The relationship between motivations for cannabis consumption and problematic use

Relación entre las motivaciones para consumir y el consumo problemático de cannabis

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Abstract

Introduction. Systematic screening of problematic cannabis use does not include the motivations that lead to consumption, although from a person-centered perspective this is fundamental. The present study explores the motivations for cannabis use in adults and its relationship with cannabis use patterns and problematic use. *Method.* Adult cannabis users (previous 60 days) were recruited in the province of Barcelona (n = 468). Information on their sociodemographic data, cannabis use pattern, Cannabis Abuse Screening Test (CAST) and the main motivation for use were collected. Motivations were categorized a posteriori according to the *Marijuana Motives Measures (MMM).* A descriptive and inferential analysis was carried out to link the motivations to sociodemographic variables, consumption pattern and probability of suffering problematic cannabis use (CAST). *Results.* Using cannabis to heighten positive feelings (35%), out of habit (29%) and to cope with negative feelings (25%) were the most frequent motivations. In comparison to other motivations, coping is related to a greater quantity of cannabis used (4 vs 3 joints per day, p = 0.005), higher probability of problematic cannabis use (77% vs 64%, p = 0.05), and greater social vulnerability (unemployment 56% vs 37%, p = 0.001; and low educational level 14% vs 8%, p = 0.042). *Conclusions.* Coping as a motivation for cannabis use is present in one out of four users and is a marker of social vulnerability, greater quantity of cannabis used and higher risk of problematic use. Patient-centered care together with preventive (emotional and social education) and clinical strategies (psychotherapy) can be useful for this population at higher risk.
Key Words: Patient-centered care; Cannabis; Motivations for cannabis use; Problematic cannabis use.

Resumen

Introducción. El cribado sistemático del consumo problemático de cannabis no incluye las motivaciones que llevan al consumo, aunque desde una perspectiva de atención centrada en la persona, este dato sea fundamental. El presente estudio explora las motivaciones de consumo de cannabis en adultos y su relación con el patrón de consumo y consumo problemático. *Método.* Consumidores adultos de cannabis (en los últimos 60 días) fueron reclutados en la provincia de Barcelona (n=468). Se pasó un cuestionario para explorar datos sociodemográficos, patrón de uso, la Cannabis Abuse Screening Test (CAST) y la motivación principal para el consumo. Los motivos de consumo se categorizaron a posteriori según la *Marijuana Motives Measures (MMM).* Se realizó un análisis descriptivo e inferencial para explorar la relación entre la motivación categorizada y variables sociodemográficas, patrón de consumo y puntuaciones de la CAST. *Resultados.* Consumir cannabis para mejorar las emociones positivas (35%), por costumbre (29%) y para afrontar emociones negativas (25 %) fueron las motivaciones más frecuentes. Respecto a otras motivaciones, el "afrontamiento" se relaciona con mayor cantidad consumida (4 vs 3 porros/día, p = 0,005), mayor probabilidad de tener un consumo problemático (77% vs 64%, p = 0,05), y mayor vulnerabilidad social (desempleo 56% vs 37%, p = 0,001; y bajo nivel de estudios (14% vs 8%, p = 0,042)). *Conclusiones.* El afrontamiento está presente en uno de cada cuatro usuarios de cannabis, es un marcador de vulnerabilidad social y de mayor cantidad de consumo de cannabis y probabilidad de consumo problemático. Una atención centrada en la persona junto con estrategias preventivas (educación emocional y social) y clínicas (psicoterapia) pueden ser de utilidad en esta población de mayor riesgo.
Palabras clave: Atención centrada en la persona; Cannabis; Motivación para el consumo; Consumo problemático de cánnabis.

