



Cannabis Webinar

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SUMMARY KEYWORDS

cannabis, THC, people, products, CBD, harms, important, question, endocannabinoid system, adolescent, drug, risk, effects, treatment, cannabinoids, reduce, medicinal cannabis, evidence

SPEAKERS

Jack Wilson, Dr. Smriti Nepal, A/Professor Tom Freeman

Smriti Nepal 00:03

Good evening everyone and welcome to the Positive Choices webinar series. My name is Smriti Nepal and I'm going to be facilitating this session today. Before I continue, I would like to acknowledge the traditional owners of Australia and recognise the continuing connection to land, water and culture. I am currently on the land of the Darkinjung people and pay my respects to the elders past, present and emerging. I further acknowledge the traditional owners of the country on which you are based and pay my respects to the elders past, present and future. I'd also like to acknowledge the Aboriginal and Torres Strait Islander people joining us for the webinar today.

Smriti Nepal 00:52

We have two speakers with us today who are going to be talking about adolescent cannabis use its prevalence, harms and intervention. Our first speaker is Tom Freeman, who is an associate professor at the University of Bath in the UK, and is the director of Addiction and Mental Health Group over there. Our second speaker is Jack Wilson. He is a PhD candidate at the Matilda Center for Research in Substance Use and Mental Health at the University of Sydney. Before we begin the presentation, I will give you a brief housekeeping and also give you an introduction of Positive Choices. So currently you are on listen only mode, which means that we cannot see you or and we cannot hear you. However, we will have a question and answer session towards the end of the webinar. So if you do have any question, please add it to the q&a panel in your screen. This webinar is being recorded and we will be making it available on the Positive Choices portal.

Smriti Nepal 01:57

If you're not familiar with Positive Choices, let me give you a brief introduction. Positive Choices was developed by the researchers at the Matilda Center and National Drug and Research Institute at Curtin University. It was developed in consultation with teachers, parents and students and is funded by the Department of Health. It provides a central access point with accurate up to date, drug and alcohol information as well as educational resources. We have a number of learning resources, factsheets, videos and games to engage young people. We also provide classroom based drug prevention



programs that are proven to reduce drug related harm. I will now hand over to our speaker Jack, who will talk to you about cannabis use. Over to you Jack.

Jack Wilson 02:53

Thank you Smriti. Okay, All right. Okay, so thank you for listening everyone. And before we begin our meeting, I would like to acknowledge the traditional owners of Australia and recognise their continuing connection to the land, water and culture. I'm currently on the land of the Gadigal people of the Eora Nation and pay my respects to their elders past, present and emerging. I further acknowledge the traditional owners of the country on which you are all on and pay respects to their elders past, present and emerging.

Jack Wilson 03:47

Alright, so just to provide a brief outline to what we'll be talking about today. I will firstly talk about the characteristics and trends of adolescence cannabis use, as well as speak about the the effects that COVID-19 may have on adolescent cannabis use. Tom will talk about cannabinoids, cannabis potency and different cannabis products. And I'll be talking about the endocannabinoid system, as well as why adolescents are at a particularly vulnerable, a particularly high risk of cannabis related harms. I'll then finish off by talking about the evidence around prevention and treatment. And Tom will finish off by talking about harm reduction strategies. I think it's also important to note here that there is a lot of content that will be getting through today. And because of that, we might not be able to go into certain detail that some of you might want us to go into. And so if there is anything that you would like us to go into further detail in the future, we're happy to do one of these talks again, I'm sure Tom will be happy to also be involved.

Jack Wilson 05:07

All right, so a bit of background. Cannabis is the most prevalent illicit drug world wide, with approximately 188 million cannabis users in the past year. Now 2.1 million of those are Australian aged over the 14 years of age. And which makes up about 10.4% of that population. 17% of 12 to 17 year olds report ever using cannabis and 5% report using it weekly. The average age of first use is just over 18 years of age. And although reasons for cannabis use are very complex, the most common cited reason is curiosity. As well as influences from friends and family.

Jack Wilson 06:03

I will be talking about two different data sets when talking about adolescent cannabis use prevalence, and that is the AIHW dataset, which is a household survey data set of 24 thousand Australians, a portion of which are young people. And in addition to that, I'll also bring up the Guerrin and White data set which is a secondary school data set of 20,000 secondary school students. So as you can see, there's a slight contrast in in how these data sets report trends over time. The household survey data shows a slight decline from 2004 to 2006. While there appears to be a slight increase according to secondary school data in ever use from 15% to 17%, from 2011 to 2017. But the household survey data does report that there are minor increases in weekly use. So those that are using appear to be using it more regularly. And just to put it in international perspective, there is a reported slight increase within the US and European datasets. And I think it's also important to note that although within



Australia there seems to be a slight increase or a slight decrease, this is really nothing compared to the more dramatic declines in alcohol and adolescent and tobacco use among adolescents. So it might be worth thinking, why is that? Why isn't cannabis really showing that same trend?

Jack Wilson 07:59

And one of the reasons may be changing perceptions around cannabis use. I mean, legal cannabis policies are becoming more common. We I'm sure we all know about this. In Australia there are legal, medicinal cannabis products under the Therapeutic Goods Administration. And there is also a surge towards trialing policies for recreational use. Now the household data set does report that among young people, there is an increased support for legalising cannabis, as well as fewer young people supporting penalties for illicit cannabis use, as well as more young people approving regular adult cannabis use. Despite this, among young people, cannabis is still most commonly nominated as the drug associated with drug problems.

