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A qualitative study of using nicotine products for smoking cessation after discharge from residential drug and alcohol treatment in Australia

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Abstract

Introduction: Tobacco smoking is highly prevalent among alcohol and other drugs (AOD) service clients and, despite interest in quitting, abstinence is rarely sustained. Nicotine products may assist after discharge from residential treatment services, but little is known about client receptivity to them. This study examined AOD withdrawal service clients' experiences of two types of nicotine products for smoking cessation post-discharge, combination nicotine replacement therapy (cNRT) and nicotine vaping products (NVP).

Methods: We held semi-structured telephone interviews with 31 Australian AOD service clients in a clinical trial of a 12-week smoking cessation intervention using Quitline support plus cNRT or NVP delivered post-discharge from a smoke-free

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residential service. We asked about health and social factors, nicotine cravings, Quitline experience, and barriers and facilitators to cNRT or NVP, then thematically analysed data.

Results: cNRT and NVP were described by participants as feasible and acceptable for smoking cessation. For most participants, cost limited cNRT access post study, as did difficulty navigating NVP prescription access. Quitline support was valued, but not consistently used, with participants noting low assistance with NVP-facilitated cessation. Participants considered both cessation methods acceptable and socially supported, and sought information on decreasing nicotine use via NVP.

Discussion and Conclusions: AOD service clients highly valued receiving cNRT or NVP with behavioural support for smoking reduction or abstinence. Both interventions were acceptable to service clients. Findings suggest a potential need to examine both whether NVP use should be permitted in this context, and guidance on the individual suitability of cNRT or NVP.

KEYWORDS

alcohol and other drugs, nicotine replacement therapy, smoking cessation, vaping, withdrawal treatment

Key Points

- People in alcohol and other drugs (AOD) treatment have higher smoking prevalence than the wider population.
- AOD service clients comfortably use combination nicotine replacement or vaping.
- Both pharmacological interventions help manage nicotine cravings and withdrawal.
- Quitline behavioural counselling is a highly valued support for smoking cessation.
- Nicotine vaping can offer AOD service clients an acceptable cessation alternative.

1 | INTRODUCTION

For many, tobacco smoking cessation is a difficult process shaped by individual, social and contextual factors, reinforcing the need for evidence-based cessation support [1]. Smoking is overrepresented among people experiencing alcohol and other drug (AOD) dependence. A systematic review (54 studies, 37,364 participants, 20 countries) found that 84% of people in AOD treatment currently smoked tobacco, compared to 31% in demographically matched samples [2]. In a US study, when compared to those not using tobacco, people using any tobacco products had a 19.7 times greater likelihood of high-severity lifetime substance use problems, and were 1.4 to 1.6 times more likely to experience a mental health condition [3].

Although tobacco cessation supports are widely available in Australia, quit attempts are not often sustained by people in AOD treatment [4]. The evidence for effective smoking cessation strategies for people in AOD treatment

is limited, but a Cochrane review found that pairing pharmacotherapy with behavioural counselling was strongly associated with tobacco abstinence [5], and should be incorporated into clinical practice. Recently in Australia, nicotine vaping products (NVP) are being used for tobacco cessation and can be used on their own or combined with behavioural support [6].

NVPs are small battery-powered devices that heat a coil to aerosolise liquid for inhalation, typically comprising propylene glycol, glycerol, water and freebase or salt nicotine, with or without flavourings. NVP product designs are evolving over time, from refillable tank [7–12], to pod-style devices [13] and clinical studies of their therapeutic applications typically use current designs.

NVPs are only legally available in Australia via medical prescription. However, nicotine replacement therapies (NRT) approved for transdermal or oromucosal use are available from pharmacies and retailers, with some publicly subsidised when prescribed for smoking

cessation (e.g., nicotine patches) [14]. Although cNRT can cost up to 50 AUD per week for an 8- to 12-week course [15], this is less than continued smoking.

Currently, there is little research on how people receiving AOD services experience smoking cessation when using different forms of nicotine products. Qualitative studies have shown that social connectedness and practical barriers [16], and staff perceptions shape the cessation experience [17]. People in AOD treatment may find that using NVPs for nicotine replacement satisfies both nicotine cravings and behavioural habits associated with tobacco smoking [18], which may provide a better cessation experience than typical nicotine replacement (e.g., patches) [19].

Critically, clients of AOD services in Australia typically arrange nicotine product purchase and Quitline access themselves following discharge from AOD services, rather than this being proactively offered. This means that few clients receive best practice tobacco cessation support. Given the importance of understanding how smoking cessation processes are experienced, in this study we explored the receptiveness, use and perceptions of cNRT or NVP paired with behavioural counselling, in a 12-week smoking cessation clinical intervention, following discharge from AOD treatment.

