



Keywords

Cannabis,
Illicit Drug,
Impact on Physical,
Mental,
Social Health,
Ordinary,
Hazardous,
Problematic Use

Received: July 30, 2017

Accepted: December 9, 2017

Published: January 20, 2018

Impact of Cannabis Consumption on Health and Occupation

Janis Dundurs¹, Johannes Gutknecht²

¹Department of Occupational and Environmental Health, Riga Stradins University, Riga, Latvia

²Faculty of Medicine, Riga Stradins University, Riga, Latvia

Email address

janis.dundurs@rsu.lv (J. Dundurs)

Citation

Janis Dundurs, Johannes Gutknecht. Impact of Cannabis Consumption on Health and Occupation. *Health Sciences Research*. Vol. 5, No. 1, 2018, pp. 14-28.

Abstract

Cannabis is the number one consumed illicit drug globally. The aim of the study was to analyze the socio-demographic data of the cannabis users in Latvia and in Germany, their professional status and to evaluate the proportion of people whose cannabis consumption could be classified as hazardous or problematic. A 38 item questionnaire was designed to categorize cannabis users into the categories *ordinary*, *hazardous*, and *problematic use*. Early “first- in- lifetime- use” could be associated with hazardous or problematic use in both countries. Both hazardous and problematic use is associated with negative impact on occupation. Tools have to be readily available to assess the use by the consumer, and specific programs for treatment of use disorders should be accessible.

1. Introduction and Aims of the Study

Cannabis by far is the number one leading illicit drug globally, with an estimated 180 million people in the age of 15 to 64 years having used it in 2013 (UNODC 2015). This corresponds to a global prevalence of 3.8 per cent (range: 2.7-4.9 per cent). [1] Even though it remains an illicit drug in most countries in Europe, the consumption of herbal cannabis becomes more popular in many countries in the EU. [2] In several countries around the world, cannabis has become a legal and freely available product during the past years, and by now, four states in the US have legalized cannabis consumption for both medical and recreational purposes. [3] Also in Germany, drug policy concerning cannabis is being under constant discussion, as recent efforts have been made in Germany by people and organizations to legalize the use of marijuana for medical and recreational purposes.

Nevertheless, the demand for treatment of cannabis use disorders and associated health conditions also is increased in high- and middle-income countries, and there has been increased attention to the public health impacts of cannabis use and related disorders in international policy dialogues. [4]

Cannabis use also is a significant topic in the medical field considering substance abuse, studies show that cannabis use is reported as the leading reason for people seeking substance abuse treatment, and is second only to alcohol as a reason for treatment entry. [5] Considering that recreational cannabis use is widespread in all socioeconomic levels, it is important to understand the extent of the impact of cannabis use on the social and personal health. Cannabis misuse is linked to several health concerns, and also is suggested to have an unmeasured impact on the occupational capacities.

The survey conducted in the course of this paper aims to assess for the impact of cannabis users on their daily life and social health. People were asked questions which aim to analyze the cannabis use, identify problematic consumption and the impact on the

occupation. It is the aim to identify the prevalence of problematic cannabis use among recreational users. The association of possibly hazardous or problematic cannabis use to other risk factors, such as early first-in-lifetime-use, cigarette smoking and alcohol consumption shall be examined as well as the primary motivation to use the drug. The study was designed to analyze the current (past 12 months) use pattern of cannabis, thereby making it possible to detect hazardous or problematic use of cannabis, and the possible appearance of occupational problems linked to that. The study aims to assess the degree of consumption of cannabis users in Germany and in Latvia, with the goal to compare and account for possible differences in the extent and impact of cannabis consumption.

2. Methods and Materials

The high prevalence of cannabis use, especially in young age in Germany and Latvia as well as the fact that cannabis misuse is the number one reason for entry into treatment led to the following survey conducted in Latvia and Germany.

2.1. Study Design

We conducted a retrospective cohort study using a questionnaire with a total sample size of 68 subjects in Germany and Latvia. In Germany, the sample size was $n=26$, in Latvia, the sample size was $n=42$. The sample size of the study was not limited in number of participants per se, but was only limited by the readiness of the users to fill in the questionnaire.

2.2. Questionnaire

People were randomly asked to fill in the questionnaire if it applied to them (i.e. if they consumed cannabis in the past 12 months). The questionnaire was created using google forms, and then distributed using social media such as Facebook, or Whatsapp.

The questionnaire was designed following already established testing systems which are used in different countries to assess for cannabis use and misuse. Additionally, adequate questions were formulated and added to the questionnaire to account for statistical data and to also inquire for the motivation of use and possible risk factors associated with cannabis misuse.

Altogether, the questionnaire contained 38 items, of which 5 SDS (the Severity of Dependence Scale), 6 CAST (Cannabis Abuse Screening Test), 8 CUDIT-R (Cannabis Use Disorder Identification Test- Revised), 8 PUM (8 item tool used in Poland). Effectively, 7 PUM questions were contained in the questionnaire, as question 6 of PUM and question 2 of CAST are identical. In the scoring process, this was taken into consideration, and question 2 from CAST was also added to the evaluation of the "missing" question 7 in PUM. Additionally, 5 questions were asked in section 1, and 6 questions were asked in section 6, inquiring for general and

additional information as explained in the following.

2.2.1. Section 1- General Information

In the first section of the questionnaire, 5 items were asked about including gender, age, occupation, study program (if applicable), and age at first cannabis use.

2.2.2. Section 2 -SDS

The Severity of Dependence Scale (SDS) is a short 5 item questionnaire developed originally as a tool to identify problematic heroin use, but has been showed to be adaptable to multiple illicit drugs. It has been modified to assess for the cannabis consumption of the past month. The questionnaire is usually handed out to patients seeking treatment for cannabis consumption prior to the beginning of the course. It is used in the questionnaire to additionally be able to identify possible cannabis dependence.

Scoring is done by adding the points distributed to each questions with a possible score range of 0-15 points, a score of ≥ 7 is suggestive positive for cannabis dependence. SDS has been tested for consistency, giving a sensitivity and specificity of 97.9% and 94.2%, respectively. [6]

2.2.3. Section 3- CAST

CAST (Cannabis Abuse Screening Test) is a questionnaire analyzing the cannabis use in the past 12 months. It is mainly used in France, and consists of 6 questions asking about the pattern of use (smoking before midday or when alone), the experience of memory problems after use, past trials to cease cannabis use, or social impact of the use (arguments with family/ friends, bad results at school or work).