Jack Wilson 09:05

So rates of cannabis use may be changing in the face of changing perceptions. But it- I mean COVID-19 may have a more dramatic impact on adolescent cannabis use. And we know that the Australian Bureau of Statistics has reported a pretty dramatic increase in nervousness and restlessness compared to before COVID restrictions and these people, and sorry, like alcohol these people may be using cannabis to cope with some of those symptoms, and these people may be at the greatest risk of developing cannabis use disorder. Now I think it's important to highlight the effects of COVID-19 on cannabis use may depend on availability. With restrictions limiting human movement and the movement of products. This has a pretty severe impact on the drug market. But it has been argued that cannabis use cannabis is less affected compared to other drugs because of its locally manufactured compared to other drugs such as heroin or cocaine that are that are typically sourced from other countries.

Jack Wilson 10:31

So what does the initial data say on how COVID-19 may have impacted on adolescent cannabis use? Well, we can see that there has been slight increase in use in the Netherlands, but a decrease in the UK. A special report of the global drug survey came out and they reported a 40% increase in cannabis use compared to before COVID-19 restrictions and Australia has the second highest proportion of that increase use compared to any other country. And most of the most common reasons for this increase appear to have that appear to be that people have more time to use the drug or boredom.

Jack Wilson 11:17

Now, there is also concern over how young people use cannabis typically through joints and bongs, which puts them at a greater risk of infection. And they are all young people also more likely to engage in risky behaviors and less likely to adhere to social distancing rules. So also important to acknowledge that the transition to homeschooling it may reduce the information and prevention programs that are typically offered to to students. So that's definitely something to be concerned about as well. So now that I've talked about cannabis prevalence and trends over time and how COVID-19 may have



impacted on these. Tom will now discuss different cannabis products and including THC content and CBD as well.

Tom Freeman 12:15

Thanks, Jack. So my name is Tom Freeman from the University of Bath in the UK and it's really a pleasure to be able to speak with you today. So when we think about cannabis, it's often considered as a single drug, but actually the cannabis plant produces many different cannabinoids and these can have contrasting pharmacological effects that have important consequences for the consumer. So the most studied cannabinoids are THC and CBD. And you can see based on the effects that they have, they can have quite contrasting effects. So THC is intoxicating. It can get people high and it can be a rewarding experience for some people. But particularly at high doses, THC can increase anxiety and transient psychotic like symptoms. We know that one of the most reliable effects of THC is to impair cognition. And also THC is addictive both in humans and non human animals. And we know that THC has these effects partially because of its impact on the endocannabinoid system. And Jack's going to talk about a bit more about this later. But you can see on the right here, this shows some of the regions in the brain where we have a high density of cannabinoid receptors. So areas like the hippocampus, which is very much involved in memory, the prefrontal cortex is very much involved in planning and decision making inhibitory control, and the basal lateral amygdala, just below the hippocampus is a reward and emotion related region. So when we think about the effects of THC, the endocannabinoid system matches on to its subjective and cognitive effects. And now CBD is very interesting because it's not an intoxicating cannabinoids, so when people use CBD, they don't tend to have any noticeable effects. But what it has been shown to do is particularly among clinical samples have some potential benefits. For example, in reducing anxiety, and reducing psychotic like symptoms. There have been two clinical trials showing that CBD could be an effective treatment for psychosis. CBD also shows pro cognitive effects particularly in people who have low cognition to start with, so it can improve memory and CBD may have potential as an anti addictive drug. So overall THC and CBD have very contrasting effects. And a balance between these in cannabis could have important consequences, for those who consume it.

Tom Freeman 14:44

And when we think about different cannabis products, it's really important to think about how they're produced in the plant. And so the cannabis plant produces at least 144 different cannabinoids. I'm only going to talk about THC and CBD today because it's the most widely studied and typically the most abundant in the plant. But all of the cannabinoids are produced in these glandular trichomes that you can see here. And these glandular trichomes play a protective role for the plant. And so, there are two things they do primarily. One is to protect the plant against UV lights which can be harmful. The plant and another is that they contain sticky secretions. So if an insect was crawling on the plant, and the sticky secretions could trap and kill the insect, so you find these glandular trichomes, and hence the cannabinoids and the most important parts of the cannabis plant, which is the flowering tops of the female plants. And so you can see this on the image on the right here see a very high density of these traits, these trichomes and that's where the cannabinoids are produced. And if we think about these trichomes this can lead us to understand why different cannabis products are made and why they might have different health effects.



Tom Freeman 15:58

Another thing about THC CBD is it their production is genetically determined. And there are three main different types of plants. So if you were to sample a cannabis plant from the population, it would typically fall into one of these three categories. So on the horizontal axis you can see the THC content, and on the sorry on the vertical axis, you can see the THC content. And on the horizontal axis you can see the CBD content. Most cannabis plants produced for recreational use are THC dominant, and this means that they just produce high levels of THC. You won't see much if any CBD in these plants. It makes sense that people who are growing cannabis produce this because it can be more profitable because THC produces intoxication you can make more profits of the THC dominant plant. You do get mixed THC CBD strains and as you can see here, this is shown in the middle you see a moderate amount of THC and CBD for these and there is some interest in this in both recreational and medicinal markets. It's less common and THC dominant. And finally you have the CBD dominant plants. These mainly produce CBD and just a very small amount of THC. And what these plants are used to produce are the CBD products that you might see on the high street and I'll talk about these a bit more in detail but if you saw CBD oil product, it would have very low levels of THC and these products are producing CBD dominant cannabis plants.