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Introduction

It is estimated that one in three Spanish people has used cannabis at some point during their life and that 2% of the population uses it daily (Observatorio Español de la Droga y las Toxicomanías, 2017). Over recent years, evidence of the risks and organic, psychological and social consequences associated with its use is increasingly robust. (López Pelayo, Miquel De Montagut, Casajuana Kögel & Balcells Oliveró, 2018; Volkow et al., 2016; World Health Organization, 2016). However, cannabis is probably the illicit drug whose image has improved most over recent years, with growing social acceptance and a fading perception of the risks related to its use (Okaneku, Vearrier, McKeever, LaSala & Greenberg, 2015). Given this trend, an analysis of possible changes in the reasons leading people to start using cannabis would be timely in order to improve approaches towards the associated problems.

At a preventive level, dissuasive measures influencing the accessibility of substances (price increases, vending restrictions, advertising bans) have been shown to be effective in reducing substance use (Anderson, Braddick, Reynolds & Gual, 2012; Meier et al., 2016; Mora, 2018). However, this type of public health measure is focused primarily on the substance involved and less on the individual's behavior. The problem of drug use would benefit from an approach including both angles: the most general - the substance itself - and the personal - knowing the motivations that lead people to put their health at risk (Anderson et al., 2017; Barrio & Gual, 2016).

In 2017, the scientific society of reference in Spain on drug-related issues, Socidrogalcohol, conducted a "Qualitative sociological study on the use of alcohol and cannabis among adolescents and young adults" (Estudio Sociológico cualitativo sobre el consumo de alcohol y cannabis entre adolescentes y jóvenes, Socidrogalcohol, 2017). This study showed what motivated Spanish adolescents and young adults from different autonomous regions to use cannabis. As discussed in this study, many young Spaniards initially use cannabis in order to seek a sense of belonging to the group and out of a sense of transgression. Later, however, their use can turn more towards managing negative emotions, such as dealing with everyday life situations and, therefore, as a way of avoiding negative effects and finding relief from discomfort (Baker, Piper, McCarthy, Majeskie & Fiore, 2004). In this stage, cannabis use can be confused with supposedly therapeutic use, as well as an excuse to alleviate the negative effects of not consuming (Lee, Derefinko, Davis, Milich & Lynam, 2017). At the same time, these motivations can be fed by phenomena such as tolerance, which requires increased doses to achieve the desired effects (Ramaekers et al., 2011). Alongside others, the Socidrogalcohol study highlights the importance of analyzing the motivations for consumption at an early age in order to better address cannabis use in our context from onset, and especially to study

their relationship with problematic use. However, this national study involves people aged under 25 and does not offer information about older users in our context, whose use and motivations may have changed over the years.

In a clinical setting, the motivational approach also presents consistent scientific evidence on the treatment of substance use disorder (SUD), including cannabis (Chatters et al., 2016; K. Cooper, Chatters, Kaltenthaler & Wong, 2015). Indeed, the motivational interview in cases of cannabis use disorder has proved efficacious, with positive results achieved in one out of seven treated, and showing a moderate effect size for abstinence/reduced use (Hedge's g 0.26 CI 95% 0.10-0.43) (Lundahl, Kunz, Brownell, Tollefson & Burke, 2010; Walther, Gantner, Heinz & Majič, 2016). In another meta-analysis, the OR for abstinence was 1.99 (95% CI 0.81-4.86) and 3.22 for reduced use. (CI 95% 2.14-4.84) (Lundahl et al., 2013). In other words, receiving treatment with motivational interviewing doubled or even tripled the probability of success with respect to standard treatment. These data are comparable, for example, to the effectiveness of lithium carbonate or aripiprazole in treating bipolar mania (Yildiz, Vieta, Leucht & Baldessarini, 2011). The motivational interview aims to discover the reasons why the patient uses the substance, and as such relies on verbalization; patients need to express the reasons and motivations for using as well as quitting, and discuss any tools they might possess to achieve this. Other necessary principles are the existence of a spirit of collaboration (horizontal relationship between professional and patient), compassion (promoting the patient's well-being) and acceptance (creating an empathic climate, promoting autonomy and affirming the patient's values) (Miller & Rollnick, 2013). In an approach focused on the patient's motivations and scale of values, these play a crucial role as part of a therapeutic strategy.

