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Perception and assessment of cannabis quality  
among cannabis users and possibilities for harm reduction

Vnímání a hodnocení kvality konopí u jeho uživatelů  
a možnosti pro snížení rizik z jeho užívání

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## **Identifikační záznam**

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## **Poděkování**

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Vám všem patří mé velké díky!

## **Abstract**

Cannabis is the most used illicit drug globally. Nevertheless, cannabis users often do not have sufficient knowledge about cannabis. Definition of cannabis “quality” can include both desirable effects and safety profile of the product. Harm reduction approach is commonly deployed for other illicit substances and it is also necessary to advance it for cannabis.

The aim of this research was to reveal what Czech cannabis users consider as “quality” cannabis and how they assess it. Respondents were asked what help them to prevent mental and physical harms and how it influenced the intoxication.

For the purposes of this thesis, ethnographic research was chosen (Janeček, 2014). Collection of qualitative data was performed using the method of qualitative semi-structured interviews (Miovský, 2006). The interviews were coded using a method of grounded theory (Strauss & Corbin, 1999).

Respondents’ motivation for use was based on bio-psycho-socio-spiritual approach. Most of the participants distinguished “quality” cannabis by smell, level of intoxication, taste, structure and “health” aspects that depend on a method of cultivation. If cannabis users asked about the origin of cannabis, in few cases they did not get the information at all. Inexperienced respondents are not able to distinguish cannabis varieties, but some of them recognize at least some differences. A vaporizer was assessed as the least harmful way to use cannabis. However, respondents in this study did not use it very often for various reasons. Most common harm reduction techniques which the respondents applied were to start to use cannabis in small doses, drink enough and eat before use, use only weak strain or do not use cannabis with alcohol.

The knowledge about the exact content of cannabis and peer-based advices could be helpful for the harm reduction manual for the cannabis users to mitigate the adverse effects from their use.

## **Key words**

Cannabis type drugs - quality - risks of use - harm reduction

## **Abstrakt**

Konopí je nejčastěji užitou ilegální drogou ve světě. Nicméně uživatelé konopí většinou nemají dostatečné znalosti o konopí. Definice „kvalitního konopí“ mezi uživateli může obsahovat jak parametry účinku, tak jeho bezpečnosti. Harm reduction přístup je prosazován pro ostatní ilegální drogy a je vhodné tento přístup prosazovat také u konopí.

Cílem této práce bylo zjistit, co považují čeští uživatelé konopí za „kvalitní konopí“ a jak jej posuzují. Účastníci byli tázáni, co jim pomáhá v prevenci před nežádoucími duševními a fyzickými vedlejšími účinky, a jak mohou tyto postupy ovlivnit průběh intoxikace.

Pro účely této práce byl zvolen etnografický výzkum (Janeček, 2014). Sběr kvalitativních dat byl proveden pomocí metody semi-strukturovaného rozhovoru (Mioviský, 2016). Rozhovor byl roztríděn do kódů pomocí metody zakotvené teorie (Strauss & Corbin, 1999).

Motivace k užití konopí obsahovala složky bio-psycho-socio-spirituálního modelu. Většina účastníků rozeznává „kvalitní konopí“ pomocí vůně, stavu intoxikace, chuti, struktury a zdravotní nezávadnosti, která závisí na způsobu kultivace. Pokud se účastníci zajímali o původ konopí, často nedostali žádnou odpověď. Nezkušené uživatelé nedokážou od sebe rozlišit různé druhy konopí, ale dokáží si všimnout alespoň nějakých rozdílů. Jako zdravotně nejvhodnější volbou pro užití konopí byl shledán vaporizér, který ovšem uživatelé z různých důvodů nepoužívají. Ke snížení nežádoucích účinků byly zmíněny techniky jako: začít s menšími dávkami, dostatek jídla a tekutin, užít slabou odrůdu nebo nemíchat užívání s alkoholem. Znalosti o obsahu konopí a rady od vrstevníků by mohli být nápomocné pro vylepšení harm reduction manuálu pro uživatele konopí.

## **Klíčová slova**

Konopné drogy - kvalita - rizika užívání - harm reduction

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## Introduction

Cannabis is the most used illicit drug globally and an illegal drug with the highest level the likelihood of it being used by all age groups (EMCDDA, 2016; UNODC, 2016), thus it is important for cannabis users to know the effects and risks to be able to avoid the adverse effects and thereby preventing that they expose themselves and the community to the potential harms. Cannabis has been in the interest of people for centuries (Miovský *et al.*, 2008) which does not mean that it is completely healthy and without risks. Undesirable consequences (like psychosis) can occur in case of poorly estimated dose especially with higher THC content (Bancroft & Reid, 2016), wrongly chosen variety, inappropriate cultivation or habitual use. Users themselves often do not accept these risks and are not even interested in the negative consequences.

Harm reduction approach is one of the four pillars of the National Drug Policy Strategy and is commonly used for long-term or injection users of illicit drugs like opiates or stimulants, and their efficacy is demonstrated by the reduction of infectious or blood transmitted diseases (Mravčík *et al.*, 2016). However, harm reduction approach is not only applicable to injecting users but also can be used to reduce damage from other drug use. Harm reduction strategies for cannabis users are not that well known and often not properly discussed.

Every cannabis user has his/her own personal preferences and different knowledge according to which he or she evaluates cannabis (Bancroft & Reid, 2016; WHO, 2007). The main aim of this analysis is to assess the perception and assessment of cannabis users regarding to the “quality” of cannabis. So far, the role of the “quality” of cannabis drugs for users in the Czech Republic has not been described, in terms of to what extent they are able to distinguish between varieties and what techniques they use to prevent the adverse effects of cannabis. Some authors mention “quality” as potency, desirable effects, taste or odour (Kalina *et al.*, 2015; Mounteney *et al.*, 2017; Běláčková, Tomková & Zábanský, 2016) but “quality” is also assessed according to the health aspects as well which are affected by the method of cultivation and subsequent storing of cannabis (Běláčková & Zábanský, 2014b; Hough *et al.*, 2003, Decorte, 2010).

In a study that preceded the work on this diploma thesis (Běláčková, Brandnerová & Věchet, 2018) we concluded that cannabis users were assessing the strength of the effects, nevertheless many participants in this study reported that they preferred

*“mild cannabis to a very potent one”*. Cannabis users prefer to grow cannabis themselves to be sure that they have organic product without mould, heavy metals or chemical fertilizers that can cause scratching on the throat (Decorte, 2010).

Legalization of cannabis could be harm reduction approach because it would reduce the influence of the black market where cannabis is purchased with unknown content and/or origin. By setting the clear rules of “quality”, preventive measures could be prepared and tested. In the case of legalization, “quality” would have a legal definition and anyone could have access to high “quality” but mainly healthy and safety cannabis.

Many users discuss the term “quality” and comparing their knowledge by scientific methods could be then considered as harm reduction. This thesis focuses on peer-based harm reduction which was described in article (Bancroft & Reid, 2016) where the cannabis users were employing all the gained knowledge about evaluation of “quality” and the knowledge is shared with the peers (Parkin, 2013). Providing information between drug users plays an important role in harm reduction approach and it is also used in the Cannabis Social Clubs where users get information about the collected product and they are educated about potential adverse effects to be able to recognize the harmful use (Běláčková, Tomková & Záborský, 2016).

This thesis focuses on describing how Czech cannabis users perceive “quality” of the drug and how they manage the risks pertaining to cannabis consumption.

# 1 Cannabis type drugs and effects

## 1.1 Cannabis plant and varieties

*Cannabis sativa L.* is dioecious plant forming on one plant a female and on the other a male inflorescence (Miovský *et al.*, 2008) and it is widely spread plant. Most likely, it comes from Central Asia from where has spread around the world (Holland, 2010). From archaeological findings, it is believed that cannabis was used by many cultures in various shamanic rituals and could influence some of the emerging Palaeolithic and Neolithic art. From the dating of today's available findings, it seems likely that cannabis was already used 6-9 thousand years ago. In 1737, a Swedish botanist discovered and described *Cannabis sativa L.* for the first time, subsequently in 1785, a French biologist found and named another species *Cannabis indica L.* The last known species of Cannabis plant, *Cannabis ruderalis* was discovered by a Russian biologist in 1924. At the beginning of the 20th century, cannabis was an insignificant topic and its significance grew only during the tightening of international and national legislation (Miovský *et al.*, 2008).

Cannabis is typically divided to sativa, indica, sativa/indica, indica/ruderalis, sativa/ruderalis. Many other varieties like indoor/outdoor or winners of cannabis cups can be found on the internet (Miovský *et al.*, 2008). Cannabis can have different look, taste, smell and effect. Small differences in cannabis plant allow growers to inbreed for their own “ideal” cannabis. “Cannabis connoisseur” is a person who has a vast knowledge about cannabis and could tell almost everything like the name of varieties, their aroma or which type of effects user can expect. Such individual can also distinguish Indica from Sativa plants (www.urbandictionary.com, 2009)

Sativa plants are higher than indica plants and grow in “Christmas tree shape” (Miovský *et al.*, 2008; Holland, 2010) Leaves are long and have wide space between the branches and grow very tall outdoors. The buds tend to be more elongated and medium thick (Rosenthal, 2010; Holland, 2010). The ratio of flowers is lower than leaves and flowering period takes more time (Miovský *et al.*, 2008). The “high” after smoking cannabis sativa is usually psychedelic, dreamy or creative, clear, energizing and cerebral, everything due to the large quantities of  $\Delta$  9-tetrahydrocannabinol (THC). Resin production is not so strong but sativa „high“, named also as “up high”, “racy or electric” have been known to induce heart racing and paranoia (Rosenthal, 2010; Holland, 2010).

Indica plants mature early, have more compact and shorter branches, short dark green leaves, sometimes purple. The ratio of buds is higher than with leaves. Buds are compact, heavy, wide and thick and the smell is “stinky”, “skunky” and “pungent” and sweet. The smoke is thick which sometimes could evoke the coughing. Indica plants were grown and bred for a large content of resin, to make hashish (Rosenthal, 2010; Holland, 2010; Miovský *et al.*, 2008). The effects of indica plants are referred to as “couch lock” or “stoned” (Holland, 2010) and lead to dulled, relaxed or hypnotic „high“ (Miovský *et al.*, 2008).

*Cannabis ruderalis* is used for creating autoflower varieties which start to flower regardless of the sunlight (Rosenthal, 2010). *Cannabis ruderalis* naturally grows with low THC content (Holland, 2010).

Every current cannabis variety (strain) comes from one of the three basic strains: *Cannabis sativa*, *Cannabis indica* and *Cannabis ruderalis* (Schmader, 2016). The Leafly website which provides reviews of different varieties of cannabis contains almost 2500 different cannabis strains (www.leafly.com, 2018). Users can find other different sorts of cannabis varieties based on flavour, expected effects, current mood or medical symptoms. At the moment, the majority of the used strains are hybrids which contain no more than 60% of sativa or indica (Holland, 2010). Every seed bank has its own name for each variety but the genetic makeup of plants may be the same, only terminology changes. At the present time, there is continuous breeding of cannabis varieties and cannabis which is facilitated by the development of indoor cultivation equipment and by improving the techniques of preparation for cannabis cultivation (Miovský *et al.*, 2008).

Cannabis plant has become a source of the recreational drug sometimes called „marijuana“. The cannabis plant was not used or grown solely for psychoactive effects but also for food, fibre, fuel, medicine and shelter etc. (Holland, 2010). Nevertheless, the main theme of this thesis is marijuana and its use for psychoactive effect.

### **1.1.1 Cannabis**

Marijuana is a flower (“bud”) with dried petals of the female cannabis plant, sometimes mixed with larger leaves. The “bud” is place where THC is largely concentrated (EMCDDA, 2015). Cannabis can be called ganja, weed, skunk, pot, grass, mary-jane, dank etc. Cannabis users most often prefer the cannabis that contains a high content of psychoactive substances as possible (Miovský *et al.*, 2008). In general, the higher

the proportion of buds on the plant is, the higher is the potency. The higher the number of big leaves plant has, the lower is the potency. Non-fertilized female cannabis flowers are called sinsemilla which means without seeds. These flowers contain the largest potency in the plant (Miovský *et al.*, 2008). The final product for smoking is a dense bud of sinsemilla (Unpollinated female flowers) (Rosenthal, 2010). Nowadays, the feminized seeds are marketed by seed companies and allow the gardener to grow only female plants. The growers had to separate the male and female plants because male flowers are not psychoactive and can only be used by the breeders who collect the pollen from males to pollinate female plants to create own seeds (Holland, 2010).

Cannabis varieties could vary in height, width, branching traits, leaf size and shape, flowering time, yields, potency, compactness, colour, taste, type of „high“ or aroma (Rosenthal, 2010; Miovský *et al.*, 2008) and could be influenced by the growing conditions (indoor, outdoor, intensity of light, temperature in vegetative growth, time of the harvest and type of drying) (Miovský *et al.*, 2008).

The plant properties, including the content of psychoactive ingredients may be affected by the cultivation method. Indoor cultivation is specifically designed to increase the percentage of THC content in the plant but also to increase the yield. This ensures uniform “quality” due to the cloning of various strains with high THC content. Indoor grown cannabis can provide stronger and more consistent product in terms of potency (McLaren *et al.*, 2008).

### **1.1.2 Hashish**

Hashish is obtained by processing mature female flowers of cannabis plants (Miovský *et al.*, 2008) and the resin-containing trichomes being compressed or cooked into balls, cakes etc. Kief is the name for the powder from resinous glands removed from the cannabis buds. It is similar to grains of sand. Kief can be used by various ways, for example to make hashish or as an ingredient for cooking (Holland, 2010).

### **1.1.3 Cannabis extracts**

Cannabis oil is extracted from hashish, also known as “hashish oil”, honey oil or cannabis extract. It is a product of marijuana leaf distillation (Miovský *et al.*, 2008; Holland, 2010; Kalina *et al.*, 2015). Cannabis oils usually contain solvents because they are needed for isolation and extraction of cannabis resin (Holland, 2010). In the past, tinctures of cannabis (ethanol extract) were commonly used and prescribed by doctors

(EMCDDA, 2015). Dab is the colloquial name for a recently developed cannabis concentrate also known as butane hash oil (BHO). BHO sometimes resembles glass or a hard, wax-like concentrate and it is created through butane extraction of THC from the flower of cannabis plant. The final product has a higher potency than traditional forms of cannabis (Loflin & Earleywine, 2014). New concerns about cannabis arise in states where cannabis was legalised (*e.g.* the U.S. states, Washington or Colorado), because legal cannabis market offers a wide range of products these intense cannabis concentrates with a content of THC up to 90 % or edibles. In regulated markets, safer approach is to implement strict requirements on labelling and packaging of cannabis edibles and concentrates which could help user to estimate the right dosage (UNODC, 2016).

## **1.2 Effects of cannabis**

Cannabis consists of over 400 compounds and at least 88 of them are cannabinoids. The best known cannabinoids discovered in cannabis plants are THC which causes the psychoactive effect, called “high“, cannabinol (CBN), cannabigerol (CBG), cannabichromene (CBC), cannabidiol (CBD) which is celebrated for medical effects (relieves inflammatory, convulsion, anxiety, nausea) and for mediating of the psychoactive effects of THC (Rosenthal, 2010). CBD also has anxiolytic and antipsychotic effects (Zuardi *et al.*, 2006).

Cannabis in small doses may cause euphoria, decrease of anxiety, and increase of sedation or sleepiness. Endogenous ligand of cannabinoid receptor, Anandamide, has similar pharmacological characteristics to THC (EMCDDA, 2015).

The course of intoxication has several phases. The initial symptoms include tightness and anxiety (often for less experienced users), the main effects are expected feelings of sedation, euphoria and happiness and often unreasonable, unassailable laughter and sharpened sensory perceptions. In the aftermath of the effects are often seen confusion, fatigue and drowsiness. Cannabis intoxication could cause also undesirable effects such as: dry mouth, red eyes, increase appetite, change in time perception, disturbances of short-term memory, confusion, obsessive thoughts, impairment of judgment and attention, extension of reaction time, panic attack, psychic experience, hallucinations or accelerating heart rate (Kalina *et al.*, 2015). Short term memory can be disconnected and damaged, spatial orientation causes a way to a heightened sensory perception of the here and now. Some effects could help someone to feel less stressed about social and

interpersonal pressures, relief from nausea, reduce of inflammation, relaxation of muscles, multiple kinds of pain are assuaged (Rosenthal, 2010). These effects could persist 24-48 hours. Long-term and intensive use causes a slow, thoughtful dealing with details, short-term memory disorders (Kalina *et al.*, 2015; Rosenthal, 2010). These effects were named as “high” or “stoned” (Holland, 2010). Biological half-life is 30 hours and cannabinoids are detectable in urine for 1-30 days, depending on frequency of use and dosage (Kalina *et al.*, 2015).

Besides the cannabinoids, the key role plays also set and setting of the person. Set including mental health, physiological health and genetic predispositions. Set and setting can influence experiences and outcomes of the marijuana use. It means that using marijuana can have different effects for different people (Rosenthal, 2010) and can be affected by strains, dosage, method of ingestions, previous experience with the illicit substances, tolerance, expectations or personality itself (Swift, Copeland & Lenton, 2000). User can even feel the “high” in case that the marijuana was weak or non-psychoactive at all (Miovský *et al.*, 2008). The importance of patterns of use is also mentioned by Becker (1966), according to which the intoxication is led by a more experienced smoker who then leads the beginner’s intoxication and prepares it for the intoxications and the following effects.

The main expected effects of cannabis intoxication are calming, euphoria, cheerfulness and sharpening of sensory perception (Kalina *et al.*, 2015). Holland (2010) focused in his book on two main factors which could influence the subjective effect of any drug. The first is the way how individual takes cannabis (inhaled, eaten, etc.) strongly determines the time course and strength of drug’s effects. The second point suggests that previous amount and frequency of using marijuana influences the subjective effects of the drug.

