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Knowledge, attitudes and practices about Cannabis light among a sample of Italian undergraduates

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Keywords: Cannabis light; tetrahydrocannabinol; cannabidiol; drug; undergraduates
Parole chiave: Cannabis light; tetraidrocannabinolo; cannabinolo; droga; studenti universitari

Abstract

Background. *Over the past few years, the market for "cannabis light", substance with a tetrahydrocannabinol content of less than 0.6% (according to Italian law), has become established. The aim of the present study was to evaluate knowledge, attitudes and practices about cannabis light products among a sample of Italian undergraduates.*
Methods. *This cross-sectional study was conducted in the academic year 2023/2024. Participants completed an anonymous questionnaire regarding socio-demographic data, knowledge about cannabis light products and their effects, attitudes and practices related to these products. Responses on knowledge were aggregated into a dichotomous variable ("good knowledge" and "poor knowledge"). A multivariate analysis was performed on the knowledge variable using age, gender, type of secondary school attended, tobacco use and having used cannabis light-containing products as independent variables.*
Results. *Only 24.6% of the sample stated that they had used a product containing cannabis light at least once and 70.1% showed poor knowledge about such products. Students from technical or vocational secondary schools were significantly less likely to have good knowledge (OR=0.4; 95%CI=0.19-0.88). In contrast, those who had used these products at least once were more likely to have good knowledge (OR=4.8; 95%CI=2.84-8.25).*
Conclusions. *Despite the increasing popularity of cannabis light products, the level of knowledge among university students remains low. Therefore, interventions are needed to fill knowledge gaps about these products and to guarantee their informed use.*

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Introduction

Cannabis is the most widely used drug globally (1), approximately 20% of the youth population in Europe aged 15 to 24 reported to have used the substance at least once (2). The effects are due to its cannabinoid components, in particular tetrahydrocannabinol (THC) and cannabidiol (CBD) (3). THC is the only psychoactive compound in cannabis, while CBD is the most famous non-psychoactive component (4), and it is considered a natural remedy for health conditions (5). A number of several studies have demonstrated the potential benefits of CBD as a treatment for the management of pain, anxiety, insomnia, depression, schizophrenia and opioid abuse (5). In 2018, the US Food and Drug Administration (FDA) approved a CBD-based medication for treating specific forms of epilepsy (6) and, in 2019, the World Health Organization (WHO) recognized cannabis as a therapeutic substance (7). In the United States alone, it has been estimated that 3.5 million people use cannabis for medical purposes (8).

Recently, the market has seen the rise of cannabis "light", characterized by high CBD and low THC content. This form of cannabis is available in various products, including smokables, inhalants, oils, lotions, and edibles. It has been demonstrated to have a high safety profile, minimizing the adverse effects associated with THC (9).

The Italian Government approved in 2016 the Law 242/16 to facilitate the cultivation of hemp and its sale, considered legal if the THC content does not exceed 0.6% (10). It applies to hemp crops of the allowed varieties listed in the Common Catalogue of Varieties of Agricultural Species, pursuant to Article 17 of the European Union Council Directive 2002/53/EC of 13 June 2002 (11). This law has led to the birth of a flourishing market that counts over 2,000 points of sale throughout the country and over 1,500 agricultural holdings, for a total of 10,000 employees in the sector (12). To these numbers should also be added the online marketing of these products.

Despite the widespread consumption of these products, there is limited scientific evidence on how CBD is acquired and used, and on the possible adverse effects resulting from its intake. In recent years, a growing phenomenon of "self-medication" has been observed using these products to treat insomnia, anxiety, and chronic pain; in some cases, CBD-containing products are taken together with alcohol, drugs and medications, increasing their effects (also adverse effects) (13). Moreover, both regular and occasional users are often unaware of the composition of the products they use, of the possible side and/or synergistic effects (due to the simultaneous use of other substances) and of the possible risks associated with misuse (14). Such occurrences inevitably result in public health issues that cannot be overlooked.

Given the ever-increasing market concerning cannabis light products and the continuous introduction of new products of this type, it is necessary to produce objective evidence useful for public health professionals. This would be essential to open a dialogue with consumers and the general population, with the purpose of increasing knowledge about these products and awareness of their use, to reduce the possibility of misbehavior and misuse.

