



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

University of Wollongong
Research Online

Faculty of Social Sciences - Papers

Faculty of Social Sciences

2013

Smoking mull: a grounded theory model on the dynamics of combined tobacco and cannabis use among men

A Banbury
Southern Cross University

Avigdor Zask
Southern Cross University

Stacy M. Carter
University of Wollongong, stacyc@uow.edu.au

Eric Van Beurden
North Coast Health Promotion

R Tokley
North Coast Health Promotion

See next page for additional authors

Publication Details

Banbury, A., Zask, A., Carter, S. M., Van Beurden, E., Tokley, R., Passey, M. & Copeland, J. (2013). Smoking mull: a grounded theory model on the dynamics of combined tobacco and cannabis use among men. *Health Promotion Journal of Australia*, 24 (2), 143-150.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library:
research-pubs@uow.edu.au

Smoking mull: a grounded theory model on the dynamics of combined tobacco and cannabis use among men

Abstract

Issue addressed Australians' use of cannabis has been increasing. Over a third of Australians (35.4%) have used cannabis at some time in their lives and 10.3% are recent users. Almost two-thirds of cannabis users combine cannabis with tobacco. The aim of this study was to understand the process of mulling - smoking tobacco and cannabis together - using a grounded theory approach. **Methods** Twenty-one in-depth semistructured interviews were conducted with men aged 25-34 and living on the North Coast of New South Wales. Interviews explored participants' smoking practices, histories and cessation attempts. **Results** A model describing mulling behaviour and the dynamics of smoking cannabis and tobacco was developed. It provides an explanatory framework that demonstrates the flexibility in smoking practices, including substance substitution - participants changed the type of cannabis they smoked, the amount of tobacco they mixed with it and the devices they used to smoke according to the situations they were in and the effects sought. **Conclusion** Understanding these dynamic smoking practices and the importance of situations and effects, as well as the specific role of tobacco in mulling, may allow health workers to design more relevant and appropriate interventions. **So what?** Combining tobacco with cannabis is the most common way of smoking cannabis in Australia. However, tobacco cessation programmes rarely address cannabis use. Further research to develop evidence-based approaches for mull use would improve cessation outcomes.

Keywords

model, cannabis, theory, tobacco, grounded, among, mull:, combined, smoking, men, dynamics

Disciplines

Education | Social and Behavioral Sciences

Publication Details

Banbury, A., Zask, A., Carter, S. M., Van Beurden, E., Tolley, R., Passey, M. & Copeland, J. (2013). Smoking mull: a grounded theory model on the dynamics of combined tobacco and cannabis use among men. *Health Promotion Journal of Australia*, 24 (2), 143-150.

Authors

A Banbury, Avigdor Zask, Stacy M. Carter, Eric Van Beurden, R Tolley, Megan Passey, and Jan Copeland

This is a pre-copyedited, author-produced PDF of an article accepted for publication in *Health Promotion Journal of Australia* following peer review. The definitive publisher-authenticated version [Banbury A, Zask A, Carter SM, van Beurden E, Tokley R, Passey M, Copeland J (2013). Smoking Mull: a grounded theory model on the dynamics of combined tobacco and cannabis use among men. *Health Promotion Journal of Australia*. Online first: 2013/8/23] is available online at <http://www.publish.csiro.au/?paper=HE13037>

Smoking mull: a grounded theory model on the dynamics of combined tobacco and cannabis use among adult men

A. Banbury^A, A. Zask^{A B C}, S. M. Carter^D, E. van Beurden^B, R. Tokley^E, M. Passey^C and J. Copeland^F

^A Southern Cross University, Lismore, NSW 2480, Australia.

^B Health Promotion, Northern New South Wales Local Health District (formerly North Coast Area Health Service), Lismore, NSW 2480, Australia.

^C University Centre for Rural Health – North Coast, University of Sydney, Lismore, NSW 2480, Australia.

^D Centre for Values, Ethics and the Law in Medicine, University of Sydney, NSW 2050, Australia.

^E Health Promotion, Mid North Coast Local Health District (formerly North Coast Area Health Service), Coffs Harbour, NSW 2444, Australia.

^F National Cannabis Prevention and Information Centre, University of New South Wales, Sydney, NSW 2031, Australia.

Corresponding author. Email: annie.banbury@scu.edu.au

Abstract

Issue addressed: Australians' use of cannabis has been increasing. Over a third of Australians (35.4%) have used cannabis at some time in their lives and 10.3% are recent users. Almost two-thirds of cannabis users combine cannabis with tobacco. The aim of this study was to understand the process of mulling – smoking tobacco and cannabis together – using a grounded theory approach.

Methods: Twenty-one in-depth semi structured interviews were conducted with men aged 25–34 and living on the North Coast of New South Wales. Interviews explored participants' smoking practices, histories and cessation attempts.

Results: A model describing mulling behaviour and the dynamics of smoking cannabis and tobacco was developed. It provides an explanatory framework that demonstrates the flexibility in smoking practices, including substance substitution – participants changed the type of cannabis they smoked, the amount of tobacco they mixed with it and the devices they used to smoke according to the situations they were in and the effects sought.

