

Puljevic Cheneal (Orcid ID: 0000-0002-3658-9772)
de Andrade Dominique (Orcid ID: 0000-0003-2674-5740)

“Teabacco”: Smoking of nicotine-infused tea

“Teabacco”: Smoking of nicotine-infused tea as an unintended consequence of prison smoking bans

Cheneal Puljevi^{1,2}, Ross Coomber^{1,3}, Stuart A. Kinner^{1,4,5,6,7}, Dominique de Andrade^{1,8,9}, Courtney Mitchell¹⁰, Alan White¹⁰, Sarah L. Cresswell¹⁰, Jasper Bowman¹⁰

¹Griffith Criminology Institute, Griffith University, Brisbane, Australia

²Queensland Alcohol and Drug Research and Education Centre, School of Public Health, and the Institute for Social Science Research, University of Queensland, Brisbane, Australia

³Department of Sociology, Social Policy and Criminology, University of Liverpool, Liverpool, United Kingdom

⁴Centre for Adolescent Health, Murdoch Children’s Research Institute, Melbourne, Australia

⁵Melbourne School of Population and Global Health, University of Melbourne, Melbourne, Australia

⁶School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia

⁷Mater Research Institute-UQ, University of Queensland, Brisbane, Australia

⁸School of Psychology, University of Queensland, Brisbane, Australia

⁹Centre for Youth Substance Abuse Research, School of Psychology and Counselling, Institute of Health and Biomedical Innovation, Centre for Children’s Health Research, Queensland University of Technology, Brisbane, Australia

¹⁰School of Natural Sciences, Griffith University, Brisbane, Australia

Cheneal Puljevi BSocSci (Hons), Ross Coomber PhD, Stuart A. Kinner PhD, Dominique de Andrade PhD, Courtney Mitchell BSc (Hons), Alan White BSc (Hons), Sarah L. Cresswell PhD, Jasper Bowman BSc (Hons).

*Corresponding Author:

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: [10.1111/dar.12848](https://doi.org/10.1111/dar.12848)

“Teabacco”: Smoking of nicotine-infused tea

Ms. Cheneal Puljevi , Griffith Criminology Institute, Griffith University, 176 Messines Ridge Road, Mount Gravatt, Qld 4122, Australia. Email: c.puljevic@uq.edu.au

Author Manuscript

ABSTRACT

Introduction and Aims: Following the introduction of smoke-free policies in prisons in several countries, there have been anecdotal reports of prisoners creating cigarettes by mixing nicotine patches or lozenges with tea leaves (“teabacco”). Among a sample of people recently released from smoke-free prisons in Queensland, Australia, the aims of this study were to explore the perceived popularity of teabacco use, motivations for its use, and describe the process of creating teabacco to identify potential associated health risks.

Design and Method: This study used a mixed-methods design. Eighty-two people recently released from prison in Queensland, Australia completed surveys at parole offices measuring teabacco use while incarcerated. Twenty-one teabacco smokers took part in follow-up, qualitative interviews to explore survey responses in greater depth.

Results: The majority of survey participants (57%) reported smoking teabacco while incarcerated, with 37% smoking teabacco frequently (> once per week). Teabacco use was primarily motivated by cigarette cravings. Participants described nose bleeds, vomiting, and headaches resulting from teabacco use, and described the perceived inevitability of prisoners finding substitutes for tobacco. Multivariate analyses found that self-rated poor physical health, having been incarcerated five or more times, experiencing cigarette cravings while incarcerated, and use of illicit drugs while incarcerated were positively associated with frequent teabacco use in prison.

Discussion and Conclusions: Our findings suggest that teabacco use has become common practice in Queensland’s smoke-free prisons. Correctional smoking bans are an important public health initiative but should be complemented with demand and harm reduction measures cognisant of the risk environment.

Keywords: Smoke-Free Policy; Prisoners; Vulnerable Populations; Tobacco Use Cessation

INTRODUCTION AND AIMS

Smoke-free policies are increasingly being introduced in correctional facilities around the world, primarily driven by concerns for the health and safety of both prisoners and staff, and risk of litigation from those exposed to second-hand smoke [1]. While some prisons have partial bans, restricting smoking to prisoners’ cells or dedicated outdoor areas [2], total bans on tobacco and related products have been introduced in prisons in Canada [3], most states of the United States (US) [4], several European countries [5], New Zealand [6], and most states and territories of Australia [7]. Smoke-free policies are currently in the process of being introduced across prisons in England [8].

These bans represent an important opportunity to reduce tobacco use and related harm among people who cycle through prisons — a population with one of the highest smoking rates in the world. Despite recent declines in global tobacco use [9], tobacco smoking among people entering prison remains extremely high (estimated at 56% of US prison entrants in 2014 [10] and 74% of Australian prison entrants in 2015 [11]) and persists at a rate two to six times that of the general population [5,12]. Epidemiological studies confirm that prisoners experience higher rates of smoking-related illness as a result [13-16], further exacerbating their already increased levels of mortality and morbidity when compared to the general population [17].

Two US-based studies reported significant declines in prisoner deaths following the introduction of correctional smoke-free policies [10,18], providing support for their positive impact on prisoner health. However, one unintended consequence of the policy, reported in some correctional facilities, has been prisoners’ creation of cigarettes using nicotine

“Teabacco”: Smoking of nicotine-infused tea

replacement therapy (NRT) provided by correctional or health authorities to assist with nicotine withdrawal. The few published studies [19-22] reporting diverted use of NRT in prison describe how prisoners first mix provided nicotine patches with tea leaves— earning this substance the nickname “teabacco”— then roll the mixture in paper (often from standard-issue prison Bibles), and finally ignite the created cigarettes using batteries or electronic appliances. Two qualitative studies with Australian prisoners have described the use of teabacco made from nicotine patches [19,20], and one study analysed the chemical constituents of teabacco made from tea leaves and nicotine patches [21]. This forensic analysis found that smoking teabacco cigarettes made from nicotine patches released nicotine, as well as several harmful toxins—providing clear evidence for the potential of teabacco to result in short- and long-term health harm.