The aim of the present study was to evaluate knowledge, attitudes and practices about cannabis light products among a sample of Italian university students.

Methods

1. Study design and participants

This was a cross-sectional study carried out on 500 students attending the Sapienza University of Rome. The research project was illustrated to all the students in the classrooms, after clarifying the purposes and the reasons of the survey. Knowledge, attitudes and practices of participants were assessed through a self-administered, anonymous questionnaire elaborated "ad hoc" and validated before the beginning of the study. The questionnaire was administered to the students of different degree courses on different days in the academic year 2023-2024. The protocol of the study was approved (Protocol n. 0256/2022) by the Ethics Committee of the Teaching Hospital Policlinico Umberto I of Rome, house of the Clinical Departments of the first and second Medical Schools of the Sapienza University.

2. Questionnaire

The questionnaire consisted of three sections: the first one collects the sociodemographic information (gender, age, nationality, secondary school attended, degree course attended, first year of enrollment, participants' residential status, parents' educational level); the second evaluates the knowledge about cannabis light products and the possible therapeutic and adverse effects; the last one assesses information about those who reported consuming these products. All the answers were coded and added in a database, specifically elaborated for statistical purposes.

3. Covariates and statistical analysis

The database management and statistical analyses were performed using STATA, version 18 (StataCorp LLC, College Station, Texas USA).

A descriptive analysis was performed on sociodemographic characteristics and answers of participants. Continuous variables were expressed as mean values ± standard deviation (SD) while categorical variables were reported as number and percentage values of respondents. Univariate analysis was performed to assess possible associations between knowledge and categorical variables using the chi squared test (with Yates's correction) and with continuous variables using Mann-Whitney U Test. Finally, multivariate logistic regression was used to assess the possible association between knowledge and the variables which resulted significantly associated to knowledge in the univariate analysis.

To perform univariate and multivariate analyses, the variables were codified as follows: gender was expressed as female = 0 and male = 1 and the nationality as Italian = 0 and other = 1. Besides, the secondary school attended was coded as "Lyceum education" = 0 and Others = 1, according to the name of programme in national language described by the Organisation for Economic Co-operation and Development (OECD) (15).

Participants' residential status was coded as follows: "Resident" = 0 and "Commuting or non-resident student" = 1, while parents' educational level was codified as 0 = "Up to secondary school" and 1 = "Degree or postgraduate education". Last year's use of tobacco's products was coded as follows: "No" = 0 and "Yes" = 1.

The variable "Cannabis light knowledge" was constructed from the scores of five questions ("What is cannabis light?", "What types of products containing cannabis light can be purchased?", "Can products containing cannabis light give adverse effects?", "Can cannabis light be used for medicinal purposes?", "Amount of THC allowed in cannabis light according to the laws of Italy"). The question "What is light cannabis?" was coded into "Don't know" = 0, "CBD-rich substance" = 1, "THC-rich substance" = 2 and then aggregated as dichotomous ("THC-rich substance/Don't know" = 0 and "CBD-rich substance" = 1). The question "Can cannabis light products give undesirable effects?" consisted of 7 products, each affirmative answer was given a value of 1 and each uncertain or incorrect answer a value of 0, creating a numeric variable from 0 to 7. This was dichotomized according to the median value. The question "Amount of THC permitted in light cannabis according to the Italian state" was coded as follows: in "THC > 3.0%/ Don't know" = 0 and "THC < 0.6%" = 1. The two remaining questions were coded as follows "No/Don't know" = 0 and "Yes" = 1.

The variable "Cannabis Light Knowledge" was dichotomized using median value as follows: "Poor Knowledge" = 0 and "Good Knowledge" = 1.

In the multivariate analysis, odds ratio (OR) and 95% confidence intervals (CIs) were calculated. The significance level was assumed as $p < 0.05$.

Results

In total, 500 students responded to the questionnaire and 462 observations were included in the univariate analysis, and 448 used in the multivariate analysis. Socio-demographic characteristics of the sample were summarized in Table 1.

The mean age of participants was 25.7 ± 6.9 years. The sample included mainly females (67.6%) and most participants were Italians (94.2%). Almost 87% of students had a Lyceum education, the remaining 13% came from technical institutes. The distribution by study area of the degree course attended showed a predominance of students coming from scientific disciplines (96.4%) compared to those from the humanities (3.6%).