The scoring is based on Yes/ No answers, ≥ 2 positive answers indicate hazardous use, while ≥ 3 positive answers indicate problematic use.

An additional question was placed in this section, asking about whether there had ever been a time where cannabis use had a negative impact on a part in their life, with options to specify. CAST has been tested for sensitivity (92.9%) and specificity (81.4%). [7]

2.2.4. Section 4- CUDIT-R

The CUDIT-R (Cannabis Use Disorder Identification Test- Revised) assesses for problematic cannabis use in the past 6 months, and is an 8 item questionnaire. It was designed to identify possible cannabis use disorder according to DSM-IV. It is also applicable to DSM-5. [8] The questions ask about the pattern of use (how often is cannabis used and how much time is spent being "high" or getting the drug), the impact of the use (memory impairment, failure to meet expectations, hazardous or risk taking behavior), and the motivation of the user to stop the consumption.

The answers are given points from 0- 4, leading to a score with a possible range of 0-32 points, a score of 8 or more than 8 indicates hazardous cannabis consumption, whereas a score of equal or more than 12 points to a possible cannabis use disorder.

CUDIT-R has been tested for consistency, giving a

sensitivity and specificity of 91% and 90%, respectively. [9]

2.2.5. Section 5- PUM

The PUM is an 8 item tool used in Poland, and has showed a high specificity (sensitivity) in detecting problematic cannabis use, which is why it was included in the design of the survey. It assesses for the cannabis use in the lifetime, and measures harmful use along with problems in interpersonal relationships and psychosocial functioning. [9]

The points distributed in the score are added, giving a possible range of 0- 8 points. A score of ≥ 3 is considered optimal for identifying cannabis problems in both sexes.

The sensitivity for PUM is 80.9%, and the specificity is 87.5% [7]

2.2.6. Section 6- Additional Questions

Apart from the aforementioned questions about problems caused by cannabis, six more questions were asked, including about the use of any other illicit drug, or about smoking and alcohol consumption status. These questions were asked to assess for possible influencing factors for cannabis use. Also, it was asked whether the user had ever seen professional help for his cannabis consumption, and to choose the most important reasons for their cannabis use.

2.2.7. Isolation of Occupationally Relevant Questions

The questionnaire contained several questions to assess for the impact of cannabis consumption on the occupation. These questions were again isolated and viewed separately to analyze the impact of the use on the daily routine related to the occupation of the individuals.

The questions isolated were question 1 of PUM (being late in school or at work), question 5 of PUM about having more and more trouble in understanding new information. This capacity is vital in most jobs, and as the majority of the participants were students and the ability to understand new information is vital, it is considered adequate to include this option in the analysis of negative impact in employment. Also included was a general question whether cannabis had a negative impact on different fields in life. The option “work,

studies, or employment” was isolated to evaluate this field separately.

2.2.8. Statistical Data

The data has been analyzed using the scoring systems for the respective questionnaires contained in the study (i.e. SDS, CAST). The scoring demanded manual evaluation of the questionnaires.

As different preexisting scales were used with different grading systems, an own evaluation system for the categorization of the users was designed:

To classify consumer's use pattern as inconspicuous or ordinary, they had to score negatively in all four scales used. If a user scored above the threshold for hazardous use in either CAST (i.e. ≥ 2) or CUDIT-R (i.e. ≥ 8) or in both of them, their consumption pattern was classified as hazardous. Additionally, if a user scored positive for one of any of the scores plus CAST or CUDIT-R in the “hazard range” (i.e. ≥ 2 or ≥ 8 , respectively), their use was also classified as hazardous.

If users scored positive in one of the scores plus in the “problematic range” of CAST and/or CUDIT-R (i.e. ≥ 3 in CAST, and ≥ 12 in CUDIT-R), their use pattern was classified as problematic.

For evaluation of the questions, cross tabulations have been made using Microsoft Excel and vassarstats.net with a cutoff range of 95%. Chi² test and Fisher exact test have been used for the contingency tables, with a two-sided p- value of <0.05 being considered statistically significant.

3. Results

The results shall be reviewed section-wise, to account for the different scoring systems applied. The results shall be reviewed in the same order as introduced in the preceding part.

3.1. Section 1- General Information

Age

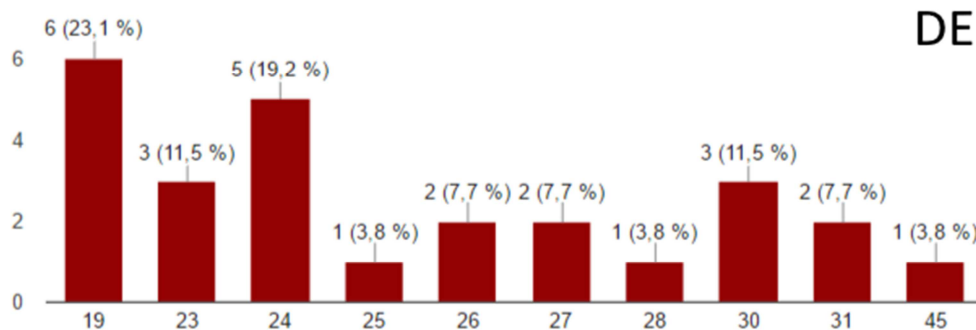


Figure 1. Age distribution of study participants in Latvia.

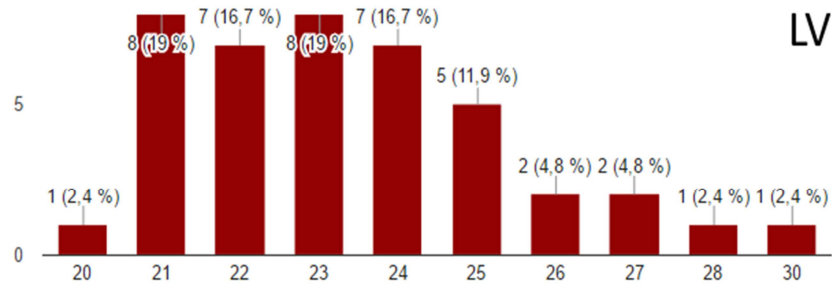


Figure 2. Age distribution of participants in Germany

In Germany, the mean age of the participants in the survey was 25.35 years (19-45 years), in Latvia the mean age was 23.40 years (20-30 years).