Conclusion: Understanding these dynamic smoking practices and the importance of situations and effects, as well as the specific role of tobacco in mulling, may allow health workers to design more relevant and appropriate interventions.

So what?: Combining tobacco with cannabis is the most common way of smoking cannabis in Australia. However, tobacco cessation programmes rarely address cannabis use. Further research to develop evidence-based approaches for mull use would improve cessation outcomes.

Keywords: concomitant use, marijuana, mulling, nicotine

Introduction

In Australia, adult daily tobacco smoking rates are some of the lowest in the world, having declined from 38.4% in 1975 to 15.1% in 2010.¹ In a national survey, the largest decline in daily smoking was for those in their early 20s to mid-40s.¹ In contrast, Australia has one of the highest prevalence rates of cannabis use in the world. Although there was a decline in cannabis use from 1998 to 2007, recent data show usage has been rising, with the proportion of people who had used cannabis in the previous 12 months increasing from 9.1% in 2007 to 10.3% in 2010.¹ Of those, the most likely group to have used cannabis were males aged 20–29 years (25%); 19.7% of this group were daily tobacco smokers.¹

Adverse health effects from smoking either tobacco or cannabis are widely documented.^{2,3} In Australia, almost two-thirds of cannabis users combine cannabis with tobacco⁴ in varying quantities, a process known as mulling. Smoking mull results in greater health risks than smoking each alone^{3,5} and may assist in reinforcing tobacco smoking.⁶ Wu et al.⁷ reported cannabis smokers take deeper and more prolonged inhalations, producing higher blood carboxyhaemoglobin levels, with more tar inhaled and retained in the respiratory tract than tobacco smokers.

Public health messages for tobacco have focussed on the harmful physical effects of smoking and on cessation methods. For cannabis, the discourse has focussed on its mental health effect and illegal status,⁸ rather than its contribution to lung disease.^{9,10} Few public health messages have focussed on the harmful effects of smoking tobacco and cannabis together. There is growing evidence that cannabis users can become regular users of tobacco through mixing cannabis and tobacco.^{11–13} Van Beurden et al.¹⁴ suggested mull smoking may be slowing tobacco quit rates among 25–34-year-old males in northern New South Wales (NSW), because those who smoke mull find it more difficult to quit tobacco. A systematic review on co-occurring cannabis and tobacco use concluded that mull users have poorer cessation outcomes than those who only use cannabis.⁵

Explanatory models of controlled drug use include a range of elements such as context and the emotional state of an individual, which are as important as the pharmacological properties of a drug in explaining drug users' experiences.¹⁵ These factors are important considerations for drug policy. Factors that explain users' ability to self-regulate or control their use include reliance on rituals and rules relating to the setting and situations of use.^{16–18} Drug careers transition over time and users learn from their own and others' experiences, situations, contexts and events.¹⁸ In one study, being employed allowed greater control of drug use, providing not only direct financial benefits, but

indirect benefits including structuring time, developing a positive identity, providing meaningful activities and expanding users' social networks.¹⁹

Few tobacco cessation programmes address cannabis use,²⁰ potentially decreasing their effectiveness for mull users. People who only smoke tobacco when smoking mull may not self-identify as tobacco users.²¹ These users may require specific strategies to reduce their tobacco use. Two recent systematic reviews identified co-occurring use of cannabis and tobacco as an under-researched area.^{5,22} The present study helps fill this gap in the literature by providing a greater understanding of the relationship between mull use and the context of its use. It aims to understand the process of smoking tobacco and cannabis together among 25–34-year-old males in northern NSW who are current and past users of both substances. This region was selected because tobacco use prevalence in men aged 25–34 years has been higher than the state average for a decade;¹⁴ it is also associated with high cannabis use.²³

Methods

We used grounded theory methodology in this study. This approach is designed to generate new explanations from data, rather than to test pre-existing theories. For the purpose of this study, we were particularly informed by Kathy Charmaz's constructivist variant of grounded theory.²⁴

All participants were male, living on the North Coast of NSW, aged 25–34 years and had experience of smoking mull. Our focus was non-treatment-seeking mull users. Twenty-one men were interviewed with a mean age of 28 years. Table 1 provides data relating to smoking status, occupation and marital status of participants. Participants had experience of smoking mull for at least 10 years and predominately smoked bong (water pipes) and/or joints.