Tom Freeman 17:28

Of course, you do see variation between THC and CBD in terms of their ratio in different cannabis products. When we think about herbal cannabis, typically this just contains THC, but there are very different types of herbal cannabis. So if left in its natural environment, cannabis is fertilised so the female plants are fertilised by the males and as a result, they produce seeds. You can see this on the left and the seed production reduces energy from the plants produce THC. So you might see a low level of THC around 6%, for seeded herbal cannabis. What growers discovered was if you separated the female plants and the males, they wouldn't become fertilized. And as a result more of that energy would be used to produce THC. And there are other methods such as growing indoor and to increase UV light or using hydroponic growing methods. And with with these kinds of methods, you can get around 15% THC or increasing up to 20 to 30% THC at the upper limit. And as you can see for some of these products, often called Sinsemilla or hydro, and on the bottom right, you can see this is a product called White Widow named after its appearance and you can see if you look closely, they're actually the trichomes are visible to the naked eye so you can see how much THC is located on this cannabis product which is very different from the seeded herbal cannabis on the left.

Tom Freeman 18:58

Now cannabis resin is a different kind of product. And there are different ways of making this, but one is by using a screening method. And what you can do is a very simple procedure growers have their herbal cannabis product and they rub it over the screen. And the aim here is to detach the trichomes. It's a very crude method. But what it does is it detaches these trichome heads from the cell and they fall through the screen. This then produces a lose substance called Kief which is essentially the trichomes and this is sometimes sold on recreational markets but it's not so common. More commonly what it's done is that this substances is then pressed into resin or hashish and so you can see here, an example of resin or hashish. This often contains THC and sometimes CBD, when it's particularly when it's



produced using mixed strains. And see the THC concentrations can be quite high with cannabis resin when compared herbal cannabis.

Tom Freeman 20:01

And then a more recent development has been the term concentrates. And the first of these to really take an impact was butane hash oil. So this uses somewhat similar principles to cannabis resin but but a bit more advanced so so producers take their herbal cannabis material and put it into a glass tube. And then by using butane, they pass butane through this glass tube and the butane dissolves the cannabinoids from the trichomes, passes through and then collects in a tray. This can be heated through a process called purging. And this produces a concentrated product, such as shatter, named after its brittle appearance with around 80% THC. And then these can get up to around 90 depending on the extraction process. And the reason that these methods are more efficient than the sieving method is actually extract the contents of the trichome cell. So, so with the cannabis resin it was just the cell heads being detached and so that's less efficient but the concentrates extract directly from the cell. And when we think about concentrates such as butane hash oil, there are several concerns here. Firstly, butane is a very flammable substance and typically this is produced in unregulated and unsafe environments. So there have been several cases where buildings have exploded, and there have been fatalities, because concentrate production has gone wrong is quite concerned for the for the health of the producers. Another concern is that when you purge the solution, you're actually left with residues, solvents, and so the product that people inhale is not safe according to medicinal standards. So there is a risk with these products that you're inhaling and dangerous levels of the butane solvent. And of course, there are other concerns about the potency of it. That we'll get into later. I should add that people have moved to more safe methods of extractions such as co2. But one of the risks particularly in illicit environments is that a method like this is very easy to do, as you can see with the rudimentary equipment and so it's particularly in illegal environments, when this kind of production method could be taken forward and potentially go wrong.

Tom Freeman 22:28

And then edibles this is another new development and it's particularly exploded in the legal cannabis markets in the US so edibles are very, very popular in the legal cannabis markets. Less so in illegal cannabis markets, but they are starting to take effect. And one of the concerning things about edible products is that they take a common a common snack, which might be attractive to children. So when I was a child Pop Tarts was a very unhealthy snack that I would never have a breakfast because it's really just sugar and fat, you shouldn't eat this I was told as a child, but what they've done is attract it to children, they've taken Pop Tarts and they've changed them to Pot Tarts, which look very, very similar, but they contain 35 milligrams of THC. It's not surprising these are attractive to youth. And one of the major risks of these edible products is accidental overdose. If we look in Colorado, which was an early state to legalise cannabis, what we can see is that 50% of all admissions to pediatric hospital for cannabis were due to edible products. Bearing in mind that these represented around 20% of all of all sales, it's really disproportionately high. And so it's a real risk with edible products that you might have accidental ingestion by children, adolescents and even pets.

Tom Freeman 23:54



Now, our talk today isn't focused on medicinal cannabis products, but it's important to illustrate that they do exist. And people might have access to them. So Dronabinol is widely used for nausea and vomiting due to chemotherapy and it can come in capsules, such as a five milligram THC capsule. And then Sativex is a plant extract of THC and CBD used for spasticity and multiple sclerosis. Epidiolex was recently approved for the treatment of childhood, severe forms of epilepsy. And this is just a CBD product. So looking at these first three products, you can see that there's variation in some products being just THC and Dronabinol others being just CBD Epidiolex and the Sativex is a combination. So similar to the recreational market, the Medicinal Products vary in their balance of THC and CBD. And also there's Bedrocan, or other medicinal cannabis products, which, as you can remember from my previous slide, this medicinal cannabis resembles street cannabis it looks just like Sensimilla and in fact it is. The differences is that Bedrocan or other medicinal cannabis products are produced to GMP so they have standards of quality and the concentrations of THC and CBD will be more close to what they advertise. But essentially it is the same product. And so, this kind of medicinal cannabis product is very difficult to distinguish from recreational cannabis, once it's taken out of its prescription pot.