2 | METHODS

2.1 | Study design and context

This was a qualitative study within a parent two-arm randomised clinical trial of the effectiveness of post-discharge smoking cessation support for AOD service clients, comparing NVP with cNRT. We conducted semi-structured telephone interviews of trial participants following a 12-week smoking cessation treatment. The trial protocol [11] is notified with the Therapeutic Goods Administration, and registered with the Australia and New Zealand Clinical Trials Registry (ACTRN 12619001787178). In short, the cNRT condition participants received a 12-week supply of patches (21 mg/24 h) combined with the choice of nicotine gum or inhalator [11], mailed in three 4-week batches. The NVP condition participants received a refillable NVP (Innokin® Endura T18-II), with unflavoured nicotine e-liquid in a vegetable glycerol base (Nicophar® 1.2%, 12 mg/10 mL) mailed in three 4-week batches. All participants received calls from Quitline Victoria counsellors trained to support smoking cessation in people with substance use disorders: one while in smoke-free residential care and post-discharge scheduled on days 1, 3, 7, 14 and 28.

Interviews were conducted at a time when Australia had introduced legislation restricting the legal purchase

of NVPs to require a valid medical prescription, including nicotine (salt or base) e-cigarettes, pods and liquids, but excluding non-nicotine containing vaping products [14]. The parent trial facilitated access for participants in the NVP condition, prior to this study.

Ethical approval was obtained via the Hunter New England Area Health Service (REGIS: 2019/ETH10554) and the University of Newcastle Human Research Ethics Committee (H-2019-0358). The qualitative study is reported according to COREQ standards [20].

2.2 | Participants

Participants were recruited prior to discharge from short stay residential AOD treatment services where tobacco smoking is prohibited, and cNRT is supplied. Eligibility included being aged ≥ 18 years, and smoking ≥ 10 cigarettes per day prior to intake. Participants were selected for qualitative interviews based on cessation method allocated to in the parent trial, gender and study site to ensure sample diversity. These selected participants were invited to complete a phone interview about their experience of using either cNRT or NVP for tobacco smoking cessation after 12-week follow-up for the parent trial [11]. A maximum of three call attempts were made, with no repeat interviews, and no participation incentives.

2.3 | Data collection

We attempted to contact 98 participants to request a one-to-one interview about their tobacco smoking cessation experience, with 31 participants consenting to interview. The interview topics (Table 1) and guide (Appendix) were designed by experienced researchers in tobacco smoking cessation and qualitative research methods. After explaining the research purpose, interviewer and interviewee roles, discussion structure and study confidentiality, we sought verbal consent prior to recording and note taking for the 40- to 60-minute semi-structured interviews. Interviewers (Joshua Trigg and Jane Rich) were experienced in qualitative health research, with this background noted for participants.

2.4 | Analysis

A company transcribed interviews verbatim, and researchers (Joshua Trigg and Edwina Williams) coded the data in QSR NVivo (v1.3). A descriptive deductive method of analysis was used to explore participants' accounts of the tobacco smoking cessation experience in reference to the topic framework guiding interviews. This

TABLE 1 Semi-structured interview topics.

| | |
|-----|--|
| 1. | Any changes noticed in lifestyle or health (positive, negative, social, emotional) |
| 2. | Ease of use of the cessation approach (acceptability, feasibility) |
| 3. | Training and support for cessation approach (satisfaction, perceptions) |
| 4. | Talking about tobacco smoking (openness, comfort, reluctance) |
| 5. | Expectations and prior knowledge (anticipated effectiveness) |
| 6. | Perceived usefulness of smoking cessation approach (reducing tobacco cravings) |
| 7. | Cessation aid quantity and nicotine preferences (amount, strength) |
| 8. | Continuation of cessation approach (continued, discontinued, plans for access) |
| 9. | Continuation perspective (replacement of cigarettes, cessation aid) |
| 10. | Accessing tobacco cessation approach aids (enablers, barriers) |
| 11. | Increasing the effectiveness of the cessation approach (perspectives) |
| 12. | Prescription access model for nicotine vaping products (perspectives) |
| 13. | Cessation approach condition alternatives (considered, used) |
| 14. | Social support for cessation approach (interpersonal) |
| 15. | Appealing and unappealing aspects of the cessation approach |
| 16. | Recommending cessation approach to others (people leaving AOD withdrawal services) |
| 17. | Experience of speaking with Quitline (enablers, barriers) |
| 18. | Perceived usefulness of speaking with Quitline (motivation, information, strategies) |
| 19. | Increasing the effectiveness of speaking with Quitline (perspectives) |
| 20. | Accessing Quitline (enablers, barriers) |
| 21. | Continuation of Quitline access (continued, discontinued, plans for access) |
| 22. | Recommending Quitline to others (people leaving AOD withdrawal services) |

Note: Tobacco smoking cessation approaches included combination nicotine replacement therapy, nicotine vaping product. The complete interview schedule is available in [Appendix](#).

