Perception of the risk of medicinal marijuana in postgraduate medical residents [version 1; peer review: awaiting peer review]

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Abstract

Background: Drugs can often cause adverse reactions, and the perception of the risk of prescription drugs could influence prescription behaviour.

Methods: This was a prospective cross-sectional study of the perception of postgraduate physicians in training of the risk of using medical marijuana, comparing it with their perception of paracetamol and sedatives. A visual analogue scale with ranges from 0 (no risk) to 10 (totally risky) was used.

Results: A total of 197 postgraduate students were evaluated; 48 women and 149 men took part, with a mean age 27.8 years. Among the different specialties, there was a difference with regard to the perception of medical marijuana and paracetamol and all perceived a greater risk with sedatives. There was no evidence of a risk perception of marijuana in relation to factors such as alcohol consumption and smoking.

Conclusions: There is a difference in the perception of risk of medical marijuana and paracetamol with this perception being greater with sedatives. Regarding specialties, the perception of risk was greater for medical marijuana in general surgery than in urology.

Keywords
Risk perception, marijuana, México, postgraduate medical residents.
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**Introduction**

Multiple therapeutic uses have been proposed for marijuana; however, in Mexico, the legalization of its therapeutic and recreational use is currently in the process of being accepted. Cannabinoids have been used for the management of certain symptoms, such as nausea and vomiting induced by chemotherapy, appetite stimulation in patients with HIV/AIDS, chronic pain, spasticity induced by paraplegia or multiple sclerosis, and anxiety, sleep, psychosis, glaucoma and Tourette syndrome.

A systematic review and meta-analysis published by Whiting et al. in 2015 evaluated the benefits of using cannabinoids. They found moderate-quality evidence for the treatment of chronic pain and spasticity and low-quality evidence regarding nausea and vomiting due to chemotherapy, weight gain in HIV infection, sleep disorders and Tourette syndrome. However, cannabinoids were associated with an increased risk of adverse effects in the short term.

The risk perceived by doctors in training as specialists is important because they could be responsible for their prescription in the future. Their perception may be similar to the fear of prescribing morphine or underestimating the effect of anti-inflammatory drugs and paracetamol.

Continuing with the research on the risk perception toward drugs, the objective of this study was to assess the perception of risk to medicinal marijuana in postgraduate medical residents of an academic hospital and compare this with the risk perception of paracetamol and sedatives.

**Methods**

**Subjects and recruitment**

This was a cross-sectional study that was carried out during May 2017 in the Dr. Jose E. Gonzalez University Hospital in Monterrey, Mexico, an academic hospital that cares for uninsured patients from three north-eastern states in Mexico. The objective was to evaluate the perception of the use of medical marijuana in postgraduate medical residents. The study protocol was previously approved by the Ethics Committee of the Universidad Autonoma de Nuevo Leon, registration number PL17-00134. We used a convenience sample of residents in postgraduate training from diverse specialties in our institution. A total of 197 medical residents from 8 medical specialties were included (anesthesiology, 34; general surgery, 34; traumatology, 20; neurosurgery, 15; urology, 14; otorhinolaryngology, 11; gynecology, 29; and internal medicine, 40). Participants were recruited and assessed in-person in offices, operating room and halls of the hospital. Individuals were assessed to determine if they met the inclusion criteria (postgraduate students in training in a medical specialty of both sexes, regardless of age, who accepted to participate in the study). Only those who did not wish to participate were excluded. After accepting, information about the study was provided and informed consent was obtained. Verbal consent was used because of the low-risk of the study.

**Survey**

A survey consisting of two sections was applied (the Spanish and English versions of the survey are available on Figshare).