Table 1. Current smoking behaviour and occupation of men aged 25–34 years living in the North Coast of New South Wales in 2009 (n = 21)

Smoking behaviour ^A		n
Mull smoker only		3
Mull and cigarette smoker		8
Mull smoker and infrequent cigarette smoker		5
Cigarette smoker and infrequent mull smoker		1
Non-smoker of mull or cigarettes		1
Cigarette only smoker		3
Occupation		
Employed		9
Unemployed		10
Unknown		2

^A Inclusion criteria: men aged 25–34 years, current or past users of mull not seeking treatment living on the North Coast of New South Wales

Participants were recruited via advertisements in local newspapers and in response to a local radio interview. Inclusion criteria were men aged 25–34 years who were current or past users of mull and not in treatment for drug or alcohol issues. A short screening tool was used on first contact by telephone, during which the research process and questions were discussed. Details collected included age, postcode, occupation and a brief history of tobacco and cannabis use. In addition,

community health workers who were not investigators approached known regular mull users personally or by telephone and invited them to take part in the study. Workers were well known and trusted by those approached and most agreed to take part. Snowballing, where early participants passed on our details to mull-using friends, was also used. Consistent with grounded theory procedures, we used theoretical sampling. Participants were purposively selected to enable the researchers to examine and elaborate their emerging theory during the course of the study.²⁴ Those selected provided a wide range of experience and views concerning tobacco and cannabis use.

An interview guide was developed by the research team to focus on development, process and context of mulling. After every three to four interviews, data were analysed and the team met to modify the interview guide and adapt the participant selection criteria guided by the developing theory.²⁴ For example, during the analysis, regular work patterns appeared to affect mull use amongst participants who were unemployed or sporadic workers. Early participants predominantly lived in an inland area where lifestyles were less conventional. Consequently, the sampling shifted to provide contrasting cases, for example males working as tradesmen on the coast with typical suburban lifestyles. This enabled us to probe the emerging theory regarding smoking practices and clarify the relationship between work and mull use.

Interviews

Semi structured interviews, typically lasting 45 min, took place between November 2009 and February 2010. They were conducted by the first author, an experienced researcher on drug issues and trained in research interviewing techniques. Interviews were face-to-face (except one, which was by telephone) and took place in community health centres across the North Coast at a time convenient to participants. Using the interview guide, participants were asked about their smoking career, cultural influences on their smoking, effects of smoking mull, living circumstances and cessation attempts, including motivations and withdrawal symptoms and monetary issues related to smoking.

The study was approved by the Ethics Committees of North Coast Area Health Service and Aboriginal Health and Medical Research Council. Participants provided written consent before starting the interview. Participants received a \$50 grocery voucher to cover travel expenses. All names used are pseudonyms.

Analysis

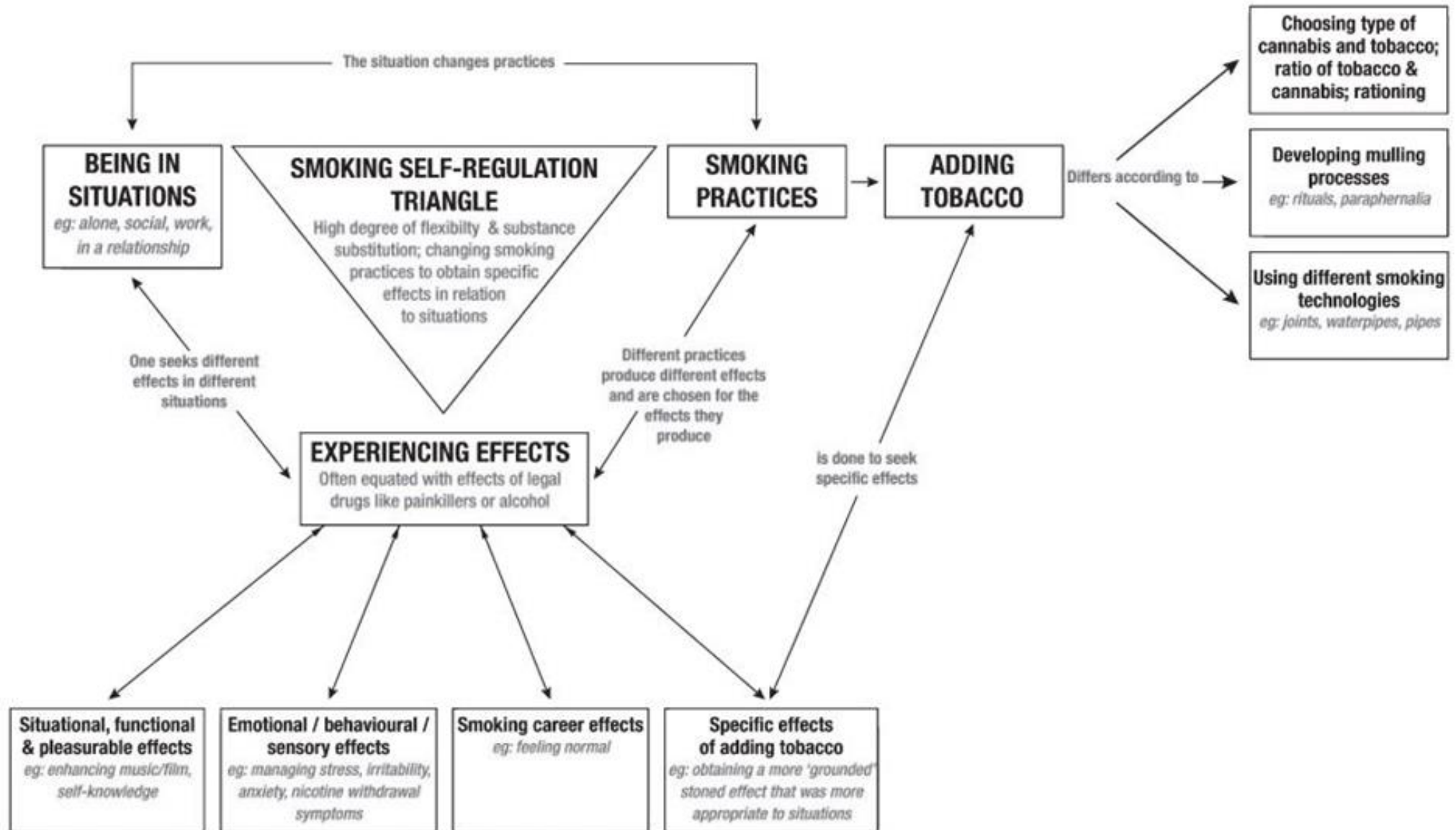
Interviews were digitally recorded, transcribed verbatim and de-identified. Initial interview coding by the first author was line-by-line, using NVivo²⁵ and staying closely 'grounded' in the data. The second stage of 'focussed' coding synthesised and conceptualised the line-by-line coding.