Tom Freeman 25:30

I've been researching THC and CBD for over 10 years and in that time, I could never have imagined how widely available CBD products would be. It's really it's quite astounding how many CBD products are available now. And one of the products which is quite new is 'cannabis light', which again just looks like a recreational cannabis product. This actually is a CBD dominant strain and so it contains very low levels of THC. So in some countries cannabis light can be sold legally as a CBD product. Other countries have no tolerance of any THC content. But again, this is very difficult to distinguish from other medicinal or recreational cannabis products. CBD oil is very very widely available around the world and it can be used potentially for health benefits although the claims around these are not supported by scientific evidence. And as this has progressed we've seen a vast array of products for example, CBD hummus, if you wanted to consume CBD as part of your lunch you could and even CBD dog treats. So really, there's no limit to how many products CBD can be found in these days. And there are some concerns particularly when people are using these for their supposed health benefits. With these non medicinal CBD products or daily doses that people consume are around 25 milligrams and this is a low dose of CBD. By contrast the clinical trials that have found medicinal benefits of CBD, is typically test 200 to 1500 milligrams of CBD. So if somebody decided to use a CBD oil because they thought it might reduce their anxiety, and this is based on some research they've read, it's very, very unlikely that they would reach a dose of CBD oil is likely to have very limited pharmacological activity due to this low dose and so essentially going to be an expensive placebo. But in terms of the risks, because these products are extracted from the cannabis plant, CBD dominant strains still produce some THC. And so there is a risk of THC content leading to a positive urine screen. If you had a workplace or school based Drug Testing Service, you might you might come as a positive test result having not even believe that you're taking cannabis you still been exposed to THC. And particularly people use a lot of these products. It is possible to reach intoxicating doses of THC, so you can easily ingest two to five milligrams of THC if you use many of these products and this could have many health risks that Jack will cover later.

Tom Freeman 28:11



Finally, synthetic cannabinoid receptor agonists or spice. These are very different to all of the other products I've discussed because they don't contain plant based cannabinoids, THC or CBD. So what synthetic cannabinoid receptor agonist drugs are is a combination of synthetic drugs added to inert plant material. So there's no cannabis plant here. It's just plant material that has no activity mixed with chemicals. These are typically imported from China and they are sprayed onto the plant material and mixed in a crude way. Similar to the butane hash oil, which is done in acute crude environment, this is often done with cement mixes. So people would mix the plant material with the products. This is an imperfect process, very different to production of a medicinal drug. So what happens is you get variable drug concentrations, and it might be that somebody consumes a small bit of spice, and they find that there's no effects. And so they think that it's not very strong. And then they consumer a higher dose, and they've actually picked up a hotspot. And this is where there's a high concentration of the drug and then this might be enough to make the overdose. So it's a very variable drug product, both in terms of the concentration of drugs within the product, but also the different combinations of chemicals within and across different batches. And from a pharmacological perspective, these are full receptors, receptor agonist, at CB one receptors, and so THC is partial agonist and this means it has a weaker activity. As a result, these synthetic cannabinoid receptor agonists can have much more severe adverse effects such as seizure and death. And these are very, very risky and should be avoided at all costs.

Tom Freeman 29:59

And when we think about cannabis generally cannabis potency has been increasing in recent decades. Looking at the different products, it's a high potency Sinsemilia or hydro cannabis, that dominant dominant market in Australia, the UK, US and Europe. And of course, as we know with alcohol consumption if people have spirit and may consume less when compared to a beverage of a lower concentration of alcohol, so people do potentially adapt their behavior when they when they have a cannabis product with different THC. So for example, people might add less cannabis to their joints, that have more THC, or they might inhale less deeply. But what we found from ecological studies is that this adaptation is only partial so people do somewhat adapt to changes in THC but not effectively. So as THC increases in the product, and there's a higher dose of THC delivered, essentially resulting in greater harms.

Tom Freeman 30:57

This is a combination of previous studies published since 1970, to 2017, what's called a meta analysis of previous studies, which have investigated THC in herbal cannabis. And as you can see, on the vertical axis, you can see THC concentrations, and on the horizontal axis you can see year. So overall there's been quite a clear increase in THC concentrations, rising over time from 1970. And particularly in recent years, you can see very, very significant changes in THC. So within herbal cannabis, the annual increase was point 3% every year and for hash and resin it was 0.58%. So cannabis potency has been increasing in recent years, both in herbal cannabis and cannabis resin.

Tom Freeman 31:50

Okay, so now jack is going to speak about adolescent harms and the endocannabinoid system.



Jack Wilson 31:55

So as Tom has mentioned, cannabis potency is increasing quite dramatically. And adolescents may be especially susceptible to the harms associated with cannabis use. Now, I'm sure we all know that adolescence is marked by a period of dramatic cognitive development where they, where during this time, they often seek reward in the face of uncertainty or potential negative outcomes. And a great example of this is early cannabis use. Now, therefore it might not be surprising that adolescence demonstrate, adolescents that use cannabis at an early age demonstrate poorer inhibition and attention, as well as requiring additional neural responses to do as well as non users. Overall, this suggests that sensation seeking and deficits in inhibition and attention may serve as risk factors for early age cannabis use.