Almost two-thirds of the sample (61.2%) were non-residents or commuters, while 38.8% resided in the same city of the university attended. Parental educational levels varied as follows: 56.9% of mothers and 58.3% of fathers studied until to secondary school, while 43.1% of mothers and 41.7% of fathers had at least a university degree. A total of 45.8% of the sample reported using tobacco in the past year.

Table 2 presents data related to the knowledge on products containing cannabis light. Almost half of the sample did not know the definition of light cannabis or provided an incorrect definition and 54% of the participants incorrectly stated that the legally permitted THC content in Italy is above 3% or they were unaware of the correct limit. Considering these last two questions and those related to cannabis light products, the median number of correct answers was 3 in a range from 0 to 7, and 70% of the students demonstrated poor knowledge.

Participants' attitude and practices related to cannabis light was presented in Table 3. Less than 25% of students reported having tried light cannabis at least once and the age of first use was for 63% of them

Table 1 - Main socio-demographic characteristics of the sample

Variable	Value
Age (years)	
Mean Value ± SD	25.68 ± 6.89
Median Value (interquartile range)	23 (7)
Range	18-68
Age n (%)	
<23 years	253 (50.6)
≥23 years	247 (49.4)
Gender n (%)	
Female	338 (67.60)
Male	162 (32.40)
Nationality n (%)*	
Italian	470 (94.19)
Other	29 (5.81)
Secondary school attended n (%)*	
Lyceum	430 (86.87)
Other	65 (13.13)
Study area of the degree course attended n (%)*	
Scientific Studies	476 (96.36)
Humanities Studies	18 (3.64)
Residential status n (%)*	
Off-site/Commuter	304 (61.17)
Resident	193 (38.83)
Mother's educational level n (%)*	
Until to secondary school	282 (56.85)
Degree or postgraduate education	214 (43.15)
Father's educational level n (%)*	
Until to secondary school	288 (58.30)
Degree or postgraduate education	206 (41.70)
Use of tobacco products last year n (%)*	
Yes	223 (45.79)
No	264 (54.21)

* This variable has some missing answers

between of 18 and 25. The cannabis light consumption resulted not so high, with a 6% of participants using these products several times a week.

A univariate analysis was conducted to assess the possible association between the variables examined and the knowledge of cannabis light (Table 4): type of secondary school attended, mother's educational level, use of tobacco products and use of cannabis light products were significantly related with knowledge.

Finally, logistic regression models were built to identify variables independently associated with knowledge (Table 5). Mother's educational level was removed from the final model according to LR test. Previous use of cannabis-containing products was the strongest predictor of good knowledge of cannabis light (OR = 4.85, CI 95% = 2.85 - 8.25, p < 0.001). Students who attended technical institutes had significantly lower odds of having good knowledge of cannabis light compared to those who had attended an academic high school (OR = 0.41, CI 95% = 0.19 - 0.89, p = 0.02).

Discussion

The first relevant result is related to the knowledge of the sample about the products under study: a significant portion of participants lack adequate awareness of cannabis light and its health-related implications. This result is in line with those of a previous study on products that contain CBD performed on a sample of German individuals. In particular, the German study found that more than half of respondents have not heard of CBD and most of them rated the health risks as low or very low (16). In addition, students who had previously used cannabis light products demonstrated significantly better knowledge of cannabis light. This trend is also confirmed by a study conducted in France (17). In this case, users were more aware of the health safety of cannabis light products, their composition and therapeutic effects than non-users. The latter, on the other hand, were more aware of the possibility of physical dependence and the toxic effects that these products may have. Indeed, products containing CBD can cause gastrointestinal symptoms, mild central nervous system depression, tachycardia, dizziness/vertigo, vomiting, nausea and agitation; besides, several toxics effects on liver, endocrine system and reproductive function are reported and should be studied in depth (18). These effects can be due to the direct pharmacological action of CBD or to the degradation of CBD to Δ 9-THC in the stomach after oral consumption or to the Δ 9-THC contained in the products as by-product due to contamination or to co-extraction and enrichment. Thus, given the growing market for some of these products, it is essential to challenge the operators' responsibility for the safety of the product and for regulatory compliance and to improve strong regulatory framework in this field (18). Recently, the new Decree-Law on Citizen Security approved by the Italian government on April 4, 2025 imposes severe restrictions, prohibiting the importation, production, processing, distribution, marketing and delivery of Cannabis sativa L.