Section 1 included general data collection questions such as age, sex, marital status, city of residence, place of birth, and time living in the city. Also, current health problems, smoking and active alcohol consumption, level of education, name of the specialty they were training in, the current semester of study, Economic income and the participant’s name, as optional data, were asked. Section 2 consisted of a 10-centimeter long line that represented the level of risk that they felt a drug could have. The respondent had to mark with an X the level of risk, considering the left side as being completely safe and the right as completely unsafe. The drugs evaluated were paracetamol, medical marijuana and sedatives. Text regarding the three drugs was arranged in three different ways in each questionnaire to avoid influencing the respondent’s decision; afterwards, the median response in centimetres was considered.

**Statistical analysis**

Statistical analysis was performed with the SPSS statistical program, version 20. Descriptive statistics of the total sample were calculated. Risk perception was reported as median with interquartile ranges. The Kruskal-Wallis test followed by a Dunn post hoc test was used to determine the difference among the different medical services. The Mann-Whitney U-test was used to compare the perception of the three drugs between smokers and non-smokers and between alcohol consumers and non-consumers.

**Results**

**Sample characteristics**

A total of 197 postgraduate medical students were evaluated; there were 48 women and 149 men with a mean age of 27.8 years (range 25 to 32). The percentage of surveyed participants according to the year of residence was 26.9% for the first year, 29.4% for the second year and 43.7% for >3 years of training. The frequency of self-reported smoking was 24.4% while for self-reported drinking it was 81.2%.

**Risk perception of medicinal marijuana, paracetamol and sedatives**

Overall, the risk perception of medical marijuana was 3 cm (IQ range = 1–5 cm) which we consider as risk perception of medium grade; for paracetamol it was 1 cm (IQ range = 1–2) which we consider as a risk of low grade, and for sedatives, 5 cm (IQ range= 4–8 cm) which we consider as a risk perception of high grade. There was a significant difference in the risk perception among the three drugs studied (p<0.01).

The risk perception according to specialty shows that all specialties studied have a greater risk perception to sedatives than to the other drugs studied (p<0.01). In this sense, the drug with the lowest risk perception was paracetamol (Table 1). Among the specialties, general surgery had the highest risk perception to medical marijuana while urology had the lowest risk perception (p<0.01). In the case of paracetamol, general surgery residents also had the highest risk perception (2 cm), while that rest of the specialties had lower risk perception (from 1 to 1.5 cm) (p= 0.04). In the case of sedatives, there no were a significant difference in risk perception between the residents of each specialty (Table 2).
Table 1. Kruskal-Wallis test comparing the medians of the different medical services. Values are given as median (IQ range).

| Medical service       | Medical marijuana risk, cm | Paracetamol risk, cm | Sedatives risk, cm | P value |
|-----------------------|-----------------------------|----------------------|-------------------|---------|
| Anesthesiology (N=34) | 3.50 (1.75–5.25)            | 1.5 (1–3.3)          | 5.0 (2–8)         | <0.01   |
| General Surgery (N=34)| 5 (3–6)                    | 2.0 (1–3)            | 6.5 (5–8)         | <0.01   |
| Traumatology (N=20)   | 2 (1–3)                    | 1 (1–1.8)            | 6 (4.3–8)         | <0.01   |
| Neurosurgery (N=15)   | 3 (1–5)                    | 1 (1–1)              | 4 (4–6)           | <0.01   |
| Urology (N=14)        | 1 (1–3.5)                  | 1 (1–1.3)            | 5 (4–7.5)         | <0.01   |
| Otorhinolaryngology (N=11)| 3 (1–3)           | 1 (1–2)              | 5 (5–8)           | <0.01   |
| Gynecology (N=29)     | 3 (1–6)                    | 1 (1–1)              | 5 (4–8)           | <0.01   |
| Internal medicine (N=40)| 4 (1.25–5)       | 1 (1–2)              | 5 (3–5.8)         | <0.01   |
| P value               | <0.01                      | 0.04                 | 0.15              |         |

Table 2. Mann-Whitney U-test comparing the variables medicinal marijuana, paracetamol, and sedatives in alcohol users, non-alcohol users, smokers and non-smokers.