Recent studies also show that the key differences between strains come from different content of terpenes, (Schmader, 2016) essential oils of cannabis plants (producing the aroma) and are main ingredient of cannabis resin. Terpenes compose the largest percentage of aromatic essential oils that allow to take users up or down, feel relaxed or focused, or help you get relaxed or satisfied (Rosenthal, 2010). **Myrcene** is the most common terpene found in marijuana and can be found also in lemongrass. Aroma of myrcene can be described as earthy, green-vegetative, and similar to cloves. Myrcene is

analgesic, antibiotic and inflammatory, blocks the aflatoxin B. **Limonene** is the second most common terpene in cannabis plants. Limonene has strong citrus aroma and has antibacterial and antifungal properties and is known for inhibition of cancer cells growth. **B-caryophyllene** is terpene known for its sweet, woody and dry-clove aroma which was found in black pepper or cloves. The taste is pepper-spicy and it is added into the tobacco to enhance the flavour. **Pinene** is connected with the pine trees, rosemary or eucalyptus. It is used as a treatment of coughing and as a topical antiseptic or bronchodilatator and helps with the memory, focus or energy. **Terpineol** has lilac, lime/citrus or apple blossom aroma. Nowadays, it is used in soaps or perfumes. Terpineol reduces motility and the capability to move which could cause that user stays on a couch and feels the strong body stone. Terpineol is often found in combination with pinene which might be the reason why some strains with pinene rather energising but they are not because of Terpineol content. **Borneol** has a menthol odour and is found in wormwood or in some kinds of cinnamon. Borneol was considered as a calming sedative. It is proved for fatigue and the recovery from stress and illnesses. The “high“ may be psychedelic if cannabis plant contains borneol in larger quantities. **Delta-3-carene** has a sweet pungent aroma. It is used in aromatherapy to dry tears, perspiration, to excess menstrual flow etc. It seems that it plays some role in the cannabis users dry mouth and red eyes. **Linalool** has a spring floral odour which reminds Lily of the Valley or Lavender. Linalool is being tested for cancer treatment and induce heavy sedation. **Pulegone** has a sweet flavour which is used in candy industry and has minty-camphor aroma. It is not found in marijuana plants in big amounts. **Cineole** is the predominant oil in eucalyptus. The odour is similar to pulegone – camphor-minty. Cineole increases bloodstream circulation, helps relief from the pain, and the topical issues (Rosenthal, 2010).

Many respondents in Běláčková & Zábanský (2014) research answered that it is important for them to have the opportunity to choose from different strains of cannabis because after long-term use, the required effects when using the same cannabis strain can be reduced.

Medical cannabis users seem to prefer Cannabis indica variety which helps them to calm down, relief from the pain (pain of joints), helps with insomnia, with glaucoma and neuropathy (Pearce, Mitsouras & Irizarry, 2014). Cannabis indica was considered as nightcap cannabis, while cannabis sativa was recommended for daytime use (Holland, 2010) because cannabis sativa strains were connected with energy and euphoria.

Cannabis sativa effects were preferred for example in the weight reduction (Pearce, Mitsouras & Irizarry, 2014).

### **1.3 Means of cannabis administration**

Cannabis intoxication can be determined by the methods of ingestion. Usual methods of administration are smoking, less frequent is the use *per os* or vaporization.

#### **1.3.1 Inhalation**

The most common way of ingesting marijuana is smoking (Holland, 2010). Cannabis smoke goes through the lungs which are composed of large surface area and many blood vessels that are connected to brain. Inhalation causes rapid increase of psychoactive effects (within seconds). Due to this fast onset (2 or 3 minutes), the experienced users can easily titrate their dose to achieve the appropriate effects. Regular user has full control on the following effects with possibly minimizing negative effects and maximizing the positive. The required effect lasts only for one or two hours (Holland, 2010; Rosenthal, 2010). Inhaled quantities of THC are highly dependent on the inhalation technique and the experience of the smoker. Intoxication may be affected by the number of breaths, the inspired volume and the length of taking the breath inside the lungs or the time between the breaths, the duration of the smoking itself or the intensity of burning/vaporizing marijuana (Miovský *et al.*, 2008; Holland, 2010). Schmader (2016) claims that inhalation is a good method for THC novices because the quick onset of effects makes it harder to unintentionally get overdose or get too “high“ and relatively short continuation of the effects will be relieve for those who do experience adverse effects. Some users inhaled smoke deeply into the lungs and hold to maximize the absorption of psychoactive substances into the blood stream (Rosenthal, 2010).

Occasional smokers of marijuana usually use only small doses of cannabis (2-3 mg of absorbed THC) which is enough for achieving the required “high”. The daily smokers can handle 5 or more “joints” (see the explanation below) per day. Intensive smokers from Jamaica can consume over than 420 mg of THC per day (Miovský *et al.*, 2008). Several studies reported that cannabis users are good in regulating their desire effects with different strains due to breath more air while smoking or taking the smaller puffs from more potent cannabis (Holland, 2010).

The following means of administration *via* inhalation exist among the users:

**Joints** contain dried cannabis flowers that are crushed into small leaves. Helpful paraphernalia is grinder which is small accessory that breaks cannabis buds down into perfect soft pieces (Schmader, 2016). Marijuana joint contains between 0,5 to 1g of marijuana (Miovský *et al.*, 2008; Mariani *et al.*, 2011). **Spliff** is a term sometimes used for joints rolled from regular rolling papers filled with a mix of cannabis and tobacco. Users say that nicotine extends the duration of the effects of the THC (Schmader, 2016). Users added tobacco to support of burning or titration of too powerful marijuana (Miovský *et al.*, 2008). In the Czech Republic, cannabis cigarette mixed with tobacco is also called joint (Miovský *et al.*, 2008). Usually, tobacco is not added to the joint with outdoor grown cannabis, called ganja (Doležal, 2010).

**Blunts** are slower burning joints which deliver more nicotine because blunts are rolled with cigar papers (Miovský *et al.*, 2008) that are made of tobacco leaf. The possible risks of blunts include developing nicotine addiction (Schmader, 2016). Preference for the use of paraphernalia differs according to users; for example blunts are more commonly used in African-American subculture (Mariani *et al.*, 2011; Montgomery & Bagot, 2016). Mariani *et al.* (2011) investigated that blunts contained 1,5 times the amount of marijuana compared to joints and blunts contained 2,5 times the amount of marijuana compared to pipes.

**Pipes** are easier to use than joints. Users who prefer to smoke cannabis without additives are rather using pipes (Miovský *et al.*, 2008). Users only place the cannabis material into the pipe. Pipes contain a bowl, suction chamber and a mouthpiece. A lot of shapes and sizes are available on the market. For example, one hitters (BAT) are small cylindrical tubes with bigger hole on the end of the tube for the material a little hole which goes directly to the mouthpiece (York, 2016) and user can breathe while burning cannabis or ash. Only 12% of smoke from pipes contains THC and other cannabinoids (Miovský *et al.*, 2008). Water pipes or “bongs” are filled with water which is added to the suction chamber. As the user inhales, smoke passes through the water to cool down the smoke and make it smoother before entering the mouth and lungs. “Bongs” are usually preferred by regular daily smokers because suction chamber is of considerable size and allows ingesting a large mass of smoke in a single inhale (Schmader, 2016). Water pipes cool the smoke which means that the negative effects of heating were decreased. Nevertheless, water pipes may bring higher concentrations of tar than joints because smoke

is breathed in more deeply and held for longer time (Swift, Copeland & Lenton, 2000; Hall & Fischer, 2010).

**Homemade devices** include, for instance, „hot knives“. Small pieces of cannabis or hashish are placed between two heated metal knives and users inhale a dense smoke which was formed between the hot knives (Schmader, 2016). “Gravity bong” is usually used on parties. Users need a bucket of water, a two litre plastic bottle cut in half equipped with smoking bowl and expand air pressure that literally force smoke into a user’s lungs (Miovský *et al.*, 2008). Apple or any kind of fruit or empty cans from beverages can be turned into a pipe as well (Schmader, 2016). Soft drink is smoke created from burning hashish stuck on the needle and needle is stuck on the coaster which is put on the glass. The smoke from burning hashish falls down to the glass and user uncovers the coaster and breath in the smoke (Miovský *et al.*, 2008).

**Vaporizers** (“vaporizing”) are an alternative ingestion method that is less harmful than joints, pipes or “bongs” because there is no burning of the material, only fumes. Vaporizers are popular among medicinal cannabis users (Earleywine & Barnwell, 2007; Miovský *et al.*, 2008). Vaporizers heat cannabis material to a temperature high enough (180-190 °C) to release active cannabinoid substances but remain cool enough to avoid the smoke and toxins associated with the combustions (Earleywine & Barnwell, 2007; Miovský *et al.*, 2008). This gives user the possibility of smoking without inhaling products of combustion like carbon monoxide and tar (Subritzky, Pettigrew & Lenton, 2016). Abrams *et al.* (2007b) found out that users who use vaporizers had a lower amount of CO in blood than user who smoked normal way. Vaporizing cannabis is auspicious substitute to smoking especially for medicinal purposes, because vaporizing has many advantages over smoking. For example, lower inhalation of toxicants and higher percentage of cannabinoids (Pomahacova, Van der Kooy & Verpoorte, 2009). Abrams *et al.* (2007a in Holland) investigated in his clinical study that after smoking vaporizers, participants had a comparable amount of THC in blood to smoking joint but without carcinogens and other toxicants (Gieringer *et al.*, 2004). Vapour is naturally softer for the throats and lungs. The most effective vaporizers emit the vapours with 95 % concentration of THC (Miovský *et al.*, 2008) and allow to target on specific cannabinoids to reach a particular type of effects. Lower temperature activates cannabinoids that are more energising, day time “high“, from sativa plants and higher temperature make a more body-centric, sedative, night time “high“ like from indica plants (Schmader, 2016). Although knowledge about

vaporizers are not common in population (Okie, 2005 in Holland, 2010). Gieringer *et al.* (2004) discovered that vaporizers attain a similar effectiveness in transmission of THC to smoking by cannabis joint while very considerably reducing level of toxins. Hazekamp *et al.* (2006) also distinguished vaporizers and found that it had sufficient safety characteristics.

**Dabbing** is the new and potentially less harmful version of hot knives. Dabbing is form of vaporization in which potent cannabis concentrates (Hash oil, shatter, wax, BHO, crumble, honeycomb, moon rock, nectar) are put on small surface known as the “nail“, which is created from titanium, quartz or ceramic (Kleiman, 2015 in Subritzky, Pettigrew & Lenton, 2016; Schmader, 2016), that has been heated with a blowtorch, creating a dense vapour. The dab is vaporized very quickly and it allows to inhale the vapours and feel the effects swiftly (Loflin & Earleywine, 2014; Subritzky, Pettigrew & Lenton, 2016). Loflin & Earleywine (2014) asked respondents why they prefer to use dabs instead of cannabis flower. The main reason was that it requires fewer hits to achieve the desired effects plus the effects were reported as a stronger and the “high” was a different. Respondents also preferred dabs because the effect is faster and longer, more effective for pain relief, give a “cleaner high”, no ash from products and better “quality”. The increased concentration of THC in BHO might lead to more rapid absorption thereby increasing risks associated with increasing physiological tolerance and potential withdrawal syndrome (Loflin & Earleywine, 2014). Smoking devices for cannabis concentrates are seen as risky for potential users, because they allow the user intake large amount of THC and it could be critical even for experienced users (UNODC, 2016).

### **1.3.2 Oral ingestion**

Cannabis used by oral ingestion is also known as „edibles“. These products have several forms for example baked products (brownies, cookies or muffins), candy (gums, bonbons, lollipops, chocolates or caramels) or infusions (Lamy *et al.*, 2016). Orally ingested cannabis has a slower onset of psychoactive effects. Cannabis products pass through the stomach, intestine where it is absorbed in the bloodstream and further in the liver (Holland, 2010) in which the THC is metabolized into the 11-hydroxy-THC then goes through the heart and brain. Absorption is slower, users have to take higher doses than with smoking and the „high“ lasts longer but it is coming up after 30-90 minutes after ingestions and peak was measured around 90 minutes after ingestion (Rosenthal, 2010; Holland, 2010).

The effects are influenced by factors like pH in stomach, filling the digestive tract with food, blood circulation or speed of digestive tract movement (Miovský *et al.*, 2008). The user has a lower ability to titrate used cannabis and effects could persist for 8 hours after only one administration (Holland, 2010). The main inconvenience of edible products is poorly estimated amount of drug to achieve the desired effect, slower onset and longer duration of intoxication which could lead to overdosing, especially for inexperienced individuals (Miovský *et al.*, 2008; UNODC, 2016). Iloveincredibles.com (2017) also warned that high altitude can escalate the effects.

**Tinctures** are cannabis concentrates in alcohol solution, which is distributed in liquid drops. If users insert drops under the tongue, the THC will get into bloodstream in the same speed as smoke or vapour. Tincture added to edibles can take around two hours before the effect will start. A positive thing about it is that tincture is stealthy and user will avoid smoking (Schmader, 2016).

**Maripills** are capsules which contain processed cannabis. Maripills are ingested orally and users could control dosage and it is also a healthier alternative than smoking (Rosenthal, 2010).

## **2 Cannabis use and related risks**

### **2.1 Prevalence of cannabis use in the Czech Republic and globally**

*“Cannabis continues to be the most widely, cultivated, produced, trafficked and consumed drug worldwide”* (UNODC, 2016). According to the world drug report it seems that cannabis consumption is slightly higher than in previous years, around 182,5 million people (3,8 %) globally consumed cannabis in 2014 (UNODC, 2016).

According to European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), lifetime prevalence of cannabis use among adults from 15 to 64 in European Union (EU) was 26,3 % which means that 87,7 million people in EU have been tried cannabis at least once. Prevalence of last year was lower with 7%, which is around 23,5 million cannabis users (EMCDDA, 2018).

The prevalence of the cannabis use in the general population of the Czech Republic has remained stable for a long time. According to Annual Reports on the drug situation, 26,6 % citizens from 15 to 64 years had at least one experience with using cannabis drugs. In last 12 months, 9,5 % and in last 30 days, 5,5 % people used cannabis drugs (Mravčík *et al.*, 2016). In the group of young adults (15-34 years old) the number of lifetime prevalence was higher, 48,8 %. In the last 12 months was 19,4 % and monthly prevalence was 11,1 % in cannabis type drugs (Mravčík *et al.*, 2016). A study among sixteen year old students, ESPAD, found even higher prevalence. In terms of lifetime prevalence, cannabis drugs were used by 42,3 % of the sixteen years old students. In last 12 month 29,7 % students used cannabis and in last 30 days, 14,6 % used it (Chomynová *et al.*, 2014).

Cannabis users in the Czech republic who claimed that they used cannabis in last 12 months, said that they used indoor grown cannabis in 32,7 %, outdoor grown cannabis was reported by 41,4 % and 23,3 % did not know about the origin of cannabis. The last group of cannabis users, 2,6 % , mentioned that they used hashish (Mravčík *et al.*, 2016).

National monitoring centre for drugs and drug addiction surveyed also use of cannabis for medical purposes. The most frequent reason for using medical cannabis was pain (53,7 %) and problems with skin (46 %), stiffness (15,5 %), tremor and convulsions (7,8 %). The most common cause of the reported problems was skin disease (46,8 %), followed by joint disease (45 %), and other diseases reported by less than 10 %

of respondents, for example cancer with 3,7 % (Mravčik *et al.*, 2016). Medical patients used medical cannabis in the form of an ointment (78,4 %), hemp cosmetics (21,6 %) hemp oil (11,9 %), cannabis extract (8,2 %), smoked cannabis (4,7 %), smoked cannabis in a mixture with tobacco (3,0 %), edibles (2,9 %), beverages (2,7 %), in the form of a suppository (1,3 %) and by vaporizer (0,6 %)(Mravčik *et al.*, 2016). The way of obtaining cannabis for medical purposes were in a pharmacy without a prescription (27,0 %), from a friend, relative or partner (other than from cultivation) (25,3 %), from a friend who cultivated (13,9 %), obtained from another person (other way than cultivation) (10,8 %), on prescription in pharmacy (8,1 %), grown by themselves (6,0 %), or acquired on the internet (4,6%) (Mravčik *et al.*, 2016). In the last 12 months, 880 000 adult population (15-64 years old) used cannabis for medical purposes, and from those approximately 570 000 probably used psychoactive cannabis (Mravčik *et al.*, 2016).

## **2.2 Harms from cannabis use**

Using cannabis can yield the following risks: accidents while driving motor vehicle, addiction on cannabis, side effects on respiratory tract (chronic bronchitis, pneumonia etc.), cardiovascular system, psychotic symptoms or psychosis (schizophrenia), lower education outcomes or increased likelihood of using other illicit drugs. Every risk is more probable, when the user starts with cannabis in adolescence or uses it daily (Hall, 2009).

It is important to mention that the harms depend on a frequency of cannabis use. Acute cannabis users have less long-term consequences (accidental injury) but for example consequences can occur when inexperienced users use powerful cannabis or inappropriate route of administration. The negative consequences on health can be felt especially by the chronic cannabis users (respiratory risks, psychosis or psychosocial consequences) (Hall, 2009).

The groups with potentially highest risks are adolescents, pregnant women, individuals with respiratory or cardiovascular diseases and individuals with a co-morbid disorder (substance use, mental health disorders) (Swift, Copeland & Lenton, 2000). The major concern is cannabis use in adolescence. It is time when human health development is fast and using cannabis can cause negative outcomes such as poor mental health, drug use and abuse, delinquent behaviour, or poor education. The average age of the first-time cannabis users has decreased in the past few decades while the preference

for more potent marijuana has increased. One of the consequences of adolescent use can be the dependence (Swift, Copeland & Lenton, 2000).

Cannabis users who have entered treatment reported symptoms at the end of their using like: feeling of paranoia, antisocial behaviour after smoking, memory loss, lack of hygiene or pain in lungs after smoking (Holland, 2010).

Cannabis intoxication affects cognitive and behavioural skills that could influence driving. Using cannabis could increase the risk of car accidents two to three times (Hall & Fischer, 2010). Tiredness and sleepiness are sometimes described as adverse effects but it depends on specific strains (Holland, 2010). Tiredness and sleepiness related to cannabis use are dangerous when driving. Cannabis is less dangerous than alcohol regarding deterioration of driving capabilities but much more hazardous when driver used alcohol and cannabis at the same time (UNODC, 2016).

Chronic use of cannabis is related to the problems with respiratory functions, aggravated cognitive functions specially centre of memory. Mental health problems like anxiety, depression or schizophrenia can occur (Holland, 2010). After overdosing by cannabis, users could behold consequences like memory damages, possible panic or paranoia, overeating, and sleep (Rosenthal, 2010). Tatarsky (2010) mentioned that thinking could be damaged after using marijuana, so the user should avoid doing activities which require learning, attention, concentration, memory or perception of time. Respiratory risk can be minimized if the user exchanges smoking for another method of ingestion, for example eating. This is not common, as cannabis users prefer intake by smoking because they could easily titrate their doses (Hall & Fischer, 2010).

There is some evidence associating cannabis usage and development of cancer. However, the study participants used both, cannabis and tobacco and the researchers were not able to separate cannabis and tobacco harm (Hall & Fischer, 2010). Both, cannabis and tobacco smoke contain many carcinogenic segments and respiratory irritants (Swift, Copeland & Lenton, 2000) that are harmful. Cannabis smoke can cause lung cancer, cancer of mouth, tongue and many others harms at respiratory tract (Hall & Fischer, 2010; Miovský *et al.*, 2008). The habit of smokers to inhale deeply and hold the smoke for an extended time results in elevated levels of carbon monoxide and tar into their lungs (Schmader, 2016). Coughing and creating of sputum or bronchitis is seen more often

in long-term smokers or heavy smokers. To avoid coughing, it is better to use the vaporizers (Holland, 2010).

High potency cannabis brings possible risks which could cause negative perception of intoxication or anxiety, panic attacks etc. between non-experienced users. Higher potency of cannabis could activate psychotic disease among predisposed individual or in acute intoxication among young and inexperienced users (Miovský *et al.*, 2008).

