

# PERCEPTION OF HARM AND BENEFITS OF MARIJUANA AND ITS RELATIONSHIP WITH THE INTENTION OF USE AND CONSUMPTION IN COLOMBIAN ADOLESCENTS

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## ABSTRACT

**Objective:** analyze the relationship between the perception of harm and benefits associated with the use of marijuana and its relation to real consumption, as well as the intention to use it in a context of regulatory changes, in young students, between 15 and 17 years old, of a public school in Bogota Colombia.

**Method:** a quantitative, cross-sectional survey was carried out. 268 students in grade 9th to 11th from a public school in the city of Bogotá, Colombia participated of the study.

**Results:** results revealed that there is an association between the perception of benefits and the consumption of marijuana. In addition, how a low perception of risk is associated with an intention to use in a context of legalization.

**Conclusion:** this is one of the first studies in Colombia which explores the intention to use (at age 18) in a context of regulatory changes, as well as the attitude of young people towards the legalization of marijuana for medicinal and recreational use.

**DESCRIPTORS:** Cannabis. Adolescence. Marijuana abuse. Illegal drugs.

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# PERCEPCIÓN DE DAÑOS Y BENEFICIOS DE LA MARIHUANA Y SU RELACIÓN CON LA INTENCIÓN DE USO Y CONSUMO EN ADOLESCENTES COLOMBIANOS

## RESUMEN

**Objetivo:** analizar la relación entre la percepción de daños y beneficios asociados al consumo de marihuana y su relación con el actual consumo, así como con la intención de uso en un contexto de cambios regulatorios, en jóvenes entre los 15 y 17 años estudiantes de un colegio público en Bogotá, Colombia.

**Método:** se realizó un estudio cuantitativo, transversal tipo encuesta. Participaron 268 estudiantes de grado 9º a 11º de un colegio público de la ciudad de Bogotá, Colombia.

**Resultados:** los resultados mostraron que existe una asociación entre la percepción de beneficios y el consumo de marihuana. Adicional a que como una baja percepción de riesgo está asociada a una intención de uso en un contexto de legalización.

**Conclusión:** este es uno de los primeros estudios en Colombia que explora la intención de uso (a los 18 años) en un contexto de cambios regulatorios, así como la actitud de los jóvenes hacia la legalización de la marihuana para uso medicinal y recreacional.

**DESCRIPTORES:** Cannabis. Adolescencia. Abuso de marihuana. Drogas Ilícitas.

# PERCEPÇÃO DE DANOS E BENEFÍCIOS DA MACONHA E SUA RELAÇÃO COM A INTENÇÃO DE USO E CONSUMO EM ADOLESCENTES COLOMBIANOS

## RESUMO

**Objetivo:** analisar a relação entre a percepção de danos e benefícios associados ao consumo de maconha e sua relação com o atual consumo, bem como com a intenção de uso em um contexto de mudanças regulatórias, em jovens entre 15 e 17 anos, estudantes de um colégio público em Bogotá, Colômbia.

**Método:** realizou-se estudo quantitativo, transversal, tipo questionário. Participaram 268 estudantes do 9º ao 11º grau de um colégio público da cidade de Bogotá, Colômbia.

**Resultados:** os resultados mostraram que existe uma associação entre a percepção de benefícios e o consumo de maconha. Além disso, também demonstraram como uma baixa percepção de risco está associada a uma intenção de uso em um contexto de legalização.

**Conclusão:** este é um dos primeiros estudos na Colômbia que explora a intenção de uso (aos 18 anos) em um contexto de mudanças regulatórias, bem como a atitude dos jovens em relação à legalização da maconha para uso medicinal e de lazer.

**DESCRITORES:** Cannabis. Adolescência. Abuso de maconha. Drogas Ilícitas.

## INTRODUCTION

Drug use is a complex and heterogeneous phenomenon,<sup>1-2</sup> that changes over time.<sup>2-3</sup> Existing policies to combat the drug problem have not been effective, and for this reason it is currently stated that a change in the approach that should be oriented towards prevention is necessary.<sup>2,4-5</sup>

Some countries in the Americas are undergoing changes, and in this transition, marijuana has been the main protagonist. The medicinal use of marijuana has been legalized in some countries (United States, Canada, some members of the European Union), while the same has happened with recreational consumption in Uruguay and in some states of the United States. Colombia is no stranger to this transition: there is currently a bill in Congress that seeks to regulate the use and production of medicinal marijuana, which has already been approved in several debates.