The state of Queensland in Australia is one jurisdiction in which anecdotal reports of teabacco use in prison have emerged. In Queensland, a tobacco ban was implemented in all correctional facilities on the 5th May 2014, and all prisoners were offered a free 12-week supply of nicotine patches (consistent with standard community practice). Nine months later, this was reduced to one week of free patches offered to all people entering prison. Unsubstantiated reports of teabacco made from nicotine patches later emerged in the media [23], leading to Queensland correctional authorities removing nicotine patches from their facilities. However, despite the withdrawal of formal NRT provision, prisoners are still able to buy nicotine lozenges (but not patches) in most prisons. It became known to us that prisoners in Queensland then began creating teabacco from nicotine lozenges instead, with this practice also reported in the media in other states [24]. There are no studies reporting the

“Teabacco”: Smoking of nicotine-infused tea

use of teabacco made from nicotine lozenges, or the health effects of smoking teabacco made from nicotine lozenges.

Although many prisoners wish to quit smoking [11,25], in the context of forced tobacco abstinence and nicotine’s highly addictive properties [26], it is not surprising that some prisoners seek alternatives to tobacco. Although there are no studies describing the motivations behind illicit teabacco or even tobacco use in smoke-free prisons, prisoners’ motivations for using these illicit substances may be understood in a similar context to other illicit drug use in prison, as Queensland prisons now list tobacco in the same contraband category as illicit drugs [27]. While data on illicit drug use by prisoners is limited [28,29], there is evidence that illicit drug use in prison is relatively common [28-30], including in Queensland prisons [31]. Previous literature describes how illicit drug use in prison is motivated by drug dependency, withdrawal symptoms, and availability [32,33], as well as the desire to alleviate the stress and boredom [32,34] experienced by many prisoners— making it easy to understand how similar motivations may be shaping teabacco use in prison.

Considering that smoke-free policies were introduced in prisons as a means to improve prisoner health, it is important to understand teabacco use, the rationale behind its use, and its associated health effects, in order to implement a best-practice harm minimisation model of tobacco cessation in correctional facilities. Among a sample of people recently released on parole from smoke-free prisons in Queensland, Australia, the aims of this study were to explore the popularity, method of creation, and motivations of teabacco use by prisoners.

DESIGN AND METHOD

During data collection for a broader study using a survey to investigate return to smoking following release from smoke-free prisons in Queensland [35], reports of teabacco use unexpectedly emerged. In response, we added further structured teabacco-related prompts to the survey. Following the completion of this quantitative data collection, we then conducted qualitative interviews with a subset of teabacco users to gain further insight into its use. The use of a mixed-methods approach, commonly used in studies of drug use and other high-risk behaviours [36,37], permits a quantitative analysis of variables derived from a survey of teabacco use to be complemented with in-depth qualitative insight into various emergent themes related to teabacco use by prisoners.

Participant recruitment

Participants were recruited from 12 Probation and Parole offices across South-East Queensland. Participants were eligible to take part in the study if: (i) they were daily smokers on entry to prison; (ii) they had been released from prison within the past two months; (iii) they were on parole and reporting in person to a Probation and Parole office; (iv) they had been out of prison for at least one full day (24 hours); and (v) their most recent period of imprisonment was longer than one week (e 8 days), to provide sufficient exposure to the smoking ban. Potentially eligible participants were identified by Probation and Parole staff members, who referred them to meet with the primary researcher in a private room within the Probation and Parole office.

“Teabacco”: Smoking of nicotine-infused tea

Data collection

In phase one of the study, following screening for eligibility and informed consent procedures, participants were invited to complete a verbally-administered survey measuring smoking behaviours before, during, and after release from prison while incarcerated. Surveys typically took 20 minutes to complete, and participants were provided with a \$20 supermarket voucher as a reciprocity payment.

In phase two of the study, survey participants who reported teabacco use while incarcerated were invited to provide contact details for participation in follow-up, semi-structured qualitative interviews. Participants who provided their contact details were contacted several weeks after survey completion and invited to return to their local Probation and Parole office. Interviews were conducted in private rooms within Probation and Parole offices, and took approximately 40 minutes to complete. Participants were provided with a further supermarket voucher as a reciprocity payment for their time. Interviews were voice-recorded with participant consent. Ethical clearance for the study was granted by Griffith University’s Human Research Ethics Committee (2015/581).

Measures

The survey measured factors related to participants’ teabacco use across five domains; socio-demographic, mental and physical health, incarceration history, tobacco use, and other drug use. Measures of teabacco use included frequency of teabacco use, types of teabacco used (patches vs. lozenges), primary reason for use, smoking of other substances, and perception of related health effects. Based on these data and a review of the existing literature, a qualitative interview guide was then developed. Qualitative interview questions

“Teabacco”: Smoking of nicotine-infused tea

were semi-structured in nature and explored participants’ experiences with and motivations for teabacco use while incarcerated, as well as the method for creating teabacco out of either nicotine patches or lozenges.

Statistical analysis

Descriptive statistics were generated for all variables of interest. We performed univariate and multivariate logistic regression analyses with frequent teabacco use (> once per week) as the outcome. Variables significant at $p < 0.05$ in univariate analyses were included in the multivariate logistic regression model. Statistical analyses were conducted using Stata version 13.1 [38].

Qualitative data analysis

While initial themes were identified in survey data, we used thematic analysis to identify trends and themes that emerged in the qualitative data. The primary researcher identified initial and emergent themes in interview transcripts, with these themes then verified by three co-authors (RC, SK, DdA). The inductive and deductive use of thematic analysis allowed for both anticipated and unexpected themes to be identified in the data [39].

RESULTS

Sample characteristics

Although 114 participants completed the survey in phase one of the study [35], researchers were not initially aware of the prevalent nature of teabacco use in Queensland prisons, and so structured prompts measuring teabacco use were only added to the survey after 32 participants had already taken part in the study. As a result, quantitative data on teabacco use were available for 82 participants (described throughout as “survey

“Teabacco”: Smoking of nicotine-infused tea

participants”). A subset of these participants (n=21) took part in follow-up qualitative interviews (described throughout as “interview participants”). Interview participants did not differ significantly from the full sample (n=82) in terms of demographic characteristics, tobacco use, or teabacco use (see Table 1). The majority of survey participants were male, one in four identified as Indigenous, the majority were aged 25 years or older, and on average had spent 22 weeks (range 2-104 weeks) in prison during their most recent period of incarceration.