Abbreviation: AOD, alcohol and other drug.

analytic approach focused on key factors of importance to the study aims identified by the team prior to interviewing. The descriptive deductive analytic approach was

guided by the six thematic analysis phases outlined by Braun and Clarke [21–23]. Interview transcripts were read by two researchers—who worked in addiction and public health fields (Joshua Trigg and Edwina Williams)—in relation to initial interview topics (Table 1) to (i) familiarise themselves with the data, before coding segments of the data deductively in relation to the initial topic framework. Over half (58%) of interviews were coded by two researchers (Joshua Trigg and Edwina Williams) with high agreement ($\kappa = 0.65$, agreement = 97.1%) [24]. Further coding was done (ii) to capture concepts not addressed by the initial topics and a final set of codes was made to compile data segments. The researchers (Joshua Trigg, Edwina Williams, Jane Rich and Billie Bonevski) then (iii) examined these descriptive codes and collapsed them into candidate themes across the dataset. The analytical team (Joshua Trigg, Edwina Williams, Jane Rich and Billie Bonevski) agreed that data from 31 interviews were sufficiently meaningful to achieve study aims. Themes were (iv) reviewed to ensure they captured different focal aspects of the cessation experience per the study aim, incorporating any new topics raised by participants, then (v) were defined and named based on codes. Quotes (vi) representing each theme are presented below to illustrate findings.

3 | RESULTS

Data were collected between 15 March 2021 and 30 June 2022. Demographic and substance use characteristics of the final sample ($n = 31$) largely reflected participants in the clinical trial ($n = 367$) and had a 31.6% response rate (31/98 contacted). Table 2 provides interviewed participant characteristics. Of those whom we attempted contact but did not interview, 1 had withdrawn from the trial, 12 had disconnected numbers, 8 declined at follow-up, 6 missed their interview after three calls and 38 did not respond to follow-up attempts. More participants were from the NVP (61.3%) condition than the cNRT (38.7%) condition and most identified as men. Tobacco smoking at time of interview is provided for context only, as this was self-reported, and intervention outcomes will be independently analysed and reported in a subsequent paper.

Participants were discharged from residential AOD treatment services located in Victoria (61.3%), Queensland (29.0%) and New South Wales (9.7%). They were not permitted to smoke tobacco or use NVPs while completing residential treatment, but cNRT was available. Interviewed participants' gender (female = 32.3%, male = 64.5%, other/non-binary = 3.2%) differed from remaining participants in the parent trial (female = 57.4%, male = 42.6%, other/non-binary = 0.0%) ($\chi^2(2, 329) = 10.58, p = 0.005$,

TABLE 2 Participants' demographic characteristics, substance use and smoking cessation group.