Transcriptions and memos were circulated to authors and regular discussions (approximately after every third interview) informed the emerging theory. Memos were used to record concepts and theory as they developed. Data saturation was reached by the 21st interview, that is, new interviews were confirming existing findings rather than producing new ones. Analysis was organised via a conceptual map that was constantly refined throughout the process.

Results

Fig. 1 presents a model of our explanation of the dynamics of smoking mull.

Fig. 1. The smoking self-regulation triangle. Mull smokers self-regulate their smoking practices – including how they add tobacco – according to the situations they are in and the effects they are seeking.



Smoking practices

Participants described various smoking practices, including mixing tobacco and cannabis in varying ratios, different modes of administration and smoking different types of cannabis. The reasons for mixing tobacco and cannabis included: enabling the mixture to burn easier; making the cannabis last longer; sharing joints with friends; aiding quitting cannabis; and to produce a 'grounded stoned' effect. Participants were asked to describe the mulling process and the associated rituals. These included issues such as the preferred tobacco source or brand, any special paraphernalia used (such as a 'mulling bowl'), the time taken to prepare and the level of enjoyment in preparing the mull mix.

It's meditative almost, just sitting back, mulling up. (Brian)

Mull was smoked predominantly in bongs and joints but other methods included pipes and cans (a drink can pricked with a small side hole where cannabis is burnt, whilst the user inhales through the can opening). These modes of administration were considered quite different from one another.

...if you smoke a joint it's more relaxed...whereas smoking a bong is really intense. You light it up and you're like, 'Suck really hard,' and boom it's gone in... (Gordon)

Individuals – and social groups – tended to have one preferred method of administration, with alternative methods in other situations to achieve certain desired effects.

...(I) usually smoke pipes; very rarely through a joint; occasionally bongs; occasionally bucket bongs. (Vince)

I don't share joints with him (a friend) unless it's a straight one. I have a pipe with him. (Stan)

Participants often had a preference regarding the type of cannabis used in mull. Hydroponically grown cannabis was considered stronger and thought to be grown with chemicals. Bush grown cannabis produced a mellower effect and was perceived to be more natural.

...(Interviewer: So if you were offered bush or hydro...) You'd take the hydro for sure... 'cause it's stronger and more expensive. It's like drinking a good bottle of red or a bad bottle of red. (John)

...nowadays I only smoke bush. I went to Victoria a few months ago, my mates said they had good stuff, I just couldn't handle it anymore ...it's a different type of stoned than bush. (Martin)

Required effects

Smoking practices changed depending on the effects sought. We identified four main categories of desired effects: (1) emotional, behavioural and sensory; (2) situational, functional and pleasurable; (3) smoking career; and (4) specific effects of adding tobacco.

Emotional, behavioural and sensory effects

These effects were sought because participants were experiencing, and wanted to counteract, anxiety, stress, a busy mind, irritability, pain, or hyperactivity. Managing these conditions was highly valued by participants, with the greatest emphasis placed on stress relief.

I think I stop stressing so much and just go through it...if I'm stoned that part of my brain seems to shut off. (Darren)

Some participants preferred to use mull than prescribed medication for pain relief. Cannabis was perceived as a mild pain reliever and less harmful than legal painkillers.

[I smoke mull]...after work for your muscles to relax...instead of being tight and tense and sore, just be relaxed and the pain's gone. (Martin)

...when I am in pain I have to smoke instead of being on painkillers. My doctor would give me some Morphine like Oxycontin but it's really addictive and it's really full on... it's an intense drug compared to cannabis...I much prefer to smoke cannabis than taking painkillers... (Ernie)

Interestingly, although tobacco was perceived as harmful, the benefits of smoking mull were considered to outweigh the harm caused by tobacco. Participants had experienced stress, disturbed sleeping patterns, irritability and anxiety as part of their everyday lives, and many of these problems can be caused by nicotine withdrawal. Consistent with this, some participants suggested their desire to smoke mull was a response to nicotine withdrawal symptoms.