[INSERT TABLE 1 HERE]

Popularity and frequency of teabacco use

Table 1 also describes survey and interview participants’ use of teabacco while incarcerated. The majority of survey participants (57%) reported smoking teabacco while incarcerated. Daily teabacco use was reported by 18% of the survey sample, and 37% reported smoking teabacco frequently (more than once a week). As such, of the survey participants who reported using teabacco (n=47), the majority (64%) were using teabacco frequently in prison.

As interview participants represent a subsample of the survey participants who were all teabacco users, a larger majority (94%) reported smoking teabacco more than once a week. Most participants who took part in qualitative interviews reported that teabacco use was common in Queensland prisons.

“Teabacco”: Smoking of nicotine-infused tea

“I’d say the majority of the guys were smoking teabacco. How often... well it depended on if you could afford to buy lozenges that week. But if you didn’t have lozenges you could give some a cool drink in exchange for a few lozenges. So most guys were smoking teabacco every day. I was smoking every second day, sometimes every day.” [Indigenous male, age 34]

Correlates of frequent teabacco use

Table 2 presents unadjusted odds ratios (OR) and adjusted odds ratios (AOR) for the associations between variables of interest and frequent (> once a week) teabacco use while incarcerated in smoke-free prisons. In the unadjusted model, frequent teabacco use while incarcerated was positively associated with self-rated poor physical health (OR 5.1, 95% confidence interval (CI) 0.4-33.0), having been incarcerated five or more times (OR 2.8, 95% CI 1.0-7.6), experiencing cigarette cravings while incarcerated (OR 1.8, 95% CI 1.1-2.8), use of illicit drugs while incarcerated (OR 8.2, 95% CI 2.6-26.5), and use of illicit drugs since release from prison (OR 3.2, 95% CI 1.1-9.7). Expressing support for the prison smoke-free policy was negatively associated with frequent teabacco use in prison (OR 0.3, 95% CI 0.1-0.9).

In the multivariate regression analysis (Table 2), self-rated poor physical health (AOR 14.4, 95% CI 2.6-78.5), having been incarcerated five or more times (AOR 7.1, 95% CI 1.7-29.2), experiencing cigarette cravings while incarcerated (AOR 2.2, 95% CI 1.1-4.3), and use of illicit drugs while incarcerated (AOR 12.7, 95% CI 2.9-55.8) were positively associated with frequent teabacco use in prison.

[INSERT TABLE 2 HERE]

“Teabacco”: Smoking of nicotine-infused tea

Method for creating teabacco

The majority of survey and interview participants described a common method for creating teabacco out of nicotine patches or nicotine lozenges, with only slight variations in methods between participants. Those who created teabacco out of nicotine patches (before patches were removed from Queensland’s correctional facilities) described how they would first rinse black teabags until the water ran clear, and then stick a nicotine patch to either side of a teabag. They would then heat this patch-teabag combination in some way so as to allow the nicotine to seep out of the patches and into the tea leaves. They would then break open the tea bags and leave the infused tea leaves to dry; often on a kettle element or on top of a tin filled with hot water. Once the mixture was dry, they would roll the mixture in paper— most commonly Bible paper.

Once nicotine patches were removed from correctional centres, participants began creating teabacco out of nicotine lozenges instead of patches. In the majority of cases, participants would first crush the lozenges, and mix the crushed lozenges with a small amount of water to create a paste. This paste would then be mixed with rinsed black tea leaves. The proceeding steps followed the nicotine patch method; participants would leave the mixture to dry, and then roll it up in Bible paper.

“When the patches got taken away, people immediately started smoking the lozenges.” [Caucasian male, age 25]

“Teabacco”: Smoking of nicotine-infused tea

“Ah it’s easy to make... With the lozenges, you just crush the lozenges, mix it with a little hot water, and then once it’s dry, roll it up in Bible paper.”

[Indigenous male, age 34]

Experience of using teabacco: nicotine patches vs. lozenges

Of the survey participants, 20% had only tried teabacco made from nicotine lozenges, 10% had only tried teabacco made from nicotine patches, and 27% had tried both types of teabacco. Among interview participants, equal numbers had only tried teabacco made from lozenges (43%) or both types (43%), while a smaller proportion (14%) had only ever smoked teabacco made from patches (see Table 1).

Most survey and interview participants reported preferring smoking teabacco made from nicotine patches (before they were removed from correctional centres), due to the “head spin” or drug high that resulted. Participants also described differing experiences of the taste and physical effects of each type of teabacco.

“The patch teabacco cigarettes were better than White Ox [rolling/pouch tobacco]; you get a huge head spin after just two drags. I don’t like the taste of the lozenge teabacco; you do get a head spin but not as good as the patches. Those patch cigarettes are so good that I still make them sometimes at home.”

[Indigenous male, age 34]

Motivations for teabacco use

Table 3 describes survey participants’ attitudes and beliefs regarding teabacco use. Many survey participants (27%) described using teabacco primarily because they were

“Teabacco”: Smoking of nicotine-infused tea

craving cigarettes as a result of the prisons’ smoke-free policy. This was also a common motivation described by many participants in qualitative interviews.

“Yeah teabacco tastes like a real smoke... it satisfies the nicotine craving so yeah that’s why I smoked it sometimes.” [Caucasian male, age 36]

Eleven percent of survey participants did not provide a motivation for teabacco use. This finding was reflected among interview participants, with many explaining that they were unable to describe a specific rational motivation for smoking teabacco, even after experiencing negative consequences.