For all these reasons, a theoretical framework which links patterns of cannabis use to motivations for use in adults in our context seems of great interest in order to better understand and address the different stages of consumption. The recent review by Cooper et al. on motivational models of substance use highlights a minimum of four motivations that vary with consumption (*heightening of positive feelings, coping, social cohesion and avoiding social rejection*) (Cooper, Kuntsche, Levitt, Barber & Wolf, 2015). Similarly, instruments such as the *Marijuana Motives Measure* (MMM) have been designed (Matalí Costa et al., 2018; Simons, Correia, Carey & Borsari, 1998), available in Spanish in an abbreviated version (Mezquita, Ruiz-Valero, Martínez-Gómez, Ibáñez & Ortet, 2019). This instrument proposes six categories of reasons for marijuana use (*promoting social cohesion, avoiding social rejection, increasing awareness and perception, routine, coping, heightening positive feelings*).

Recent studies have analyzed the relationship between specific motivations and the risk of problematic use (Buck-

ner, Walukevich, Zvolensky & Gallagher, 2017; Fox, Towe, Stephens, Walker & Roffman, 2011; Mezquita et al., 2019; Moitra, Christopher, Anderson & Stein, 2015), postulating its potential in forecasting how use may develop. However, the information on the relationship between motivations and problematic use in our context has been focused more on adolescents and less on adults, who have more heterogeneous contexts of use (Patrick, Bray & Berglund, 2016). Moreover, despite scientific evidence to warrant their involvement in the risks associated with cannabis use, motivations for consumption are currently not explored in systematic screening tools for high-risk and problematic users of cannabis. (López-Pelayo, Batalla, Balcells, Colom & Gual, 2015). Therefore, the relationship between the motivations among adults in our context to use cannabis and the patterns of use and problematic use is little explored at present.

The aim of this article is to describe the main motivation for the use of cannabis as reported by adults in a little studied cultural context such as the province of Barcelona, taking into account different environments of use (cannabis associations, universities, mental health outpatient clinics and leisure), and as a second step, to analyze its relationship with consumption patterns and the probability of problematic use. Based on the literature, our hypothesis is that coping motivations will correlate with more frequent and intense use and with a higher risk of problematic use.

Methodology

Sample

Between February 2015 and June 2016, cannabis users were recruited in four clinical and non-clinical environments in the province of Barcelona: university campuses, mental health outpatient clinics, leisure areas and cannabis associations. The selection criteria for participation were: 1) to have used cannabis in the previous 60 days; 2) to give consent for participation; and 3) to be at least 18 years old. Participants were excluded if: 1) they did not declare consent for participation; 2) presented cognitive impairment which would prevent them answering the questionnaire; and 3) presented linguistic barriers.

Recruitment and procedure

The volunteers were recruited on a convenience basis following a naturalistic approach. They were proactively approached in leisure spaces, cannabis associations and universities. In addition, health professionals in outpatient mental health centers referred patients after checking the selection criteria. Before starting the study, the interviewer informed the volunteers about the purpose of the study as well as to the anonymity and confidentiality of their data. In terms of participation, volunteers responded to a print-

ed questionnaire administered by an interviewer, mostly in the context in which they had been approached.

Instruments

For this study, a questionnaire was designed, and as part of its preparation, questions previously used in similar contexts were reviewed (Delegación del Gobierno para el Plan Nacional sobre Drogas, 2013; Delegación del Gobierno para Plan Nacional sobre Drogas, 2015; Villalbí, Suelves, Saltó & Cabezas, 2011). Questions related to the following variables were incorporated: 1) sociodemographic characteristics (sex, age, marital status, higher educational level, employment situation); 2) pattern and habits of cannabis use (frequency of use in the previous 30 days, frequency of use in the previous 12 months, number of joints smoked in the previous 30 days); 3) main motivation for cannabis use; 4) Cannabis Abuse Screening Test (CAST) (Legleye, Karila, Beck & Reynaud, 2007).