Gender

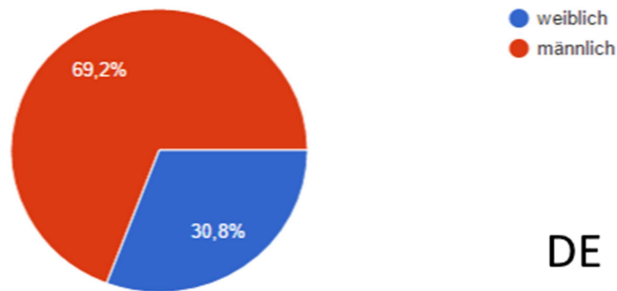


Figure 3. Gender distribution of study participants in Germany.

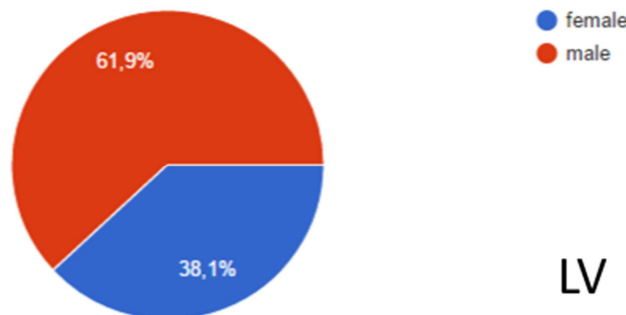


Figure 4. Gender distribution of study participants in Latvia.

Table 1. Gender distribution of participants in Germany and Latvia.

	Female	Male
Germany	8 (30.8%)	18 (69.2%)
Latvia	16 (38.1%)	26 (61.9%)

Fisher exact test (two- tailed): p 0.3642

Occupational status

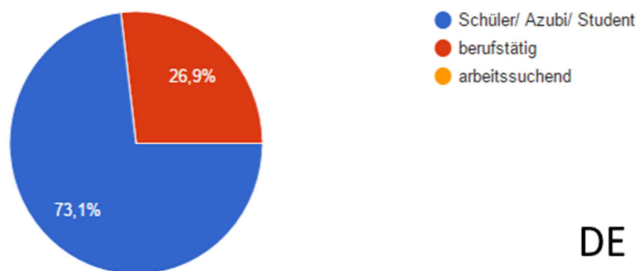


Figure 5. Occupational status of study participants in Germany.

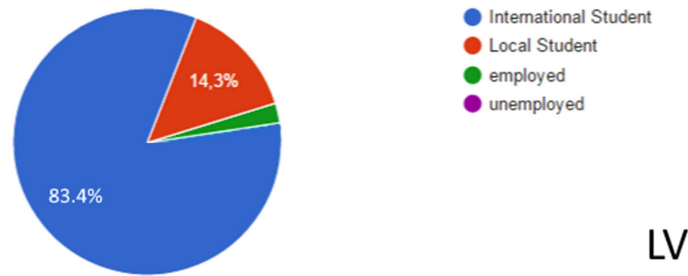


Figure 6. Occupational status of study participants in Latvia.

Table 2. Occupational status of participants in Germany and Latvia.

	Students	Employed
Germany	19 (73.1%)	7 (26.9%)
Latvia	41 (97.7%)	1 (2.3%)

Fisher exact test (two- tailed): p 0.0039

3.2. Section 2- SDS

In SDS, a score of ≥ 7 is considered positive, thus indicating cannabis dependence.

Table 3. SDS score of participants in Germany and Latvia.

	negative <7	positive ≥ 7
Germany	24 (92%)	2 (8%)
Latvia	40 (95%)	2 (5%)

Fisher exact test (two- tailed): p 0.4960

3.3. Section 3- CAST

In the CAST questionnaire, scoring is based on two levels. A score of ≥ 2 is indicative for hazardous use of cannabis, while a score of ≥ 3 is suggestive for problematic use.

Table 4. CAST score of participants in Germany and Latvia.

	negative <2	positive ≥ 2	≥ 3
Germany	13 (50.0%)	4 (15.4%)	9 (34.6%)
Latvia	19 (45.2%)	8 (19.1%)	15 (35.7%)

Chi² test value: 0.2 df: 2 p: 0.9048

3.4. Section 4- CUDIT-R

Similarly to CAST, CUDIT-R is also subdivided into two levels of cannabis misuse. A score of ≥ 8 is suggestive of hazardous cannabis use, and a score of ≥ 12 indicates problematic cannabis use.

Table 5. CUDIT-R score of participants in Germany and Latvia.

	negative <8	positive ≥ 8	≥ 12
Germany	17 (65.4%)	5 (19.2%)	4 (15.4%)
Latvia	26 (61.9%)	7 (16.7%)	9 (21.4%)

Chi² test value: 0.4 df: 2 p: 0.8187

3.5. Section 5- PUM

In the PUM scale, a score of ≥ 3 indicates problematic cannabis use.

Table 6. PUM score of participants in Germany and Latvia.

	Negative <3	Positive ≥3
Germany	17 (65.4%)	9 (34.6%)
Latvia	27 (64.3%)	15 (35.7%)

Chi² test value: 0.03 df: 1 p: 0.8625

3.6. Interpolation and Categorization of Results

Interpolation of the scores was necessary for the sake of easier evaluation. The results after interpolation allowed for a specific categorization of the cannabis use pattern.

Table 7. CAST score of participants in Germany and Latvia.

	Ordinary use	Hazardous use	Problematic use
Germany	11 (42.3%)	8 (30.8%)	7 (26.9%)
Latvia	17 (40.5%)	9 (21.4%)	16 (38.1%)

Chi² test value: 1.17 df: 2 p: 0.5571

Table 8. Relation of use pattern and gender in Germany and Latvia.

Gender	Female			Male		
	Ordinary	Hazardous	Problematic	Ordinary	Hazardous	Problematic
Germany	3	3	2	7	5	6
Latvia	8	2	6	9	7	10

Fisher exact test (two- tailed): Germany: p 0.9999
Latvia: p 0.5555

Table 9. Extent of use in relation to use pattern in Germany and Latvia.