“The taste was foul, and it made my head buzz. I didn’t like it but I kept doing it. I don’t know why. I really don’t know why I kept smoking it.” [Caucasian male, age 40]

Some survey and interview participants reported smoking teabacco as a means of feeling a drug high, commonly described as “head spins”. Some interview participants described experiencing intense head spins as a result of teabacco smoking, while others experienced less intense or no head spins from teabacco use.

“People were using the teabacco because it gives you a drug high, not necessarily because they missed smoking. I got a huge head spin from it, it feels like smoking twenty [tobacco] smokes at once.” [Indigenous male, age 30]

“Teabacco”: Smoking of nicotine-infused tea

A further notable motivation for teabacco use reported by both survey and interview participants was rebellion, with a few interview participants describing that their creation and use of teabacco was a way of protesting against the tobacco-free policy.

“Yeah I liked smoking the teabacco because it felt like we were sticking it to the screws [prison officers], you know, like you can take away our smokes but we will still find a way to smoke.” [Caucasian male, age 28]

[INSERT TABLE 3 HERE]

Smoking alternative substances

Among survey participants, 41% were aware of people smoking substances other than tobacco or teabacco, with the most commonly-described alternative substances being the strings found on the inside of banana peels, and plain tea leaves. Only 34% of survey participants were aware of people using nicotine lozenges as per recommended dosage instructions (i.e., oral ingestion). Interview participants described the smoking of other substances in more detail, and many survey and interview participants agreed that prisoners will always find something to smoke, even when nicotine lozenges are not available.

“Yeah we girls were smoking anything we could. Some girls smoked lettuce sap, like they squeezed the lettuce until juice came out and put that with the tea leaves. Other girls smoked the stringy bits from banana peels, those things make you feel quite high when you smoke it; you get a big head spin.” [Caucasian female, age 38]

“When people couldn’t afford to buy lozenges, some people just smoked plain tea leaves. People will always smoke something in prison. Some people just roll up

“Teabacco”: Smoking of nicotine-infused tea

newspaper and smoke that. You get such a huge headache from that. Yeah the guys always find something to smoke.” [Indigenous male, age 34]

DISCUSSION

In this sample of people recently released from smoke-free prisons in Queensland, we found that teabacco use while incarcerated was common, and that the majority of those who used teabacco did so frequently. Although this study will require replication in other settings and with larger samples, it is the first to describe the popularity, method of creation, and motivations of teabacco use by prisoners, and the first to describe the creation and use of teabacco made from nicotine lozenges.

The creation and use of teabacco may be motivated by a number of interacting factors. Firstly, substance displacement is described by the United Nations Office on Drugs and Crime as an unintended consequence of drug control policy whereby, following the control of a drug through the reduction of either supply or demand, users instead use another drug with similar psychoactive effects, but less stringent controls [45]. This process has been described in other studies [46,47], where participants explain that they choose to use new and untested substances (such as novel psychoactive substances) because the perceived risk of legal trouble from using known illicit drugs (such as heroin) is greater than the perceived risk of serious health issues from using untested substances. With our results showing a significant association between experiencing cigarette cravings in prison and frequent teabacco use while incarcerated, it is clear that the smoking of teabacco may be understood as a substance displacement phenomenon following the introduction of smoke-free policies in

“Teabacco”: Smoking of nicotine-infused tea

prison. A further example of this phenomenon can be seen in participants’ reporting smoking of alternative substances such as banana peel strings or plain tea leaves when NRT options were unavailable.

Secondly, the creation and use of teabacco can be understood within Rhodes’s Risk Environment framework [48,49], which describes how environmental, economic, social, and structural factors in a particular setting interact to influence individuals’ choice to engage in drug use, and their vulnerability to drug-related risks and harms. The creation and use of teabacco can thus be understood as an unintended consequence of, and response to, a change in environment—the introduction of smoke-free policies. Finally, using the concept of situated rationality, similar in nature to substance displacement, users may weigh the risks of illicit drug use in correctional environments (i.e. sanctions or disease transmission) against its perceived benefits (i.e. pleasure or reduced stress) [50,51] providing some explanation for why prisoners may engage in behaviours that may seem irrational when considering the risk of being caught and possible negative health effects, yet are adaptive given the limited options when managing drug dependency in a prison context.

Our analysis identified a number of factors associated with frequent (more than once a week) teabacco use while incarcerated. Firstly, people who used illicit drugs in prison were also more likely to use teabacco frequently while incarcerated; a logical association considering that teabacco (and tobacco) are also considered illicit substances in the prison environment. Secondly, people who rated their physical health as poor were more likely to be frequent teabacco users. Although there is only one study describing the health risks associated with using teabacco made from nicotine patches [21], it is possible that these

“Teabacco”: Smoking of nicotine-infused tea

participants’ teabacco use (combined with other illicit substance use) had adverse effects on their health, or that these participants report poor physical health as a consequence of a propensity to engage in health-harming behaviours, including teabacco use. Finally, those who had experienced five or more periods of incarceration were more likely to be frequent teabacco users, possibly due to a normalisation of teabacco use among those who experience repeat periods of incarceration. Furthermore, with little evidence of teabacco used outside of prison environments (One participant reported creating teabacco out of nicotine patches at home, following his release from prison, but there is no sense of this as common practice), the link between repeat incarceration and teabacco use may reflect the majority of teabacco users’ initiation of teabacco use in prison, echoing other studies’ findings [52,53] documenting initiation of drug use (specifically heroin) in prison. To the extent that this is the case, teabacco use provides further evidence of the health-depleting effects of incarceration, and an impetus to invest in evidence-based harm reduction efforts in this environment.