Cannabis from unknown sources might also bring some risks because it may contain a number of unwanted ingredients such as pesticides, heavy metals, *Escherichia coli* bacteria, *Penicillium*, *Aspergillus*, microbes that produce strong carcinogens (Aflatoxin B) etc. Purchase of cannabis from uncontrolled sources can cause potential health hazards especially for cannabis users who use it for medical purposes as well as for those who use cannabis daily (Hazekamp, Sijrier & Verpoorte, 2006). The marijuana obtained from Dutch coffee shops was found to contain fungi and bacteria, unlike medical cannabis which was grown in a controlled environment (Hazekamp, Sijrier & Verpoorte, 2006). Běláčková & Záborský (2014) claimed that cannabis sold on the black market that does not have any information of its origin can make a risk with regard to its possible harmful effects on health, for example adulterants contained in hashish were wax from candles, butter, henna or sand (McPortland, 2002).

Infections can be seen as well due to the sharing of smoking devices. Tatarsky (2010) recommends to not sharing water pipes or joints with anyone or do not touch the joint by lips or clean the devices before using.

Dependence on cannabis is possible as for any other drug. Cannabis dependence is often seen in chronic, daily or near-daily cannabis users. “*Cannabis dependence is characterised by marked distress resulting from impaired control over cannabis use and difficulty in ceasing use despite harms caused by it*” (Hall & Fischer, 2010). Anthony *et al.*, (1994 in Hall & Fischer, 2010) mentioned in his study from the United States that risk of developing cannabis dependence is comparable to alcohol dependence but it is lower risk than from opiates or nicotine. Over the last few years, number of patients who seek treatment from cannabis use is increasing (Hall & Pacula, 2003).

One of the probable harms is a cannabis dependence syndrome, described by type of cognitive, physical and behavioural symptoms (craving, the sense of loss of control

of using, continuing to use in spite of negative consequences, neglect of other pleasures and interests, increasing tolerance and withdrawal syndrome) (Tatarsky, 2010; Kalina *et al.*, 2015; Swift, Copeland & Lenton, 2000). Withdrawal syndrome can appear when regular long-term user suddenly completely stops the using of cannabis. The reported symptoms were depressed mood, disturbance of attention, psychomotor restlessness, sleep disorders (Kalina *et al.*, 2015), weird dreams, irritability, anger or aggression. Less common reported symptoms were headaches, sweating, stomach pain, physical tension. The most withdrawal symptoms occur within the first twenty-four hours with another strike happening in the following two to four days later and they last approximately one or two weeks (Holland, 2010). Generally, the chronic use raised the risk of experiencing other adverse effects (Swift, Copeland & Lenton, 2000). For treatment from cannabis dependence, cognitive behavioural therapy is used (Hall & Fischer, 2010).

Some cannabis users have difficulties to control their use. Decrease of their ability to smoke less or decrease of ability to plan smoking on specific occasions. National survey in the USA reported that among active cannabis users, nearly 40 % tried to reduce or quit using of marijuana. One of the largest indicators that control is lost is when cannabis user spends most of his time in activities around the cannabis, for example obtaining or recovering from the effect of cannabis. Long-term use can also influence school or work performance, duties at home etc. Users reported some problems related with cannabis use as: *“spending more time only with smoking friends”* , *“losing touch with family and friends”* *“prefer smoking instead of hobbies”*, *“problems in romantic relationship”*, *“lower self-esteem”* etc. (Holland, 2010).

Regular users who smoke only one variety can become resistant to the effects. This can happen with low or high potency cannabis or with hashish. It is due to different cannabinoids in each plant and rapid increase of the tolerance to specific kind of cannabinoids. Tolerance is formed after repeated exposures to marijuana over time. Thus, to achieve the desired effect, it is necessary to use larger doses of cannabis which leads to possible harms to health (King, 2007).

### 3 Harm reduction and cannabis use

#### 3.1 Harm reduction and its role in drug policy

Harm reduction is an alternative approach to the traditional abstinence-based approach to illicit drug use. Harm reduction approach lead users to intentional, responsible and healthier use (Tatarsky, 2010; Swift, Copeland & Lenton, 2000).

*“First, the central defining characteristic of harm reduction is a focus on the reduction of harm as a primary goal rather than the reduction of use; it must include strategies for those that continue to use as well as those aimed at reduction of use or abstinence; and there should be some attempt to evaluate whether these strategies will probably result in a net reduction in drug-related harms “ (Lenton & Single, 1998)..*

Harm reduction seeks to minimize, reduce or mitigate *e.g.* health risk, spreading infection disease, risk of other health complications, long-term use of high doses, overdosing or loss of human dignity. The best known practises are needle and syringe exchange, distribution of condoms, providing information (about treatment options or other professional care), counselling services and risk education. Drug consumption rooms are also part of the harm reduction approaches. Counselling and education within harm reduction contain advices, instructions and explanations on how to safely apply the drug, how operate with paraphernalia and other similar purely technical information. Printed materials containing this information are quite specific and their distribution must be limited to the range of clients they are created for. Harm reduction is used in drop-in centres and outreach programmes (low-threshold programmes). Education aims at reducing health risks from drug use and it is an integral part of treatment programmes (Kalina *et al.*, 2001). The concepts of harm reduction are closely related to health promotion and public health. Harm reduction approaches are used globally by the United Nations and also it is part of EU drugs strategy and action plans and it is part of the drug policy in most European countries (Rhodes & Hedrich, 2010).

Some scholars suggest that the total harm from drug use might be reduced by cannabis use. Several scholars suggest that legalization could be related to a substitution effect where people may switch alcohol use to cannabis use which may cause that alcohol-related harm in society will be reduced (Lucas *et al.*, 2013 in Sznitman & Zolotov, 2015). In a wider perspective, the substitution treatment can also be included under harm reduction (Kalina *et al.*, 2001).

### **3.2 Reducing harms from cannabis use**

Some harm reduction strategies are very similar to those used for alcohol. A huge public health challenge for cannabis harm reduction is informing young people about the risks. The changes in frequency of using are more often seen in occasional than regular users (Hall & Fischer, 2010). Education about cannabis risks has to be handed over to cannabis users, but also to the peers to increase the perception of these problems (Hall & Fischer, 2010).

Swift, Copeland & Lenton (2000) suggested in their publication several techniques to reduce harms from using cannabis. One of the principles is not to mix using of cannabis with other drugs, smoke only in a safe place with trustworthy friends who provide the feeling of confidence and could reduce unpleasant side effects. Users should know that the side effects will pass. Another harm reduction is not sharing joints or “bongs” with others and cleaning smoking devices regularly. Harms could be reduced also by avoiding the addition of tobacco into the joints, rather smoking joints than water pipes and avoiding deep breaths. More suitable is smoking from vaporizers where cannabis is heated not burned. Nevertheless, it was found that users need to inhale more vapours to reach the needed effects.

EMCDDA released monograph about harm reduction for reducing harms from cannabis use: Avoid using cannabis more often than weekly because it could lead to developing mental health problems or cannabis dependence. Avoid ingestions by smoking joints or “bong”, instead of that, use vaporizers. Avoid deep inhalation and holding the breath inside the lungs to reduce possible harms on respiratory track and do not drive during and after intoxication (Hall & Fischer, 2010).

First step in decreasing the risk of dependence is to educate users of the risks. Risk of cannabis dependence could be higher if the individuals use cannabis daily for weeks or months. The risk is high also for adolescents with respiratory problems or mental health problems like depression or anxiety. Individuals, who have a psychosis in family anamnesis, should be careful or should not use cannabis at all because it could induce psychosis, other mental disorder or it could cause unpleasant experiences after taking cannabis. Consequences for those who are susceptible and vulnerable to psychosis or mental disorders could be really serious. It is really important to warn people

with experiences with psychotic symptoms to reduce prevalence of cannabis use or stop with cannabis entirely (Hall & Fischer, 2010).

Gieringer, St. Laurent, & Goodrich (2004) suggest strategies of harm reduction for cannabis smoking. For example, use the higher “quality” cannabis with higher number of cannabinoids or the least harmful smoking devices *e.g.* vaporizers. Problems with the respiratory tract, for example coughing, are related to smoking. Using water pipes increases the concentration of tar in lungs because user holds the cool smoke longer than with joint. These problems could be solved by solely eating/drinking cannabis containing food or beverages. However, the user has to be patient with the effects and not take further doses (Tatarsky, 2010). Vaporization and oral or topical ingestion are safer for the respiratory tract than smoking because burning of cannabis produces unhealthy chemicals which could damage all parts of respiratory truck, including mouth (Rosenthal,2010). If user does not want to quit smoking, then it is recommended to not mix tobacco with cannabis and not inhale smoke deeply or hold the smoke (Tatarsky, 2010). Hall & Fischer (2010) also recommend avoiding the “deep inhalation” or holding the breath inside of lungs because it delivers quantities of tar but the amount of inhaled THC stays the same. Cannabis user should eliminate adding tobacco to their joints because tobacco contains other dangerous, addictive and cancer causing compounds (Hall & Fischer, 2010). Some of social clubs members are willing to quit with tobacco and smoke only pure cannabis (Běláčková, Tomková & Záborský, 2016).

Acute harms (such a paranoia, anxiety, feeling “stupid”) could be terrifying but it is important for user to remember that these feeling will pass soon. Potency of cannabis is varying. When user does not know how strong material he or she has, it is always better to start with lower doses and wait. Another tip which Tatarsky (2010) recommends, was to not take any other drug when using the cannabis because it might cause additional negative effects. People with mental illnesses should be aware that it could cause a psychotic episode, if user takes the risk, it is again important to remember that the negative effects will pass in few hours (Tatarsky, 2010).

### **3.3 Harm reduction strategies commonly deployed by cannabis users**

Many drug users discuss “quality” from the point of view of harm reduction. Cannabis users share their ideas how to maximise effects of the drugs (Bancroft & Reid, 2016). Cannabis users have often problems with tolerance. Some

authors recommend using lower doses and less often, stopping smoking for a while to reduce THC tolerance in body (Tatarsky, 2010; King, 2007) or have an access to choose from many different strains. Smoke more than before is not an ideal option (King, 2007).

Cannabis paraphernalia could also influence the amount of harms. “Roach” is the usual filter used for joints. It is a small strip of paper which has been folded and rolled into filter shape. It helps to keep air flowing freely and prevents from the inhalation of the small pieces into the mouth (Schmader, 2016; Miovský *et al.*, 2008). Classical tobacco filter is not preferred because it can also absorb the desirable psychoactive substances (Miovský *et al.*, 2008). Nesládek (2011) describes this as an insufficient protection from the harms. More effective protection against the tar is usage of cottons filters. According to that study, user can then more easily assess the “quality” of cannabis. Low “quality” cannabis with the fertilizers residues is colouring the filter to brown-black while with high “quality” marijuana is the filter mostly yellow-brown.

Users can also minimise the adverse effects of cannabis use if they can distinguish time for smoking cannabis indica and cannabis sativa products. Cannabis sativa plants are recommended for daily use and indica plants are suitable for night time. To consume an indica product in the beginning of the day could be demotivating (Holland, 2010; Schmader, 2016).

Specific websites with cannabis edibles product are describing few advices for users who are determined to try cannabis by oral ingestions. Recommendations are as follows: Start to consume lower doses and slowly, user should stay hydrated and be aware that the effects could be different from smoking and that the consumer could feel more body buzz. The last recommendation is to not mix it with alcohol and other substances and wait two hours before the effect starts (iloveincredibles.com, 2017).

### **3.4 Potency and ability to titrate**

Marijuana users seem capable of minimising the risks from using cannabis that is too strong. High potency cannabis may lead to smoking less amount of marijuana to attain the desire effects. When cannabis users smoke potent cannabis, they tend to smoke smaller and shorter puffs. Smoking less cannabis could lead to decrease of inhaled tar and other toxicants (Holland, 2010). More potent cannabis does not mean that is more harmful, because cannabis user can titrate cannabis *e.g.* by diluting it with tobacco (Miovský *et al.*, 2008).

Titration is a way how patient can use the exact amount of cannabis to feel the required psychoactive effects on and at the same time to experience the lowest harms (Miovský *et al.*, 2008).

The best way to titrate cannabis is by inhalation. The higher the THC content is in cannabis, the lower content of carcinogenic combustion products patient inhales. That is one of the reasons for using vaporizers where the concentration of THC in vapours is several times higher than from the smoke of cannabis joints. It helps the user to smoke less, because they feel the effects with small amount of smoked marijuana (Miovský *et al.*, 2008).

Ability to titrate the concentration of cannabis products improves with the experience and length of the user's career (Korf, Benschop & Wouters, 2007). This behaviour is similar to alcohol users (Miovský *et al.*, 2008). The risk of highly potent cannabis is particularly prevalent for young and inexperienced users who may be exposed to an increased risk of negative experiences in acute intoxication with the use of high potency cannabis (Miovský *et al.*, 2008).

Some users reported that if they have weak outdoor strains, they have to hold the smoke longer or smoke bigger amount of marijuana (Běláčková & Zábanský, 2014a). Users can hold more potent smoke in lungs for shorter time. However, those who search for the most striking “high” can be exposed to greater damage; according to some authors, it is unlikely that users adapt smoking, according to the effectiveness of a particular cannabis (McLaren *et al.*, 2008). Otherwise McLaren *et al.* (2008) has suggested that behaviour during the smoking of cannabis is more governed by a learned habit than potency.

### **3.5 Alternatives to illicit market as a measure to reduce cannabis-related harm**

Harm reduction approach could be seen also as legalised cannabis market because it provides safe (purity from residuals such a pesticides and moulds), consistent (measured amount of THC and CBD) and pure product to customer (Kilmer, 2014). Moreover, legal cannabis market could then replace the black market (Subritzky, Pettigrew & Lenton, 2016). Legalised cannabis market already exists in some jurisdictions of the USA (Washington, Colorado, California...) and Uruguay. These markets allow cultivation and sale of cannabis for recreational purposes. Every jurisdiction has its own regulations which

differs *e.g.* in limit on the purchased cannabis. Uruguay law allows the user to access only one of three legal channels which were established. Individuals can choose from home cultivation, entering the social clubs or buy cannabis from retail pharmacies. These markets may provide a wide range of strong cannabis extracts and cannabis edibles thus creating potential public health concerns. Safer approach is to implement strict requirements on labelling and packaging of cannabis edibles and concentrates which could help user to estimate the right dosage (UNODC, 2016).

In comparison to illegal off-line drug market, cryptomarket could provide safer place for purchasing drugs. Sellers and customers on darknet mentioned “quality”, predictability, reliability and safety as the reasons why is the cryptomarket more advantageous (Bancroft & Reid, 2016). Cryptomarket’s sellers can define “quality” and purity of their goods, some even specify content of chemicals by adding the chemical test results. If buyers are discontented with the “quality” or purity of products, they simply leave negative feedback. These points may make sellers more reliable, by communication with buyers and trusted advertisement about the “quality” than buyers who obtain their drugs off-line. Drug dealers sell their products through the offline markets, sometimes selling goods under given weight which could be moderated by trust between sellers and buyers. Cryptomarket decreases the fear of violence correlated with face-to-face, off-line market. Harm reduction is provided by sharing information about dosing, determining drug content and purity, appropriate space for use or combining drugs. This kind of peer-support could underestimate the potency and what is good for someone, does not have to be good for another one (Aldridge, Stevens & Barratt, 2017). Cryptomarkets might help the user to titrate dosage since the previous buyers described their experiences with the “quality” and purity and they also shared the procedure of using to achieve different kinds of effects (Bancroft & Reid, 2016).

Also, cannabis social clubs are remarkably different and more auspicious than any opportunity that could appear on a legalised/regulated cannabis market (Běláčková, Tomková & Zábranský, 2016). Offering the illicit substances in a controlled setting could be seen as harm reduction. Cannabis social clubs accept only regular cannabis user and may push members to reduce their consumption (Běláčková, Tomková & Zábranský, 2016). Běláčková, Tomková & Zábranský (2016) found a number of aspects in which the cannabis social club model is hopeful as a harm reduction strategy for cannabis use. Risks for the respiratory tract from smoking are still valid, but risks of consuming

unknown contaminants, heavy metal, pesticides, moulds are reduced. “Clean” cannabis product decreased risks of respiratory system (Quora, 2013 in Subritzky, Pettigrew & Lenton, 2016). Important property of cannabis social clubs is that they can clarify cannabis strains and inform members about different psychoactive effects, different strength and different tastes. This kind of knowledge could help to better match cannabis use to actual mood or daily activity. Such a competence is a feature of accomplishing mental well-being. The main reason for entering the social clubs was often better “quality“ of the product, control of the content and purity of the cannabis product. Clients of social clubs were assured that the product was grown organically. The members also found advantage in possible refund if cannabis which they obtained was not good for them. They could have their money back and choose something different, unlike on the black market where this was practically impossible (Běláčková, Tomková & Zábranský, 2016). Using cannabis in private social clubs helps the members feel more secure and safe. Members did not have to hide or be afraid of stigma as a “drug addict” because they have a calm place to ingest cannabis (Běláčková, Tomková & Zábranský, 2016).

Additionally, cannabis users believe that cultivating their own cannabis can reduce the harms from buying cannabis on an illegal market. We discuss that in the following section.

## 4 User perceptions of cannabis “quality“

Alcohol and cigarette use is easy to quantify because the substances are legal, which means that the potency and standardized quantity is known (Johnson & Golub, 2007 in Mariani *et al.*, 2011). The same applies for pharmaceuticals where efficacy and safe dosage is defined (WHO, 2007). While, with marijuana the potency varies immensely, the same goes for the amount of what can be bought and every user has subjective judgement which depends on interaction between the drug and the user (Johnson & Golub, 2007 in Mariani *et al.*, 2011; WHO, 2007).

Bancroft & Reid (2016) described that term drug “quality“ is not clear. According to terminology of forum users and participants in their study simplistically interpreted term “quality” as “*good*” or “*chemically pure*.” Chemical purity was cited as uncontaminated product, ideal state for achieving the desired effect or chemical strength of the drug. Darknet drug users judge the “quality” of product by their experience, the purpose of use, and its context. Term “quality” is understood as potency and drug users are interesting about desired effects more than for safety and predictability of the drug. Some growers do not always pay attention about “quality” and knowledge about the plant but they pay attention to strong cannabis strains and the financial profit from it (Decorte, 2010).

On the other hand “quality” is also perceived from the perspective of health and safety. Běláčková & Zábanský (2014b) demonstrated that cannabis users pay attention of the way how cannabis was cultivated. The cultivation can determine the “quality” for example: Large-scale growers add the fertilizers just before harvest to increase the yields and potency but the fertilizers will not absorb in time which means that cannabis will include “earthy” taste and smell and it could scratch in the throat.

Growers in Hough *et al.* (2003) study reported that “quality“ of purchased cannabis is very poor and contains “*unknown ingredients*” and they grow their own to avoid the poisons from poor “quality“ cannabis often known as “soap” or “soap bar”. Cultivation guaranteed them high “quality“ potent product. Decorte (2010) investigated that Dutch small-scale growers are also not satisfied with the offered cannabis product (“*too strong*” or “*chemically boosted*”) and therefore they grow “milder”, “healthier” and “more organic” cannabis (Decorte, 2010). A proper drying method can also influence the “quality” (taste, smell and content of active substances). Providing good “quality” cannabis is the safest

through small-scale growers who do not profit from it but are more interested in “quality” (Běláčková & Zábanský (2014b).