Frequency of consumption	Germany			Latvia		
	Ordinary	Hazardous	Problematic	Ordinary	Hazardous	Problematic
1x/month or less	10	2	2	14	3	1
2-4x/month	1	6	-	3	4	5
2-3x/week	-	-	-	-	1	5
4x/week or more	-	-	2	-	1	5
daily	-	-	3	-	-	-

To be able to assess the statistical relevance of the correlations by the Fisher exact test, consumption frequencies have been categorized into three groups: low- grade use (1x/ month or less and 2-4x/ month), intermediate use (2-3x/ week) and high-grade use (4x/ week and daily).

Fisher exact test (two- tailed): Germany: p 0.0003
Latvia: p 0.0004

3.7. Section 6- Additional Questions

Motivation of use

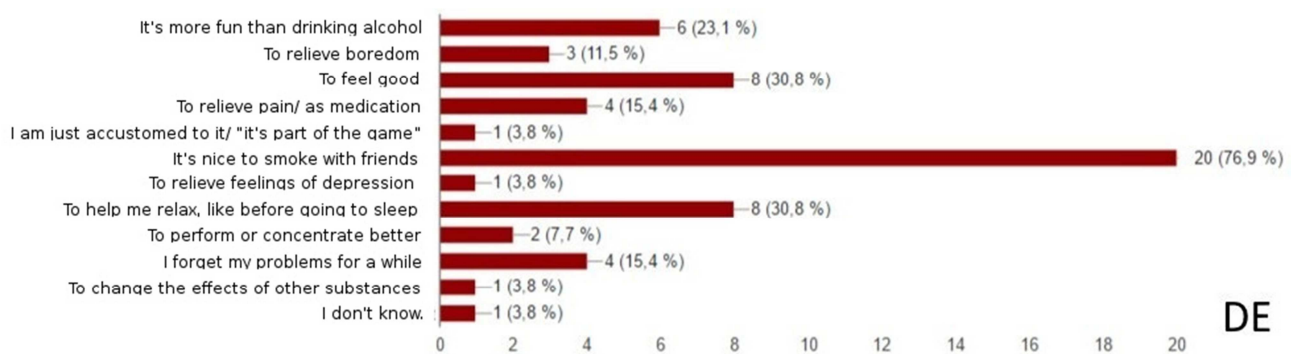


Figure 7. Motivation of cannabis use of study participants in Germany.

DE

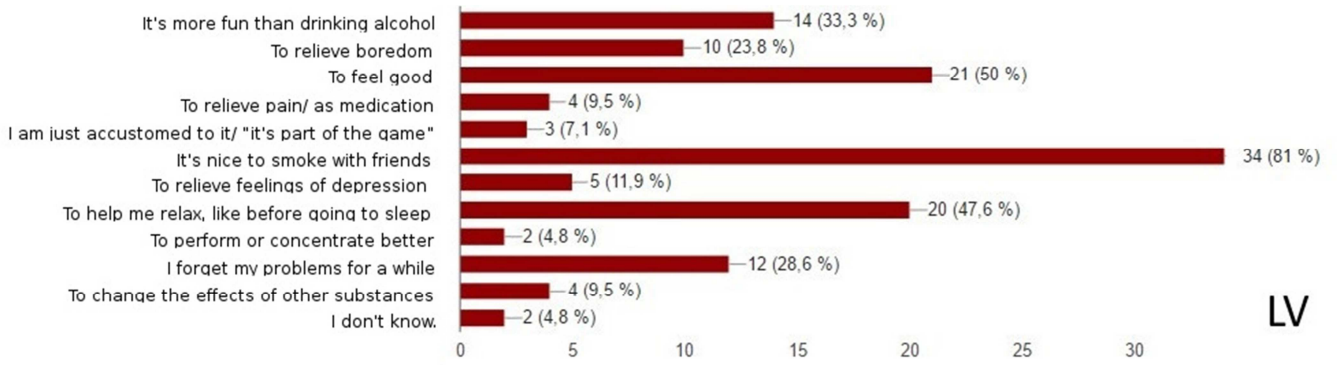


Figure 8. Motivation of cannabis use of study participants in Latvia.

In this question, participants were asked to choose up to three options which best describe their main motivation for cannabis consumption. In both countries, most participants stated to use cannabis because “It's nice to smoke with friends”, with 76,9% in Germany and 81% in Latvia.

The second most common reason in both countries is “to feel good/ better”, with 30,8% in Germany and 50% in Latvia choosing that option.

The third most common reason in Germany, also with 30,8%, is “to help me relax, like before going to sleep”. The same reason is the third most common answer in Latvia as well, with 47,6% of the participants choosing that option.

The answer options displayed in the graphic above are (from top to bottom): It's more fun than drinking alcohol- To relieve boredom- To feel good- To relieve pain/ as medication- I am just accustomed to it/ “it's part of the game”- It's nice to smoke with friends- To relieve feelings of depression- To help me relax- To perform or concentrate better- I forget my problems for a while- To change the effects of other substances- I don't know.

Age at first use of cannabis

Table 10. Age at first use of cannabis of study participants in Germany and Latvia.

	Ordinary use	Hazardous use	Problematic use
Germany	18.18 years	16.25 years	16.57 years
Latvia	17.41 years	15.33 years	15.93 years

Chi² test value: 0.01 df: 2 p: 0.995

Did you ever use other (illicit) drugs than cannabis?

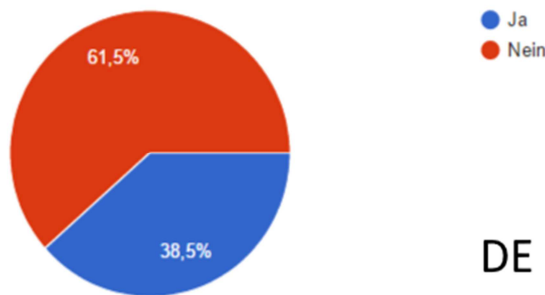


Figure 9. Illicit drug use (no- red; yes- participants in Germany.

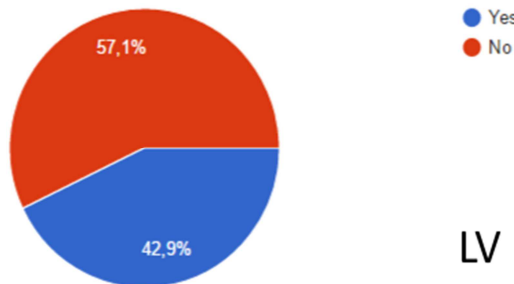


Figure 10. Illicit drug use (no- red; yes- blue) in study participants in Latvia

Table 11. “Ever” illicit drug use of study participants in Germany and Latvia.