Jack Wilson 33:13

But cognitive deficits may not just be a risk factor but they also may be a consequence of early cannabis use. Now and this may be due to the impact that early age cannabis use has on the endocannabinoid system. Now the effects of cannabis occur primarily through the endocannabinoid system, which is a biological system important in human development. It's made up of neuro transmitters called endocannabinoids, as well as neural receptors and plays a critical role in that early development. It's responsible for the it can assist in the generation of neurons particularly during cognitive development, and it's also responsible for a wide range of functions including memory and movement. And you can see in the figure there that the endocannabinoid system occupies a wide spatial range of our neural system. So during the important time of neuro maturation, the endocannabinoid system plays a very important role. And hence it may be more vulnerable to disturbances from exogenous cannabinoids such as THC, which could have a supra-physiological effect on our cannabinoids, our Endocannabinoid receptors, almost like an overload, therefore altering normal brain functioning and possibly leading to an increased risk in mental health outcomes and cognitive impairments.

Jack Wilson 35:01

Now after evaluating the evidence around the effects of adolescent cannabis use, we can see that the greatest argument is for an increased risk of psychotic symptoms, followed by anxiety and in some cases depression. There is also some longitudinal evidence to suggest the link between early age cannabis use and possible neurological decline, particularly in IQ and episodic memory. Now, I think the greatest message to get from this slide and impossibly most of the talk is that these effects sorry these that early cannabis users are at the greatest risk when they use cannabis as an early age more frequently and at a greater quantity. Unfortunately, little evidence has looked at how potency impacts on this association.

Jack Wilson 36:04

So much of the evidence looking at the impact of cannabis potency on health outcomes is in adults. If we look inside the lab, we can see that studies show a dose dependent relationship between THC consumption, and harms, such as cognitive impairment, anxiety and psychotic like symptoms. If we're looking at observational studies, we can see that these effects persist beyond acute intoxication with



where those using more potent cannabis products are more likely to have cannabis use disorder, psychotic conditions, and depression and anxiety.

Jack Wilson 36:48

One particular study shows that compared to those using low potency cannabis, use of high potency cannabis poses a four times greater risk of cannabis use problems and a two times greater risk of anxiety disorders.

Jack Wilson 37:07

So, it's important to look at the limitations of this research so we can, so we can consider future research. Now, although studies looking at the health effects in adults are very helpful in drawing conclusions from the impact of cannabis use, it's very difficult to generalize these findings to adolescence. So future research must employ measures of cannabis potency when looking at adolescent cannabis use. And they can do this by including verbal descriptions in the question. So for instance, when asking young people about what type of cannabis they use, maybe ask them about, you know what color it was, did it have seeds, some of those things that Tom suggested earlier. It also may be really helpful to include those pictorial aids so pictures of the different types of cannabis. And in doing this, we can guarantee a more accurate assessment of cannabis type.

Jack Wilson 38:14

So considering that young, considering that people usually use cannabis, at that sort of in that adolescent period, school is a great setting for delivering prevention programs. So, a few systematic reviews have identified what works best in prevention programs prevention in terms of reduce, sort of delaying, the onset of cannabis use. Now, we can see that interactive programs are superior to lecture style, so making sure that the participants are interactively engaged within the program. It's also important to adopt a social influence approach so not just not just giving information about cannabis use and the harms, but also helping young people develop skills to resist substance use. The instructor has also been found to be a pretty strong predictor of prevention program efficacy. So teachers and clinicians must be provided with with the necessary information in delivering these programs. It's also important to acknowledge the role of parental relationships and incorporating this into these programs. We know that parental style and family structures can have a pretty strong association with the initiation of cannabis use, and age at which at the age of which people use cannabis and the frequency at which they use.

Jack Wilson 40:00

So another type of intervention is called Preventure. And it was developed by researchers at the University of Montreal. Now, Preventure is a personality targeted intervention for those that are at a greater use of a greater risk of using cannabis. And it identifies those personality profiles for those that might be at a greater risk and focuses on motivational factors for risky behavior and while also providing coping skills. Now that it Preventure typically delivers four workshops where they focus on four different types of risk personality profiles, and those are anxiety sensitivity, hopelessness, impulsivity and sensation seeking. Now Preventure has shown to reduce the odds of consumption 24



months of following intervention compared to those that were at a higher risk but did not use the program or do not receive the program.

Jack Wilson 41:16

So despite higher levels of problematic cannabis use very few people who use cannabis seek assistance from a health professional. And as young people develop problematic cannabis patterns, psychosocial treatments should always be the primary treatment option. So, um, systematic reviews again have shown that optimal programs incorporate a combination of cognitive behavioral therapy, motivation enhancement therapy and contingency management approaches. And they also have a mix of digital and clinical delivery. So emphasizing that digital delivery again. They've also been shown to be optimal when they have more than four sessions and delivered for over a month. Now, unfortunately although psychosocial treatments have been shown to lead to reductions in cannabis use at post treatment there is little evidence to suggest that these reductions persist long term.