Table 2 - Participants' knowledge about cannabis light

What is cannabis light n (%)*		Substance rich in CBD	253 (51.42)
		Substance rich in THC/I don't know	239 (48.58)
Purchasable cannabis light containing products	Smoking products n (%)*	Yes	321 (67.15)
		No/I don't know	157 (32.85)
	Creams and unguents n (%)*	Yes	256 (54.01)
		No/I don't know	218 (45.99)
	Oils and essences n (%)*	Yes	285 (60.13)
		No/I don't know	189 (39.87)
	Foods n (%)*	Yes	242 (51.16)
		No/I don't know	231 (48.84)
	Drinks n (%)*	Yes	187 (39.79)
		No/I don't know	283 (60.21)
	Cosmetics n (%)*	Yes	178 (37.87)
		No/I don't know	292 (62.13)
Cannabis light products undesirable effects n (%)*		Yes	243 (50.31)
		No/I don't know	240 (49.69)
Cannabis light products therapeutic use n (%)*		Yes	310 (64.05)
		No/I don't know	174 (35.95)
Cannabis light products THC content in Italy n (%)*		THC < 0.6%	223 (46.17)
		THC > 3.0%/I don't know	260 (53.83)
Cannabis light products possible adverse effects	Dry mouth n (%)*	Yes	176 (51.31)
		No	167 (48.69)
	Stun n (%)*	Yes	202 (59.59)
		No	137 (40.41)
	Appetite alteration n (%)*	Yes	205 (59.77)
		No	138 (40.23)
	Interactions n (%)*	Yes	192 (55.81)
		No	152 (44.19)
	Liver effects n (%)*	Yes	83 (24.41)
		No	257 (75.59)
	Cardiovascular effects n (%)*	Yes	160 (46.78)
		No	182 (53.22)
Cannabis light products therapeutic use	Gastrointestinal effects n (%)*	Yes	124 (36.47)
		No	216 (63.53)
	Respiratory effects n (%)*	Yes	167 (48.69)
		No	176 (51.31)
	Fatigue n (%)*	Yes	132 (38.71)
		No	209 (61.29)
	Chronic pain n (%)*	Yes	286 (74.67)
		No	97 (25.33)
	Head trauma n (%)*	Yes	69 (18.16)
		No	311 (81.84)
	Migraine n (%)*	Yes	217 (56.81)
		No	165 (43.19)
	Epilepsy n (%)*	Yes	129 (34.49)
		No	245 (65.51)
	Insomnia n (%)*	Yes	246 (64.91)
		No	133 (35.09)
	Anxiety/Stress n (%)*	Yes	274 (71.73)
		No	108 (28.27)
	Parkinson n (%)*	Yes	177 (46.58)
		No	203 (53.42)
	Alzheimer n (%)*	Yes	87 (22.96)
		No	292 (77.04)
	Mood Alteration n (%)*	Yes	137 (35.96)
		No	244 (64.04)
Cannabis light knowledge n (%)*		Poor Knowledge	324 (70.13)
		Good Knowledge	138 (29.87)

*This variable has some missing answers

Table 3 - Participants' attitude and practices related to cannabis light

Ever used cannabis light products n (%)*	Yes	119 (24.64)
	No	364 (75.36)
Age of cannabis light first use n (%)§	< 17 years	26 (21.85)
	18-25 years	75 (63.03)
	26-30 years	17 (14.29)
	>31 years	1 (0.84)
Cannabis light consumption frequency n (%)*,§	< once a week	36 (31.03)
	2-4 times a week	5 (4.31)
	>5 times a week	3 (2.59)
	I only tried once	72 (62.07)
CBD knowledge n (%)*,§	Yes	34 (29.57)
	No	81 (70.43)
Combined use n (%)*,§	Yes	20 (17.70)
	No	93 (82.30)

*This variable has some missing answers
§This question was administered just to participants who reported having consumed cannabis light products at least once (n = 119)