	Ordinary use		Hazardous use		Problematic use	
	Germany	Latvia	Germany	Latvia	Germany	Latvia
Yes	1	6	4	2	5	10
No	10	11	4	7	2	6

Fisher exact test (two- tailed): Germany: p 0.0242
Latvia: p 0.1241

Do you smoke?

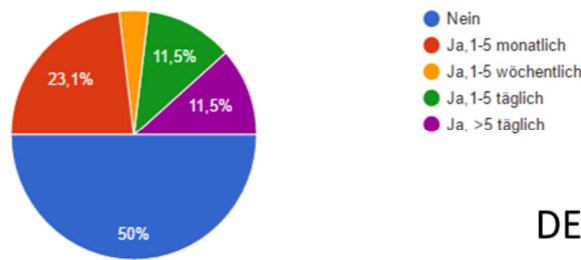


Figure 11. Smoking behavior of study participants in Germany.

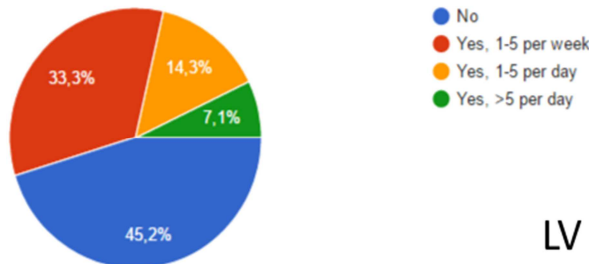


Figure 12. Smoking behavior of study participants in Latvia.

The aim in this question was not to identify “true smokers” in the sense of daily heavy smokers, but rather the fact that smoking is a constant element in the daily life of the participant. Thus, for reasons of clarity and comprehensibility, smoking behavior has been classified into two categories:

“Smokers”: those who answered *yes, >5 daily*, *yes, 1-5 daily*, and those who answered: *yes, 1-5 weekly*

“Nonsmokers”: those who answered *no* or *yes, 1-5/month*

Table 12. Smokers and non- smokers in study participants in Germany and Latvia.

	Ordinary use		Hazardous use		Problematic use	
	Germany	Latvia	Germany	Latvia	Germany	Latvia
Smokers	1	9	3	2	3	12
Nonsmokers	10	8	5	7	4	4

Fisher exact test (two- tailed): Germany: p 0.2408
Latvia: p 0.0381

Do you drink alcohol?

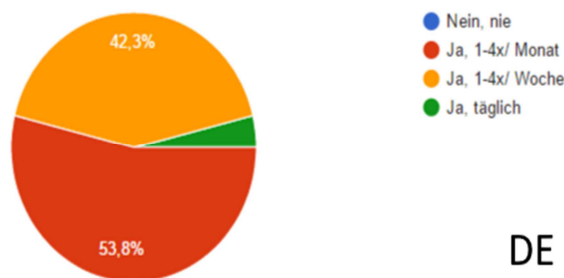


Figure 13. Alcohol drinking behavior of study participants in Germany.

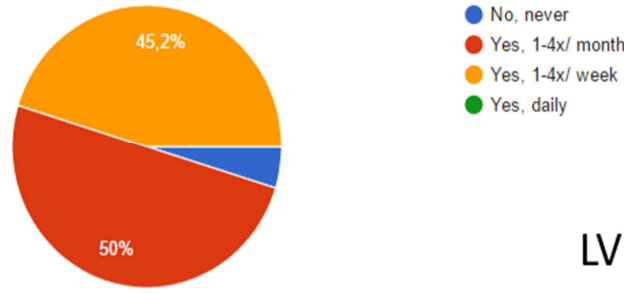


Figure 14. Alcohol drinking behavior of study participants in Latvia.

Table 13. Alcohol drinking behavior of study participants in Germany and Latvia.

	Ordinary use		Hazardous use		Problematic use	
	Germany	Latvia	Germany	Latvia	Germany	Latvia
No, never	0	0	0	1	0	1
Yes, 1-4/ month	7	9	2	7	5	5
Yes, 1-4x/ week	4	8	5	1	2	10
Yes, daily	0	0	1	0	0	0

Fisher exact test (two- tailed): Germany: p 0.2562
 Latvia: p 0.0503

3.8. Occupationally Related Questions

Have you ever skipped school (/work) or came late because of cannabis use?

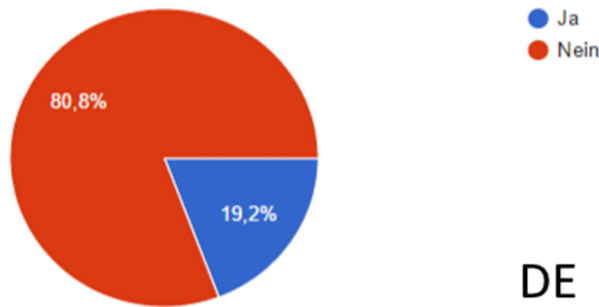


Figure 15. Skipping/ Being late of study participants in Germany.

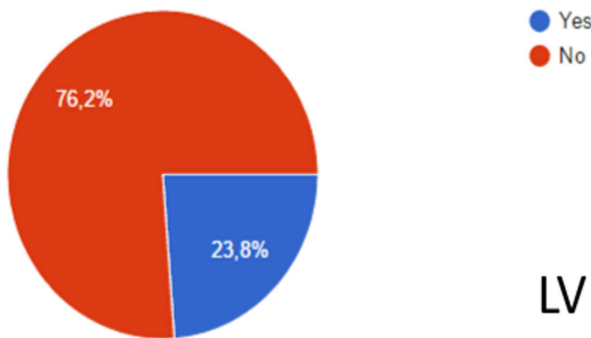


Figure 16. Skipping/ Being late of study participants in Latvia.

Table 14. Skipping/ Being late of study participants in Germany and Latvia.

	Ordinary use		Hazardous use		Problematic use	
	Germany	Latvia	Germany	Latvia	Germany	Latvia
Yes	0	1	1	2	4	7
No	16	16	7	7	3	9

Fisher exact test (two- tailed): Germany: p 0.0054
 Latvia: p 0.0260

Do you have more and more problems in studying and understanding new information?