| Drug               | Alcohol user, median cm (Q1–Q3) | Non-alcohol user, median cm (Q1–Q3) | P value* | Smoker, median cm (Q1–Q3) | Non-smoker, median cm (Q1–Q3) | P value† |
|--------------------|---------------------------------|-------------------------------------|----------|---------------------------|-------------------------------|---------|
| Medicinal marijuana| 3 (1–5)                         | 4 (2–5)                             | 0.16     | 3 (1–5)                   | 3 (2–5)                       | 0.107   |
| Paracetamol        | 1 (1–2)                         | 1 (1–3)                             | 0.08     | 1 (1–2)                   | 1 (1–2)                       | 0.367   |
| Sedatives          | 5 (4–8)                         | 5 (4–6)                             | 0.27     | 5 (4–7)                   | 5 (4–8)                       | 0.591   |

*Alcohol user vs non-alcohol user. †Smoker vs non-smoker.

Risk perception by self-reported smokers and self-reported alcohol consumption
Both groups, smokers and non-smokers, had a greater risk perception of sedatives than other drugs. The risk perception of medical marijuana (p=0.11), paracetamol (p= 0.37) and sedatives (p= 0.59) was not statistically different between smokers and non-smokers (Table 2). In the case of self-reported alcohol consumption, sedatives also had the greatest risk perception in both alcohol users and non-alcohol users. There was no significant difference between groups in the risk perceived for medicinal marijuana, paracetamol and sedatives.

Discussion
In this study, we evaluated the risk perception of medical marijuana in medical residents of several specialties in Monterrey, Mexico. To our knowledge, this is the first study in medical residents. Overall, the risk perception of medical marijuana was 3 cm. We consider that the perceived risk to medical marijuana is medium, since medical marijuana, in reality, is still under study for the treatment of some diseases; therefore, its use should be cautious. The low risk perception may also suggest that medical residents have a favourable attitude towards medicinal marijuana and thus, a willingness to recommend it. The latter should be evaluated in other studies.

We previously evaluated the risk perception toward medicinal marijuana in undergraduate medical students. The risk perception of the use of paracetamol, marijuana and sedatives is the same in graduate students and undergraduate students. However, in this previous study, the risk perception of medical marijuana in undergraduate students was different between smokers and non-smokers and between alcohol and non-alcohol users.

One of our limitations is that only the degree of risk perception was assessed; however, the degree of knowledge, which is an objective of future research, should be contemplated by other studies. It is worth mentioning that the lack of knowledge of drugs has been associated with a negative attitude to prescribing them, as in the case of opioids (opiophobia). There is evidence of knowledge of the potential risks of medical marijuana and recommendations have been made for medical marijuana use in patient care in the United States. In Mexico there are no studies that have evaluated the knowledge and experience in the use of medical marijuana in patient care nor a legal basis for it.

Conclusions
Risk perception to medical marijuana in medical residents of Monterrey, Mexico is 3 cm (IQ range = 1-5 cm) which we consider as a risk perception of medium grade. Among the different specialties, there was a difference with regard to the perception of risk of medical marijuana. There was no difference between smokers and alcohol users in risk perception. The
degree of knowledge toward medicinal marijuana is an objective of future research in medical students and postgraduate medical residents.

Data availability

Underlying data

Figshare: Raw data and survey of risk perception to medical marijuana of medical residents. https://doi.org/10.6084/m9.figshare.7742723.v1.

Underlying data for this study are available in file “Raw data Risk perception of medical marijuana in Postgraduate medical residents.xlsx”.

Extended data

Figshare: Raw data and survey of risk perception to medical marijuana of medical residents. https://doi.org/10.6084/m9.figshare.7742723.v1.

The following extended data are available:
- Survey Risk perception of Medicinal marijuana Mexico.pdf (English translation of questionnaire).
- Survey Risk perception of Medicinal marijuana Mexico.pdf (Original Spanish-language questionnaire).

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

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