...smoking cannabis with tobacco – the more you smoke, the more your body wants the nicotine. I was smoking it with tobacco, without tobacco for years each, it's easy to see that the tobacco makes you really want (it) – the tobacco is the addiction. (Shay)

Situational, functional and pleasurable effects

Participants used mull to enhance pleasurable situations such as watching movies, listening to music or being with nature; smoking also relieved boredom.

[Being stoned] the colours are nicer, the sun's nicer...the feeling of the water is different and everything is much more gentle. (Ernie)

Participants also described using mull to reflect, self-evaluate, or view their circumstances in a wider context. They believed smoking mull helped them work towards becoming a 'better' person and make sense of the world around them.

I can have a smoke and think, I've been working too much or been deceptive or bad in some way or mean to some people, or just drinking too much...Usually, it's bad things I see I'm doing. (Gordon)

Smoking career effects

Smoking career effects were the effects people sought when they had been smoking mull consistently over a long period of time. For some, not being stoned was unusual and in this non-stoned state, they felt peculiar. They smoked mull to seek the effect of feeling 'normal'.

It keeps me at a level where I'm not as stoned but I'm still stoned enough to just function completely normally. (Shay)

Specific effects of adding tobacco

Some participants described a 'spin' effect – a 'rush' or 'high', experienced when smoking mull. This was attributed to tobacco. Some would adapt their smoking to ensure they gained the strongest 'spin'.

...the effect is different when you smoke it [cannabis] with tobacco; you get a different rush off it. (Tony)

Participants described a different effect experienced when tobacco was added to cannabis as opposed to smoking just cannabis. Smoking just cannabis was described as 'high', 'ethereal' and 'floaty'. Most participants reported that these effects made them unable to function well but by adding tobacco the effect was more grounded, so they felt more 'in control'. The tobacco enabled them to smoke cannabis without inhibiting their daily activities. This was highly valued.

If you have a pure weed joint, you're going to get really whacked [high]...so it [tobacco] makes it feel less so – tobacco makes it a more relaxed stoned. (Gordon)

Most participants perceived tobacco as bad for their health and some described it as 'disgusting' and 'evil'. Conversely cannabis was seen as 'green' and 'natural'.

...just think tobacco is also a lot more dangerous than mull. (Shay)

Situations affecting smoking

People sought different effects depending on the different physical, social or 'life situations' they were in. For example, men smoked differently at home, at work and when they were out socialising.

...at a social gathering, it's just a part of what you do... people are rolling joints and then someone else will roll a joint and someone else will roll another joint, and so it just goes round ...[but] when I'm by myself, I'll go days without smoking anything. (Stan)

Smoking mull was used by participants to enhance social situations and as a distinct bonding agent.

...like everyone's talking and having a good time... I think the social side is important to smoking, if it wasn't there I'd get bored with it a lot quicker. (John)

Being at work changed participants' smoking, commonly prohibiting mull use or in some cases changing smoking practices and the effects sought. Participants had often changed their smoking when their employment status changed or in response to the values of a new partner.

I would never smoke pot before or at work, I always waited until I got home....I quit pot [cannabis] when I was 17 for three months...because of a [new] girlfriend. (John)

Self-regulation and the relationship and dynamics of model key components

The emerging explanation from the data was that smokers self-regulated their mulling practices, depending on the effects sought and situations encountered. Here, self-regulation means smokers are highly flexible in their smoking practices and deliberately regulate their own smoking. Their ability to do this had evolved over time.

It's something I choose for its time and its place now, it's not a habit for me ... [it] doesn't have control over me now, manipulating my lifestyle. (Stan)

Through self-regulation, participants were able to function in everyday situations such as work, socialising and being with their family. They imposed their own rules and strategies to self-regulate their smoking. These included, for example, smoking only at certain times of day, or smoking only after completing particular tasks.

...I think what are you going to do with your day, if you're just sitting around getting stoned? But for some reason it's ok to after midday. (Darren)

Others restricted the amount they smoked by not buying tobacco so they only smoked socially using other people's tobacco.

...I won't have any tobacco at home purposely, 'cause I know I have this potential for that addiction...so if someone comes and has tobacco, I grab it off them and mix it. (Ernie)

Participants described constant adaptations of their smoking depending on their circumstances and the required effect. Flexible smoking practices included substance substitution between tobacco and mull. Tobacco was substituted for mull when participants were at work, in public, or when cannabis was not available. For those who only smoked using bongs, tobacco would be smoked through a bong when their mull supply ran out. Tobacco and/or alcohol were often substituted for mull during a cannabis quit attempt.

(Interviewer: How often would you smoke tobacco through the bong?) When I've run out of mull. (Interviewer: And how often does that happen?) Well nowadays, I can't afford to spend the amount of money that I used to on it, so it'd be weekly. (Martin)

Participants combined tobacco with cannabis in varying ratios and smoked using a variety of equipment; depending on the situation they were in and the effects required. Different sets of values operated, which would change smoking practices in different situations to match these values. This was sometimes about the acceptability of the practice itself and sometimes about the potential effects of acting in an acceptable or unacceptable manner.