Table 4. Association between the knowledge about cannabis light and socio-demographic characteristics or attitude vs smoking tobacco or using cannabis light products

Variable*		Bad Knowledge	Good Knowledge	p-value
Age (years)		25.96 ± 7.52	25.31 ± 4.63	0.25
Gender	Females	224 (69.14)	83 (60.14)	0.06
	Males	100 (30.86)	55 (39.86)	
Nationality	Italian	302 (93.21)	133 (96.38)	0.18
	Other	22 (6.79)	5 (3.62)	
School level	Lyceum	272 (84.21)	126 (92.65)	**0.02**
	Other	51 (15.79)	10 (7.35)	
Study area	Scientific Studies	309 (96.56)	132 (96.35)	0.91
	Humanities Studies	11 (3.44)	5 (3.65)	
Residence condition	Resident	114 (35.19)	56 (40.58)	0.27
	Off-site/Commuter	210 (64.81)	82 (59.42)	
Mother's educational level	Until to secondary school	201 (62.04)	68 (49.28)	**0.01**
	Degree or postgraduate education	123 (37.96)	70 (50.72)	
Father's educational level	Until to secondary school	195 (60.56)	79 (57.25)	0.51
	Degree or postgraduate education	127 (39.44)	59 (42.75)	
Use of tobacco products last year	Yes	129 (40.31)	81 (60.90)	**<0.01**
	No	191 (59.69)	52 (39.10)	
Ever used cannabis light products	Yes	47 (14.55)	67 (48.55)	**<0.01**
	No	276 (85.45)	71 (51.45)	

*All variables have some missing answers

Table 5 - Logistic Regression: variables independently associated with Cannabis Light knowledge

Variable		Odds Ratio (ORs)	Confidence Intervals (95% IC)	p-value
Age		0.99	0.96 - 1.03	0.76
Gender	Female (reference)	1.00		0.17
	Male	1.39	0.87 - 2.21	
Secondary school attended	Lyceum (reference)	1.00		**0.02**
	Other	0.41	0.19 - 0.88	
Use of tobacco	No (reference)	1.00		0.40
	Yes	1.24	0.75 - 2.06	
Ever used products	No (reference)	1.00		**<0.001**
	Yes	4.85	2.85 - 8.25	

inflorescences, including CBD flowers, CBD resins and CBD oils, regardless of their compliance with legal THC limits. However, this Decree is not in line with the European regulatory framework and, thus, it is not certain that it will be able to come into force (In Italy, Decree-Laws, issued by the Government and immediately valid for 2 months, must be re-approved – as such or modified – by the Parliament within the period of validity, under penalty of lapse). Besides, even if it will be approved, the Italian citizen will be free to buy products containing CBD in other Europe countries. Consequently, although the laws protecting human health could be considered an essential prevention tool, integrated strategies are necessary in order to successfully contrast the possible health risks associated with products containing CBD.

Partial knowledge may indeed influence whether or not to use such products. In addition, this could suggest that firsthand experience drives individuals to seek more information about the substances they consume. Conversely, those with no prior usage may rely on misinformation or lack of awareness altogether, as evidenced by the 54% of participants who incorrectly identified the legal THC limit or were unaware of it.

The type of secondary school attended by the participants could also play a role in reaching correct knowledge or not. Indeed, students having a Lyceum education exhibited better awareness compared to their peers from Technical Institutes. This finding is innovative as, in our knowledge, no articles investigating this association have been found in the literature. This may reflect differences in curriculum exposure to scientific knowledge or critical thinking skills, underscoring the need for educational interventions across school types.

Additionally, research has pointed out that university students tend to have limited knowledge about health-related topics, even when these subjects are highly relevant to their lifestyle choices and personal experiences. This aligns with findings from previous studies on body art awareness, which indicate that, while university students may be aware of general health risks, they often lack specific knowledge about complications and contraindications (19). In the context of CBD, this knowledge gap suggests a broader issue in health literacy among university populations, where increasing access to products does not necessarily correlate with informed use. Knowledge of the topic also influences perceptions of the risks and benefits of cannabis, as shown by a study on Austrian medical students. In this case, the male population was more supportive of the legalisation and prescription of cannabis for medical purposes, in contrast to the female population, that focused more on the adverse effects and health risks (20). The increased acceptance by medical students of cannabis for medicinal purposes suggests that the medical community should prioritise the development of specific educational programmes. In this way, such treatments would have a greater chance of success as safe and viable therapies (21).