Marijuana is the illicit drug used in the world, both by adults, young people and adolescents. In Latin America, the consumption of this substance has shown an important increase.<sup>6</sup> According to the Inter-American Drug Abuse Control Commission (CICAD-OAS) study on drug use in the Americas, in the hemisphere,<sup>4-5</sup> 21.26% of schoolchildren have used this substance at some time in their lives. However, there is great variability among countries and sub regions, for example in North America, 30.5% of schoolchildren have used marijuana in life, while in South America 9.9% of the young population and adolescents in school have used this substance in life, 7% in the last 12 months and 5% in the last year. The increase within the prevalence of consumption in the adolescent population is worrisome and may positively be thought-about a matter of public health interest.<sup>7</sup>

Regarding the Colombian context, the most recent study on the consumption of psychoactive substances carried out with the general population (12 to 65 years of age) revealed that the most frequently used illicit drug is marijuana (11% at some point in life, 3.2% last year, 0.6% last month); this study showed an increase in the use of this substance in comparison with the prevalence of life.<sup>8</sup> The last study conducted in 2011 was on the school population in Colombia, which showed that the substance with the greatest presence of consumption in young people is alcohol (life prevalence is 63.4%), followed by tobacco (24% at some point in life) and marijuana (7% at some point in life).

The possible harm and benefits of marijuana are currently the subject of great controversy. There is evidence about the possible medicinal benefits, especially for the management of some symptoms of chronic diseases.<sup>8-11</sup> However, there are studies that claim that this evidence has a moderate and exclusive quality for the management of pain and spasticity,<sup>12</sup> as it is not robust for the management of other symptoms.<sup>12-13</sup>

Regarding the damages associated with consumption, the picture is similar. On the one hand, there is evidence of neuron-anatomical changes associated with the marijuana use.<sup>14-15</sup> It has been found, for example, to be related to low white matter integrity.<sup>16</sup> In adults who have used this substance since an early age, there is a deterioration in the neuronal connectivity of some brain regions.<sup>13</sup> In contrast, there are studies that question the evidence regarding neuron-anatomical changes, because they found no differences (neither in adults nor in adolescents) between frequent consumers and non-consumers in hippocampus, amygdala or cerebellum volumes.<sup>17</sup> A recent study reported that cannabis use affects the glutamate transmission and synaptic plasticity.<sup>18</sup>

These possible effects compromises cognitive functions.<sup>19-20</sup> Moreover, it has been reported that a decrease of up to eight points in the IQ is associated with the frequent use since an early age.<sup>21</sup> However, the evidence regarding the impact on neuron-cognition should be clearer.<sup>22</sup> The side effects of marijuana use are not limited to neuron-anatomical and cognitive changes. The use of this substance has been reported as a predictor of risky sexual behavior in adolescence and recent evidence suggests a possible association between marijuana use and risky sexual behavior. Adolescents (n = 728; 33% female).<sup>16,23</sup> In a longitudinal study it was found that frequent users of marijuana have more

labor, social and economic difficulties than non-smokers.<sup>24</sup> An interesting result of this study is that people with dependency started drinking at an earlier age; this coincides with the previous results.<sup>23</sup>

However, despite the current evidence that calls into question some of the negative consequences, what is conclusive is that the harmful effects associated with the use of marijuana are more likely to occur if it starts at an early age<sup>13,24,23</sup> and that marijuana, alcohol and other substances consumption in adolescence brings school, legal, family and affective problems.<sup>25-26</sup>

The consumption of marijuana in adolescence happens due to multiple factors.<sup>27-28</sup> There are several theories that seek to explain the use of drugs in this stage of the life cycle;<sup>28-30</sup> most propose models composed of different domains, such as biological, intrapersonal, interpersonal and sociocultural.

Some researchers claim that socio-cultural is the most important factor,<sup>31-32</sup> while others highlight the individual field, which has been widely studied in particular with regard to the perception of consumption risk. There is an important evidence that a lower perception of risk is associated with a higher probability of consumption.<sup>28,33-34</sup>

Concerning Colombia, the last national study on alcohol and drug consumption<sup>8</sup> recorded that the perception of risk of marijuana use is lower in adults than in adolescents (72% vs. 65%). Other studies in the country have found a relationship between perceiving low risk with having consumed or having the intention to do so at a later age.<sup>35-36</sup> Although learning about the health-level risk of using marijuana has a small effect on consumption habit.<sup>36</sup>

Now, the regulatory changes regarding the medicinal and recreational production and consumption of marijuana have increased the interest in studying its effects, the possible change in the attitude towards consumption and the intention to use. In 2014, the annual study on substance use in adolescents in the United States<sup>7</sup> found a significant change in the attitude toward consumption, since the lowest levels of risk perception associated with marijuana consumption since 1991 were recorded in the school population.