For example, if a user was at home alone, he could smoke a bong, with a cannabis-rich mix, enabling him to achieve 'emotional, behavioural and sensory effects' such as managing anxiety or stress by achieving a 'floaty' or 'ethereal' stonedness, taking him away from present thoughts and sensations.

However, in a public social gathering, a bong would be conspicuous and a legal risk, and rather than managing anxiety or stress, he would more likely seek to enjoy ‘situational, functional and pleasurable’ effects with his social group. An even tobacco–cannabis mix joint would best achieve these effects because a joint is a lesser legal risk (being smaller and easier to dispose of) and easily shared amongst friends in this situation:

I smoke joints when I’m at a party, it’s easier – not likely to get caught so much carrying a joint around than a bong and they are more socially acceptable when everyone’s had a few drinks. (John)

Smokers in this study valued mull, perceiving pure cannabis to be too hot and harsh and to produce a less functional high; this led participants to use a tobacco–cannabis mix when socialising, whatever their personal preference. Some participants had lived in other locations where mull was disdained and pure cannabis widely preferred. However being able to share joints was a social good, so even though they believed tobacco was undesirable, when they moved to the North Coast they began adding tobacco to their cannabis so people would share their joints.

...before I came to Australia, just marijuana by itself; I was smoking cigarettes separately. A little while after being here all my friends I met were smoking – mixing...so to share with them I’d start smoking with tobacco. (Stan)

Those who smoked mull whilst working chose their practices carefully. They often selected their cannabis type, mull mix and administration method to match work tasks. For example, using a bong and being very stoned would relieve the boredom of repetitive manual tasks. In another situation, such as working with the public or dangerous equipment, abstinence or a more tobacco-rich mix in a joint may be chosen.

I smoke whilst at work. I’m a builder, so lots of chainsaws, power tools, I don’t always smoke; depends what part of the job. For instance, if there’s measuring I don’t smoke. If it’s the sub floor going down, that’s thousands of nails, it’s really helpful to smoke a joint, you just continue to bang. (Ernie)

As noted above, work could also constrain mull use. This occurred in several ways. Some felt it was either unacceptable or impossible to do their work whilst using mull. For others, workplace drug testing policies inhibited their use, sometimes leading them to substitute tobacco for mull.

Discussion

This is the first study, to our knowledge, to specifically focus on the way young men co-use tobacco and cannabis. Although we know mixing tobacco with cannabis is commonplace^{4,8,11,26,27} an explanation of the mulling process has not previously been available. The model fills a gap in the literature by identifying factors and mechanisms influencing co-occurring cannabis and tobacco use.⁵ It provides an understanding of mull usage and the important role of tobacco, which could assist in refining interventions to reduce tobacco and/or cannabis use.

Mull was perceived as a ‘third’ substance that had specific effects, unlike those of smoking only cannabis or tobacco. By adding tobacco to cannabis, users were able to feel stoned without being too ‘high’. They described this as being more ‘grounded’, which was preferred because they were

able to function normally. Being able to participate and act normally was important to participants because many had family and/or work responsibilities.

Boys et al. described the importance of the functionality of drug use in explaining use.²⁸ Our participants used mull to relieve stress, manage anxiety, aid sleeping and reduce irritability. These symptoms have been reported in both cannabis and tobacco withdrawal.^{29,30} Mull users reportedly have more severe clinical problems and poorer cessation outcomes than for each substance alone^{5,31} and nicotine dependence may be one of the most important adverse effects of cannabis use.^{20,32,33} One concern arising from our study is that users have a false perception that mull helps address these debilitating symptoms and they seemed often unaware that they could be caused by cannabis and/or tobacco withdrawal.

Our model suggests that users could potentially be encouraged to develop less harmful ways to achieve similar effects to those they gain from mull. Mull users have concerns about the health-damaging effects of tobacco,⁸ but, paradoxically, it often became an invisible substance in mull; they focused on the positive and functional effects of smoking mull. For some mull smokers, particularly those who do not usually smoke cigarettes, highlighting the effect of tobacco withdrawal symptoms may provide greater insight to their smoking patterns and improve cessation outcomes. Those wanting to stop smoking tobacco, may be motivated to use harm reduction strategies, such as removing tobacco from their cannabis mix or exploring less harmful ways of delivering cannabis, such as vaporisation.³⁴ Consistent with other work on controlled drug use^{18,19,35} our model shows the dynamic nature of smoking. It details how situations and drug effects are related, in that users regulate drug use according to the situation and the effects sought, including substituting between mull and tobacco.^{8,26} Over time they had learned to self-regulate this process. Prevention efforts that build on and develop the self-regulation abilities of users may be effective cessation strategies for mull users. Prevention programmes should not simply address the substance itself but take into consideration the social context of its use.^{36–38}

Health promotion policy and programmes treat tobacco use and illicit drugs as separate issues with the consequence that cannabis use is rarely addressed in smoking cessation programmes.^{11,26,27} Cannabis use is a barrier to quitting and reduces the occurrence of tobacco smoking cessation attempts.^{11,32} Our study provides additional evidence that these issues are inextricably linked for mull smokers and should be viewed together. As tobacco smoking prevalence declines, hard-to-reach minority groups, such as mull smokers, will need to be targeted. At present, there is little evidence of the most effective strategies to quit tobacco whilst using mull. Tobacco cessation strategies are more likely to be successful with mull smokers if they respond to the dynamics of mull smoking.