The CAST assesses potential problematic use by measuring the frequency of six events in the previous 12 months: 1) "Have you smoked cannabis before midday?", 2) "Have you smoked cannabis when you were alone?"; 3) "Have you had memory problems when you smoked cannabis?"; 4) "Have friends or family members told you that you should reduce or stop cannabis consumption?"; 5) "Have you tried to reduce or stop your cannabis use without succeeding?" and 6) "Have you had problems because of your cannabis use (argument, fight, accident, poor results at school, etc)?". All questions are answered using a scale which in its full version are equivalent to the following scores: "never"=0, "rarely"=1, "from time to time"=2, "fairly often"=3 and "very often"=4. CAST scores can range from 0 to 24 points, and have been linked to the probability of presenting problematic cannabis use as follows: low (≤ 3), moderate (4-6) and high (≥ 7) (Blankers et al., 2014).

To investigate the main motivation for cannabis use, it was decided to explore this variable by means of an open question ("What is your main reason for using cannabis?"). This was part of the heteroadministered questionnaire. For subsequent analysis, responses were categorized based on the categories proposed in the Marijuana Motives Measure (MMM) (Benschop et al., 2015, Simons et al., 1998), which classifies the motivations into six categories (translated into Spanish by Matalí Costa (Matalí Costa, 2015)): *Coping* – using cannabis to deal with negative feelings; *Enhancement* - to heighten positive feelings; *Social* - to improve social cohesion and support; *Conformity* - to avoid social rejection; *Expansion* - to expand awareness and perception; and *Routine* – out of habit or custom. The classification was carried out independently by two researchers (CC and CO). In the case of divergent encodings, the response was examined in order to agree on a single category. If the answer remained ambiguous or corresponded to more than one coding option, it was discarded (missing*).

Analysis

First, a descriptive analysis was carried out to determine frequencies and percentages for all qualitative variables collected. For quantitative variables, distributions were explored and, as a second step, means or medians established, along with corresponding standard deviations or interquartile ranges (IQR). Next, possible differences between the variables collected (sociodemographic variables, consumption pattern, quantity consumed and CAST score) by main motivation were described and analyzed. For this, the chi square test was used with categorical variables, while the U Mann-Whitney test was performed with quantitative variables. In a subsequent analysis, we explored how the number of joints smoked per day varied according to the main motivation for use, employing an Omnibus analysis and a Poisson-based distribution analysis to do so. Statistical significance was considered at p values equal to or below 0.05. Statistical analyses were performed with the SPSS program (IBM®, version 19).

Ethical considerations

The study protocol was approved by the Ethics Committee of the Hospital Clínico de Barcelona (HCB / 2014/0770). It was not necessary to obtain written informed consent because participation was anonymous and refusal to give verbal consent was an exclusion criterion. Study procedures were prepared in accordance with the Declaration of Helsinki (World Medical Association Declaration of Helsinki, 2013).

Results

Description of the sample

The questionnaire was answered by 468 cannabis users. For 433 participants, the main motivation for use was encoded using the categories proposed in the MMM (92.5% of the answers). Three categories stood out: e*nhancement* (35%), r*outine* (29%) and *coping* (25%). The other three categories (*social cohesion,* c*onformity,* and *expanding awareness and perception*) accounted for 11% in total (Table 1). For the analysis, these three categories were grouped as "other".

Participants were mainly young adults (median age 27 years, IQR 14), mostly men (n = 331, 76%) and single (n = 323, 75%). At the time of the survey, more than half of the sample (n = 307, 71%) said they had completed at least advanced secondary studies and were working (n = 239, 55%). The majority of users (n = 324, 75%) reported having used cannabis on more than 20 days in the previous month. On average, participants said they smoked 3 joints per day (IQR 3.5). According to CAST scores, the probability of presenting problematic use of cannabis was low in 10% of the sample (N = 41), moderate in 23% (N = 100) and high in 67% (N = 290). More details are displayed in Table 1.