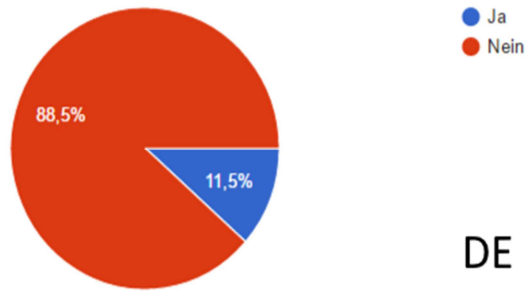


Figure 17. Problems studying / learning of study participants in Germany.

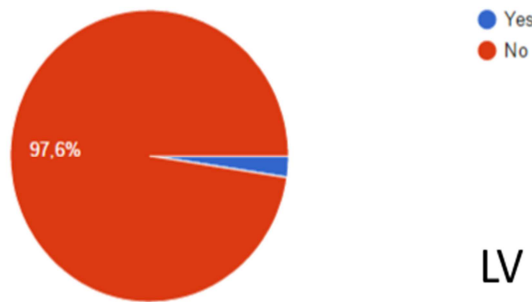


Figure 18. Problems studying/learning of study participants in Latvia.

Table 15. Problems studying/ learning of study participants in Germany and Latvia.

	Ordinary use		Hazardous use		Problematic use	
	Germany	Latvia	Germany	Latvia	Germany	Latvia
Yes	0	0	0	0	3	1
No	11	17	8	9	4	15

Fisher exact test (two- tailed): Germany: p 0.0134
Latvia: p 0.5952

Was there ever (and in the last 12 months) a time that you felt your use of marijuana had a harmful effect on your... (multiple answer possible)

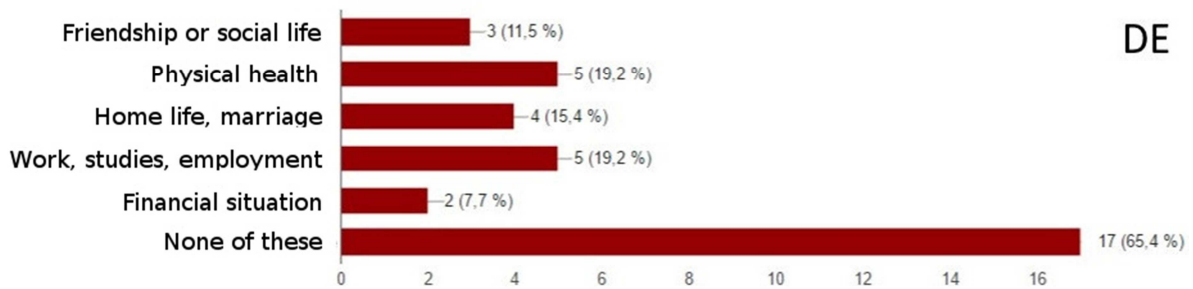


Figure 19. Impact of cannabis on aspects of participants in Germany.

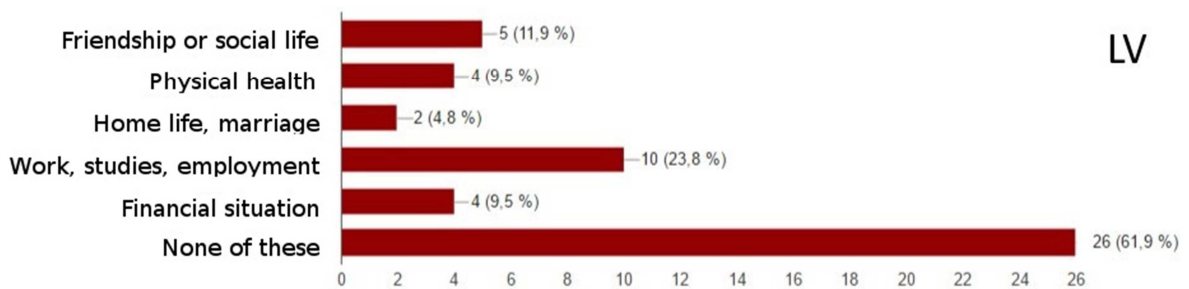


Figure 20. Impact of cannabis on aspects of life of study of life of study participants in Latvia.

Answers displayed in Figure 19. and Figure 20. (from bottom to top): Friendship or social life- Physical health- Home life, marriage- Work, studies, employment- Financial situation- None of these.

Isolated analysis of the option Impact on work, studies, or employment?

Table 16. *Impact of cannabis on aspects of life of study participants in Germany and Latvia.*

	Ordinary use		Hazardous use		Problematic use	
	Germany	Latvia	Germany	Latvia	Germany	Latvia
Yes	0	2	1	0	4	8
No	11	15	7	9	3	8

Fisher exact test (two- tailed): Germany: p 0.0054

Latvia: p 0.0096

4. Discussion

The study has certain limitations that have to be considered when evaluating and analyzing the results. The fact that the data was retrieved from self- answered, and due to its illicit nature also anonymous questionnaire, it has its limitations in objectivity. Moreover, there is a real possibility of selection bias in the readiness of filling in a questionnaire about illicit drug use, which has been tried to reduce by rendering the survey anonymously.

The mean age of the participants was comparable, with a mean age of 25.35 years in Germany and 23.40 years in Latvia. In gender distribution, there is no significant difference between the two countries, in either of the countries the males dominate in the consumption of cannabis. In Germany, the male proportion of the participants was 69.2%, and in Latvia 61.9% were males.

When it comes to occupational status, significant differences in the groups have been found (p value in Fisher exact test <0.05). In Germany, 73.1% of the participants were students, and in Latvia as many as 97.7% were students. This can be explained by the distribution of the questionnaires, as they were spread through social media and available in English language for Latvia. This led to the fact that mostly students filled in the survey in Latvia, with 85.4% of the student group in Latvia being international students (35 of 41), and 14.6% local students.

The analysis of the individual scores was all without significant differences between the countries. Interestingly, out of each group, 2 persons could be categorized as cannabis dependent according to the SDS questionnaire. This finding is far above the global estimations of cannabis dependency which vary from below half a percent to 1-2% in high income countries. [2] This large spread can be explained by a relatively small sample size. After interpolation of the individual scores and categorization of the users into a newly designed system, there was as well no difference between the countries. In Germany, 30.8% of the participants could be assigned to the group with a hazardous use pattern, whereas in Latvia, 21.4% belonged to that group. In Germany 26.9% of the persons were assigned to the group of persons who showed a problematic use pattern, and in Latvia, 38.1% were in that group. The value of ordinary users was comparable in both countries, with 42.3% in Germany and 40.5% in Latvia. A significant relation between gender and the prevalence of

hazardous/ problematic use pattern could not be seen ($p > 0.05$).