Although this study did not directly measure the health impacts associated with teabacco smoking, participants in other studies [19,20] have described a number of associated negative health consequences, such as nose bleeds, vomiting, and headaches. These symptoms may support results of a forensic analysis demonstrating the release of harmful toxins following the smoking of teabacco made from nicotine patches [21], as well as results from our forensic analysis of teabacco made from nicotine *lozenges* [54] showing that while smoking teabacco made from nicotine lozenges does result in the release of some mildly harmful toxins, overall these chemical constituents are far less harmful than those released from smoking teabacco made from nicotine patches, or traditional tobacco. As a result, our

“Teabacco”: Smoking of nicotine-infused tea

findings do not support removing nicotine lozenges from correctional facilities, in response to diversion, at least until further research directly establishes the health consequences of smoking teabacco made from nicotine lozenges. Nicotine lozenges are currently the only smoking cessation support available to people entering Queensland’s prisons—a population with one of the highest levels of tobacco use in Australia [55] and of all global prison populations [4,5]. Furthermore, participants’ reporting of smoking alternative substances (such as banana peel strings or plain tea leaves) indicate that in the event of nicotine lozenges being removed from prisons, prisoners may turn to smoking other potentially more harmful substances as a substitute. With people in Australian prisons currently barred from accessing government-subsidised medications through the Pharmaceutical Benefits Scheme, arguably a progressive change in policy would be the provision of subsidised smoking cessation pharmacotherapy (such as prescription medications varenicline and bupropion) to prisoners [56]. This would be consistent with Australia’s commitment [57] to providing equivalent access to a low-cost and highly effective [58] means of smoking cessation for a vulnerable population with markedly higher rates of smoking-related illness [13-15]. A further strategy with potential merit in assisting people entering and leaving smoke-free prisons to remain smoke-free, and to avoid the use of potentially harmful alternative substances like teabacco, is the provision of electronic cigarettes. Although the quantity and quality of current evidence is currently limited, [59] electronic cigarettes may represent an effective means of smoking cessation, [60,61] and are available for purchase in some correctional facilities in the US[62] and in the United Kingdom.[63,64] Future research may benefit from examining prisoners’ perceptions of the merits of these various smoking cessation support strategies (including

“Teabacco”: Smoking of nicotine-infused tea

subsidised pharmacotherapy, electronic cigarettes, behavioural counselling, or other strategies) to gauge support prior to the initiation of any formal programs.

Limitations

This study is, to the best of our knowledge, the first to investigate the presence and perceived popularity, method of creation, and motivations for teabacco use by prisoners, and the first to describe the use of teabacco made from nicotine lozenges. As such, this study lays the groundwork for future studies, especially those investigating the health risks associated with teabacco use. However, this study had three notable limitations. Firstly, the results of the quantitative survey are limited in their generalisability due to the small sample size, our use of convenience sampling, and the sample comprising people released from prison to parole within a small geographical area of Queensland, Australia. However, the contextual nature of the qualitative findings suggests that these findings are likely to resonate in other similar settings [65]. The small sample size also limits the power of the multivariate analyses. A second limitation concerns our use of self-reported data, which may be limited by participants' reluctance to disclose illicit behaviours or by recall bias. Thirdly, some participants described previous use of teabacco made from nicotine patches, which were banned from Queensland facilities in early 2016. As such, these results may not be an accurate representation of *current* teabacco use in Queensland's prisons.

Conclusions

This study reports that the diverted use of nicotine replacement therapy, nicknamed “teabacco”, is common within Queensland's smoke-free prisons. Teabacco use is primarily motivated by cigarette cravings resulting from smoke-free policies. Individuals who rated

“Teabacco”: Smoking of nicotine-infused tea

their physical health as poor, who had been incarcerated five or more times, who experienced cigarette cravings while incarcerated, and who had used illicit drugs while incarcerated were more likely to use teabacco more than once a week. Correctional smoking bans can be an important public health initiative but, like many supply reduction efforts, produce the potential for collateral harms and would sensibly be complemented with demand and harm reduction measures, as well as further high-quality research into the unintended consequences of their implementation to accommodate the specifics of the context in which they are implemented. Harm reduction approaches allied to prison smoke-free policies would enable informed and evidence-based approaches.

Author Disclosures

Role of funding source

Professor Stuart A. Kinner is supported by NHMRC Senior Research Fellowship APP1078168.

Conflict of interest

The authors declare no conflicts of interest.

Acknowledgements

The authors gratefully acknowledge participants and Queensland Corrective Services, especially Probation and Parole office staff members, for their assistance with the collection of data for this study.

REFERENCES

1. Butler TG, Richmond RL, Belcher JM, Wilhelm KA, Wodak AD. Should smoking be banned in prisons? *Tob Control* 2007;16:291-3.
2. Ritter C, Stöver H, Levy MH, Etter J-F, Elger B. Smoking in prisons: the need for effective and acceptable interventions. *J Public Health Policy* 2011;32:32-45.
3. Collier R. Prison smoking bans: clearing the air. *Can Med Assoc J* 2013;185:E474.
4. Kennedy SM, Davis SP, Thorne SL. Smoke-free policies in U.S. prisons and jails / A review of the literature. *Nicotine Tob Res* 2015;17:629-35.
5. Baybutt M, Ritter C, Stöver H. Tobacco use in prison settings: a need for policy implementation [Internet]. *Prisons and Health*. Geneva, Switzerland; 2014. Available from: http://www.euro.who.int/__data/assets/pdf_file/0004/249205/Prisons-and-Health,-16-Tobacco-use-in-prison-settings-a-need-for-policy.pdf
6. Bonita R, Beaglehole R. New Zealand leads the way in banning smoking in prisons. *BMJ* 2013;346:f3923.
7. Butler TG, Yap L. Smoking bans in prison: time for a breather? *Med J Aust* 2015;203:313.
8. Woodall J, Tattersfield A. Perspectives on implementing smoke-free prison policies in England and Wales. *Health Promot Int* 2017 [Epub ahead of print].
9. GBD 2015 Tobacco Collaborators. Smoking prevalence and attributable disease burden in 195 countries and territories, 1990-2015: A systematic analysis from the Global Burden of Disease Study 2015. *Lancet* 2017;389:1885-906.
10. Binswanger IA, Carson EA, Krueger PM, Mueller SR, Steiner JF, Sabol WJ. Prison

tobacco control policies and deaths from smoking in United States prisons: population based retrospective analysis. *BMJ* 2014;349:1-12.