The relationship between sociodemographic variables and reasons for use

Table 2 shows how there are statistically significant differences in the various motivations to consume depending on age, educational, employment, frequency of use, number of joints smoked daily, and the likelihood of problematic use (according to CAST). As regards the other participants, those whose main motivation puts them in the "coping" group are unemployed or without income to a greater extent (56% vs 37%, X^2 = 13.949, p = 0.001) and have a lower level of completed education (14% vs. 8%, X^2 = 6.330, p = 0.042) (Table 2). These users also turned out to be older than those who claimed to use cannabis mainly for the other reasons (29 years of age (IQR 14) vs 26 (IQR 16), U = 17144.5, p = 0.033).

The relationship between patterns of use, problematic use and the main motivation to use cannabis

There was a statistically significant difference in the number of joints smoked daily depending on the main motivation for use (Table 2). Regarding the other motivations, users who said they were smoking for coping reasons consumed a greater number of daily joints (3 joints (IQR 3.5) versus 4 joints (IQR 4), U = 15917, p = 0.007). Similarly, the omnibus test suggested a change in this variable according to the main motivation for use (F = 3.784, p = 0.002). The subsequent Poisson distribution test showed that only the 'coping' motivation obtains a statistically different result (p = 0.006) and suggests that this motive would increase daily consumption by 1.06 joints (95% CI 1.02-1.11) (data not shown in the tables).

The likelihood of problematic use according to CAST scores was also statistically different depending on the main reason for consumption (Table 2). In contrast to other motivations, users who reported consuming for 'coping' reasons were less likely to be classified as having a low probability of problematic use (6% vs. 11%), and, on the other hand, were more likely to be classified as having a high probability of problematic use (64% vs 77%) (Table 2).

Discussion

This study describes the use of cannabis by adults in the province of Barcelona, focusing on the main motivation for cannabis consumption in order to understand its involvement in patterns of use and possible problematic use. Three motivations stand out in our context: "heightening positive feelings" (35%), "habit" (29%) and "coping" (25%). For more than two thirds of users, the main reason to use cannabis are habit and positive sensations, but we also find that for 25% of users cannabis is a vehicle to alleviate emotional discomfort. Likewise, using cannabis to deal with emotional distress is the main reason for use among those with more intense and problematic patterns of use.

Table 1. *Descriptive statistics of the main motivation for cannabis use, sociodemographic variables and consumption pattern.*