During 1991 to 2011 a study in the United States did not find a significant increase in consumption in states where medicinal marijuana is legal.<sup>37</sup> With US data, other researchers reported that marijuana use in adolescents from 2002 to 2008 increased in states where the medicinal use of marijuana is legal and there is a lower perception of risk in comparison with the states in which these regulatory changes have not been presented.<sup>38</sup> A more recent study reported that the legalization of recreational marijuana is associated with an increase in use among young people who previously used it, but not in those young people who did not use it.<sup>39</sup> Similar results have been shown in the adult population.<sup>40</sup> It was not found an increase in consumption associated with regulatory changes in similar studies.<sup>41-42</sup>

All studies generally conclude that current information is not sufficient to infer causality between regulatory changes and this substance's consumption.

Regarding the intention to use in a possible context of regulatory changes, an investigation based on the data of five years (2007 to 2011) of the American annual study and estimated that of the group of young people who did not consume marijuana, the prevalence of consumption in life would increase by about 6% if the substance were legal. For those who had already used marijuana at some time in their lives, they assured that in a context of legalization of use 46% would continue using the substance with the same frequency and 18% would smoke marijuana more frequently.<sup>43</sup> However, there are few studies on the intention to use in a regulatory change context, so there is no clear evidence in this respect.

The present study analyzes the relationship between the perception of harms and benefits associated with marijuana consumption and its relation to real consumption, as well as the intention to use it in a context of regulatory changes, in young people between 15 and 17 years old from a public school in Bogotá, Colombia.

## METHOD

A quantitative, cross-sectional survey was carried out. The data in this study are part of a multicenter study conducted in nine countries (10 cities) in Latin America and the Caribbean. The data in this article correspond only to the Colombian sample.

Participated of this study, 268 students from grade 9th to 11th (46% men and 54% women) with an average age of 16 years old  $DE=$  from a public school in the city of Bogotá. The educational institution was selected at convenience. Students aged between 15 and 17 years who were enrolled in mixed public school selected, who had the ability to read and write in Spanish without needing any help and have made an informed consent and consent from their parents or legal representatives were taken into account in the inclusion criteria. The exclusion criteria were: students who do not wish or cannot provide informed consent or whose parents or legal representatives do not wish or cannot give their consent and/or do not have the ability to read and write in Spanish without assistance.

The data were collected through a protocol consisting of 23 items from two scales: a) CICAD's Inter-American Uniform Data System (SIDUC) for high school students and b) Monitoring The Future (MTF); and the complete Benthin Risk Perception questionnaire.<sup>44</sup>

*SIDUC* is a standardized methodology created to obtain data, construct concepts and provide answers on the consumption of psychoactive substances (SPA) used throughout the Americas and the Caribbean.<sup>6</sup> The (10) items on consumption behavior of this questionnaire were used. Questions were included about consumption frequency, friends' consumption and another about perception of risk of marijuana consumption which is measure through a Likert scale of four points (1 no risk, 2 slight risk, 3 moderate risk, and 4 great risk), being the lower scores indicates the lower the perception of the risk of cannabis use.

The MTF is a US survey designed by the National Institute on Drug Abuse to explore changes in values, behaviors and lifestyle orientations of American youth.<sup>7</sup> Three items were included to explore the general perception of damage related to the experimental and frequent use of marijuana and to assess marijuana use intentions in the context of regulatory changes and medical marijuana beliefs. *SIDUC* has also used questions in the Latin American context.

The Benthin Risk Perception<sup>44</sup> evaluates, through a seven-point Likert scale, the perception of risks and benefits regarding various behaviors. It has been widely used in studies that explore the perception of risk, harm and benefits of SPA consumption, which mostly report Cronbach's alpha equal to or greater than 0.70.<sup>45-46</sup> A modified version was used to assess the perceptions of participants regarding the harms and benefits related to the use of marijuana. A high score indicates a lower perception of risk and damage and a greater perception of benefits. For the Colombian sample, an average reliability was found ( $\alpha= 0.68$ ).

The study was carried out in two phases, describing each of them below.

First approval was requested from the Ethics Committee of the Center for Addiction Treatment and Mental Health, and, subsequently, the Ethics Committee of Investigations Division of the El Bosque University and the District Educational Institution, which is obtained in February of the year 2015. Afterwards, the informed consents were sent to the parents or legal representatives of the students accompanied by a letter from the school. The students had to give back the signed informed consent by the parents of the participants, they could bring it back before the date agreed for the application of the questionnaires or the day of the application.