11. AIHW. The health of Australia’s prisoners 2015, Cat. no. PHE 207 [Internet]. Canberra, Australia; 2015. Available from: <http://www.aihw.gov.au/publication-detail/?id=60129553527>
12. AIHW. National Drug Strategy Household Survey 2016 Key Findings [Internet]. Canberra, Australia; 2017. Available from: <http://www.aihw.gov.au/alcohol-and-other-drugs/data-sources/ndshs-2016/key-findings/>
13. Cropsey KL, Binswanger IA, Clark CB, Taxman FS. The unmet medical needs of correctional populations in the United States. *J Natl Med Assoc* 2012;104:487-92.
14. Rosen DL, Schoenbach VJ, Wohl DA. All-cause and cause-specific mortality among men released from state prison, 1980-2005. *Am J Public Health* 2008;98:2278-84.
15. Binswanger IA, Krueger PM, Steiner JF. Prevalence of chronic medical conditions among jail and prison inmates in the USA compared with the general population. *J Epidemiol Community Health* 2009;63:912-9.
16. Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG, et al. Release from prison — a high risk of death for former inmates. *N Engl J Med* 2007;356:157-65.
17. Fazel S, Baillargeon J. The health of prisoners. *Lancet* 2011;377:956-65.
18. Dickert J, Williams JM, Reeves R, Gara M, DeBilio L. Decreased mortality rates of inmates with mental illness after a tobacco-free prison policy. *Psychiatr Serv* 2015;66:975-9.

“Teabacco”: Smoking of nicotine-infused tea

19. Hefler M, Hopkins R, Thomas DP. Successes and unintended consequences of the Northern Territory’s smoke-free prisons policy: results from a process evaluation. *Public Heal Res Pract* 2016;26:1-8.
20. Djachenko A, St John W, Mitchell C. Smoking cessation in smoke-free prisons: a grounded theory study. *Int J Prison Health* 2016;12:270-9.
21. Morrissey H, Ball P, Boland M, Hefler M, Thomas DP. Constituents of smoke from cigarettes made from diverted nicotine replacement therapy patches. *Drug Alcohol Rev* 2016;35:206-11.
22. Collinson L, Wilson N, Edwards R, Thomson G, Thornley S. New Zealand’s smokefree prison policy appears to be working well: one year on. *J New Zeal Med Assoc* 2012;125:164-8.
23. Michael P. Queensland prisoners smoke tea leaves soaked in nicotine after smoking ban. *The Courier Mail* [Internet]. Brisbane, Australia; 2014 May 15; Available from: <http://www.couriermail.com.au/news/queensland/queensland-prisoners-smoke-tea-leaves-soaked-in-nicotine-after-smoking-ban/news-story/0c185f2ad2d73875a3588044ea2962c3>
24. Pearson E. Highly trained dog squad is on the job at Lara prisons. *Geelong Advertiser* [Internet]. Geelong, Australia; 2016 Jun 5; Available from: <http://www.geelongadvertiser.com.au/news/geelong/highly-trained-dog-squad-is-on-the-job-at-lara-prisons/news-story/f953536ad9c73b23b554b40a13544724>
25. Kauffman RM, Ferketich AK, Murray DM, Bellair PE, Wewers ME. Tobacco use by male prisoners under an indoor smoking ban. *Nicotine Tob Res* 2011;13:449-56.

“Teabacco”: Smoking of nicotine-infused tea

26. Pontieri FE, Tanda G, Orzi F, Chiara G Di. Effects of nicotine on the nucleus accumbens and similarity to those of addictive drugs. *Nature* 1996;382:255-7.
27. Queensland Government. Daily life in prison- Prohibited and restricted items. Brisbane, Australia; 2018.
28. Montanari L, Royuela L, Pasinetti M, Giraudon I, Wiessing L, Vicente J. Drug use and related consequences among prison populations in European countries. In: Enggist S, Moller L, Galea G, Udesen C, editors. Prisons and health [Internet]. Copenhagen, Denmark; 2014. p. 107–12. Available from: http://www.euro.who.int/__data/assets/pdf_file/0019/249202/Prisons-and-Health,-13-Drug-use-and-related-consequences-among-prison.pdf
29. Carpentier C, Royuela L, Noor A, Hedrich D. Ten Years of Monitoring Illicit Drug Use in Prison Populations in Europe: Issues and Challenges. *Howard J Crim Justice* 2012;51:37-66.
30. Fazel S, Bains P, Doll H. Substance abuse and dependence in prisoners: A systematic review. *Addiction* 2006;101:181-91.
31. Kinner SA, Jenkinson R, Gouillou M, Milloy M-J. High-risk drug-use practices among a large sample of Australian prisoners. *Drug Alcohol Depend* 2012;126:156-60.
32. Wilson GB, Galloway J, Shewan D, Marshall L, Vojt G, Marley C. “Phewww, bingoed!”: Motivations and variations of methods for using heroin in Scottish prisons. *Addict Res Theory* 2007;15:205-24.
33. Cope N. Drug Use in Prison: The experience of young offenders. *Drugs Educ Prev Policy* 2000;7:354-66.

“Teabacco”: Smoking of nicotine-infused tea

34. Seal DW, Belcher L, Morrow K, Eldridge G, Binson D, Kacanek D, et al. A qualitative study of substance use and sexual behavior among 18- to 29-year-old men while incarcerated in the United States. *Heal Educ Behav* 2004;31:775-89.
35. Puljevi C, de Andrade D, Coomber R, Kinner SA. Relapse to smoking following release from smoke-free correctional facilities in Queensland, Australia. *Drug Alcohol Depend* 2018;187:127-33.
36. Coomber R, Pavlidis A, Santos GH, Wilde M, Schmidt W, Redshaw C. The supply of steroids and other performance and image enhancing drugs (PIEDs) in one English city: Fakes, counterfeits, supplier trust, common beliefs and access. *Perform Enhanc Heal* 2014;3:135-44.
37. Carroll JJ, Marshall BDL, Rich JD, Green TC. Exposure to fentanyl-contaminated heroin and overdose risk among illicit opioid users in Rhode Island: A mixed methods study. *Int J Drug Policy* 2017;46:136-45.
38. Stata. *Stata Release 13.0*. Texas, USA: Stata Corporation; 2013.
39. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77-101.
40. Queensland Government Statistician’s Office. SEIFA Socio-Economic Indexes for Areas [Internet]. Brisbane, Australia; 2011. Available from: <http://www.qgso.qld.gov.au/products/tables/seifa/index.php>
41. Cooper J, Borland R, McKee SA, Yong HH, Dugue PA. Depression motivates quit attempts but predicts relapse: differential findings for gender from the International Tobacco Control Study. *Addiction* 2016;111:1438-47.