Additionally, tobacco prevention strategies may be more effective if they address the possibility of young people becoming tobacco smokers via mull. Drug prevention messages have mainly focussed on the mental health effects evident in a relatively small proportion of users. The public health risk associated with young people becoming dependent on tobacco may be much greater.³³

This research builds on previous research by proposing original conceptualisations of mulling practices and provides a greater understanding of combining tobacco and cannabis, which could inform prevention and treatment strategies.^{3,11,13,20,21,26} However, there are limitations to this study. It is based on self-reported narratives and a small purposive sample. This study was

conducted in a non-urban area of Australia with a high prevalence of mull smoking. Comparative work in urban areas, and in areas of lower prevalence, would assist with determining transferability of our findings to other settings. Smoking practices also vary between countries. For example, mull use in Australia is similar to the UK and European countries^{11,26,27} but in the US and New Zealand cannabis is more commonly smoked alone.³⁹ Bongs are more common in Australia than in European countries.^{39,40} It is important that researchers and health practitioners develop a good understanding of the ecology surrounding substance use. For regions and countries where users normally smoke mull, the focus should be on this ‘third’ substance rather than on cannabis alone. It is possible that some published findings regarding cannabis dependence actually reflect unidentified nicotine dependence.

Conclusion

In order to design more relevant and appropriate tobacco cessation interventions and services, the specific role of tobacco in cannabis smoking needs to be identified and addressed. Tobacco and cannabis cessation and management will benefit from greater understanding of the dynamic smoking practices and the importance of situations and effects, as well as the specific role of tobacco in mulling. Future research should focus on how tobacco smokers who smoke mull have successfully quit one or both substances, or on the effects of using mull when attempting to quit tobacco.

Acknowledgements

We would like to thank the participants, Advisory Committee, Leonie Jefferson, Chalta Lord and Colleen Cartwright. Stacy Carter is supported by NHMRC Career Development Fellowship 1032963. She is an Associate Editor of the HPJA and was excluded from all editorial decision making about this manuscript. This research was supported by the Australian National Cannabis Prevention and Information Centre and the North Coast Health Promotion Unit.

References

- [1] Australian Institute of Health and Welfare. 2010 National drug strategy household survey report. Drug statistics series no. 25. Cat. no. PHE 145. Canberra: AIHW; 2011.
- [2] CDC Office on Smoking & Health. National Center for Chronic Disease Prevention & Health Promotion – CDC. The health consequences of smoking. A report of the Surgeon General. Atlanta, GA: CDC’s Office on Smoking & Health; 2004.
- [3] Copeland J, Gerber S, Swift W. Evidence-based answers to cannabis questions: a review of the literature. Canberra: Australian National Council on Drugs; 2006.
- [4] Australian Institute of Health and Welfare. 2007 National drug strategy household survey: detailed findings. Drug statistics series no. 22. Cat. no. PHE 107. Canberra: AIHW; 2008.

- [5] Peters EN, Budney AJ, Carroll KM (2012) Clinical correlates of co-occurring cannabis and tobacco use: a systematic review. *Addiction* 107, 1404–17.
- [6] Clough AR (2005) Associations between tobacco and cannabis use in remote indigenous populations in northern Australia. *Addiction* 100, 346–53.
- [7] Wu TC, Tashkin DP, Djahed B, Rose JE (1988) Pulmonary hazards of smoking marijuana as compared with tobacco. *N Engl J Med* 318, 347–51.
- [8] Akre C, Michaud P, Berchtold A, Suris J-C (2010) Cannabis and tobacco use: where are the boundaries? A qualitative study on cannabis consumption modes among adolescents. *Health Educ Res* 25, 74–82.
- [9] British Lung Foundation. *A smoking gun? The impact of cannabis smoking on respiratory health*. London: British Lung Foundation; 2003.
- [10] Reid PT, MacLeod J, Robertson JR (2010) Cannabis and the lung. *Journal of the Royal College of Physicians of Edinburgh*. 40, 328–34.
- [11] Amos A, Wiltshire S, Bostock Y, Haw S, McNeill A (2004) ‘You can’t go without a fag... you need it for your hash’ - a qualitative exploration of smoking, cannabis and young people. *Addiction* 99, 77–81.
- [12] Okoli CTC, Richardson CG, Ratner PA, Johnson JL (2008) Adolescents’ self-defined tobacco use status, marijuana use, and tobacco dependence. *Addict Behav* 33, 1491–9.
- [13] Tullis LM, Dupont R, Frost-Pineda K, Gold MS (2003) Marijuana and tobacco: a major connection? *J Addict Dis* 22, 51–62.
- [14] van Beurden EK, Zask A, Passey M, Kia AM (2008) The null hypothesis: is cannabis use contributing to high tobacco use prevalence among young North Coast males? *N S W Public Health Bull* 19, 72–4.
- [15] Zinberg N. *Drug, set, and setting: the basis for controlled intoxicant use*. New Haven, CT: Yale University Press; 1984.
- [16] Grund J-P. *Drug use as a social ritual: functionality, symbolism and determinants of self-regulation*. Rotterdam: Instituut voor Verslavingsonderzoek; 1993.
- [17] Becker HS. *Outsiders: studies in the sociology of deviance*. New York: The Free Press; 1997.
- [18] Decorte T (2001) Drug users’ perceptions of ‘controlled’ and ‘uncontrolled’ use. *Int J Drug Policy* 12, 297–320.
- [19] Nasir S, Rosenthal D, Moore T (2011) The social context of controlled drug use amongst young people in a slum area in Makassar, Indonesia. *Int J Drug Policy* 22, 463–70.
- [20] Humfleet GL, Haas AL (2004) Is marijuana use becoming a ‘gateway’ to nicotine dependence? *Addiction* 99, 5–6.