Assessing the correlation of the extent of use showed a significant correlation between intermediate and high- grade use and the categorization into hazardous and problematic use in Germany as well as in Latvia ($p < 0.05$). Nevertheless it also was shown that low- grade use did not exclude hazardous or problematic use patterns. This shows that the problem is multi-factorial and very individual, and the extent of cannabis use alone is not decisive for the impact that is assigned to cannabis consumption by the participants. This finding is consistent with findings in earlier studies and research concerning cannabis use. [10]

Concerning the motivation of use, both countries showed interesting similarity in the order of chosen answers. The ranking of the top five most commonly chosen answers was precisely the same for both countries, with the exception that in Germany rank 2, 3 and rank 5, 6 had shared values (30.8% and 15.4%, respectively). This reveals the most common motivation in both countries is a social factor, namely to smoke with friends. 76.9% of the German group and 81% of the Latvian group chose that option to be one of the three primary motivations for them. This is followed by the consumption out of the reasons to feel good and to relax.

In both countries, the main part of the users can be classified as recreational users, as only 15.4% of the German group and 9.5% of the Latvian group are using cannabis also as medication/ to relieve pain.

Taking to account the age at first use of cannabis, there is indeed a correlation of the age of use and hazardous or problematic use in both countries, and there is no statistically significant difference in the countries. The mean age at first cannabis use in both countries is higher for ordinary users than for hazardous or problematic users, being 18.18 years in Germany and 17.41 years in Latvia. For users showing a hazardous or problematic consumption pattern, the mean age of first cannabis consumption decreases by a mean of 1.77 years in Germany, and 1.82 years in Latvia (16.41 years in average for hazardous/ problematic users in Germany, and 15.63 years in Latvia). This is consistent with various other studies which highlight the importance of early age cannabis consumption in the course of the development of disorders and misuse of the drug, as stated in the introduction part.

The three questions about use of other illicit drugs,

smoking and alcohol consumption aimed to reveal a correlation between cannabis consumption patterns and addictive behavior in general. Nevertheless, no final conclusion concerning this could be drawn from the results in the study. In Germany, there is correlation between illicit drug use and cannabis hazardous or problematic use ($p < 0.05$), while in Latvia there isn't such a correlation ($p > 0.05$). This might be explained by the difference in the legal status and the availability of the drug in the countries. In Germany, cannabis is illegal, but its consumption is legal. In Latvia, even the consumption is illegal. Consequently, cannabis and thus also other drugs may be available in Germany, and thus also making the access to other drugs easier.

In cigarette smoking behavior and cannabis hazardous/problematic use, a significant correlation could be found for Latvia, but not for Germany. Alcohol consumption and the use pattern of cannabis did not show a correlation in neither of the countries.

In the section of occupationally related questions, three questions were asked, assessing for the direct influence of cannabis use patterns to the occupational situation. The first question asked about skipping school or work due to cannabis, and both in countries there was a correlation of hazardous/problematic use patterns and a positive answer to the question ($p < 0.05$ in both countries). The second question asked about trouble understanding new information, a capacity which is important in most occupations, and vital in the occupation "student". In this question, there has been a correlation of hazardous/problematic use and a positive answer in Germany ($p < 0.05$), but not in Latvia ($p > 0.05$). In the third question aiming at identifying trouble in occupation due to cannabis, it was asked whether in the past 12 months cannabis had a harmful effect on different fields in the lives of the participants. The most commonly chosen answer was "no", cannabis had no impact on any field, but second to that in both countries, "work, studies, or employment" was the second most commonly chosen answer, with 19.2% in Germany and 23.8% in Latvia. Isolating this option, it was revealed that there is a statistically significant correlation between choosing this option and hazardous/problematic cannabis use patterns in both countries.

Thus, taking together the three questions concerning work-related trouble due to cannabis consumption, there has been a correlation in all three questions in Germany, and in 2 out of 3 questions in Latvia.

5. Conclusions and Proposals

Cannabis is not, as widely perceived, a harmless drug but poses risks to the individual and to society. The impact on physical, mental, and social health has been studied and gives inconclusive results. Impact on physical health seems to be mainly associated with smoking, while deterioration of mental health has been associated with cannabis consumption in several studies; particularly a linkage of early first use in life is associated with risks of harm in the field of mental

health. Social health impacts are difficult to analyze due to its multi-factorial nature, but again early and longstanding use seems to be decisive in this field.

In the survey, the majority of the participating cannabis consumer groups in both countries has been identified to show either hazardous or problematic use patterns (57.7% in Germany and 59.5% in Latvia). No significant differences have been found in the prevalence of ordinary, hazardous, and problematic cannabis consumption patterns in those countries. Both hazardous and problematic use is associated with earlier first- in- lifetime- use of cannabis. Hazardous use as well as problematic use has been shown to be associated with a negative impact on occupation, while participants who could be assigned to the category of ordinary cannabis consumption did not show these findings.

Concluding we might state that not the extent of cannabis consumption per se is the problem, but as with other drugs as alcohol, the pattern of use is decisive for negative impacts on different aspects of daily life, particularly occupation. The pattern of use in turn is depending on many different factors apart from the extent of cannabis consumption, such as social factors, personal factors, or the kind of cannabis that is consumed.

Therefore it has to be assured that people are not only aware of the potential risks that possibly come with cannabis consumption, but also have knowledge about and easy access to questionnaires and scoring systems which help them identify possibly problematic use patterns. By doing so, problems may be identified early, and cannabis users are able to adapt their consumption by reducing it, or in best case ceasing the use to prevent possible deterioration in health and different aspects of daily life.

Also, it is vital that those who seek help are assured to know where to reach out to, and that programs for the treatment of cannabis dependence are in place. This is valid particularly for Latvia, where special programs of cannabis treatment are not existent at present. [11] Nevertheless, further research is necessary in this field to allow for reliable data, and directed measures.