“Teabacco”: Smoking of nicotine-infused tea

42. Whooley MA, Avins AL, Miranda J, Browner WS. Case-finding instruments for depression: Two questions are as good as many. *J Gen Intern Med* 1997;12:439-45.
43. Kotz D, Brown J, West R. Predictive validity of the Motivation To Stop Scale (MTSS): A single-item measure of motivation to stop smoking. *Drug Alcohol Depend* 2013;128:15-9.
44. Bradley KA, Debenedetti AF, Volk RJ, Williams EC, Frank D, Kivlahan DR. AUDIT-C as a brief screen for alcohol misuse in primary care. *Alcohol Clin Exp Res* 2007;31:1208-17.
45. UNODC. 2008 World Drug Report [Internet]. Trends in Organized Crime. Vienna, Austria; 2009. Available from:
https://www.unodc.org/documents/wdr/WDR_2008/WDR_2008_eng_web.pdf
46. Martin A, Anette K. Aspects of Substance Displacement - From Illicit Drugs to Novel Psychoactive Substances. *J Addict Res Ther* 2016;7:8-10.
47. Rolles S, Kushlick D. Prohibition is a key driver of the new psychoactive substances (NPS) phenomenon. *Addiction* 2014;109:1589-90.
48. Rhodes T. The “risk environment”: A framework for understanding and reducing drug-related harm. *Int J Drug Policy* 2002;13:85-94.
49. Rhodes T, Singer M, Bourgois P, Friedman SR, Strathdee SA. The social structural production of HIV risk among injecting drug users. *Soc Sci Med* 2005;61:1026-44.
50. Moore D. Key Moments in the Ethnography of Drug-Related Harm: Reality Checks for Policy-Makers? In: Stockwell T, Gruenewald P, Toumbourou J, Loxley W, editors. *Preventing Harmful Substance Use: The Evidence Base for Policy and Practice*.

“Teabacco”: Smoking of nicotine-infused tea

- Chichester, England: Wiley; 2005. p. 433–42.
51. Bloor M, Robertson M, McKeganey N, Neale J. Theorising equipment-sharing in a cohort of Scottish drug users. *Health Risk Soc* 2008;10:599-607.
 52. Singleton N, Farrell M, Meltzer H. Substance misuse among prisoners in England and Wales. *Int Rev Psychiatry* 2003;15:150-2.
 53. Boys A, Farrell M, Bebbington P, Brugha T, Coid J, Jenkins R, et al. Drug use and initiation in prison: results from a national prison survey in England and Wales. *Addiction* 2002;97:1551-60.
 54. Mitchell C, Puljevi C, Coomber R, White A, Cresswell SL, Bowman J, et al. Constituents of “teabacco”: A forensic analysis of cigarettes made from diverted nicotine replacement therapy lozenges in smoke-free prisons. Manuscript in preparation. 2017;
 55. AIHW. The health of Australia’s prisoners 2015, Cat. no. PHE 207 [Internet]. Canberra, Australia; 2015. Available from: <http://www.aihw.gov.au/publication-detail/?id=60129553527>
 56. Puljevi C, de Andrade D, Carroll M, Spittal MJ, Kinner SA. Use of prescribed smoking cessation pharmacotherapy following release from prison: a prospective data linkage study. *Tob Control* 2018;27:474-8
 57. United Nations General Assembly. United Nations Standard Minimum Rules for the Treatment of Prisoners (the Nelson Mandela Rules) [Internet]. Vol. A/RES/70/1. Vienna, Austria; 2015. Available from: https://www.unodc.org/documents/justice-and-prison-reform/GA-RESOLUTION/E_ebook.pdf

“Teabacco”: Smoking of nicotine-infused tea

58. Cahill K, Stevens S, Perera R, Lancaster T. Pharmacological interventions for smoking cessation: an overview and network meta-analysis. *Cochrane Database Syst Rev* 2013;(5):CD009329.
59. Hartmann-Boyce J, McRobbie H, Bullen C, Begh R, Stead LF, Hajek P. Electronic cigarettes for smoking cessation. *Cochrane Database Syst Rev* 2016;93:178-9.
60. Nutt DJ, Phillips LD, Balfour D, Curran HV, Dockrell M, Foulds J, et al. Estimating the harms of nicotine-containing products using the MCDA approach. *Eur Addict Res.* 2014;20:218-25.
61. Britton J, Arnott D, McNeill A, Hopkinson N. Nicotine without smoke— putting electronic cigarettes in context. *BMJ* 2016;353:i1745.
62. Curry L, Lee YO, Rogers T. E-cigarettes made especially for inmates. *Tob Control* 2014;23:e87-8.
63. McNeill A, Brose LS, Calder R, Hitchman SC, Hajek P, McRobbie H. E-cigarettes / : an evidence update. A report commissioned by Public Health England. *Public Heal Engl [Internet]*. 2015;111. Available from:
www.gov.uk/government/uploads/system/uploads/attachment_data/file/454516/E-cigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England.pdf
64. Caruana D. Certain jails in the UK are allowing inmates to vape in their cells. *Vaping Post [Internet]*. London, England; 2017 Oct 25; Available from:
<https://www.vapingpost.com/2017/10/25/certain-jails-in-the-uk-are-allowing-inmates-to-vape-in-their-cells/>
65. Pearson M, Parkin S, Coomber R. Generalizing applied qualitative research on harm

“Teabacco”: Smoking of nicotine-infused tea

reduction /example of a public injecting typology. *Contemp Drug Probl*
2011;38:61-91.