Jack Wilson 42:32

Now overall, there are a few limitations to consider when looking at prevention and treatment programs. So few programs have cannabis specific sessions and this is pretty concerning because there are risk factors and harms that are unique to cannabis. So there needs to be an increase in cannabis specific sessions. Also, there's a little discussion about different cannabis products or THC content. This is quite concerning because we've just heard about how THC is associated with those harms. Also, few studies have assessed the efficacy of treatment in adolescence, often looking at adults. So considering that the aim of these interventions is to facilitate the avoidance of cannabis related harm, Tom will now discuss some strategies to aim to minimise that harm.

Tom Freeman 43:33

Thanks Jack. So as Jack illustrated there, if a young person is using cannabis treatment really is the best option. Ideally, the best thing to do would be to stop using cannabis altogether. But the long term effects of treatment are mixed. For some people, it's not effective, some people aren't able to quit completely. And for some people quitting isn't actually their desired goal. They might prefer to use cannabis. With this in mind harm reduction guidelines can be very helpful because we know that the risks of cannabis can be very modifiable, depending on the way in which cannabis is used. And so kind of Canada's low risk cannabis use guidelines have really been instrumental in this process. Before this, there were never any evidence based guidelines widely available to people who use cannabis. So these are 10 recommendations based on a systematic review of the evidence. And to anyone who is in contact with people who use cannabis and might be interested in reducing their harm, I'd recommend this resource. So the first recommendation is important. The best way to to reduce the risks of harm is by completely abstaining. So if people can completely abstain, that's the best thing to do, if you can encourage that. But those who do choose to use a really important thing to do is to delay taking up cannabis until later in life. So if you avoid that adolescent period, you can potentially avoid the effects of THC on your neurodevelopmental processes, it's going to be much less risky if you use it in adulthood. Another key recommendation is identifying and choosing the lower risk cannabis products. And those specifically are cannabis products with low THC or low THC to CBD ratios. Another point as I illustrated earlier, don't use synthetic cannabinoids. These are far more risky and should be avoided at all costs.



When cannabis is used, it's often burnt. So smoking cannabis does carry carry significant risks and if you can find a safe way of using it doesn't involve burning this is preferable. Also there are harmful smoking practices. For example, combining cannabis with tobacco. This can increase your risks of cannabis dependency, and it can expose you to tobacco and potentially create an addiction to tobacco in addition to cannabis. Another important recommendation is to limit and reduce how often you use cannabis. This is possibly the most important one because if we look at the adverse effects of cannabis, one of the most reliable predictors is frequency of use. If you're a daily cannabis user, your risk of psychosis is considerably higher than if you are somebody who uses occasionally. And the same for cannabis use disorders and cognitive impairment. So, if you do use frequently reducing the amount, the number of days you use, it's very important. As Jack and I discussed, cannabis can have cognitive impairing effects. And so it's really important that people don't use and drive or to operate machinery. And this can be a risk in terms of accidents. The relationship between cannabis and mental health is complex. And we don't have time to go into the full details here. But if you do have mental health problems, or you have a family history of these, you should avoid cannabis. And also if you're pregnant, you should avoid cannabis because THC can cross the placenta and these risks can happen additive and potentially synergistic effects. So it's best to take all of them if you avoid combining this with these risks that can further reduce the harms that you experience.

Tom Freeman 47:13

So overall, these, these evidence based guidelines are very helpful. And they are a really good starting place for reducing the harms of cannabis. However, they do have some limitations at present. For example, they don't have any recommendations based on the quantity of use, you can see the two recommendations that are related to specific products and type of use. They just speak about the type of products you use and how often you use them, but they don't say how much you should use and how you could avoid harm that way.

Tom Freeman 47:48

And this contrasts with with alcohol where we have very good harm reduction guidelines for alcohol around the world. And if we think about alcohol guidelines, they're very much based around the concept of quantity of use. So for example, in Australia, we have a concept of a standard drink. And this can be used to for any different type of drink, whether it's beer, wine or spirits. Based in recommendations for healthy adults, you should drink no more than 10 standard drinks a week. This way you can cut your lifetime risk of harm. So by having this quantitative recommendation, this is a very effective way of reducing risk compared to having no quantitative information at all.

Tom Freeman 48:27

And for cannabis, we don't have that yet. But as I showed you, there are different cannabis products. They all contain THC. So the concept of the standard THC unit may be something that people could use to monitor their consumption and reduce their risks. So for example, with a standard THC unit, five milligrams of THC, which is a low dose that can produce intoxicating effects, but not adverse effects in naive users. This could be a concept of use of people could use in terms of monitoring consumption on a weekly or monthly basis.



Tom Freeman 49:11

The concept of a standard THC unit is moving forwards in terms of NIDA, the National Institute on Drug Abuse. And so maybe that in future, there are similar health based guidelines to those we have on alcohol, for example, you should consume no more than 10 THC units per week. And in order to make these recommendations, we would need to have stronger evidence in order to guide consumers in this way. But thinking back to adolescents, this could be a really good concrete way to give recommendations about how much more vulnerable they are because people like Jack and myself often provide the message of saying adolescents are more vulnerable. But by having quantitative recommendations, we can really say how much more vulnerable they are. And by doing this, we can really hopefully encourage them to delay their use, and by illustrating the increased harms based on quantity when used in adolescents.

Tom Freeman 50:04

So Jack's gonna wrap up now, over to you Jack.

Jack Wilson 50:09

Excellent. So I would usually take this time to wrap up and summarise what we've gone through tonight. But I'm aware that we don't have much time left. And so for more questions, I'll just skim through the summary. But I'm not sure Smriti perhaps you have these slides online for people look through. It's definitely available in video format.