		Coping		Heightening positive feelings		Social		Avoiding rejection		Expanding awareness and perception		Habit		Total	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Sex	Men	81	75	122	80	18	78	5	100	15	75	90	72	331	76
	Women	27	25	30	20	5	22	0	0	5	25	35	28	102	24
	Total	*108*	*100*	*152*	*100*	*23*	*100*	*5*	*100*	*20*	*100*	*125*	*100*	*433*	*100*
Marital status	Single	73	68	119	78	19	83	5	100	11	55	96	77	323	75
	Partner or married	26	24	24	16	4	17	0	0	8	40	23	18	85	20
	Separated / divorced / widowed or other	9	8	9	6	0	0	0	0	1	5	6	5	25	6
	Total	*108*	*100*	*152*	*100*	*23*	*100*	*5*	*100*	*20*	*100*	*125*	*100*	*433*	*100*
Highest educational level attained	None or primary	15	14	10	7	0	0	0	0	0	0	16	13	41	9
	Secondary	79	73	110	72	16	70	4	80	13	65	85	68	307	71
	Tertiary	14	13	32	21	7	30	1	20	7	35	24	19	85	20
	Total	*108*	*100*	*152*	*100*	*23*	*100*	*5*	*100*	*20*	*100*	*125*	*100*	*433*	*100*
Employment situation	Working	43	40	91	60	15	65	4	80	14	70	72	58	239	55
	Permanent disability	5	5	1	1	0	0	0	0	0	0	7	6	13	3
	Without work or income	60	56	60	39	8	35	1	20	6	30	46	37	181	42
	Total	*108*	*100*	*152*	*100*	*23*	*100*	*5*	*100*	*20*	*100*	*125*	*100*	*433*	*100*
Frequency of consumption in the last month	Fewer than 10 days	16	15	23	15	11	48	0	0	1	5	15	12	66	15
	Between 11 and 20 days	9	8	16	11	3	13	0	0	4	20	10	8	42	10
	More than 20 days	82	77	113	74	9	39	5	100	15	75	100	80	324	75
	Total	*107*	*100*	*152*	*100*	*23*	*100*	*5*	*100*	*20*	*100*	*125*	*100*	*432*	*100*
Problematic use according to CAST[a]	Low risk	7	6	19	13	6	26	0	0	3	15	6	5	41	10
	Moderate risk	18	17	39	26	11	48	0	0	5	25	27	22	100	23
	High risk	83	77	93	62	6	26	5	100	12	60	91	73	290	67
	Total	*108*	*100*	*151*	*100*	*23*	*100*	*5*	*100*	*20*	*100*	*124*	*100*	*431*	*100*
Age *(median and IQR[b])*		29	16	26	12	28	12	21	5	30	13	29	17	27	15
Joints smoked per day in the last month *(median and IQR[b])*		4.00	4.00	3.00	3.00	2.00	1.50	4.00	6.00	2.00	1.75	3.00	4.00	3.00	3.50

Note. [a] CAST: Cannabis Abuse Screening Test; [b] IQR: Interquartile Range; Missing data correspond to omissions.

In a framework of person- rather than substance-centered care, the motivation for use is an important variable that could improve the approach to cannabis use at the clinical and public health levels in order to minimize negative consequences and the most severe cases deriving from problematic cannabis use.

The relationship between motivations for cannabis use and the probability of presenting problematic use

In our sample, one out of every four users said they used cannabis mainly to cope with discomfort ("coping"). This category was associated with more intense consumption and a higher risk of problematic use. It is, therefore, the motivation for use with the greatest impact on health, and this is consistent with other studies such as that of Moitra et al. (Moitra et al., 2015), which found that US users aged 18 to 25 years who used cannabis to deal with discomfort had a 1.85 times higher probability of being diagnosed with cannabis use disorder, according to DSM-5, compared to those who did so for other reasons (OR = 1.85, 95% CI 1.31, 2.62, p <.01).

Other studies also link coping-related use with increased problematic use of cannabis in adults (Bujarski, Norberg & Copeland, 2012; Johnson, Mullin, Marshall, Bonn-Miller & Zvolensky, 2010) and highlight the modulating role that this motivation can have in users with greater anxiety and

Table 2. *Inferential analysis of the main motivations expressed for cannabis use (dependent variable) and independent qualitative variables (sociodemographic characteristics, consumption pattern and probability of problematic use).*