Author Manuscript

Table 1: Characteristics of quantitative and qualitative interview participants

Characteristic	Quantitative survey (N=82) N (%)	Qualitative interviews (N=21) N (%)
<i>Socio-demographic</i>		
Aged 25 years or older	66 (81)	20 (95)
Male	75 (92)	16 (76)
Indigenous	22 (27)	5 (24)
Lived in disadvantaged suburb ^a	52 (63)	16 (76)
<i>Incarceration history</i>		
e5 times in adult prison	22 (27)	4 (19)
Most recent period of incarceration e20 weeks	34 (42)	9 (43)
<i>Tobacco use</i>		
Smoked e20 cigarettes per day prior to incarceration	49 (60)	11 (52)
Used tobacco in prison	16 (20)	3 (14)
Resumed tobacco smoking following release from prison	77 (94)	20 (95)
<i>Teabacco use</i>		
Used teabacco in prison	47 (57)	21 (100)
Used patches only	8 (10)	3 (14)
Used lozenges only	17 (20)	9 (43)
Used both patches and lozenges	22 (27)	9 (43)
Daily teabacco use in prison	15 (18)	7 (33)
Frequent teabacco use (> once a week) in prison	30 (37)	13 (62)
Infrequent teabacco use (<once a week) in prison	2 (2)	1 (4)

^a Socio-economic Indexes for Areas score of 3 or below [39].

Table 2: Descriptive statistics, and unadjusted and adjusted odds of frequent (> once a week) teabacco use according to participant characteristics (N=82)

Exposure	Number (%) with characteristic (N=82)	Number (%) frequently used teabacco (n=30)		OR (95% CI)	AOR (95% CI)
		Among those with characteristic	Among those without characteristic		
<i>Socio-demographic</i>					
Aged e25 years	66 (81)	23 (35)	7 (44)	0.7 (0.2-2.1)	
Male	75 (92)	29 (39)	1 (14)	3.8 (0.4-33.0)	
Indigenous Australian	22 (27)	7 (32)	23 (38)	0.8 (0.3-2.1)	
Lives in disadvantaged area (SEIFA) ^a	52 (63)	17 (33)	13 (43)	0.6 (0.3-1.6)	
<i>Mental and physical health</i>					
High depression score ^b	24 (29)	6 (25)	24 (41)	0.5 (0.2-1.4)	
Poor physical health ^c	13 (16)	9 (69)	21 (30)	5.1 (1.4-18.6)*	14.4 (2.6-78.5)**
<i>Incarceration history</i>					
e5 times in adult prison	22 (27)	12 (55)	18 (30)	2.8 (1.0-7.6)*	7.1 (1.7-29.2)**
Most recent period of incarceration e20 weeks	34 (42)	13 (38)	17 (35)	1.1 (0.5-2.8)	
<i>Tobacco use</i>					
Smoked e20 cigarettes per day prior to incarceration	49 (60)	19 (39)	11 (33)	1.3 (0.5-3.2)	
Smoked tobacco in prison	16 (20)	9 (56)	21 (32)	1.5 (0.8-3.0)	
Supported the prison smoke-free policy	41 (50)	10 (24)	20 (49)	0.3 (0.1-0.9)*	0.3 (0.1-1.2)
Experienced cigarette cravings while incarcerated	57 (70)	24 (41)	6 (25)	1.8 (1.1-2.8)*	2.2 (1.1-4.3)*
Future plans to stop smoking (MTSS) ^d	61 (74)	22 (36)	8 (38)	0.9 (0.3-2.6)	
High proportion of social network smoke ^e	14 (17)	6 (43)	24 (35)	1.4 (0.4-4.4)	
<i>Other drug use</i>					
Used illicit drugs in prison	19 (23)	14 (74)	16 (25)	8.2 (2.6-26.5)**	12.7 (2.9-55.8)**
High risk alcohol use since release (AUDIT-C) ^f	31 (38)	15 (48)	15 (29)	2.3 (0.9-5.7)	
Cannabis use since release	9 (11)	6 (67)	24 (33)	4.1 (0.9-17.7)	
Any illicit drug use since release	17 (20)	10 (59)	20 (31)	3.2 (1.1-9.7)*	3.0 (0.7-12.9)

* $P < 0.05$; ** $P < 0.01$; ^a Socio-economic Indexes for Areas (SEIFA) score of 3 or below (39); ^b A score of 3 on a three-level depression index (40,41); ^c self-reported assessment of physical health; ^d Motivation to Stop Scale (MTSS) score e2 (42); ^e self-reported proportion of family members and friends who smoke; ^f Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) score e4 [43]. AOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio.

Table 3: Attitudes and beliefs regarding teabacco use in prison (N=82)

	N (%)
<i>Primary motivation for teabacco use in prison</i>	
Craving cigarettes	22 (27)
No reason provided	9 (11)
Wanted a head spin	5 (6)
Boredom	5 (6)
Stress Relief	3 (4)
Rebellion	2 (2)
To fit in	1 (1)
Aware of other prisoners ingesting lozenges orally, as per dosage instructions	28 (34)
<i>Aware of people smoking alternative substances in prison</i>	
Banana peel strings	21 (26)
Plain tea leaves	6 (7)
Orange peels	2 (2)
Lettuce sap	1 (1)
Wild tobacco	1 (1)
Lawn clippings	1 (1)
Disinfectant	1 (1)
Newspaper	1 (1)



Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:

Puljevic, C;Coomber, R;Kinner, SA;de Andrade, D;Mitchell, C;White, A;Cresswell, SL;Bowman, J

Title:

'Teabacco': Smoking of nicotine-infused tea as an unintended consequence of prison smoking bans

Date:

2018-11-01

Citation:

Puljevic, C., Coomber, R., Kinner, S. A., de Andrade, D., Mitchell, C., White, A., Cresswell, S. L. & Bowman, J. (2018). 'Teabacco': Smoking of nicotine-infused tea as an unintended consequence of prison smoking bans. DRUG AND ALCOHOL REVIEW, 37 (7), pp.912-921. <https://doi.org/10.1111/dar.12848>.

Persistent Link:

<http://hdl.handle.net/11343/284181>