Appendix

Questionnaire

Section 1 General Characteristics

1. Gender
 - female
 - male
2. Age
 -
3. Nationality/ country of residence (current)
 -
4. Occupation
 - student (international)
 - student (local)

- employed
- unemployed

5. Age at first cannabis use ever (estimate if you don't know)

-

Section 2 Check the Answer That Best Applies to How You Have Felt About Your Use of Cannabis over the Past Year/ 12 Months

6. Did you ever think your use of Cannabis was out of control?

- Never or almost never
- Sometimes
- Often
- Always

7. Did the prospect of missing a fix/ a joint make you very anxious or worried?

- Never or almost never
- Sometimes
- Often
- Always

8. How much did you worry about your use of Cannabis?

- Not at all
- Little
- Often
- Always or nearly always

9. Did you wish you could stop?

- Never or almost never
- Sometimes
- Often
- Always

10. How difficult would you find it to stop or go without Cannabis?

- Not difficult at all
- Quite difficult
- Very difficult
- Impossible

Section 3

11. Have you ever smoked cannabis *before midday*?

- No
- Yes

12. Have you ever smoked cannabis *when you were alone*?

- No
- Yes

13. Have you ever had *memory problems* when you smoke cannabis?

- No
- Yes

14. Have *friends or members of your family* ever told you that you ought to reduce your cannabis use?

- No
- Yes

15. Have you ever tried to reduce or stop your cannabis use *without succeeding*?

- No
- Yes

16. Have you ever had problems *because of your use* of cannabis (argument, fight, accident, bad result at school, etc.)?

- No
- Yes

Section 4 Check the Answer That Best Applies to How You Have Felt About Your Use of Cannabis over the Past 6 Months

17. How often do you use Cannabis?

- Never
- 1x/ month or less
- 2-4x/ month
- 2-3x/ week
- 4 or more times a week

18. How many hours were you “stoned” on a typical day when you had been using cannabis?

- Less than 1
- 1 or 2
- 3 or 4
- 5 or 6
- 7 or more

19. How often during the past 6 months did you find that you were not able to stop using cannabis once you had started?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

20. How often during the past 6 months did you fail to do what was normally expected from you because of using cannabis?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

21. How often in the past 6 months have you devoted a great deal of your time to getting, using, or recovering from cannabis?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

22. How often in the past 6 months have you had a problem with your memory or concentration after using cannabis?

- Never
- Less than monthly

- Monthly
- Weekly
- Daily or almost daily

23. How often do you use cannabis in situations that could be physically hazardous, such as driving, operating machinery, or caring for children:

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

24. Have you ever thought about cutting down, or stopping, your use of cannabis?

- Never
- Yes, but not in the past 6 months
- Yes, during the past 6 months

Section 5

25. Have you ever skipped school classes or came late to school because of cannabis use?

- Yes
- No

26. Have you had a serious argument with family members because of your cannabis use?

- Yes
- No

27. Have you had a serious argument with friends because of your cannabis use?

- Yes
- No

28. Have you ever bought cannabis yourself?

- Yes
- No

29. Do you have more and more problems In studying and understanding new information?

- Yes
- No

30. Have you ever used cannabis when you were alone?

- Yes
- No

31. Do you often feel desire for cannabis?

- Yes
- No

32. Have you ever spent so much money on cannabis that you had to resign from other things or activities?

- Yes
- No

Section 6

33. Did you ever use other drugs than Cannabis?

- Yes
- No

34. Did you ever see a professional (Therapist, doctor, Guru,...) for your Cannabis use?

- Yes
- No

35. If Cannabis would be accessible more easily in your

area, would you consume more?

- Yes/ probably
- Don't know
- No/ rather not

36. What are (three of) the most important reasons why you use marijuana and/or hash?

- It's more fun than drinking alcohol
- To relieve boredom
- To feel good
- To relieve pain/ as medication
- I'm just accustomed to taking it/it's part of the game
- It's nice to smoke with friends
- To relieve feelings of depression
- To help me relax, like before going to sleep
- To perform or concentrate rather
- I forget my problems for a while
- To change the effects of other substances (drugs or alcohol)
- I don't know

37. Do you smoke cigarettes?

- Yes
- No

38. Do you drink alcohol?

- No, never
- Yes, 1-4x/ month
- Yes, 1-4x/ week
- Yes, daily

References

- [1] United Nations Office On Drugs And Crime, United Nations World Drug Report 2015; 1. Available at https://www.unodc.org/documents/wdr2015/World_Drug_Report_2015.pdf
- [2] World Health Organization. The health and social effects of nonmedical cannabis use. 2016; 10. Available at http://www.who.int/substance_abuse/publications/msbcannabis.pdf
- [3] Wikipedia entry "Legality of cannabis by country" on 15.10.2016 https://en.wikipedia.org/wiki/Legality_of_cannabis_by_country
- [4] World Health Organization. The health and social effects of nonmedical cannabis use. 2016; 10. Available at http://www.who.int/substance_abuse/publications/msbcannabis.pdf
- [5] World Health Organization. The health and social effects of nonmedical cannabis use. 2016; 12. Available at http://www.who.int/substance_abuse/publications/msbcannabis.pdf12
- [6] De Las Cuevas C, Sanz EJ et al. The Severity of Dependence Scale (SDS) as screening test for benzodiazepine dependence: SDS validation study. *Addiction* Volume 95, Issue 2 February 2000; 245–250 Available at <http://onlinelibrary.wiley.com/doi/10.1046/j.1360-0443.2000.95224511.x/abstract;jsessionid=C1A5412428DA9B48657918D0594C56C0.f04t04>

- [7] Piontek D, Kraus L, Klempova D. Short scales to assess cannabis-related problems: a review of psychometric properties. *Substance Abuse Treatment, Prevention, and Policy*, 2008, Volume 3, Number 1; 25. Available on <https://substanceabusepolicy.biomedcentral.com/articles/10.1186/1747-597X-3-25>
- [8] Up To Date: Treatment of cannabis use disorder. Available at <http://www.uptodate.com/contents/treatment-of-cannabis-use-disorder>
- [9] Adamson SJ, Kay-Lambkin FJ et al. (2010). An Improved Brief Measure of Cannabis Misuse: The Cannabis Use Disorders Identification Test – Revised (CUDIT-R). *Drug and Alcohol Dependence* 110: 137-143. Abstract available at <https://www.ncbi.nlm.nih.gov/pubmed/20347232>
- [10] World Health Organization. The health and social effects of nonmedical cannabis use. 2016; 6f. Available at http://www.who.int/substance_abuse/publications/msbcannabis.pdf
- [11] World Health Organization. The health and social effects of nonmedical cannabis use. 2016; 46. Available at http://www.who.int/substance_abuse/publications/msbcannabis.pdf