#### 4.1 “Quality” pertaining to effect

According to the users, “quality” cannabis should be “sticky” and should have characteristic and acceptable smell (Kalina *et al.*, 2015). Mounteney *et al.*, (2017) mentioned that “quality” could be assessed by reliability, purity and potency, predictability of effect and user’s satisfaction. Users have some preferred methods to judge the drug: Assessing of taste, comparing the opinions with other users on-line and off-line as well and chemical tests, if it available (Bancroft & Reid, 2016). Limitation in most of the studies about cannabis “quality” was the measure of only one component, THC (Freeman & Swift, 2016).

Bancroft & Reid (2016) also agree that the understanding of “quality” depends on users’ knowledge, their own and others experiences with the drug and normative statements about the amount of chemical substances. When user evaluate “quality cannabis”, it is important to consider grower’s skills and their abilities of grow conditions and plant itself, not only strain. Assessment of taste, aroma and type of “high” is subjective. For “cannabis connoisseurs”, it is important if cannabis was grown organically. According to the users, smell and taste is more pleasant when chemicals weren’t involved in cultivation and the same applies to the desired effects and possible follow up hangover (King, 2007). In a study preceeding to this thesis, cannabis users assessed the strength of the effects and many participants reported that they preferred “*mild cannabis to a very potent one*” (Běláčková, Brandnerová & Věchet, 2018). Dependent users could seek for the high THC cannabis (Freeman & Winstock, 2015) but considerable group of cannabis users prefer low THC cannabis (Korf, Benschop & Wouters, 2007).

Bancroft & Reid (2016) claims that user needs to be more experienced and have more knowledge to judge and assess to kind of „high“ and other subjective effects produced by cannabis.

Cannabis connoisseur Jason King, author of the *Cannabible* assume that high “quality” cannabis should smell the same like it taste. He mentioned in his book that indicator of sparkling buds on the day light suggest the amount of resinous glands which portend “quality” cannabis. If the ash from the smoked joint stays clear and grey, it implies that grower did flushing and drying process correctly. Drying process is important factor

for the “quality” of cannabis. If the bud is properly dried, the stems should brake easily (King, 2007).

Cannabis users in New York are willing to pay more for “quality” cannabis because they assume they are more potent (contain higher percentage of THC). Unknown percentage of THC does not prevent retailers to increase the price of so-called highly valued “premium product”. Retailers often claim to sell prestigious varieties that cannabis experts need to know and understand. They also promote how rarely these varieties are available, so they can also set higher prices for vendors. Whether these premium varieties have a higher potential is not scientifically validated because the percentage of THC content was not measured in this research, so it should be done in future research (Sifaneck *et al.*, 2007).

Bancroft & Reid (2016) reported, that users, who purchase their drugs on dark net, agree, that “quality“ of drugs sold there is high, which proves also term “street quality” meaning low “quality“ product. This was caused by feedback from the previous customers and evaluation of the seller.

#### **4.2 “Quality” pertaining to a “safer” product**

As mentioned above, the “quality“ can be also viewed from the perspective of health and safety. In order to verify safety requirements, it is necessary to have a good relationship with the grower or to grow the cannabis itself to ensure proper fertilizer addition, proper flushing the plant from fertilizers, drying and storing method. However, cultivation is the key of “quality” associated with “health and safety”.

Some authors (Lenton, 2015; Potter *et al.*, 2015) mentioned that one of the reasons for cannabis cultivation is a wish to minimise the harms due to grow milder cannabis and cannabis without adulterants which means that the product may be the least harmful. Běláčková & Zábanský (2014a) asked the respondents of a qualitative study why they cultivate cannabis. The response was that dealer did not know anything about the source, what was the genetic base, which fertilizers were used and if the grower allowed for a period of time before harvest when no fertilisers were used.

One of the reasons for cannabis cultivation is desire to have “quality“ product grown organically, have particular variety with desired potency (Běláčková, Maalsté, Zábanský & Grund, 2015) and this can be accomplished by passing different growers tips

and techniques to grow organic product without mould, bacteria, heavy metals and insecticides (Decorte, 2010).

In another study, the main reasons for cannabis cultivation was that it is cheaper than buy cannabis, further provision for personal use and enjoyment, following by that the cannabis is without adulterants, which means that it is healthier and eventually avoid to be on the illegal market (Potter *et al.*, 2015). Motives for cannabis growing were not only economic ones (notably to save money, or for profit). Growers also responded “*the love of the plant*”; for medical use; social capital; personal pride in a growing a good plant; for sharing with friends; home cannabis is milder or healthier (Decorte, 2010). In countries like the United Kingdom, cannabis users, however, reported a low level of knowledge about the cannabis cultivation (Wilson *et al.*, 2017).

According to research that preceded the work on this diploma thesis (Běláčková, Brandnerová & Věchet, 2018) low “quality“ cannabis was characterized as overdried or the opposite, wet and dark, sometimes seeds or leaves included. Respondents perceived health-related concerns like “*harsh on the throat*”, which was caused by chemical residues from fertilizers. The case of chemicals of contaminated cannabis was more common in commercially produced marijuana. Czech participants in Běláčková & Zábanský (2014a) study reported that Vietnamese large-scale products are of bad “quality”.

Cannabis growers are very critical of cannabis “quality“ available on the black market (Bancroft & Reid, 2016) that is the reason why personal cultivation is frequently a logical choice for cannabis users to minimize the risks associated with black market (Potter *et al.*, 2015). People grow their own cannabis due the lack of “quality“ product on the black market, disbelief in non-organic growing techniques, unavailability of appropriate strains, desired potency, the low possibility to buy cannabis in general, and disagreement with supporting criminal organizations (Hakkarainen & Perala, 2011; Potter, 2006 in Běláčková, Maalsté, Zábanský & Grund, 2015).

Plants that were grown organically have a stronger odour than plants fed with chemical fertilizers. To improve “quality” of cannabis is necessary to “flush” cannabis plants by water. Flushing cannabis plant means that the plant is fed only with water during the last two weeks of their growth to exclude salts and minerals which have been collected during the life cycle and cause the chemical odours and taste (Holland, 2010).

Another important process for good “quality” taste and smell is curing of marijuana during which a lot of the cell’s metabolic processes continue. Buds are stocked in jars and curing continues there when jars are kept in dark at 15-21°C and with 50% humidity. After curing comes the drying process which is important for cannabis bud aroma and flavour as well (Rosenthal, 2010). Another problem is with the inappropriate drying methods. Scratching in the throat is a sign of chemical residues, which are contained in the cannabis because of insufficient flushing. The chemical residues are contained when burning joint whistles and jabs (King, 2007). King (2007) also described few indicators which could help to users find out the low “quality” cannabis. One of the significant indicators was that material was too wet or full of chemical salts, so it was difficult to ignite. The overdried cannabis material or already crushed cannabis buds reduce the effect. Wet cannabis already packed in plastic bag could be dangerous because it could contain moulds.

All these concerns were demonstrated in the study that preceded the work on this diploma theses in that cannabis users seem to prefer to buy cannabis from grower directly, than from dealer who “*just sell*”, when they get the chance (Běláčková, Brandnerová & Věchet, 2018). The purpose of this thesis has been to gain more direct evidence into how cannabis users define cannabis “quality“, i.e. to see whether health-related aspects make part of this definition.

## **5 Research Design**

### **5.1 Aim of the Research**

The aim of this research was to reveal what Czech cannabis users consider as “quality” cannabis and how and with what characteristic they assess it. At the same time, the purpose was also to discover user’s methods which they apply to avoid side effects and physical and mental harms from cannabis use.

### **5.2 Research Questions**

What are the required effects which cannabis users seek from their cannabis use?

How do cannabis users understand the term “quality” cannabis?

How do cannabis users recognize, that the particular cannabis is of good “quality”?

Do cannabis users pay attention to the origin of cannabis, what kind of variety it is and how to distinguish them?

How do cannabis users perceive the role of paraphernalia in reducing harms?

How do cannabis users perceive the role of paraphernalia to achieve desired effects?

How do cannabis users prevent the physical side effects?

How do cannabis users prevent the psychological side effects?

### **5.3 Methods**

For the purposes of this study, ethnographic research was chosen. Ethnographic or field research can be defined as a systematic and methodical direct confrontation of researcher with the analysed social and cultural situation, with the answer to all researcher’s questions as accurately as possible. It is an empiric study of people through the ethnographic data, in this case behaviour and habits. The main effort of researcher is to capture the phenomenon, and find out in which context this phenomenon is detected, how this phenomenon works and what is the significance and value for the research subject (Janeček, 2014). Aim of this study is to collect new ethnographic data about using cannabis and techniques to assess its “quality” and on their basis to formulate new hypotheses or theories that could benefit to all cannabis users for safer use.

Collection of qualitative data was performed using the method of qualitative semi-structured interviews, which was made and structured according to research questions

(questionnaire can be found in Attachment 1). A semi-structured interview can solve many disadvantages of unstructured and structured interview. It is created by using schemes that are binding for the interviewer and are specified using a range of issues on which the interviewer asks participants. These schemes are called the core of the interview. One of the benefits of this tool is the ability of the researcher to ask additional questions in order to correctly understand the idea (Miovský, 2006).

### **5.3.1 Methods of data collection**

Respondents were approached through Facebook in the group focused on growing cannabis. After reading the announce they could self-select to participate and contact the researcher (the author of this thesis) to arrange for an interview. From these initial seeds, snowball sampling via their personal networks was applied, which is ideal method for gaining new respondents on the basis of nominations of already contacted respondents (Hartnoll *et al.*, 2003). Also, in this thesis, stratified targeted sampling method was used (Miovský, 2006). This method is used in cases where is possible to divide basic sample into different groups. In this case, groups of men, women, users in age 18-24, 25-34 and 35 years and more, regular users and growers. Thanks to stratified targeted selection method author can ask respondent to nominate another user from a group where representation was lacking.

The eligibility criteria for the research were the use of cannabis in the past twelve months; the minimum age limit was eighteen years.

Chosen participants were invited on a neutral place, which suited both the researcher and the respondent. Before interview started, respondents were familiarized with information about the study and that the study was anonymous and the verbal consent and whole interview was audio-recorded. All interviews were performed by the author of this thesis. After the interview, the record was transcribed into MS Word by the author of this thesis and were deleted after transcription.

## **5.4 Research tool**

The aim of the interview was to understand user's knowledge about cannabis preparation and usage. Main aim was to discover how cannabis users recognize cannabis "quality" to avoid to minimise any harm from eventually unexpected effects. Semi-structured interview was used in this study because it was important to gain the trust of respondent to and get honest responses. For this, it was necessary to require that

the conversation passed freely and casually but at the same time, it was possible to ask additional questions. It was important to keep the structure of interview because the respondents may tend to move away from the topic.

Semi-structured qualitative interviews were conducted personally in Prague (n = 23) and through the online application Skype (n=2).

The privacy of respondents was guaranteed in all cases during the semi-structured interview and after that. For that purpose, a list of random generated names was provided in order not to disclose any identifying information about individuals mentioned in the course of the interview. Respondents were also asked to assign randomly generated names to all individuals who they mentioned in the interview.

The interview and the coding were performed in the respondent's and author's native language, Czech, and excerpts presented in this thesis were translated by the author for this thesis.

#### 5.4.1 Sample description

Sample of this study consisted predominantly of long-term cannabis users. This sample of long-term users was chosen because of their sufficient experience with cannabis. As a part of the sample, also occasional users were chosen to easily see the contrast between their knowledge and find out after what rules they follow.

**Tab. 1- Sample Description**

	Estimated number of users who have consumed cannabis in the last 12 months in the general population	Target number of respondents in the study (out of the total estimated number of respondents 25)	Actual number of respondents in the study
Gender (men)	66%	16	17
Users 18- 24	49,1%	12	11
Users 25-34	28%	7	8
Users 35 and more	22,9%	6	6
Regular user (cannabis was used at least once a week or often)	32%	15*	19
Cannabis grower	8,2%	10**	11

\* Number of respondents in the group of regular users was increased to ensure enough number of users with numerous experiences.

\*\* Number of respondents in the group of growers was increased to find the difference in perception of cannabis “quality” between users who purchase cannabis or the ones who grow their own.

**Tab. 2 - Specific information about respondents**

	NAME	G E N D E R	DATE OF INTERVIEW	AGE	REGULAR USER	GROWER	REGION
1	Jamall	M	13.09.2017	24	YES	YES	Ústecký
2	Eddie	M	15.09.2017	23	YES	NO	Karlovarský
3	Sonny	M	16.09.2017	19	YES	NO	Středočeský
4	Freddy	M	18.09.2017	32	NO	YES	Praha
5	Erica	F	18.09.2017	24	YES	NO	Praha
6	Ray	M	19.09.2017	31	YES	YES	Praha
7	Larry	M	20.09.2017	19	YES	YES	Středočeský
8	Felix	M	20.09.2017	25	YES	NO	Ústecký
9	Arnold	M	21.09.2017	27	YES	YES	Praha
10	Natalia	F	22.09.2017	29	NO	NO	Praha
11	Johny	M	23.09.2017	24	YES	NO	Ústecký
12	Anthony	M	28.09.2017	44	YES	YES	Středočeský
13	Tom	M	29.09.2017	35	YES	YES	Západočeský
14	Jeniffer	F	02.10.2017	30	YES	NO	Praha
15	Jack	M	03.10.2017	28	YES	NO	Ústecký
16	Russel	M	04.10.2017	51	YES	YES	Praha
17	Thomas	M	09.10.2017	41	YES	NO	Praha
18	Thea	F	11.10.2017	32	YES	YES	Praha
19	Willow	F	12.10.2017	19	NO	NO	Liberecký
20	Cindy	F	13.10.2017	24	NO	NO	Ústecký
21	Ben	F	19.10.2017	19	YES	NO	Jihočeský
22	Miranda	F	20.10.2017	40	NO	YES	Jihočeský
23	Bob	M	23.10.2017	24	YES	NO	Praha
24	Borat	M	02.11.2017	38	YES	YES	Praha
25	Emily	F	11.12.2017	19	NO	NO	Plzeňský

## 5.5 Methods of Analysis

Then, the interviews were coded (which is “process of analysing data”) (Strauss & Corbin, 1999) using the method of grounded theory.

*“Grounded theory is a general methodology for developing theory that is grounded in data systematically gathered and analysed. The theory evolves during actual research and it does this through continuing interplay between analysis and data collection.*

*A central feature of this analytic approach is a general method of comparative analysis”* (Strauss & Corbin, 1999).

Grounded theory is a part of qualitative research, where systematic techniques and analytic method allows researcher to create theory grounded on empiric base and fulfil requirements of “good science”. Procedures are designed to ensure accuracy and criticality of the analysis and emphasize creativity as well (Strauss & Corbin, 1999).

The qualitative data were coded in the NVIVO software into individual codes. Groups of codes were related with research questions. Codes were gathered into categories and after that, theories were inducted.

Quantitative data (age, gender, highest reach educations, smoking tobacco, first use of cannabis, experiences with other illicit substances) were assembled and processed in Statistica software with basic statistic methods. Socio-demographic data and data about using of cannabis were used for the sample description.

## **5.6 Ethics**

Before the beginning of the interview respondents were informed about the purposes of the questionnaire, methods of study and consequent using of data. Respondent received paper with informed consent to this study and subsequently was introduced to the risks related to their study participation and with other information from informed consent. Respondent participation in the research was voluntary and anonymous. The recorder was turned on and the author asked the respondent if he/she agrees to participate in the study. Anonymity was ensured by selecting a random name or nickname for the participant, and they were advised not to mention any facts that could identify anyone that they mentioned during the interview, including themselves. If anyone was named, the author subsequently replaced it at the point of reviewing the transcripts. All participants were informed about possibility to terminate the interview at any time. The measure includes not contacting other respondents by the interviewer. Respondents were recruited via snowball sampling by handing over the announce to each other and, if they were interested, they could contact the interviewer. The computer, on which the interview conversations and transcriptions were stored, was protected by a password and the records were deleted after the transcription.

## 6 Results

### 6.1 Sample Description

For the purposes of this study, 25 interviews were conducted in the Czech Republic and from all participants, 16 were men (64 %) and 9 were women (36 %). The youngest respondent was 19 and the oldest 51 years old. The average age was 29.

From all respondents, 19 of them were regular cannabis users (76%) and 11 participants had an experience with growing cannabis plants (44%). 11 participants were from Prague (44%), 5 participants from Ústí region (20 %), 3 respondents were from Central Bohemian region (12%), 2 respondents were from West Bohemian region (8 %), 2 respondents were from South Bohemian region (8 %), 1 participant was from Liberec region (4%) and one was from Karlovy Vary region (4%).

The interviews lasted 63 minutes on average. Shortest interview was terminated after 27 minutes and the longest after 102 minutes.

24 of the 25 people reported being single at the time of data gathering (96%).

Most of the respondents (n=14) reported that their highest obtained education was secondary with graduation (56%), 8 participants finished college degree (32%), 2 respondents finished vocational school (8%) and 1 finished higher vocational school (4%).

From all 25 respondents, 9 said that they are employed (36 %), 6 of them were students, 4 were self-employed, 3 were self-employed and employed at the same time, 1 was student and employed at the same time, 1 participant was on maternity leave and last participant was unemployed.

With regard to salary, 8 respondents earned 30 thousands and more, 8 respondents earned 15-30 thousands of Czech crowns, 3 respondents earned 0-15 thousands, 5 respondents did not have any salary at the moment of the interview and one participant refused to say it.

7 respondents lived at their apartment alone, 6 of them lived with their friends, 5 of them lived with partner and kids, 4 respondents lived with parents, 3 participants lived with partner.

Almost every participant (n=24) had smoked cigarettes, cigars or water pipe in their lives (96 %) and 13 were daily cigarettes smokers, 4 were regular but not daily smokers, 4 were occasional cigarettes smokers and 4 did not smoke cigarette at the time of the interview.

All participants in this study drunk alcohol in last 12 months. 11 of them said that they drank one time per month or less, 7 participants drank alcohol 2-4 times per month, 4 participants drank alcohol 2-3times per week and 3 participants drank alcohol 4 times and more per week.

12 participants reported use of other illicit substances in last 12 months. 9 from those 12 respondents used more than one illicit drugs. Most frequent used illicit drug was LSD (n=9), followed by cocaine (n=8), Psilocybin was used by 6 people, 4 respondents used methamphetamine and 4 respondents used MDMA, ecstasy was used by 3 respondents and 2 respondents used ketamine. Some respondents reported use of 2-CB, Salvia divinorum, Amphetamine, GABA or heroin.

Every participant used cannabis or cannabis drugs in last 30 days and 14 of them used cannabis daily or almost daily, 4 respondents use cannabis few times a week, 4 respondents one time a week and last 3 used it less than one a week.