[21] Burns CB, Ivers RG, Lindorff KJ, Clough AR (2000) Cannabis: a Trojan horse for nicotine? *Aust N Z J Public Health* 24, 637

[22] Agrawal A, Budney AJ, Lynskey MT (2012) The co-occurring use and misuse of cannabis and tobacco: a review. *Addiction* 107, 1221–33.

[23] Didcott P, Reilly D, Swift W, Hall W. Long-term cannabis users on the New South Wales North Coast. Lismore: National Drug and Alcohol Research Centre Northern Rivers Area Health Service; 1997.

[24] Charmaz K. *Constructing grounded theory: a practical guide through qualitative analysis*. London: SAGE Publications Inc; 2006.

[25] International QSR. NVivo 8. Doncaster, Victoria: QSR International Pty Ltd; 2008.

[26] Hight G (2004) The role of cannabis in supporting young people's cigarette smoking: a qualitative exploration. *Health Educ Res* 19, 635–43.

[27] Bélanger RE, Akre C, Kuntsche E, Gmel G, Suris J-C (2011) Adding tobacco to cannabis—its frequency and likely implications. *Nicotine Tob Res* 13, 746–50.

[28] Boys A, Marsden J, Strang J (2001) Understanding reasons for drug use amongst young people: a functional perspective. *Health Educ Res* 16, 457–69.

[29] Vandrey RG, Budney AJ, Moore BM, Hughes JR (2005) A cross-study comparison of cannabis and tobacco withdrawal. *Am J Addict* 14, 54–63.

[30] Budney AJ, Vandrey RG, Hughes JR, Thostenson JD, Bursac Z (2008) Comparison of cannabis and tobacco withdrawal: severity and contribution to relapse. *J Subst Abuse Treat* 35, 362–8.

[31] Vandrey RG, Budney AJ, Hughes JR, Liguori A (2008) A within-subject comparison of withdrawal symptoms during abstinence from cannabis, tobacco, and both substances. *Drug Alcohol Depend* 92, 48–54.

[32] Ford DE, Vu HT, Anthony JC (2002) Marijuana use and cessation of tobacco smoking in adults from a community sample. *Drug Alcohol Depend* 67, 243–8.

[33] Patton GC, Coffey C, Carlin JB, Sawyer SM, Lynskey M (2005) Reverse gateways? Frequent cannabis use as a predictor of tobacco initiation and nicotine dependence. *Addiction* 100, 1518–25.

[34] Abrams DI, Vizoso HP, Shade SB, Jay C, Kelly ME, Benowitz ME (2007) Vaporization as a smokeless cannabis delivery system: a pilot study. *Clin Pharmacol Ther* 82, 572–8.

[35] Harling MR (2007) The place and meaning of 'controlled', illicit substance use in the private lives of a group of individuals. *J Subst Use* 12, 1–12.

[36] Akre C, Belanger R, Mejia D, Suris J-C (2011) Addicted to the cannabis community? The socializing role of cannabis use. *J Adolesc Health* 48, s72

[37] Hesse M, Tutenges S, Schlieve S (2010) The use of tobacco and cannabis at an international music festival. *Eur Addict Res* 16, 208–12.

[38] Perez A, Ariza C, Sanchez-Martinez F, Nebot M (2010) Cannabis consumption initiation among adolescents: a longitudinal study. *Addict Behav* 35, 129–34.

[39] United Nations Office of Drugs and Crime. 2006 World drug report. Volume 1: analysis. Vienna: United Nations Publications; 2006.

[40] Stafford J, Burns L. Australian drug trends 2010. Findings from the Illicit Drug Reporting System (IDRS). Australian Drug Trend Series No. 55. Sydney: National Drug and Alcohol Research Centre, University of New South Wales; 2011.