		Coping				Heightening positive feelings				Habit				Other motivations			
		No		Yes		No		Yes		No		Yes		No		Yes	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Frequency of use in the last month	Fewer than 10 days	50	15	16	15	43	15	23	15	51	17	15	12	54	14	12	25
	Between 11 and 20 days	33	10	9	8	26	9	16	11	32	10	10	8	35	9	7	15
	More than 20 days	242	74	82	77	211	75	113	74	224	73	100	80	295	77	29	60
	Total	325	100	107	100	280	100	152	100	307	100	125	100	384	100	48	100
	X^2	0.312				0.173				2.360				6.185			
	p value	0.856				0.917				0.307				0.045			
Highest educational level attained	None or primary	26	8	15	14	31	11	10	7	25	8	16	13	41	11	0	0
	Secondary studies	228	70	79	73	197	70	110	72	222	72	85	68	274	71	33	69
	Higher education	71	22	14	13	53	19	32	21	61	20	24	19	70	18	15	31
	Total	325	100	108	100	281	100	152	100	308	100	125	100	385	100	48	100
	X^2	6.330				2.378				2.285				8.860			
	p value	0.042				0.304				0.319				0.012			
Employment situation	Working	196	60	43	40	148	53	91	60	167	54	72	58	206	54	33	69
	Permanent disability	8	2	5	5	12	4	1	1	6	2	7	6	13	3	0	0
	Without work or income	121	37	60	56	121	43	60	39	135	44	46	37	166	43	15	31
	Total	325	100	108	100	281	100	152	100	308	100	125	100	385	100	48	100
	X^2	13.949				5.518				5.185				4.855			
	p value	0.001				0.063				0.075				0.088			
Problematic use according to the Cannabis Abuse Screening Test	Low risk	34	11	7	6	22	8	19	13	35	11	6	5	32	8	9	19
	Moderate risk	82	25	18	17	61	22	39	26	73	24	27	22	84	22	16	33
	High risk	207	64	83	77	197	70	93	62	199	65	91	73	267	70	23	48
	Total	323	100	108	100	280	100	151	100	307	100	124	100	383	100	48	100
	X^2	6.005				4.114				5.114				10.246			
	p value	0.050				0.128				0.078				0.006			

Note. Missing data correspond to omissions.

distress (Ecker & Buckner, 2014). Therefore, this motivation for use would not only appear to be a predictor of problematic use (Fox et al., 2011; Patrick et al., 2016) but could also indicate a greater degree of complexity in addressing consumption in specific cannabis users (Buckner et al., 2017).

Our results also show that users who consume mainly in order to cope are more often unemployed and have a lower educational level, which would in turn increase social vulnerability among these users. For this reason, it is relevant to identify these users at an early stage, when a motivational approach can have a great impact on the course of their lives and on their personal development. Studies like those of Matalí Costa show that even at early stages such as adolescence, coping-related use can be an indicator of a faster progression towards regular and more problematic use (Matalí Costa, 2015). This circumstance, added to the fact that cannabis use in adolescence produces greater and potentially irreversible damage to the organism, underlines the importance of early identification and intervention (Hall & Degenhardt, 2014; Patton et al., 2007)

Weaknesses and strengths

Among the potential weaknesses of the study, it should be noted that motivations were not assessed with a structured instrument which also allowed several motivations to be collected simultaneously. At the time of the design of this study, the MMM in Spanish had not yet been validated, so an open question was chosen to gather the main motivation. Although it does not allow for the exploration of motivation from a multidimensional point of view, this is also a strength in the sense that through an open question, the information obtained was less conditioned and more honest, thereby providing a better reflection of a less frequently document-

Table 3. *Inferential analysis of the main motivations expressed for cannabis use (dependent variable) and independent quantitative variables (age and number of joints smoked per day).*

	Coping		Heightening positive feelings		Habit		Other	
	No	Yes	No	Yes	No	Yes	No	Yes
Number of joints per day								
Median	3.00	4.00	3.00	3.00	3.00	3.00	3.00	2.00
IQR	3.50	4.00	3.50	3.00	3.25	4.00	3.50	2.50
Static U	15917		24042		21174		13514	
p value	0.007		0.932		0.728		0.002	
Age								
Median	26	29	28	26	26	29	27	25
IQR	14	16	15	12	14	17	15	10
Static U	17144.5		21929		19528.5		14924	
p value	0.033		0.060		0.074		0.040	

ed variable. To minimize potential interobserver variability, the assessment was carried out by two independent observers and in case of disagreement or ambiguity (less than 10% of the responses) the answers were discarded.