Another relevant result emerged from the present study is that approximately a quarter of the sample studied are cannabis light products' users. Such a finding is not comparable with other studies because research reporting data on the use of products containing cannabis did not report the percentage of THC in the products. However, one study outlined that prevalence rates of cannabis use may be higher among university students than in the general population (22). In fact, up to 25% of young people start using cannabis after admission to university and cannabis use in the last 12 months among them is around 20-30% (23). The latter figure is in line with our percentage, which is 23.8%.

Moreover, the age of first use aligns with university years, suggesting that this population group is particularly vulnerable to both experimenting with, and misunderstanding, the properties and effects of cannabis light products. One of the key findings is that nearly two-thirds of our students tried cannabis light at the age between 18 and 25 years old. This period coincides with increased academic pressures, social transitions, and personal stressors commonly experienced during university life. This data is confirmed by a German study, which finds that the use of cannabis is more frequent in the age group under 30 years (16). This result is further strengthened by data from the European Drug Observatory, which states that, in Europe, about 10% of those 15–24-years old recently used cannabis (24). Previous research has indicated that young adults often resort to substances like cannabis to manage stress and anxiety, given the widely publicized calming effects of CBD (25,26). However, the misuse of such products for self-medication could mask underlying mental health issues and lead to unintentional side effects, especially when combined with other substances like alcohol or tobacco (27). This is a further essential point which pushes to develop new strategies for the prevention of smoking and alcohol abuse, for which the adverse effects are well known.

The potential long-term effects and dependency risks remain an area of concern: recent findings

indicate that CBD use can influence emotional regulation and cognitive function, potentially leading to altered stress responses in young adults (28).

Conclusions

Given the burgeoning market for products containing cannabis light and the increasing trend of self-medication among young adults, it is important for public health professionals to design targeted educational campaigns specifically devoted to these products. In particular, initiatives should aim to improve awareness about the legal, health, and safety aspects of cannabis light use, particularly focusing on the university population that appears most susceptible to its experimentation and misuse.

Riassunto

Conoscenze, attitudini e pratiche sulla Cannabis light in un campione di studenti universitari Italiani

Premessa. Negli ultimi anni si è affermato il mercato della "cannabis light", sostanza con contenuto di tetraidrocannabinolo inferiore a 0,6% (secondo la legge italiana). Lo scopo dello studio era valutare le conoscenze, le attitudini e le pratiche circa i prodotti contenenti cannabis light di un gruppo di studenti universitari Italiani.

Metodi. Questo studio trasversale è stato condotto nell'anno accademico 2023/2024. I partecipanti hanno completato un questionario anonimo riguardante dati socio-demografici, conoscenza sui prodotti contenenti cannabis light e loro effetti, e consumo degli stessi. Le risposte sulla conoscenza sono state aggregate in una variabile dicotomica ("buona conoscenza" e "scarsa conoscenza"). Sulla variabile "conoscenza" è stata effettuata un'analisi multivariata utilizzando come variabili indipendenti l'età, il genere, il tipo di scuola secondaria frequentata, il consumo di tabacco e l'aver utilizzato prodotti contenenti cannabis light.

Risultati. Solo il 24,6% del campione ha dichiarato di aver utilizzato almeno una volta un prodotto contenente cannabis light e il 70,1% ha dimostrato una scarsa conoscenza riguardo tali prodotti. Gli studenti provenienti da scuole secondarie tecniche o professionali hanno mostrato una probabilità significativamente inferiore di avere una buona conoscenza (OR=0,4; IC95%=0,19-0,88). Al contrario, coloro che hanno utilizzato almeno una volta questi prodotti presentavano una maggiore probabilità di avere una buona conoscenza (OR=4,8; IC 95%=2,84-8,25).

Conclusioni. Nonostante la crescente popolarità dei prodotti contenenti cannabis light, il livello di conoscenza tra gli studenti universitari rimane basso. Pertanto, sono necessari interventi per colmare le lacune conoscitive su questi prodotti e per garantire un uso consapevole.

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