Smriti Nepal 50:36

Yes, Jack. Thank you so much, Jack and, Tom, that was so informative, so much information in each slide that you talked about. Yes, the slides and the recorded webinar will be made available on the Positive Choices website. So we have some time left for questions. So without any delay, I'll get to the questions. Um, the first question is, is there any long term impact of cannabis use on the neuromuscular system?

Jack Wilson 51:15

Yeah, Tom, perhaps this might be something that are you aware of anything?

Tom Freeman 51:21

I'm not aware of any long term impact? No. No.

Smriti Nepal 51:26

Okay, so that's okay. And the second question is for Tom, you mentioned that 2014 studies found people who use cannabis partially adapted their smoking behavior when smoking stronger products and also that in recent years potency and types of products increase. Are there any recent research on whether people adapted behavior with these new products?

Tom Freeman 51:55

Ah yep that's an interesting question. So these studies were conducted in the UK one one was by my group. And one was by a group in the Netherlands, quite similar studies and so so for our study, we



found that people, as THC increased, added less cannabis to their joints. And the Dutch study found primarily the titration was based on less inhalation. And these were based on as THC increased, they inhaled less cannabis. And these were based on typical herbal products. There was a very recent study published just last week that looked at concentrate use, as well as herbal cannabis use. And there was some evidence of titration and people were asked to consume higher or lower concentration products within these categories. So particularly potent concentrates versus less potent concentrate and the same to the herbal product. There was some evidence of titration but what it did show was that those who consume the concentrates, the most potent product had higher THC in their blood. So it is a case whereby typically as THC rises, you do get more THC, not completely. It's not it's not a one to one relationship, but generally as THC increases, you get more THC in your blood.

Smriti Nepal 53:15

Interesting. Thank you, Tom. The next question is, among all adolescents who use cannabis, what proportion will become long term users? Is it that the younger they start, the higher they are at risk of dependency?

Tom Freeman 53:34

Absolutely. So that's one of the most robust findings in terms of risk of dependency. So people, there are varying estimates of the risk of dependency and people who use often people would say it's around one in 10. More recently, estimates have been around 30% of people who use cannabis have a cannabis use disorder. If you use in adolescence that increases to 50% or higher So the younger you start, the greater your risk of developing a cannabis use disorder characterised by persistent use, despite adverse consequences.

Jack Wilson 54:07

I'll just extend on what Tom also said. That one in 10 has always been sort of something that's been communicated around sort of the literature. And yeah, definitely there's some some newer studies, including one by my supervisor, Christina Marel, has found that the, the risk is actually much higher than one in 10.

Smriti Nepal 54:34

Okay, the next question is about your thoughts on how we can encourage young people who use cannabis to seek help. Are they not seeking help? Are they're not seeking help because they don't identify the cannabis use as problematic?

Jack Wilson 54:57

Yeah, I mean, I think it's, I think it's sort of a bit of both but it's I think it's sort of it's both that they that they're not offered where they should be, as well as people, you know, sometimes don't associate their cannabis use as problematic. A lot of people say no, it's a plant. It's not harmful. And, I mean, although that sort of that's something that really needs to be educated to users. So it really drills the importance of information to young people. Especially, yeah, especially letting them know what what we know so they can be equipped with making the right choices, and also preparing programs and treatment options as well. So I think the there's a lot of alot of onus on researchers, particularly.



Smriti Nepal 56:02

This next question would be to Tom, Tom the harm reduction guidelines you shared. One of the guideline was to avoid smoking burnt cannabis. The question is what does the current evidence say are safer ways of using?

Tom Freeman 56:21

Okay, so going back to the first recommendation, the safest method of cannabis use is not to use any at all. Obviously, it's important to note that if you do use combusting cannabis is dangerous when compared to either an inhaled method of, for example, a vaporised method or an edible method. And I should note that there have been risks, particularly in the US around vaping related injuries and these were from particular cartridges that were made with THC concentrate. So there are some vaping related methods which are dangerous, but these are very limited and if you vape a normal cannabis products such as herbal cannabis this is much safer than combusting. So essentially you should be either vaping or using edible products, but you should avoid cartridges which are made with THC rather than a cannabis product itself. I hope that answers the question. I'm afraid it's not a particularly easy one to answer. And I should also add that those recommendations were made before the problems came out with these vaping related injuries. So it's quite a nuanced message with the vaping but overall, vaping is safer than combustion.

Smriti Nepal 57:41

Okay, I think it is important to answer this next question. So how do you help students and young people understand the difference between medicinal and recreational cannabis?

Jack Wilson 57:57

Yeah, that is a very important question. I think it's important to identify why, what types of medicinal cannabis are being provided and why. And the evidence around that and that's difficult to communicate to, to school students, but we've got to find out a way of being able to synthesise that and make it user friendly, so to speak. And, and also just to sort of drill down that as Tom said, the the, it's best to not use cannabis at a young age to avoid those those harms. So, yes, I understand that it is very difficult to sort of divide between that medicinal and recreational cannabis use and and communicate that to young people. Tom, do you have anything to add?