19 participants assumed that obtaining cannabis would be very easy (76%), 5 respondents assumed fairly easy and one participant answered quite difficult.

Average age of the first consumption of cannabis was 16.7, the youngest age was 12 and the oldest 28.

## **6.2 What are the required effects which cannabis users look for?**

The first research question focused on the motivation for cannabis use. The respondents were asked what was the main reason for use and what kind of effects caused by cannabis they required. All 25 respondents answered this question, some of them told many reasons for use. The most common answer about motivation for cannabis use was relaxation (answered by 18 respondents). Some examples are demonstrated below:

*Jennifer: "Team building and evoke some relaxed atmosphere, to calm down at the party and bring it on as well. The person feels right and is sober enough. It is still a drug but it is not something that could destroy you. It is a medium to open something interesting."*

Thea: *"To induce a state of well-being and relaxation. I use it recreationally and medically."*

Erica: *"For me, it's kind of reward. When I cook, clean the apartment, wash the dishes or if I had a challenging day at work, it is nice to smoke a joint when you did all duties. I am not doing it every day but it is nice and relaxing. In addition, I like more the taste of the food when I am high".*

The interesting fact was that second most common reason for cannabis use were medical effects which was mentioned by 7 respondents (with 9 references). It was shown that Czech cannabis users who participated in this study also cared about medical effects and some of them used cannabis because of positive properties as seen in the text below:

Eddie: *"I can displace the thoughts which bothered me for long time. Sometimes, when I smoke, it can stop the headache."*

Erica: *"I had an accident, since then I have excruciatingly painful migraines. When I smoke a joint, it is the only moment when my head stops hurting."*

Larry: *"I had some sleeping problems but now I can fall asleep without any problem. It's also very good for hangover. I smoke joint and subsequently my head stops hurting and I can eat."*

In this study, enjoyment was the third most common reason for use and it was mentioned by 7 respondents. Examples of answers are written below:

Willow: *"It supports the fun."*

Emily: *"I am not looking for it, it always finds me but it is fun, relaxing and everything is funny."*

Another most frequent reason was concentration which was mentioned by 6 respondents.

Natalia: *"It helps me to concentrate and focus only on one thing."*

Jack: *"I have stressful job and after using I am calmed down and during the sport I can be more focused on the certain activity."*

The reason to have a good mood was mentioned by 5 respondents and interesting examples are demonstrated in following statements:

Russel: *"So you get rid of the negative feelings inside you and you start to think more. I started to feel good when I was alone and I started to think differently about life, work, and relationships."*

Ben: *“It guarantees good mood and good state of mind and I like it”*. Felix’s answer was: *“I don’t take it to end the depression but more like a source of entertainment in my free time or improves mood.”*

Respondents mentioned also habit (mentioned by 3 respondents) as the reason for using cannabis, examples are shown here:

Freddy: *“Probably the habit after years of using, the intoxication is the same and it gives you nothing so it is a habit. That is the reason why I am trying to quit.”*

Felix: *“It is the way of relaxation and maybe it is an addiction. Sometimes I smoke without any reason. It is connected to ritual like after work, after workout, after good sex, whatever. Someone has associated cigarette and I have a joint”*.

In this research, reasons like sharpening the senses (noted by 2 respondents), displace thoughts (1 respondent) and no hangover (1 respondent) were mentioned by the participants. Some respondents see cannabis as a medium to something new (1 respondent), reward (1 respondent), to expanding consciousness (1 respondent), or they use cannabis for meditation (2 respondents), creative activity (1 respondent) or when they are bored (3 respondents).

Johnny: *“Everyone has a job, families, their own lives and you can’t drink ten beers, some shots and go home. However, with cannabis you are good the day after, no hangover, no alcohol residues. It is safer for work, you can work normally.”*

Natalia: *“I like to do yoga or draw when I am high”*.

Social dimension was perceived by 3 respondents, time for yourself was perceived by 1 respondent and the same for taste for food (1 respondent) or deeper thoughts (1 respondent). Some respondents seek for cannabis because of the different state or intoxication itself (4 respondents), an example is described below:

Sonny: *“When I have free day, I smoke. It is the same reason why people seek for alcohol, for the intoxication.”*

### **6.3 How do cannabis users understand the term “quality” cannabis?**

The term cannabis “quality” was not specified and everyone assumed cannabis differently. All 25 respondents were asked what the cannabis “quality” means for them and many answers contained complex responses with more than 3 characteristics. Most of the participants (mentioned by 12 respondents) distinguished “quality” cannabis by smell, next frequent characteristic was the level of intoxication in other words “high”

which was mentioned by 11 respondents, followed by taste (9 respondents) and structure (8 respondents).

Johnny: *“It has some texture and quality. You can see if it is compact or soft and if you see the crystals of resin or if it is hairy.”*

**Q: What it means if cannabis is hairy?**

Johnny: *“If you have bud with multiple crystals of resin also bud is hard and compact, it is sign of quality. If you can smell the essence, it is good. After these characteristics you can see if it is super strong or super weak. If the bud smells a lot, it is stronger. But it has also happened to me that the bud was without smell and it was super strong, so it is difficult to say. I would probably judge according to the structure.”*

Jack: *“Quality cannabis means: Structure, colour, smell, it is nice to look at and has a good taste when you are smoking it.”*

Ben: *“It looks nice, it is highly resinous and it has big orange pistils but not too much. It feels hard when touched. I don’t judge the taste when I am smoking it. I judge only the high, how it works”.*

Very important characteristics of “quality” were the aspects of a “healthy” product which needed to be without chemical residues (7 respondents); “flushing the fertilizers from the cannabis plant by water” (which was mentioned by 4 respondents), also “quality” cannabis must be without moulds and other plant diseases (3 respondents) and it must not irritate the throat (4 respondents) which is achieved by well-dried cannabis (6 respondents) and appropriate storage (3 respondents) of it. One respondent thought that “quality” cannabis was characterised by the absence of adverse effects.

Thea: *“It must be without mold, smell adequately, dried so it is not wet and it is not possible to crumble it too easily. It has nice taste, it does not scratch in the throat and it works”.*

Ray: *“It is properly cleaned, it must look nice. You will notice if cannabis was prepared, grown and handled correctly – it is dried and flushed. If cannabis is properly cleaned from fertilizers and properly dried and stored, you reach the best taste and characteristics which plant can show you. It also must be without seeds.”*

Felix: *“It has nice smell, you can’t smell the fertilizers, nice to look at, resin coated, compact.”*

**Q: How do you recognize the fertilizers inside?**

Felix: *“Earthy-metallic odour, if you have unflushed cannabis, we call it clay”.*

Cannabis users also assumed the “quality” from the amount of resin on the buds which was mentioned by 5 respondents and 2 respondents evaluate maturation of the buds. Czech cannabis users also distinguish “quality” after balanced ration of active substances (1 respondent) and cannabis grown indoor (1 respondent). One respondent always get the “quality” cannabis from proven source. “Quality” cannabis should be without seeds (1 respondent), without genetic modification and one respondent distinguish by colour.

#### **6.4 How do cannabis users recognize that they obtained cannabis of a good “quality”**

Czech cannabis users have some idea of what could be the “quality” cannabis but how to recognize it, that is a different question. Respondents recognize the “quality” of cannabis by similar methods as in previous research question but mostly it depended on the experiences of the user and his smoking career. Several respondents (n=6) had problems with recognizing the “quality” of cannabis when they first saw it and they judged only after use, depending on the ongoing effects (12 participants, included those who know how to recognize “quality” cannabis, mentioned that they judge the “high”) but one user mentioned that if source is unknown, “quality” will not be recognized before use, some examples are given below:

**Q:”Do you recognize, that purchased cannabis is a good quality and how?**

Emily: *No, I don’t.*

**Q: Do you recognize it after use? According to high?**

Emily: *Yes I judge it according to how the effect works on me.”*

Anthony: *“It is difficult to recognize it before use and if you don’t know the source then you cannot recognize it”*

**Q: “Can you recognize it by an appearance?**

Natalia: *No I can’t. I am not that experienced, probably I would assume it according to the smell.*

**Q: How it should smell?**

Natalia: *Not too aggressive, not chemically. If it smells too intense or it has unpleasant smell, it means it is going to be too strong. If it smells nicely, it’s good. I can recognize it after use mostly and I trust the people who gave it to me that cannabis is alright.”*

Some of the respondents from this study have knowledge and experiences with cannabis and they recognized “quality“ by similar characteristics which were mentioned in previous research question about understanding of “quality“ cannabis. 12 respondents

assess according to the desired effects, 8 respondents recognize it according to smell, 7 respondents by taste (participants judged scratching on the throat and presence of fertilizers), 6 respondents by appearance (participants detect structure, diseases, colour, moistness or maturity) 2 respondents would recognize bad “quality” because it will contain seeds or leaves and stems cited also by 2 respondents. 2 respondents judge according to the presence of resin. Characteristics are demonstrated in the quotes below:

Eddie: *“I can recognize it little bit before use but mostly after use. However, after appearance you can recognize it. You can have airy buds which are not compact, it is in most cases worse or you can have solid and hard buds which are ok.”*

**Q:”Do you recognize that purchased cannabis is a good quality and how?**

Ray: *Yes, I can recognize good and bad quality cannabis. I can recognize also outdoor cannabis from indoor grown. I judge it by the branches. Indoor grown cannabis always has smaller diameter of branches than the outdoor varieties. You can recognize it according to buds as well. The buds from the top of the plant are so compact that it looks the same as the indoor but when someone crush the buds and you will see bigger stems, then you know.*

**Q: Can you distinguish outdoor and indoor strain after use?**

Ray: *I don’t think so, it depends on growing conditions but you can recognize it by the appearance not by the effects. Outdoor buds are more deciduous. It happened to me that I had an indoor and outdoor and people wanted more outdoor.*

**Q: Can you tell me, why it happened?**

Ray: *I had a good strain and those people were not regular users and this strain was not so strong and had a lower amount of THC compared to the indoor models.”*

Larry: *“According to appearance, odour, taste, and size of the buds. You have two buds. One will be outdoor grown and second will be indoor grown. The buds grown under light will be compact and hard as a rock.*

**Q: Can you recognize it after use?**

Larry: *Depending on the strength of the high. More you are stoned, more quality cannabis you have. But it also depends on circumstances. How you feel, who is around you, what is the set and the setting. It is subjective.”*

Participants were also asked on their preference of cannabis and what type of cannabis suits them. 14 participants named specific cannabis strains, 12 respondents prefer use sativa based cannabis and 5 participants prefer indica based cannabis, 5 respondents rather use outdoor grown cannabis, 4 respondents choose strains according to the situation, 4 respondents use what they get, 2 participants prefer indoor grown

cannabis, 2 respondent prefer to use their grown cannabis, 2 respondent named specifically strong cannabis and 2 respondents prefer weaker cannabis. Only one respondent mentioned CBD.

Jamall: *“I prefer sativa because it energizes you. I don’t like to be stoned after indica, maybe at the end of the day, before sleep.”*

Johnny: *“Weaker cannabis with happy “high”. I don’t like cannabis which destroys you.”*

Miranda: *“Sativa. When I smoke, I still have to work, so I need cool “high””.*

## **6.5 Do cannabis users pay attention to the origin of cannabis, what kind of variety is it and how to distinguish them?**

In the questionnaire for this thesis were two questions which were about the origin of cannabis. First question focused on the origin of cannabis when bought and the second question was about the cannabis that was already rolled in a joint and was offered to smoke it to the respondent.

### **6.5.1 Origin of purchased/given cannabis**

Below, responses to the question if cannabis users were interested about the product they buy or get (e.g. asking the dealer about the origin or type of cannabis). 16 respondents have an interest of what they received. However, 10 of them cited that people do not know the origin and one respondent cited that dealer does not like to talk about the origin or dealer may tell the false information. Nevertheless, in few cases the buyer did not get the information at all. Some respondent quoted that they receive information when the source is proven.

**Q:** *“When you are purchasing the cannabis, do you have interest what kind of variety is it?”*

Borat: *Yes, sometimes I don’t have to know the name to know it's good that I want it.*

**Q:** *Do you ask about the origin and how was cultivated?*

Borat: *Yes I ask, but I don’t expect that someone will tell me the truth. People don’t know or they cannot tell me the truth and there is no way how to find out.*

**Q:** *So, you do not buy from grower directly?*

Borat: *You cannot trust the grower as well. We do not have a Czech Trade Inspection on cannabis. We do not have control of quality here.”*

Ray: *“I always know the origin because I buy cannabis from the growers directly.”*

Felix: *"It would be nice but nobody is able to say anything, except the grower from whom you have purchased. This information is lost on the black market."*

Lack of information about cannabis could lead to the adverse effects and user could experience negative intoxication. 8 respondents do not care about the origin of cannabis and their reasons are that they would not get the information anyway, one respondent mentioned that he has interest only about the price (this respondent was also dealer so it could affect his respond) or participants do not have interest to know information about the origin when they saw that purchased cannabis is a good "quality". Examples are shown in quotes below:

**Q: "When you are purchasing the cannabis, do you have interest what kind of variety is it? How it was cultivated?"**

Johnny: *No, not at all. People don't like to discuss it. I can ask on the strain, they will tell me inconspicuously if it is good or bad. If dealer has something special, he will tell me. Once, he had something and told me that I have to be careful with that. When you ask what is it, they mostly don't know.*

**Q: Do you ask how was it grown?**

Johnny: *My dealers sell only indoor. Outdoor is not popular. I know that it exists but it is mostly for fun when someone grows their own cannabis and enjoyed it."*

Jack: *"No, I don't care about origin, strain, quality or way of growing. I care about the price and I decide if the price matches what I have in front of me. "*

Sonny: *"No, I like any cannabis. In the end, it is not worth it to poke around because nobody tells you anything exactly, no one knows because no one cares about it. "*

### **6.5.2 Origin of currently smoked cannabis in the group of people**

Cannabis is a social drug and it is mostly used in a group of people. That is the reason why the question about cannabis that is already prepared in joint, or when someone offer to smoke joint with them was used. Did the respondents ask the owner of the used cannabis what is inside of joint and what the origin of what they smoke is? More than half of the participants (16 respondents) ask what kind of cannabis it is, how strong the cannabis is, or how much tobacco is contained. Examples below:

Borat: *"First, I look how much tobacco is inside. I don't smoke cigarettes, so I don't like joints with a lot of tobacco. When joint is already rolled you can see the colour or the smell"*

Larry: *"It depends who offers it to me. If it is from a friend, I ask, is it outdoor or skunk? It tells you more or less how strong or weak is it."*

Two respondents mentioned that these questions are posed only because of politeness. 8 respondents do not ask or do not get the information back and one respondent does not use cannabis which is not his at all. Some illustrations from interview are shown here:

Ben: *“I ask what it is. They say, they don’t know or it is outdoor, greenhouse and it is good. That’s it. I don’t care about it, I just ask to continue the conversation and to avoid the silence.”*

Jamall: *“Yes, I am trying to ask but people mostly don’t know.”*

Jack: *“No, I can recognize it after first puff.”*

Participants also care about people who offered them joint and were aware of strangers and prefer to share joint with friends.

Bob: *“It depends if I know the owner. People don’t know the information about smoked cannabis and if I don’t know them, I don’t smoke at all.”*

Cindy: *“I would ask and I check the people who they are, if I don’t know them, I refuse.”*

Natalia: *“When I barely know the group of people, I ask. From people who share cannabis with me, I know what I should expect. People I don’t know, I am more careful and I rather smoke less and then see.”*

The reasons why participants refused cannabis were discussed in the question about risk of sharing cannabis. The interviewer asked the participants what risks they perceive during the sharing cannabis with other people. 16 respondents mentioned that risk of sharing lies in the possibility of catching a disease (tonsillitis, herpes etc.) 4 respondents perceive the risk in poor “quality” of cannabis, 4 participants do not perceive any risks, 3 respondents mentioned the risk of being caught, 3 respondents would be aware of unknown content, 2 respondents would be careful about strong cannabis and one respondent cares about the amount of tobacco contained in the joint. Few examples about the risks of sharing with people are demonstrated here:

Johnny: *„If you don’t know the source, you can catch herpes or cannabis could be mixed with something else.“*

Cindy: *“I avoid to smoke joint from strangers. I don’t want to catch herpes. That is the reason why I don’t smoke with unknown people.”*

Ray: *“Risk of strong weed for the beginners. Maybe some herpes is possible to catch.”*

### 6.5.3 Recognition of cannabis varieties

Experiences with cannabis varieties are different as an ability to distinguish strains from each other. 8 less experienced respondents assume that they cannot distinguish cannabis varieties at all but some of the respondents could distinguish some differences e.g. sativa and indica effect. As seen in the sentences below:

Johnny: *“Probably not, I know that there are some varieties but I never care about it. I know that there are differences after high, in the appearance. When I have 5 plants in front of me, I cannot distinguish them.”*

Ben: *“I think that I can’t. I think that every weed works the same. Sometimes it makes me want to sleep, so I assume that it was indica.”*

Eddie: *“Nowadays, it is difficult, because genetics did a lot and when you have hybrid 50:50 sativa: indica, it is difficult. After sativa strains I laugh, after indica strains I want to go sleep.”*

Characteristics according to which distinguish cannabis varieties were similar to the characteristics reported in previous questions. Several respondents named more than two indicators. Some participants in this study distinguished cannabis strains according to its appearance (3 respondents), odours (5 respondents), taste (3 respondents), state of “high” (3 respondents), comparisons of sativa and indica plants (5 respondents), differences of grown indoor cannabis and outdoor grown “ganja” (3 respondents). Examples of statements for better illustration of consumer’s knowledge are written below.

**Q: “Do exist the different varieties of cannabis? Can you distinguish them? According to what?”**

Larry: *Sativa, indica and ruderalis. Kush and Haze. I know, there are much more but I cannot distinguish them, only sativa and indica differences. Sativa has narrow leaves when it grows and the indica has wide, but you cannot recognize it after buds. You cannot distinguish because people don’t know.”*

Miranda: *“You can see the structure of the plant. I can distinguish sativa plants from indica plants, that’s it. I can distinguish skunk from outdoor ganja.”*

**Q: How do you distinguish it?**

Miranda: *The plant grown outdoor does not have as solid flowers.”*

Ray: *“I can. It is difficult but you can easily recognize 100% sativa plants from 100% indica plants. Sativa is always higher and according to “high” you can distinguish the indica. If you have a hybrid 60: 40 you won’t recognize easily what it is. When I have bud in the zip*

*lock bags, I cannot distinguish. When you smoke only quality cannabis, you will notice the commercial growing where people don't care how it tastes but the important reason is the biggest harvest. Sativa plants are more euphoric and indica more damping."*

#### **6.5.4 Experiences with specific strains**

Below are listed snippets from interviews which illustrate the knowledge and experiences with different cannabis strains. Participants were asked on their experiences with specific strains. 15 respondent mentioned some name of the strains, 12 respondents mentioned experience with sativa and indica based cannabis, 6 participants cited experience with CBD, 4 respondents described experience with outdoor and indoor grown cannabis, 3 respondents mentioned fruity strains, 2 participants reported hashish and 2 respondents (inexperienced users) were not able to discuss about strains because they never get information about it. Every respondent from following examples was an experienced smoker with big enthusiasm to cannabis and majority of them were also growers.