A further possible limitation of the study is that the assessment of cannabis use frequency was not precise enough to determine irregular use, although consumption was explored in the previous 30 days and the previous 12 months, thus matching the questions of other questionnaires applied with similar aims and in similar contexts (Bashford, Flett & Copeland, 2010; Delegación del Gobierno para el Plan Nacional sobre Drogas, 2009). The type of cross-sectional study used is another potential limitation, given that this design prevents the development of the individual's motivations and patterns of use, as well as the temporal relationship between them, from being observed. Finally, this study is part of a project which priority was to understand patterns of use among adults in our context. Therefore, both the procedure and the assessment instruments of this ad-hoc designed study may be more appropriate if the design is specifically aimed at analyzing the motivations for cannabis use. Due to the exploratory nature of the study, our results need to be confirmed with longitudinal studies designed for this purpose.

Strengths include the considerable sample size (> 450 participants), a wide variety of user profiles (recruited in four very different areas), a comprehensive assessment of cannabis use patterns and the likelihood of problematic use according to the validated CAST scale.

Implications of results

From a clinical perspective, our results show that exploring the motivations for cannabis use should be prioritized, especially in the case of coping motivation, since this is a possible indicator for early identification of users with a greater likelihood of suffering problematic use. At a clinical level, early identification of such users could improve their clinical treatment. Motivational interviewing has proven useful in the management of patients using cannabis (Blevins, Banes, Stephens, Walker & Roffman, 2016; Bonsack et al., 2008), with an exploration of the reasons for use playing a key role in this type of approach. The reasons for use, together with possible reasons for quitting, allow the exploration of ambivalence and the application of different strategies to increase the likelihood of change by helping to reduce consumption and its negative consequences. Also, exploring whether cannabis plays a role in alleviating discomfort could help in implementing more effective coping strategies. This user profile could benefit from strategies involving the management of emotions and coping with life events as a theoretical framework, for example, mindfulness (Garland & Howard, 2018; Li, Howard, Garland, McGovern & Lazar, 2017; Witkiewitz et al., 2014) or group therapy (Korshak & Delboy, 2013).

In terms of public health, it is essential to continue working on drug policies governing the accessibility of substances (probably aiming to reduce the number of users who consume out of habit), analogous to what has been done with tobacco, or diversify young people's leisure possibilities (potentially diminishing the number of users who consume to heighten positive emotions). However, our results suggest that such strategies will have less of an effect on those users with a more intense and problematic consumption pattern, mainly motivated by the desire to cope with discomfort. Therefore, an approach that includes emotional management training (*social and emotional learning programs*) as a preventive strategy could be useful for these patients (Hernández-Serrano, Espada & Guillén-Riquelme, 2016; Jones, Greenberg & Crowley, 2015; Payton et al., 2000; Socidrogalcohol, 2017).

Conclusion

The use of cannabis as an "escape route" leads to greater risks to health and greater social vulnerability. A motivational focus centered on the person is essential in particular to address those users for whom cannabis is an aid in coping with discomfort. It must be accompanied by preventive strategies (emotional management training) and therapeutic strategies (for example group therapy or mindfulness).

Finally, when patients report that their cannabis use is motivated by alleviating some type of distress it should set off alarms bells and guide us to a more detailed assessment of their consumption pattern. And inversely, those patients turning to professional help with intense or problematic consumption should be explored to determine whether cannabis plays a role in alleviating distress and should thus be helped with more effective coping strategies.

Contributions

Cristina Casajuana Kögel, Hugo López Pelayo, María Mercedes Balcells Oliveró and Antoni Gual Solé designed the study. Cristina Casajuana Kögel wrote the first version of the manuscript. All other authors contributed to the editing and final revision of the manuscript. All authors approved the final document.

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Conflict of interests

Hugo López Pelayo has received fees and travel grants from Lundbeck, Exeltis and Otsuka. María Mercedes Balcells Oliveró has received fees from Lundbeck. Antoni Gual Solé has received fees, research grants and travel grants from Lundbeck, Janssen, Pfizer, Lilly, Abbvie DyA Pharma and Servier. The aforementioned fees did not influence this article. The other authors declare that they have no potential conflicts of interest.

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