Students who had their parents' consent could give their consent. Each student had to give the informed consent signed by the parents or legal representative to guarantee this process. All participants were informed that participation would be voluntary and that confidentiality will be maintained at all

time. After selecting the participants, the questionnaires were applied in the classrooms. The students completed the questionnaires anonymously.

All the ethical principles for investigation with minors established by Colombian law were taken into account. Voluntariness and confidentiality were guaranteed. Consent was obtained from the legal representatives of the children and assent of all the participants.

## RESULTS

Initially, it describes the prevalence of marijuana use, the intention to use this substance for medicinal and recreational purposes at the age of majority (18 years) in the context of regulatory changes and marijuana use attitudes.

The study included 268 9th to 11th grade students from two public schools, one located in Bogotá and the other in a nearby municipality of Bogotá. 46.4% of the participants were men and 53.6% were women, with an average age of 16 years ( $DE = .81$ ) and a range of 15 to 17 years old. From the total participants, 30.2% belonged to 9th grade, 38.2% to 10th grade and 31.3% to 11th grade.

Regarding the prevalence of marijuana consumption in the sample, it was found that 31% had used marijuana once in their lives, 22% in the last year (20% men, 24% women) and 10.8% in the last 30 days (10.5% men, 11.2% women). On the other hand, we found an average of 14 years ( $DT = 1.5$ ) old to the onset of marijuana use.

Regarding the intention of use at age 18 in a context of regulatory changes, 52% of the surveyed population reported that they would not use it even if it were legal, 36% would try it or continue using it and 12% said they did not know. On the other hand, the results revealed that close to half (46%) had a favorable position regarding the use of marijuana for medicinal purposes (46% men, 45% women) and 16% said that they agree with the additional use of this substance for medicinal and recreational purposes, while 26% reported that it should not be used in any context (22% men, 28% women).

### Association between perception of harm, benefits and prevalence of marijuana use

A binary logistic regression was carried out using the standard method to evaluate the association between the perception of harm and benefits associated with the marijuana use and the prevalence of life, last year and last month. It was found that the models were able to locate correctly marijuana use. For some time in life he correctly placed 69% ( $R^2 = 1.48$  Nagelkerke;  $\chi^2_{(2)} = 29,86$ ,  $p < 0.001$ ), 76% for the last year ( $R^2 = 1.86$  Nagelkerke;  $\chi^2_{(2)} = 34,56$ ,  $p < 0.001$ ) and 89% for the last 30 days ( $R^2 = 1.00$  Nagelkerke;  $\chi^2_{(2)} = 13,67$ ,  $p = 0.001$ ).

In reviewing the association between the perception of harm and benefits and the consumption of marijuana, it was found that the perception of damage does not present a significant association with consumption lifetime or last month, but it does have for the last year. With regard to the perception of benefits, the results showed that the greater perception of benefits was significantly associated with consumption in the three prevalence, particularly over the last 12 months, when it was found that a greater perception of benefits was associated with marijuana consumption (Table 1).

As seen in Table 1, the effect size given by the OR is low for the association between harm perception and consumption in the last 12 months ( $OR = 1.54$ ); while for benefits the effect size is greater, especially for the association with the year prevalence ( $OR = 2.0$ ).

**Table 1** – Association between perception of risk, harm and benefits and prevalence of consumption according to Logistic Regression, Bogotá 2014 coefficients.

Perception	Life prevalence		Prevalence Year		Prevalence month	
	B	OR	$\beta$	OR	$\beta$	OR
Harm	0.282	1.32	0.43	1.54*	0.38	1.46
Benefits	0.60	1.82†	0.66	2.0†	0.50	1.66*

\* $p < 0.05$ ; † $p < 0.001$ ,

### Association between intention of use and perception of risk according to frequency

Finally, the possible relationship between the perception of risk of marijuana consumption and the intention to use it (at age 18) in a context of regulatory changes was evaluated. To perform this analysis, the results were grouped into two groups, one composed of those who said they would not consume the substance (60%) and the other by those who affirmed their intention to try it or continue using it (40%). The people who answered “I do not know” were excluded from this analysis. A binary logistic regression was performed.

The results showed a significant association between the risk perception and the intention to use marijuana in a context of changes in regulations ( $R^2=1.53$  Nagelkerke;  $\chi^2_{(2)}=23,38$ ,  $p < 0.001$ ). However, this association was found only for a low perception of risk if the substance is used once or twice ( $OR= 1.74$ ,  $Wald= 8.92$ ,  $p=0.003$ ), but not for a low risk perception of occasional or frequent consumption. In general, a relationship has been found between intending to test it at the age of 18 or continuing to use it and having a low perception of risk if consumed with a low frequency.