***Q: "What is your experience with different species of cannabis?"***

*Ray: I have experiences with many strains and hashish which is extract, the resin took from the buds. I like indica for evenings and sativa for daytime use. I would not recommend to someone who needs to sleep well to use sativa for good sleep.*

***Q: Do you know some specific name?"***

*Ray: Haze and Euforia mostly euphoric strains, Sweet Afghan Delicious- Afghan varieties are indica dominants strains, 80%-100% indica. I had this from my friend to use it before sleep. Someone told me that 100% indica and sativa don't exist. But seed banks claim that they have 100% strains, for example Desfrán, I am interested in this variety."*

***Q: "What is your experience with different species of cannabis?"***

*Thea: Very rich. I researched that content of THC is not so important. We smoked cannabis which had 20% THC but other strain with 12% of THC had more intoxicated and euphoric high. So, there is clear that it does not matter on the THC content but on the mix and synergy of the active substances in cannabis to induce proper pleasant effects for the mind and the body.*

***Q: So, there was some percentage of CBD?"***

*Thea: CBD and terpenes... the substance ratio is important. The interaction between substances as well. Everybody should find their own strain, which is good for their conditions.*

***Q: Did you find something what suits you?"***

*Thea: Conspiracy Kush, IP or Critical.*

**Q: *So, these models have lower THC?***

Thea: *Not at all. But outdoor grown cannabis, grown by my friends on gardens, I am not sure about the purity and they don't know about genetics. Only when they buy seeds from seedbank, you can be sure.*"

Borat: *"There are some strains which suits me, they are tastier strains or less tasty. There exist a lot of different tastes. It is like when you drink alcohol. You can be drunk from alcohol but everybody will chose what they like, rum, vodka etc. So it is the same with cannabis. Effects can differ, one time you smoke and you are completely stupid and these varieties are not good for work.*

**Q: *Do you have an example of these strains?***

Borat: *White Russian, Cricital Mass... these varieties are really heavy and grounding. These are definitely not for a recreational user.*

**Q: *These strains are indicas?***

Borat: *Yes, but someone said that differences on sativa and indica is not completely accurate but what else do we have, right?"*

## **6.6 How do cannabis users perceive the role of paraphernalia to harm reductions?**

Participants named the way of using cannabis which they know and tried in previous intoxications and sometimes described the differences and why the specific method of ingestion is the best. Every respondent had tried inhalation of cannabis through the joint. "Bong" was mentioned throughout all interviews 20 times and 10 respondents mentioned that "bong" is too strong for the use. Respondents also mentioned experiences with water pipes (5 respondents), vaporizer (8 respondents), dry drink (2 respondents), pipe (7 respondents), hot knives (1 respondent), "gravity bong" (4 respondents), cannabis drops (3 respondents), extractor (2 respondents), suppositories (2 respondents). One inexperienced user mentioned also intravenous administration. Respondents noted that they were familiar about adverse effects caused by tobacco use or "bong" use. Next statements are used as an illustration.

**Q: *"Can you notice some negative health consequences from using joints?"***

Tom: *There is the tobacco which is not optimal for health but I always smoke the cigarettes so it did not have a big impact"*

**Q: *"Can you notice some negative health consequences from using bongs?"***

Sonny: *Bigger chance to get the lung cancer due to inhaling larger amounts of the smoke, yes, it is cooler but it is tricky for your lungs because you expand the alveoli and you inhale*

*more harmful substances. When you smoke joints, the smoke is hotter so it could scratch on your throat which defends you to inhale bigger amount. But bong will catch only ash and dust, nothing else... you still inhale everything.”*

An important part of the questionnaire was the issue of safer use. Respondents were asked if they know some safer way to use cannabis. Vaporizer was mentioned by 19 respondents. Interesting fact is that 3 respondents did not mention vaporizers as safer choice for using cannabis though they had an experience with it. Following examples show quotes about vaporizers and also show why vaporizers are not used ordinary.

Borat: *“I don’t like vaporizers.*

**Q: Why?**

Borat: *On the one hand it’s a habit of smoking joints and I don’t like the taste, it’s like when you eat cauliflower. Vaporizers cut the spectrum of different smell and it is not the same.”*

Thea: *“Vaporizing is healthier way than burning with tobacco. Extract is the ideal form but I would recommend this for people who need to cure something with it or non smokers.*

*Nevertheless, smoking is smoking.*

**Q: Why do you not prefer the vaporizer?**

Thea: *Joint is a ritual and the taste is unique, the high from vaporizer is cleaner and you inhale pure active substances. You don’t have the same intoxication as when you smoke joint.*

**Q: The high is stronger with vaporizers?**

Thea: *I would say weaker. When you smoke joint you inhale also nicotine, tar and some other substances from cannabis. From vaporizer you smoke pure active compounds. This also does the effect in your head. Like some people feel dizzy after smoking cigarettes if they are not use to smoke.”*

**Q:”Why don’t you use a vaporizer?**

Sonny: *Because it is expensive and I heard nothing good about pen vaporizers, only that they will break in a month. And Volcano vaporizers which releases vapors into the balloon cost 10 000 and it is big investment which I cannot afford it.”*

As safer variations of use were also mentioned edibles (4 respondents), joints (4 respondents), drops (1 respondent), using of carbon filters (1 respondent), e-cigarette (1 respondent), suppositories (1 respondent) and one un-experienced used mentioned “bong” as a safer choice. One participant did not know the least harmful use of cannabis or did not care about safer use (2 respondents).

Arnold: *“Vaporization and cannabis edibles or almost everything except the smoking. You should be careful with the food, the liver change THC to the metabolite 10 times active than before. If you use cannabis by edibles, you should be careful. In edibles, there is no heating, so it includes more cannabinoids and effects are stronger. It is important to start with smaller doses. The effects could be unpleasant and takes longer than when you smoke”*

Jack: *“It is never safe to your mind but physically you can use carbon filters or vaporizers when you will inhale less of pollutants.*

**Q: *Why do you not use it?***

Jack: *I am used to smoke joints or bong.”*

## **6.7 How do cannabis users perceive the role of paraphernalia to desired effects?**

The preferred method of using and why it is the best method of administration is illustrated in the following sentences. Experiences with vaporizers were reported above. Different favourite methods of ingestions if the vaporizer use is not common are described in this research question. 15 respondents choose joint as the best way how to use cannabis because joint is the tradition, social element, the fastest method of administration, tastes better or joint has slower onset of the effects. Some quotes about joint use are written below:

**Q: *“Why is the joint the best way how to use cannabis?”***

Johnny: *It is the most social. Your “high” is average, you don’t need any special devices so you are inconspicuous. It is chill. Just roll it and that’s it. You can share with your friends and you or friend won’t break anything. It is rapidly prepared and it won’t destroy you.”*

Freddy: *“You can feel the taste and you will enjoy it more with joints. When you smoke pipe, it could be dirty and it’s not good.”*

Bob: *“With vaporizers you can smoke again after 20 minutes. With the joint, you should be careful, it depends on what do you smoke. I assume bong as nonsense and I don’t enjoy it. It shoots you out of your head. A lot of people went vomiting after the use of bong. It is a big side effect.”*

3 respondents choose “bong” as a favourite method (because of stronger effects, to save the cannabis material and misconception that it is safer), 2 respondents preferred edibles for some occasions, 1 respondent vaporizer and 1 respondent would choose cannabis drops.

Thea: *“People are high enough from the joint. With cannabis edibles, it is different. Onset starts after an hour and you are intoxicated for 8 hours. You go to sleep, you wake up and you are still high. I don’t prefer this. If I have to work next day, taking 6 cookies is a nonsense. It is better to smoke a joint which lasts an hour.”*

Larry: *When you smoke bong you save the material. You are more stoned from less cannabis. Blunt... you will put more cannabis into it but it is better to smoke it with more friends, you will be more high than from the same amount in the joint. It could be placebo. It is difficult to say but the strongest high comes from the bong.”*

**Q: “Why do you prefer bongs?”**

Sonny: *Because of water filtration, it causes that most of the adverse substances or impurities stay in the water but cannabinoids stay in the smoke because they are organic and they do not bind to the water.*

**Q: Can you compare the high after using bong and joint**

Sonny: *The effects after using bong will come faster and it is more intense. Also, you will save the material. Because you are more intoxicated from bong than from joint.”*

### **6.7.1 Other elements than paraphernalia to achieve desired effect**

Paraphernalia is not the only element which can influence the desired effects. The setting was important for 16 respondents and 7 respondents think that the place where cannabis is used does not affect the effects and 2 respondents do not care about where they smoke cannabis. Influencing by set mentioned 13 respondents and 11 participants assess alcohol as the medium which could influence the effects. Example is given below:

**Q: “What else could influence the effects?”**

Miranda: *Probably health condition, actual state of mind and using other substances. I don’t smoke when I drink and I don’t drink when I smoke. But I don’t drink either. Just do not combine.”*

Titration could be used as a harm reduction technique or to better estimate the dose. Holding the smoke inside the lungs was cited by 6 respondents and depth of breath was mentioned by 2 respondents. Participants quoted using of smaller doses and adding tobacco. These techniques are usually used as a method of titration to reach desired effects (11 references about titration cited by 8 respondents).

**Q: “When you have strong weed, do you titrate it? Or you smoke less?”**

Anthony: *Of course, I don’t roll normal joint but I roll only half or I don’t smoke at all. I put it into bong or vaporizer to put lesser amount. Or I can put little bit into the pipe.*

**Q: Can you influence it by holding the smoke?**

Anthony: *No, you can't. The hoax that when you hold the smoke you get the as much substances as possible is not true.* ”

Larry: *No, it does not influence it if you will hold the smoke. Only your brain will be without oxygen for a while. THC is absorbed immediately when you inhale. More weed you smoked, more stoned you will be.*”

**Q: Why do not you roll the pure cannabis without tobacco?**

Tom: *I would be stoned too much all the time.*”

To reach the desired effect, the way of smoking is highly important. Participants were asked about their first cannabis smoking and if they received some advices or techniques how to use cannabis properly. 13 respondents received advices for their initial cannabis use. These advices were about holding the smoke inside the lungs (6 respondents), how to smoke (5 respondents), the expected effects (4 respondents) and smoked amount. 6 participants from the study did not get any initial information about cannabis use and 12 respondents gave the advices to the beginner smokers. Advices from our participants were more detailed and contained: rather use smaller amount (9 respondents), holding the smoke inside the lungs (4 respondents), relax (2 respondents), do not use strong cannabis (2 respondents), expected effects (2 respondents), how to smoke (2 respondents), comfort (1 respondent), do not use “bong” (1 respondent), do not speak while exhaling (1 respondent), do not use it with alcohol (1 respondent), it could scratch on the throat (1 respondent) and corrective advice how to not destroy the joint (1 respondent). Some examples are given below:

Ben: *“Relax and slowly inhale. Hold the smoke inside the lungs for a while and exhale.”*

Borat: *“Start carefully, when you are exhaling, do not speak, rather less than more, hold the smoke, relax, I am with you.”*

Emily: *“I said to her how to inhale, because she is not a smoker. I said also what effect she could expect.”*

## **6.8 How do cannabis users prevent the physical side effects?**

Research question about prevention of side effects was answered by all respondents. 7 respondents recommend to start to use only with small doses of cannabis to prevent physical side effects, 5 respondents recommend to drink enough. 3 respondents think that to avoid the physical side effects it is necessary to eat. 2 respondents suggest that one of the choices how to avoid the side effect is to choose proper variety and

2 respondents would use only weak strains. 2 respondents recommend to not use cannabis in combination with alcohol or do not use “bong” at all (1 respondent).

Freddy: *“You have to put the right amount in the joint according to smokers and current strain and according to THC percentage. Outdoor strains have less of THC.”*

Arnold: *“I am trying to smoke on balcony, on the fresh air, cool with water, eat something sweet, Coca Cola, water with honey and lemon. You cannot influence it that much because it is already in blood and it will disappear after some time.”*

Russel: *“It is good to have nice food and movement. You have to walk. Sitting in front of the fridge is the way to hell.”*

Jennifer: *“For me it is recreational drug so I am trying to stay in conscious state of mind and I choose to drink 4 beers or smoke. Mixing with alcohol leads to physical side effects, I want to vomit and I have headaches. When someone did not tell me anything about quality, I rather smoke less. Sometimes my hands tremor, I feel dizzy, I sweat and I feel cold. However, it could happen after smoking cigar as well, if smoker can’t smoke properly.”*

Respondents mentioned that the prevention from the physical adverse effect is: use in safe space (setting - 1 respondent), use after activity (1 respondent), movement (1 respondent), put legs up (1 respondent), do not use during the illness, do not sit on the direct sun (1 respondent) be in the warm place (1 respondent). Next statement is used as an illustration:

Jack: *“When I am sick, I don’t smoke because it could make it worse.”*

6 respondents do not prevent side effects and 3 respondents advised to not use at all. Following arguments show examples of users who do not prevent physical side effects:

Jamall: *“I don’t prevent it. When I feel bad, I stop smoking. Sometimes I vomit, however after a while, I am ok again. Life continues.”*

Bob: *“I never had a problem with it.”*

### **6.8.1 Reduction of ongoing negative physical consequences**

Interesting information were collected from a question about reducing currently ongoing side effects. Participants cited food (carbohydrates or fats), water, to wait until the effects pass, go to sleep, raise the legs up or go to fresh air. These advices are illustrated in the following statements:

Jack: *“I know that it helps to eat or just consume some carbohydrates or fats on which the cannabinoids bind.”*

Thomas: *“A lot of water and put the legs up and go to sleep.”*

Willow: *“Wait till the effects are gone.”*

## **6.9 How do cannabis users prevent the psychological side effects?**

Harm reduction strategies are also important to apply before use. All 25 respondents were asked how they prevent the mental side effects and also if already feel something, how to reduce it or how to overcome it. 6 respondents answered that they never felt mental side effects from cannabis. Examples are written below:

Anthony: *“I don’t feel any side effects. It only encourages me when I need to work.”*

Eddie: *“When I felt really bad, cannabis helped me. I used other illicit substances. So it helped me to handle with withdrawal symptoms”*

Ben: *“Most of the time, I don’t feel any. When you have some life decision, it is better to skip it. Weed will show you some new perspective and new thoughts and sometimes it might be too much”*

6 respondents would recommend not to use at all. 5 respondents recommend to do use cannabis only when in good mood and 4 respondents suggest do not to use it when depressed or anxious. 2 respondents assume that to avoid the mental side effects, it is important to use cannabis only with friends. Examples are given here:

Thomas: *“When you have bad experiences with cannabis, it is better to discontinue with it.”*

Miranda: *“I don’t smoke when I have bad mood because I know that it would make it worse.”*

Natalia: *“I use only when I am not emotionally upset because I don’t want to increase the actual bad emotion. I don’t use it like a medicine. I am ok and I want to enjoy something else. I would not use with people which I don’t know or in place I don’t know. For example, not in the shopping centre, it is better to use it at home or on some nice meadow.”*

In this study were also mentioned advices as: start with small doses (1 respondent), use only when they are not duties (1 respondent), do not use strains which do not suit them (1 respondent), eat before intoxication, eat some sweet or drink coffee (1 respondent), be sure that side effects will pass out soon (1 respondent) or do meditation (1 respondent). Next statements are used as an illustration:

Emily: *“It is about the experience. I already know that it can happen but I have to remind myself that it is not reality. I have experience that when I am ok before use, it will be ok after use as well. When I am stressed and then go to some party where I have to think, it is different. I smoke when I have nothing to do.”*

Borat: *“I drink coffee or eat something sweet. When I ate brisket before smoking I am more satisfied of it. Food calms me down.”*

### **6.9.1 Reduction of ongoing negative mental consequences**

Respondents were asked what they would do if they or their friend would feel some side effects. Respondents suggest to calm down (4 respondents), go to sleep (2 respondents), stop use (2 respondents), eat some sugar (2 respondents), go to the nature (1 respondent), do sport (1 respondent), listen enjoyable music (1 respondent) or change the subject of conversation to something positive (1 respondent). Some examples of advices are shown here:

Jack: *“I am trying to find the way how to get away from these mental problems, for example by doing sport.”*

Thea: *“I would calm him down and sugar could eliminate the effects. I would be with that person, calm his or her mind down and be cool. If I would feel some negative effects, I would go sleep. In case of some serious mental effects, I would stop use it.”*

Ben: *“Speak with friends in positive way, nice music, nature and no stress.”*

## 7 Discussion

This thesis primarily looked into the definition of cannabis “quality” and the ability to recognize “quality” cannabis by the users. Participants were asked on their preference of specific strain or cannabis variety and why is that cannabis appropriate. They were asked about their motivation to use cannabis. Respondents mentioned the knowledge about purchased/given/shared cannabis and described a situation on the market regarding the discovery of origin. Recognition of cannabis varieties was described and some experienced users shared their experiences with specific strains. The respondents described also means of drug administration and how it influenced the intoxication. Participants mentioned other elements than paraphernalia that can influence the effects. Participants were asked on their first cannabis experience and mainly on the given advices how to use cannabis. Practical techniques were collected also from the research question how to prevent the physical and mental side effects or how to reverse them.

### *The bio-psycho-socio-spiritual reasons to use cannabis*

Results from the research questions about reasons for use were relatively similar to those which were described in previous studies (Simons, Correia, & Careym 2000; Shrier & Scherer, 2014; Osborne & Fogel, 2008). We looked at the reasons to use from the perspective of bio-psycho-socio-spiritual model of addiction (Kalina *et al.*, 2008). Biological part can be seemed as the desired effects which cannabis users look for. Our research shows that the most commonly mentioned reason for use was a relaxation (n = 18). Respondents have always mentioned more than one reason for use. 7 respondents in our sample used cannabis to help them with specific health problems. Users can experience intoxication as a spectrum of pleasant feelings like euphoria, blissful balance, activation or unpleasant feelings of discomfort experienced as anxiety or paranoia. The most characteristic somatic effects are dryness in the mouth, cold and hunger (Dvořáček, 2008; Miovský, 2003). A change in behaviour occurs when negative aspects of using cannabis predominate over positive ones (Andrlová *et al.*, 2016) that means that participants in this study perceived mostly positive ones, or that they were dependent.

The psycho model includes complex of addiction treatment (counselling, motivational training etc.) (Kalina *et al.*, 2008) which is needed especially for the dependent cannabis users or for those who perceive the negative effects of using *e.g.* psychosis. Some respondents perceived reasons for use only because of habit or

dependence which could be caused by their long term use of cannabis. Cannabis may create dependence syndrome which is comparable to alcohol dependence (Anthony *et al.*, 1994). Although, it is not the same dependence syndrome that is being talked about in connection with illicit drugs (Engelander *et al.*, 2010; Pol *et al.*, 2014). However, in some cases, cannabis is also used as substitution during withdrawal syndrome from other illicit drugs *e.g.* crack (Lau *et al.*, 2015).