Tom Freeman 59:02

Yeah, just to add to that, I would recommend anyone who's considering this issue to speak to a health care professional. And one, one good way to distinguish would be that if your physician recommends that you should use a medicinal cannabis product, and they've assessed your symptoms, and they believe that this is an effective, safe treatment, then you could consider that as an option. There are many cases where people might think they're using cannabis in the medicinal way. Actually, they could be somewhat self medicating. And there's a real risk here, both in terms of the product they're using, and the reasons they're using it. So medicines are typically provided in a very controlled environment using specific dosing regulations. And so it's there's a lot of overlap but people think they're using cannabis medicinally but actually, they're not so also the evidence for medicinal cannabis. There's



some evidence but it is only for a few conditions is a really strong evidence so important to have that in mind. Best to speak to a healthcare professional if in doubt.

Smriti Nepal 60:06

We have a few more questions, just wondering if you guys can stay a few extra minutes to answer some of these questions.

Tom Freeman 60:13

Sure.

Smriti Nepal 60:15

Okay. So the next question is, is there any information on whether and how much poly substance use including cannabis, as opposed to cannabis use alone? Or as the primary drug of concern might be a driver into treatment?

Jack Wilson 60:34

Well, I'm sorry. Sorry you go, you go, Tom,

Tom Freeman 60:37

That's okay Jack go for it.

Jack Wilson 60:39

I was just going to discuss the the high prevalence of tobacco use amongst those using cannabis and especially when tobacco use in joints and so yeah, that's something to consider, but in terms of treatment, I don't know. Do you want to extend on that Tom?

Tom Freeman 61:04

Can I just check that I understood the question was this about whether police prosecution is a particular route into treatment? Could you repeat the question?

Smriti Nepal 61:14

So is poly substance use as opposed to cannabis use alone or as the primary drug of concern a driver into treatment?

Jack Wilson 61:24

A driver.

Tom Freeman 61:27

So yeah, based on the data, cannabis as a primary drug is the majority of cases but poly substance use is common and it's often difficult to tease apart the role of a drug such as tobacco is often overlooked. Other drugs such as alcohol, but generally cannabis as a primary drug does account for a significant proportion of treatment admissions. think it definitely varies on a case by case basis. So each person



has their own set of problems and it's nothing, when you look at treatment figures, you can often forget that each person has their own story and their own unique circumstances.

Jack Wilson 62:06

And just add to that cannabis use is quite frequently used by those with opioid dependence as well. Yet there is very little evidence to sort of look into the impact that cannabis use may have on those with opioid dependence. So there are a lot of other substance use conditions where cannabis may be the secondary drug used as well.

Smriti Nepal 62:36

The next question is, how? How can you explain to a young person who uses cannabis to reduce their anxiety on a daily basis that it actually increases their anxiety?

Tom Freeman 62:55

Yeah, this is a tricky, a tricky thing to do. In a motivational interviewing session you might be exploring some of the potential positives as well as some of the negatives of the drug. And you might see that there's ambiguity, whereby people do see some positives and they keep on using it perhaps to reduce anxiety. But it might be that in the long term, they're finding that their sleep is becoming disrupted. They are becoming more chronically anxious. And this is more of a negative effect. But of course, we don't know that for all people cannabis increases anxiety for some people that might have beneficial effects. And so this would be another situation where on a case by case basis, it wouldn't be that cannabis increases anxiety for everyone.

Smriti Nepal 63:39

Okay. I'll ask you two more questions. So the next question is, are there female and male differences in risk of harms from THC?

Tom Freeman 63:54

Yes, sex difference is a really interesting area of research and the findings have been mixed. But typically what people see is that females do tend to be more sensitive to the effects of THC. And also, there's some evidence that females respond more in terms of pain relief. So there may be some differences, perhaps related to the endocannabinoid system that make females more sensitive. Also in terms of dependency, females are less likely to come forward to treatment, but they're also less likely to try cannabis. Amongst those who do try females can have a poor trajectory in terms of dependency. Don't know if you want to add anything Jack?

Jack Wilson 64:38

No, no.

Smriti Nepal 64:41

And the last question I like to put forward is, would you agree that adolescent cannabis use is a major risk factor to poly substance use disorder in the future?



Jack Wilson 64:54

Sorry, can you can you say that again? Smriti.

Smriti Nepal 64:57

Would you agree that adolescent cannabis use is a major risk factor to poly substance use in the future.

Jack Wilson 65:06

Um, yes, I mean, well, yes. A high proportion of those that use more harmful substances often use cannabis prior to that substance, but the reason for this is unclear. And this is typically communicated via the gateway theory or slippery slope argument. It can all be pretty cringe because this relationship is quite complex. And but yeah, it's definitely something to look out for that once someone uses cannabis, they are they may be more likely to use other substances. And but whether this is due to the sort of whether this is due to a lot of background factors, or the pharmacology of cannabis and other systems that whereby those drugs are consumed it, that's another whole argument.

Smriti Nepal 66:17

Tom, do you have anything else to add to that?

Tom Freeman 66:20

No, I think that's great.

Smriti Nepal 66:23

Okay. Okay, I think I will end the question and answer section now. If you have any further questions, please do send us an email at info@positivechoices.org.au. And my apologies to those whose questions we couldn't address here due to the lack of time. But if you do want your questions answered, then we are happy for you to email us. And I would like to thank you again, Tom and Jack, for your presentation and for making time for us and for the Positive Choices audience. And yeah for your informed session. Thank you so much.

Tom Freeman 67:06

Thank you.

Jack Wilson 67:06

No probelm thank you.

Smriti Nepal 67:07

Thank you.