these persons.

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