Social dimension as the reason for use were mentioned only by 3 respondents, although almost every participant said that they use cannabis with other people because of more pleasant intoxication. However, these people must be friends to improve the intoxication, if not, intoxication might go in the wrong way. Social element was reported also in question about the best method to use cannabis in which respondents noted joint as the best way to use cannabis because of ritual to smoke in a circle of people where the joint is shared by everyone. This was observed also by Korf, Benschop & Wouters (2007), almost three quarters of their respondents shared the joint with others. In different studies social reasons were: use to be more social (Shrier & Scherer, 2014).

Spiritual model focuses on the spiritual part of human and respondents use cannabis to feel of the enjoyment, concentration, open mind, do creative activity or meditation. Enjoyment was described as the main reason for use in publication from Shrier & Scherer (2014).

*Definition of cannabis “quality” – “nice buds” that are “strong” and “safe”*

Cannabis “quality” depends on the way of processing and features of the material (Andrlová *et al.*, 2016). Respondents described what “quality” cannabis meant for them and how they perceived it. In literature, “quality” cannabis has been extensively described according to reliability, purity, potency, predictability of effect and user’s satisfaction (Mounteney *et al.*, 2017).

In this research, users rated “quality” cannabis according to many characteristics. Respondents judge “quality” of cannabis according to their human senses: appearance, odour, taste and the “high”. Participants spoke about the effects and if it is “strong” or “weak”. Some respondents judge the “quality” according to amount of resin which helps them to recognize strong cannabis which means that some cannabis users seek for potent cannabis. Higher potency could be associated with lower “safety”, for example in case

of cannabis from Vietnamese large scale growers. Few respondents mentioned that Vietnamese growers spray heavy metals mixed with honey particle to fake the “sticky” and resinous look. That means that cannabis users care about the potency of cannabis, if cannabis will work on them and if they will reach the desired effects. This approves one part of the “quality” which is evaluated mostly by the potency (Bancroft & Reid, 2016).

However, respondents were also interested in a final state of intoxication and the type of “high” which can be influenced not only by the potency but also by type of strain, the proportion of active substances, terpenes, the way of cultivation, the way of drying, curing and by the storage method. These characteristic could be influenced by the method and way of cultivation. Ideally grown cannabis will fulfil characteristics of second part of meaning “quality” as “safety”. Many respondents said that “quality” cannabis should be properly cultivated and correctly flushed with water at the end of the growing to get rid of the residues from fertilizes and other harmful substances. The “quality” cannabis should also not contain any mould, not be overdried or too wet and should be stored properly as well. This suggests that cannabis users in this study included safety-related aspects in their definition of cannabis “quality”. The interest in a way of cannabis cultivation and if it does not contain harmful substances which could bring negative effects, harms and other consequences, was a sign that they are interested in getting accurate information about the used cannabis. A previous research from Decorte (2010) showed that users decide to cultivate cannabis just to have a “healthier“, milder and more organic product without chemicals than what they can get in coffee shops. This study shows that the know-how about (safe) cannabis cultivation method can be a part of user’s perception of cannabis „quality“. References about safer “quality” cannabis were cited only by growers.

Perception and assessment of “quality” cannabis help users to mitigate the harms caused by cannabis use. If cannabis users are sure about the “quality” of their cannabis or the “quality” is determined by the law (case of legalization), they can be sure that cannabis does not contain residues from fertilizers and they will not consume heavy metals and other pollutants. This perception makes their cannabis use “safer”.

*The limited options to distinguish „quality“– the importance of knowing the source*

The skills to judge “quality” cannabis have been shown mostly by the long-term experienced users who tried many different cannabis varieties. Many respondents would not be able to distinguish “quality” cannabis and they evaluate it only after use according

to “high” they experienced. However, to evaluate cannabis after use is too late and it will not prevent from consuming unhealthy or contaminated cannabis. Some respondents mentioned that the reason why they are not able to evaluate cannabis “quality“ was that they did not get the information about purchased cannabis. They either do not know the grower personally or they do not have any information about the origin of cannabis at all. This is a big issue with the cannabis purchased on a black market where this information is missing. As it was mentioned in the background section, this problem could be partly solved on darknet or on regulated cannabis markets. On darknet in particular, the feedback from customers also helps users to get closer to the product because customers can mention what is the accurate dosage (Aldridge, Stevens & Barratt, 2017; Bancroft & Reid, 2016).

Participants also mentioned the content of fertilizers and chemical residue that are unhealthy and some respondents noted also how they find the presence of fertilizers. It makes them cough or they sense the “earthy-metallic” smell. This information is not scientifically validated and it may not be reliable. If participants received some information, it was because they had a close relationship with the grower who grows his own cannabis. Participants sometimes got the information about cannabis in a form of simple statement: “*It is good*”, which is not accurate information and what is good for one user might not be good for another user. One respondent noted that until the cannabis becomes legal in Czech Republic and the trade inspection will test the “quality” of cannabis, buyer will never know the information about cannabis exactly. Before that will be the case, the most appropriate way to have “quality” cannabis is to cultivate it yourself or have good and “proven” grower. In our sample, there was only one person who said that what mattered to him the most was the price of cannabis. Interestingly, this person was buying cannabis to sell it again. This helps to illustrate the difference between preferences of the users and the sellers. Some respondents noted that they do not care about the origin. Some of the reasons were that if they asked about origin in past, they did not get any information, so if they ask, it is only to make the conversation.

The skills to judge “quality” cannabis have been shown mostly by the long-term experienced users who tried many different cannabis varieties. Their knowledge may be forwarded to less experienced users to help them with recognizing as it is with the initial cannabis use guided by peers. This fits to theory from Becker (1966).

In this research, participants were also interested in the origin of an already prepared joint or already shared joint in a group of (known or unknown) people. The use of cannabis which is unknown to the user can be risky but it is sometimes the case that (unknown) cannabis is passed between the people in a circle who may not even know each other. Most of the participants in this research, when this happened to them, asked the owner of the joint how strong it is and they even asked some additional questions like how much tobacco is added to the joint. Engeland (2011) noted that tobacco could add some stimulating effects but also increases the amount of tar in the smoke. Harm reduction strategies here included (among some respondents) that if they do not know the person who offers the joint, they do not use it at all or use only a little bit. More than half of the participants do not want to share a joint with strangers because they are afraid of infectious diseases like herpes etc. Other concerns are the risk of using poor “quality” cannabis, too strong cannabis, too much tobacco inside of the joint or contamination of others with illicit drugs or unknown content.

*Differences between cannabis strains only among „advanced users“*

The knowledge of different cannabis varieties was dependent on previous experiences of the consumers. While every single participant in this study was aware of the fact that there are more varieties that differ in certain aspects, most of them could not distinguish individual strains (or, more broadly, the sativa and the indica varieties). The most common way of recognizing them was by the “high” itself. They can tell if the cannabis is an indica with sedative effects on the body or a sativa that is energizing and affects rather the mind. Several respondents could recognize cannabis types according to similar characteristics as they do with recognizing of “quality” cannabis. Among these characteristics were aroma, appearance, taste, high, sativa or indica plants and outdoor or indoor grown cannabis. Indica and Sativa characterization is more complicated because each cannabis seed bank has its own breeder and many varieties have different ratios of sativa and indica (mix of those are called hybrids). Notwithstanding, half of the participants prefer only sativa based cannabis because it energizes them compared to indica based cannabis that rather puts them to sleep.

The growers who thought that they were able to distinguish strains would mostly do it according to the appearance of the plant which will tell them if the plant is sativa or indica based. However, the cannabis users can rarely see the plant since they buy or obtain

only the “buds”. Distinguishing specific strains is mostly for experts (called “cannabis connoisseurs”) because to assign name to the plant is highly difficult. It is possible to find numerous information from cannabis seed banks on the internet that describe their product for customers so they can have all information about strains and which effects could be expected from these specific varieties.

*Safe paraphernalia exists, but „not for me“*

Respondents from this study had experience with majority of the methods of administration that were outlined in the background section. Every participant tried usage by joint and joint was evaluated as the favourite way to use cannabis. It was supported by many arguments among the respondents. The harm reduction aspect was that a joint was applied for better control of the smoked amount (Andrlová *et al.*, 2016). However, joints (“spliffs”) also have some negative consequences that are caused by burning and adding the tobacco and the amount of it contained in the joint is different for different users. Some authors (Pol *et al.*, 2014; Holland, 2010) investigated that user of stronger cannabis inhale smaller volume of smoke. In this study, it was also mentioned that users also perceive the “quality” of the prepared joint and the way of preparation which can affect the whole intoxication. Several respondents mentioned that they use safer filters in their joints that catch more pollutants than the mostly common used regular paper filter called “roaches”. However, the cigarette filters decrease the amount of inhaled THC by 60 % and ratio of tar is higher to THC. “Roaches” do not filtrate the smoke, they only extend the distance between the burning end of a joint and user’s lips. User should use only a simple white paper because from glossy or printed cartons, other harmful chemicals are released (Engelander, 2011).

Respondents in this study said that “bong” is a method of use which is not suitable for beginners, very quickly creates a very powerful intoxication which some users require but for some it might be inappropriate. Some participants who prefer “bong” claim that one of the reasons they use them is that it saves the material because they are “high” by a small amount of cannabis because “bong” can help it multiply. As it was mentioned, “bong” is used if the user wants to be “high” very quickly and strongly. Usually, the whole kettle filled with cannabis is smoked at once while in case of joints, user can easily pause the smoking. One participant argued that “bong” has less adverse health effects due to the water filtration than the joint. However, “bong” has water filtration into which captures

the pieces of ash, etc. but the research shows that “bong” damages health the most of the known smoking methods anyway. The harmful substances pass through water anyway and when the smoke is cooled down, user can inhale a greater volume of the smoke and greater amount of carcinogens and tar (Engelander, 2011). Pol *et al.* (2014) suggest that large volume of puff is associated with higher THC in the blood and if some users increase their puff duration (“atypical” smoking) it could raise the risk of cannabis dependence. Nevertheless, more data is needed to fully evaluate what could affect the THC exposure in the body. Here could be seen that the information that circulate among users is not based on evidence and it is important to share outcomes of available research and help the users to use safely.

The least harmful tool for cannabis use is the vaporizer. A total number of 19 participants mentioned vaporizer without hesitation. However, most of them do not own one. The reason is a high price of vaporizers, and the experience with the taste of vaporized cannabis is not positive and the strength of the “high” is not strong enough, therefore participants prefer to choose other methods of administration. This is different than the study of Lee *et al.* (2016) in which the users claimed that they use vaporizers because of the least harmful use, better tasting, subsequent better effects and for higher satisfaction. Nevertheless, subset of participants from Lee *et al.* (2016) study preferred vaporising rather than smoking. However, we found that some participants did not know that the vaporizer is the least harmful form of using so they do not know how this equipment differs from the harmful ones. This issue still needs to be further explored and investigated. Nevertheless, Czech cannabis users do not prefer vaporizers because they are used to the ritual of joint smoking, they feel better taste and different effects. It is possible that if cannabis users would know the adverse effects properly and how it can damage the health, they would use more responsibly.

Respondents in this study also mentioned the cannabis edibles as a healthier way of use, as it prevents the risks to the respiratory tract, see *e.g.* Andrlová *et al.* (2016), but it can be more difficult to determine the appropriate dosing.

To conclude, while the study participants distinguished cannabis “quality” based on „safe“ cultivation techniques, the paraphernalia are not chosen according to the risks. They were chosen according to the experiences and enjoyment which could be caused

by particular devices. However, the paraphernalia are not the only things that can affect the “high”. Intoxication is much more complex and users are familiar with it.

### *Influencing the intoxication*

The users mentioned other ways which affect the intoxication. One of these aspects is the set and setting and mixing the cannabis use with drinking of alcohol. The study participants were also putting the tobacco into the joint to titrate cannabis because most users do not smoke only pure cannabis because it is too strong. This experience with titration of strong cannabis was investigated also by Pol *et al.* (2014). Cannabis users put tobacco into the joint to save the material and some users claim that it helps with burning. However, experienced users claim that joint with “quality” cannabis burns perfectly and it is not necessary to put tobacco in it. One participant who was not satisfied with titration by tobacco put mint or herbs instead of the tobacco. Engeland (2011) mentioned that herbs are not better than tobacco because any combusted material may damage the airways.

Other ways how to influence the effects, that we mentioned by participants, is holding the smoke inside the lungs to induce faster and stronger “high”. The users who want to feel more intoxicated inhale larger volume of smoke. The experienced participants know that holding the smoke will not help to absorb more active substances but it is rather more harmful because the active substances are absorbed already within the first few seconds and with holding the breath those pollutants get deeper into the lungs.

Intoxication could be influenced by the methods of administration, which was also approved by Vacek (2003), for example in the use of joints. Respondents assessed that they like joints because of simple dosing. They can only take few puffs and then wait until the effects begin and then proceed with smoking according to the current intoxication and mood.

### *Minimising the harms – user-based practices*

Initial use might be crucial and inexperienced users should know and care how to inhale smoke/vapor, to use the least harmful way to reach the desired effects or they should know what cannabis can cause. Half of the participants had a friend who guided them during their initial use and gave them some advices. These advices were not similar with advices recommended by EMCCDA in the monograph dealing with harm reduction

(Rhodes & Hedrich, 2010), for example holding the smoke inside the lungs was relatively often used technique how to smoke cannabis recommended by participant's mentor. However, in reality it is not recommended. Peer-based advices which participants got contained techniques how much and how to smoke or what effects could be expected. Participants were also asked if they have ever given advices to a new inexperienced smoker. These peer-based advices from our participants were more detailed and respondents recommend to start to using smaller doses, do not use strong cannabis, have comfort and relax, they described the expected effects or how to smoke properly.

The physical consequences of cannabis use are not as serious as it is with other illicit drugs. Long-term consumption of alcohol causes damages of gastrointestinal tract, damages of nervous system, functional and organic damages to the circulatory system. Opiates have only small differences between effective dose and lethal dose, therefore an overdose can easily occur. Stimulant use causes psycho-motor function disorders, toxic psychosis, anxiety, dependence, etc. Harm reduction approach seeks to reduce these consequences as much as possible. Harm reduction is most associated with needle and syringe replacement with an effort to stop the spread of infectious diseases. However, these strategies are applied for alcohol as well due to distribution of alcohol testers, safe bars, web application to find out the level of alcohol in the blood or peer-based advices like do not drink on an empty stomach or drink soft drinks when drinking alcohol. Harm reduction strategies are also common for cigarette users (e-cigarette, snuff or chewing tobacco, cigarette filters, nicotine patches and nicotine chewing gums) (Kalina *et al.*, 2015). Thus, it is necessary to create strategies which will suit the cannabis users. In a case of cannabis, there is no control of product safety (standard drink labelling or decrease of nicotine in the cigarettes) so cannabis users do not know the "safe" amount of cannabis use (Swift, Copeland & Lenton, 2000).

Nevertheless, there are some health consequences from cannabis use so it was the aim to ask the cannabis users what techniques they use to prevent the adverse effects and if any adverse effect appeared what techniques they used to help mitigate or eliminate these effects. Some respondents noted that it is important to start with smaller doses (the method of titration) or a suitable or weaker variety. If side effects occur, it is advisable to stop using. Our respondents described that they would avoid the smoking from unknown people to avoid the risks of catching herpes. This quote suits to the Holland (2010)

recommendation to not share joints and “bongs” because of the risk of spreading infectious diseases.

Respondents mentioned that the adverse effects mostly come in combination with drinking of alcohol. For the safest use it is good to have a good set and setting which was mentioned by respondents and also by Rosenthal (2010). Respondents mentioned that best way how to reduce adverse effects is to go to sleep. Respondents described hypothetical scenario because they did not feel any negatives effects. The effects from cannabis do not last long as it is with stimulants or opiates, therefore it is important to know that these effects will pass soon. Respondents in this study, however, did not mention any experience with a “bad trip” which can appear as anxiety, paranoia, confusing, hallucination etc. Most respondents did not experience any negative psychological side effects either. This was also similar in previous study by Vacek (2003). The negative mental health side effects are extraordinary and usually appear when the user uses higher doses or high potency cannabis. High potency concentrates like BHO may cause more negative effects and less positive effects especially when associated with mental health problems such as psychosis and cannabis dependence (Chan, 2017). Our participants created the hypothetical scenario when there were some undesirable psychic effects. They assumed that if any in some occasions occurred, it was because of already existing bad mental condition or it was caused due to the use of alcohol and cannabis together. Psychological disorder may persist and in some affected individuals with psychological issue in the family, it can cause schizophrenia. In the literature is mentioned the cannabis psychosis (Kalina *et al.*, 2015). However, this was not cited by participants at all, not even by their family members or close friends.

To help to reduce the mental side effects, respondents recommended again to go to sleep, be in a positive spirit, with friends, or do some fun activity. According to the participants, physical side effects can be reduced much more easily than the mental ones which cannot be influenced by raising the feet, drink or eat some food. Eating could reduce them due to the propensity of cannabinoids to bind to fats. Appropriate set and setting, to avoid the use of alcohol at the same time, has been mentioned as one of the harm reduction point in methodical guide for workers in treatment (Andrlová *et al.*, 2016). The participants noted that if cannabis user feels some bad mental state, it is better to avoid the cannabis use. This advice was also written in harm reduction magazine for long-term

illicit drug users, published by official Czech non-governmental non-profit organization for drugs and drug addiction SANANIM (Dekontaminace, 2013).

Our participants reported more techniques than the ones described in harm reduction monograph (avoid the regular use, do not hold the smoke, use of vaporizers, do not drive motor vehicles when intoxicated and informing young people about risks from cannabis use) (Rhodes & Hedrich, 2010). Nevertheless, they didn't mention to avoid the daily use nor the driving under influence. However, participants further reported different techniques like to eat sugar or fats, on which cannabinoids bind, go to sleep or raise the legs. The recommendations could be used as peer-harm reduction technique in the case of ongoing side effects but it would be good to verify them for implementation to the qualified strategies of drug policy.

### *Limitations*

This data set is not representative. The aim was to have similar respondent characteristics to those cannabis users in the Czech Republic, but a number of the respondents in the group of regular users was increased (n= 19) to ensure sufficient number of users with wide experience and the same applies for the increased number of respondents in the group of growers (n=11). About half of participants were experienced cannabis users. 41 respondents have been approached and 25 of them participated on this research. 8 men and 8 women refused to attend this study. It is not known what other characteristics of those who refused to participate in the study were.

## 8 Conclusion

This thesis researched how cannabis users assess the “quality” of cannabis and how could these techniques of recognition help them to avoid adverse effects from using cannabis. Participant’s motivation to use cannabis in this study was relatively similar to those already investigated in literature. Participants have always mentioned more than one reason for use. The reasons for use were compared to the bio-psycho-socio-spiritual approach.