## DISCUSSION

The objective of the study was to explore the perception of harm and benefits of marijuana and its association with consumption in high school students, as well as the intention to use it in a hypothetical context of regulatory changes. The results showed that there is an association between the perception of benefits and the use of marijuana for some time in life, as well as last year and last month, while the perception of harm/risk was associated only with consumption in the last 12 months.

These findings are another support for the relationship between low perception of harm / risk and marijuana use, as has been found by multiple research.<sup>7,28–33</sup> However, it is noteworthy that this association was found only for last year consumption. This may reflect a possible attitudinal change toward marijuana use in adolescents, as it has been registered in the United States.<sup>7,27</sup> In the Colombian context, in the last national study on alcohol and drug consumption,<sup>8</sup> it was found that the perception of risk of marijuana use was lower in the adolescents than in adults.

This finding should be taken into consideration when making prevention, as most programs and practices in Colombia have been aimed at increasing risk perception. Information about the physical damage associated with marijuana use has little effect on their use.<sup>36</sup> The results of this study show a relationship between the perception of benefits and the use of marijuana, therefore, at a preventive level, information should focus not only on harm and risks but also on beliefs associated with the benefits.<sup>36</sup> Similar to the results found in Colombia,<sup>36,47</sup> the results of this study reflect that a low perception of harm is associated with consumption, although this study provides new information since this relationship was only significant for the last year prevalence, in general the perception of risk of occasional consumption does not seem to be indicative of consumption for the Colombian sample. This finding brings with it prevention challenges, as most programs and practices in Colombia have focused on risk perception. The results indicate that prevention must take into account the belief regarding the criterion of frequency of use.

Another finding that draws attention is the high perception of risk of frequent marijuana use and high percentages of consumption compared to the national average of the study conducted in 2011.<sup>8</sup> It was found some time in life (National 7% vs. 31.3%), last 12 months (National 5.2% a 15% vs. 22.3%) and last month (National 2.8% vs. 10.8%). However, prevalence should be read with caution since the sample is not representative of the Colombian population.

This is one of the first studies in the country that explores the intention to use (at age 18) in a context of regulatory changes, as well as the attitude of young people towards the legalization of marijuana for medicinal and recreational use. Based on these findings, a low perception of risk associated with the use of marijuana once or twice has been associated with an intention to use it in a context of legalizing its use. These results are related to those reported by a study,<sup>39</sup> which indicates that recreational marijuana legalization is associated with increased use by people who have already used the substance. These findings suggest the importance of a differentiated and not necessarily universal orientation of prevention efforts, in addition to taking into account a health promotion perspective that reinforces non-marijuana behaviors to intervene in factors that protect young people from consumption.

The research has some limitations. First, the results should be interpreted with caution since the participants belong to a public school in Bogotá, therefore they do not represent the country's adolescents. Second, to explore the intention of use (to a majority of age) through hypothetical questions and in a cross-sectional study only allows speaking of relationships and not of causality. The ideal situation would be to perform studies such as the one where the possible changes in consumption are estimated with longitudinal data.<sup>43</sup>

## CONCLUSION

This research shows an association between the perception of benefits and the use of marijuana and explores the attitude of young people towards the substance and its possible intention of use in a context of regulatory changes. Despite the study's limitations, these results may be an x-ray of a possible youth attitudinal change that should be explored in greater depth, especially at this time when there is so much ambiguity about possible cannabis damage and benefits.

Although there is currently ambiguity in the information, the evidence of the risks associated with the use of marijuana in adolescence are consistent. For this reason, protecting minors through prevention is fundamental.

Adolescent prevention of substance use faces several challenges in the country as it has to conform to science standards and the historical context. Although there are several initiatives in Colombia, there are several deficiencies due to lack of resources, political will, training and research.

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## **NOTES**

### **CONTRIBUTION OF AUTHORITY**

Study design: Rodriguez MFR, Khenti A.

Data collect: Rodriguez MFR.

Data analysis and interpretation: Rodriguez MFR, Khenti A.

Discussion of the results: Rodriguez MFR, Khenti A.

Writing and / or critical review of content: Rodriguez MFR, Khenti A.

Review and final approval of the final version: Rodriguez MFR.

### **ETHICS COMMITTEE IN RESEARCH**

Approval was requested from the Ethics Committee of the Center for Addiction Treatment and Mental Health (CAMH) under the Reference Protocol code # 088/2014, with the approval date of October 28, 2014 and, subsequently, the Ethics Committee of Investigations Division of the El Bosque University and the District Educational Institution, which is obtained in February of the year 2015.

### **CONFLICT OF INTEREST**

There is no conflict of interest.

### **HISTORICAL**

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