The term of “quality” cannabis was the main theme of this thesis and the definition of cannabis “quality” in this study included both effect and safety-related aspects in their definition of cannabis “quality”. Participants assume that the “quality” cannabis has good appearance, odour, taste, structure, amount of resin. Cannabis users cited that the important characteristics are the desired effect, type of “high” and if cannabis is strong enough. These were important factors of recognition of “quality” cannabis. “Quality” cannabis was also described by participated growers as properly cultivated which means that it does not contain any moulds or residue from fertilizers which is done by flushing cannabis plant with a pure water, correctly dried and stocked. Respondents noted that by these actions cannabis reaches the best taste, smell and ratio of active substances. Properly grown cannabis was assumed as “safer”. Still, it was easier for them to recognize the “quality” after use when they feel the effects rather than before. Most of the respondents admitted that they are not able to distinguish varieties between each other but they are able to differ some dissimilarity *e.g.* effects after using sativa strain or indica strain and outdoor and indoor grown cannabis.

Cannabis users look for “quality” cannabis which includes desired effects and health-related aspects but they do not have the option how to evaluate if cannabis is “safe”. Cannabis users would choose “quality” cannabis rather than unknown “quality” from the dealer. Cannabis users do not often have a chance to have close relationship with the grower to get proper information about the origin of cannabis and only possibility to have proven “quality” cannabis is to cultivate it themselves because experiences with purchasing on the black market have not been always good. Legalization of cannabis could be harm reduction approach because it would reduce the influence of the black market where cannabis is purchased with unknown content and unknown origin. By setting clear rules of “quality”, preventive measures could be prepared and tested. In the case

of legalization, “quality” would have a legal definition and anyone could have access to high “quality” but mainly healthy and safe cannabis.

Less experienced users were seen at risk of having false information about adverse effects, the strength of the cannabis and possible risks associated with methods of administration. Experienced users could mitigate the risk because they are familiar with more information about cannabis which they gathered for their user’s career. Cannabis users educate each other for their initial cannabis use but some information did not lead to the least harmful way of administration, *e.g.* holding the smoke in the lungs.

It was researched that cannabis knowledge about the origin is not often provided, even dealers do not always know or do not tell the information about the purchased cannabis. To get the information about cannabis, it is good to have an established relationship with the grower or grow cannabis on their own.

According to the paraphernalia, participants assumed that the best way how to use cannabis is a joint and it was supported by the arguments that joint is the best for titration of dose which can influence the intoxication. On the other hand, “bong” was considered as the dangerous methods of use for beginners because the intoxication is too strong. As the least harmful way how to use cannabis was assessed the vaporizer. Nevertheless, most of the participants do not use it because of they do not like the taste, inappropriate and possible weak effect or because of high prices of vaporizers. Probably, a more widespread use of these devices could help users to adopt this practice from their peers. However, the information about cannabis use should be verified for users to spread only the facts, not false information.

One of the findings was that the cannabis users apply harm reduction strategies which are commonly deployed for safer using of different drugs, to avoid adverse effects and use cannabis in safer ways. Those strategies were especially the good set and setting. Interestingly, cannabis users mentioned that they minimised risks in terms of not using with strangers and do not use unknown cannabis to avoid too strong intoxication, to avoid to inhale unhealthy cannabis or refuse to smoke joint from strangers to avoid to catch transmitted disease. This points to the importance of knowing what cannabis they use.

The last issue of this thesis was about the prevention of the undesired mental and physical side effects and in case that some of them occurs, how to reverse them. Most

study participants have never felt any mental side effects and only few had an experience with physical consequences. Every participant recommended to start to use cannabis in small doses, not to use “bong” and having a good set and setting is also of high importance. In the case when side effects occur, the respondents mentioned that it is necessary to stop the use of cannabis. Harm reduction strategies included (among some respondents) that if they do not know the person who offers, for example, a joint, they do not use it at all or use only little bit. To reverse the side effects participants would go to sleep, eat some food, drink sweet beverages, raise the legs or wait until the effects pass. These practices were not inline with what’s been previously recommended in the literature, sometimes included false information *e.g.* “*bong is safer*” and sometimes users advised additional information *e.g.* drink, eat or sleep. It is necessary to verify peer-based information about cannabis use because some information are not included in harm reduction guidelines and could be useful for drug policy.

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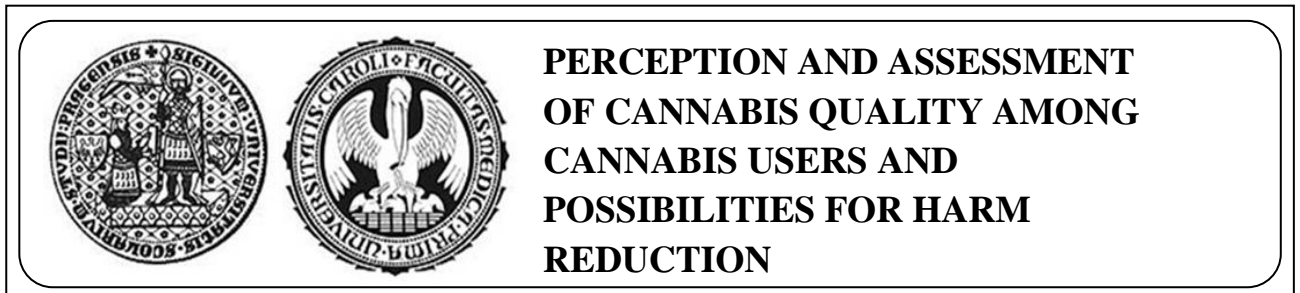
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## 10 Attachments

### 10.1 Attachment 1



#### INFORMED CONSENT

**Random generated name:**

**Date:**

**Interviewer:**

Hello, thank you very much for your participation in this study. This study is **anonymous**, based on a random name generator, your name is now:

I will now switch on an audio recorder and read an informed consent text to you, containing the information about the research you are participating in, the ways in which you will be guaranteed your anonymity and confidentiality and the risks you are bearing when agreeing to participate in the research. After I finish reading this text, I will ask you to consent or disapprove verbally that you are voluntarily participating in this research.

Audio recording an interview is important to avoid the loss of information and capture all the information from the interview. The recording of the conversation will be saved on a computer that is protected by password and the record will be deleted after the transcription.

The research project for diploma thesis *Perception and assessment of cannabis quality among cannabis users and possibilities for harm reduction* was prepared by me, Bc. Michaela Brandnerová, student of master degree on Department of Addictology on 1st Faculty of Medicine of Charles University, with help and surveillance from my supervisor Ing. Mgr. Bc. Venduly Běláčkové Ph.D. The main purpose of the research is to investigate how cannabis users perceive “quality” of the drug and how they manage the risks pertaining to cannabis consumption.

At the same time, this research focuses on identifying user techniques that are used to prevent physical and mental side effects. You will be asked questions about the quality of cannabis, how do you recognize it, how to obtain cannabis and how do you use it to avoid possible side effects.

The risks associated with the research are linked to the fact you are disclosing your and other (not identified) individuals’ criminal activities that in case they were linked to your personal identity would lead to criminal prosecution.

To help us protect your privacy, make sure, you do not use a real name and surname when you are talking about yourself or about the others. If you want to mention your friend's name, it is fine, as long as you do not use their surname or any other information that might

identify them directly. For this reason we have generated a random name or nickname for you, and please, if you mention other people, it will also be better to assign them a name or nickname. I also ask you not to mention any other facts that would cause you or others to be identified.

Due to these measures, the risks of disclosure of information is minimised and only one who will be able to connect the obtained information with you is only an Interviewer. However, I can promise you that no voluntary disclosures from my side will be made.

Moreover, I would like to point out that possession of a drug for own use in a small amount is not a criminal offense and it is not even a cultivation of cannabis for own use in small quantities.

The measures include not contacting other respondents by the interviewer herself. After we finish the interview, I will ask if you would be willing to recommend any other person to this research and if you would hand over announce about this research so the recommended person could contact me.

The structure of the interview which shall take approximately one hour of your time will be as follows. I will fill in a questionnaire with the basic information about your *sociodemographic characteristic* and your *personal use* of psychoactive substances. In the course of the interview, I will also ask you particular questions about your *experience with cannabis*, including descriptions of situations you were exposed to in more detail. At the end of the interview, you will be given time to provide me with additional information you find useful as to the subject of the research.

I want you to know that you have the option to *interrupt* the interview and discontinue it at any time during the interview. Unfortunately, you will not *benefit* directly from participating in this research study (you will not be paid for it) but in a long term I hope it can be used to evaluate and change current drug policies.

**Do you have any questions regarding the potential risks and benefits in regards to your participation in this research study? By agreeing to the interview, you claim not to be under influence of any legal or illegal substance. Do you agree to participate in the study now?**

## **Interview**

### **1) Gender**

- a) male                      b) female

### **2) Age**

### **3) Region**

### **4) Family status**

- a) not married      b) married ( b) with children/ c) without children)

### **5) The highest obtained education**

- a) elementary school      b) high school with /without graduation      c) higher vocation school  
d) University degree      e) Ph.D

### **6) How would you describe your job/employment/**

- a) Employed      b) Self-employed      c) both employed +self-employed  
d) on pension      e) on invalid pension      f) student  
g) in household      h) on family allowance      i) unemployed  
j) other \_\_\_\_\_

### **7) What is your monthly income?**

- a) 0- 15 000Czk      b) 15 000- 30 000Czk      c) 30 000Czk  
d) I do not want to share      e) I do not have any

### **8) Who do you share a household with?**

- a) Alone                                      b) with parents                                      c) with a partner  
d) with a partner/children      e) with friends/other people                      f) on campus

### **9) Have you ever smoked tobacco, such as cigarettes, cigars or a water pipe?**

Cigarettes: YES –NO; Cigars YES –NO, Water pipe: YES –NO Other devices:

- 1) I have tried it      2) occasionally                      3) regularly but not daily                      4) daily

### **10) Did you smoke tobacco during the last 30 days?**

YES–NO

- 1) occasionally                      2) regularly but not daily                      3) daily

### **11) Did you drink any alcohol in the last 12 months?**

YES –NO

### **12) How often do you drink alcohol?**

- a) 4 times a week or more often                      b) 2-3 times a week  
c) 2-4 times a month                      d) once a month or less often

**On how many days did you use another illicit drug (other than cannabis or hashish) in the last 30 days?? YES - NO**

Other illicit drugs: \_\_\_\_\_

- 30 days: a) daily or almost daily                      b) several times a week  
                  c) at least once a week                      d) less than once a week

**13) Did you use cannabis or hashish in the last 12 months? Did you use cannabis or hashish in the last 30 days?**

12= YES – NO,                      30dnũ = YES - NO

**14) During the last 30 days, on how many days did you use hashish or marihuana?**

- a) daily or almost daily, b) several times a week, c) at least once a week, d) less than once a week

**15) How difficult do you think it would be to get some cannabis or hashish within 24 hours?**

- a) impossible,      b) very difficult,                      c) quite difficult,                      d) quite easy,      f) very easy

**16) At what age did you use hashish or marihuana for the first time? Describe the situation.**

(Motivation, From who? Advices + help with intoxication? Effects, did you use cannabis with the beginner? Did you tell him/her some advices?)

**17) Where did you get the information about the cannabis and how to use it?**

**18) Can you please tell me everything about the last time you used cannabis?**

**How did you get it? Describe the situation.**

(From who did you get the cannabis? Did the person give you information about the cannabis you got? How did you feel after use? How was the quality of the cannabis you smoked?)

**19) What characteristics do you consider in judging the quality of cannabis?**

**20) Can you recognize that purchased cannabis is a good quality and how? Before use/ after use?**

**21) What type of cannabis suits you?**

**22) How do you get the quality cannabis? How many times during the previous 12 months did you have the quality cannabis?**

**23) Do exist the different varieties of cannabis? Can you distinguish them? According to what?? (strains? fertilizers?)**

**24) What is your experience with different varieties? Please describe.**

**25) When you obtain the cannabis, do you have interest what kind of variety is it? ( strain) Do you ask about the origin and how it was cultivated?**

**26) How do you receive the cannabis? – How many ways of receiving cannabis have you tried? (Share, Buy, Sell, Give, Receive for free, Grow)**

- **RECEIVE CANNABIS BY SHARING**

(Can you please tell me everything about the last time you received cannabis by sharing? Explain to me the scenario in which you were offered to smoke? Why did you receive cannabis for free? Do you know where the person got the cannabis? What kind of risks did you perceive at the setting? How much cannabis have you shared? Some people try to pay back a person who shares cannabis with them, for instance smoke with him next time, buy him a drink or just treat him nicely. If it this was your case when you last smoked cannabis, can you please describe it to me? Whose cannabis was it? How frequently do you smoke cannabis with this person? How was the quality of the cannabis you smoked?)

- **BUYING CANNABIS**

(Why did you buy the cannabis? How much did you pay for your cannabis? What amount of cannabis did you buy? How was the price negotiated (good price, was it a fixed price, did you get any discount)? How was the quality of the cannabis you bought? Do you have option to chose from more than one product? What did seller tell you about the quality? Did you discuss the quality? What kind of risks did you perceive at the setting? How would you describe your relationship to the person you bought this cannabis from? How frequently do you buy from this particular person and why? What did you do with purchased cannabis? Do you have option to ask for specific strains or for some expected effects? What do you know about the cannabis you bought, where did it come from (country, indoor/outdoor grown)? Do you trust your seller? Do you believe that he or she tells you the truth about origin of cannabis? Did you have an option to try cannabis before you bought it to make sure of the quality? Why is it better to buy than grow your own cannabis?)

- **TRADING SOMETHING ELSE FOR CANNABIS**

(Can you describe me the situation when you last traded something else for cannabis with other people? Why not for money? What amount? What quality? What is a good trade?)

- **RECEIVING CANNABIS FOR FREE**

(Who initiated the trade (please, don't provide any identifying information about the people you

mention)? Why did you receive the cannabis for free? How was the quality? What role plays the quality in giving the cannabis to other people? How regularly do you receive cannabis for free? Do you know what cannabis you have received and origin of it? Did you try to pay for it? What amount did you get?

- **CULTIVATING CANNABIS**

What type of equipment and other circumstances do you need so that you can start to grow cannabis? Where did you get the equipment?

Why did you start growing cannabis? What kind of risks did you perceive when growing your cannabis? What do you do to avoid the risks of being caught by police (like close windows in a house, go to a hidden setting)? How long have you been smoking before you started to grow it? Who would you get cannabis from before you started to grow it (please, don't provide any identifying information about the people you mention)? Do you grow from clones or from seeds or do you have mother plant?

Why do you prefer to grow it rather than to buy it?

What is the quality of cannabis compared to what you can get on the black market?

How much of the cannabis you grow covers your personal use? What do you do with the rest? Do you think that you use more than when you only buy cannabis? How do you choose the strains? According to what? Do you prefer to grow outdoor or indoor and why? How can you influence to grow quality cannabis? What do you do for it? Please describe (growing method, fertilizers, genetics, drying method).

- **SELLING CANNABIS**

(Why did you choose to sell cannabis rather than to share it or smoke it yourself (if these options are relevant)? Who initiated the trade (please, don't provide any identifying information about the people you mention)? How the previous situation differs from the situations when you usually get cannabis for free? What kind of risks did you perceive at the setting? How did you meet the people you sold it to? From whom did you get the cannabis you were selling? Do you give a choice to buy more than one variety? How the quality differs? What kind of cannabis would you rather sell and what kind of cannabis would you rather smoke by yourself or share with somebody? What kind of cannabis would you rather sell to a friend? What amount and for how much did you sell it? When did you decide what price they were going to pay you? Is it your main income? How does the price you paid for cannabis affect your willingness to sell it? Do you give some discounts?

- **GIVING CANNABIS FOR FREE**

For how much and what amount of cannabis did you give out for free? Why did you give cannabis for free? How did the previous situation differ from the situations when you usually share cannabis? What kind of cannabis would you rather give out for free and what kind of cannabis would you rather smoke by yourself or share with somebody?

(Who initiated the trade (please, don't provide any identifying information about the people you mention)? Why did you receive cannabis for free? What was the quality? What role plays the quality in giving the cannabis to other people? How regularly do you receive cannabis for free? Do you know what cannabis you have received and origin of it? Did you try to pay for it? What amount did you get?

- **TRADING CANNABIS FOR SOMETHING ELSE**

(Can you describe me the situation when you last shared cannabis with other people? Why not for money? What is the amount you trade? For what are you willing to trade cannabis? Who initiated the trade (please, don't provide any identifying information about the people you mention)? What was the quality you traded?

- **SHARING CANNABIS**

Can you describe me the situation when you last shared cannabis with other people? In what way it is more beneficial for you to share than to smoke cannabis alone? What was the quality of the shared cannabis? What advantage you perceive in sharing cannabis? Sometimes when cannabis is shared, some people happen to be passed a joint of cannabis that they don't want to smoke – if this happened there, can you tell me about it? Can you please describe me the place where you shared cannabis, how did it look like? What kind of risks did you perceive at the setting? With whom would you share and with whom do not? What kind of cannabis would you rather share and what kind of cannabis would you rather smoke by yourself? How does the price you paid for cannabis affect your willingness to share it with other people? When you share cannabis, do people tend to pay you back for it and how much?

**27) Why did you use cannabis last time? Describe the situation.**

(Why do you use cannabis? What are the required effects which cannabis users seek for? (recreational use/medical use))

**28) Does the quality affect the price? Does more expensive cannabis mean that it is better?**

**29) How did you smoke your cannabis (joints, pipes, blunts) – and why like this?**

(How do you prepare it, what do you need for it, do you mix cannabis with something and in what ratio? Do you know other method of administration? What is the best way how to use cannabis? Do you recognize that you smoked enough? Do you recognize it in time? Do you know some follow ups cause by specific method of ingestion?

- 30) Do you know some safer way of using? Why you use it or do not use it?**
- 31) How can influence the method of using the desired effects? Can you notice some negative health consequences from using specific devices?**
- 32) Have you ever tried to change the method of administration? Why and what is different? What kind of equipment you use to reach desired effect? What kind of method of administration did you try?**
- 33) Have you ever went through the negative experience? Can you describe me the situation? How would you prevent it?**
- 34) How do you prevent the physical side effects? When you feel the side effect, what do you do to reduce it? (Amount, concentration, potency, paraphernalia, number of breaths, length of holding the smoke?)**
- 35) How do you prevent the mental side effects? When you feel the side effect, what do you do to reduce it?? (Amount, concentration, potency, paraphernalia, number of breaths, length of holding the smoke?)**
- 36) Is the setting important? Can you please describe me the place where you smoked cannabis, how did it look like and what is the advantage of it?**
- 37) When someone is offering the cannabis, do you have interest what kind of variety is it? How is it strong? So you know how much you can use.**
- 38) Can you describe me the situation when you last used cannabis only by yourself? Why alone?**
- 39) What are the benefits of smoking cannabis to share it with other people than smoke alone??**
- 40) Do you know some other elements how can you influence the intoxication?**
- 41) Have you ever tried to stop using cannabis?**

(Why? What were the negative consequences? What were the positive consequences after you stopped? Did you notice some withdrawal symptoms? Why did you start to use cannabis again?)

**42) Would you like to add something related to the topic of the research?**

**Thank you for your participation in the study. In case you want to recommend some other people to take part in the study, please give them announce with information so that they can contact us.**