| Pseudonym ^a | Gender | Age ^b | Income/ week ^b | Primary drug ^{bc} | Initial cig/day ^b | Smoking ^d | Cigarette craving ^b | Group |
|------------------------|-----------|------------------|------------------------------|----------------------------|---------------------------------|----------------------|-----------------------------------|-------|
| Brian | Male | 39 | \$401–500 | Alcohol | 25 | Yes | Moderate | cNRT |
| Lisa | Female | 49 | \$201–300 | Heroin | 20 | Yes | Strong | cNRT |
| Ben | Male | 30 | \$301–400 | Alcohol | 30 | Yes | No urge | cNRT |
| Zeke | Male | 48 | >\$500 | Alcohol | 40 | No | Extremely strong | cNRT |
| Kara | Female | 52 | \$301–400 | Cannabis | 25 | No | Extremely strong | cNRT |
| Daniel | Male | 51 | \$401–500 | Alcohol | 40 | No | Strong | cNRT |
| Tom | Male | 45 | \$301–400 | Methamp-hetamine | 23 | Yes | Very strong | cNRT |
| Russel | Male | 66 | >\$500 | Alcohol | 12 | No | Moderate | cNRT |
| Rion | Male | 29 | \$301–400 | Cannabis | 20 | Yes | Moderate | cNRT |
| Julien | Male | 59 | >\$500 | Alcohol | 40 | Yes | Strong | cNRT |
| Sarah | Female | 71 | >\$500 | Alcohol | 17 | Yes | Strong | cNRT |
| Cane | Male | 34 | >\$500 | Alcohol | 25 | Yes | Extremely strong | cNRT |
| Brock | Male | 37 | \$201–300 | Alcohol | 10 | Yes | No urge | NVP |
| Ravi | Male | 32 | \$301–400 | Alcohol | 40 | Yes | Strong | NVP |
| Wade | Male | 54 | \$401–500 | Alcohol | 30 | Yes | Strong | NVP |
| Patricia | Female | 54 | \$301–400 | Alcohol | 20 | Yes | Slight | NVP |
| Acacia | Nonbinary | 41 | \$401–500 | Alcohol | 10 | Yes | Strong | NVP |
| Bruce | Male | 52 | >\$500 | Alcohol | 20 | No | No urge | NVP |
| Omar | Male | 69 | >\$500 | Alcohol | 15 | No | Don't know | NVP |
| Ash | Female | 48 | \$301–400 | Alcohol | 25 | No | Strong | NVP |
| Ronan | Male | 52 | >\$500 | Alcohol | 15 | No | Extremely strong | NVP |
| Casey | Female | 47 | \$401–500 | Heroin | 17 | No | Moderate | NVP |
| Akhil | Male | 30 | >\$500 | Alcohol | 18 | No | Strong | NVP |
| Cole | Male | 43 | Don't know | Alcohol | 12 | No | Moderate | NVP |
| Amy | Female | 38 | >\$500 | Alcohol | 15 | No | Very strong | NVP |
| Priya | Female | 60 | \$301–400 | Alcohol | 20 | No | Strong | NVP |
| Jason | Male | 39 | \$201–300 | Alcohol | 20 | Yes | Extremely strong | NVP |
| Henry | Male | 48 | >\$500 | Alcohol | 15 | Yes | Strong | NVP |
| Morgan | Female | 57 | \$301–400 | Alcohol | 20 | No | Very strong | NVP |
| Erin | Female | 49 | >\$500 | Alcohol | 35 | Yes | Very strong | NVP |
| Isaac | Male | 66 | >\$500 | Alcohol | 40 | Yes | Strong | NVP |

Abbreviations: cNRT, combination nicotine replacement therapy; NVP, nicotine vaping products.

^aParticipant pseudonyms are used in this paper to support deidentification without depersonalisation [38].

^bAs reported in the trial baseline survey.

^cPrimary substance for residential alcohol and other drug treatment.

^dAny use of cigarettes (including reduced use) as reported at time of qualitative interview. Craving to smoke was self-reported as *no urge*, *slight*, *moderate*, *strong*, *very strong* or *extremely strong*. Weekly income after tax. Cigarettes per day is defined as the usual amount smoked when able to smoke.

$\phi = 0.18$), including by age ($M \pm SD$: interviewed = 50.25 \pm 11.74, not interviewed = 44.82 \pm 10.44 years) (Welch's t (35.12) = 2.48, $p = 0.018$, $d = 0.51$).

We coded participant experiences to eight themes relating to tobacco smoking cessation using NVP or cNRT approaches: (i) acceptability and usability;

(ii) perceived effectiveness; (iii) nicotine usage pattern and perceived self-efficacy; (iv) supportive behavioural counselling; (v) health and psychosocial changes; (vi) social support for quitting; (vii) recommending use in AOD specific contexts; and (viii) continued access and use. Themes are illustrated in participant quotations, also

noting age, gender, tobacco smoking cessation approach and self-reported smoking (S) or non-smoking (NS) status at the time of interview.

3.1 | Theme 1: Acceptability and usability

Acceptability of NVP as a cessation aid was influenced by views on device design, usability and satisfaction of behavioural habits associated with cigarette smoking.

‘You know, [you’re] using something with your hands, and it still blows that “smoke.” It’s very similar in that [it’s] sort of what your brain has been used to doing.’

(Erin, 49, F, NVP, S)

‘It’s just a habit now. It’s part of my routine. When I leave the door it’s like “Keys, purse, phone ...” It used to be “... cigarettes,” and now it’s “... purse, phone and vape.”’

(Ash, 48, F, NVP, S)

Tobacco cessation via cNRT was also reported to satisfy the behavioural habits of smoking by some participants, with nicotine inhalators considered particularly acceptable for this reason, as they mimic similar movements to tobacco smoking.

‘The inhalers were outstanding ... It’s because [you] have it, like, you’ve got in your hand’.

(Tom, 45, M, cNRT, S)

Participants who used cNRT considered this approach acceptable and adaptable to their preferences, irrespective of whether they were smoking at the time of interview.

‘The patches are awesome, but the gum is okay, and the lozenges are complete rubbish’.

(Kara, 52, F, cNRT, NS)

‘That was my favourite, because with my inhaler [inhalator] I had something in my hand ... and if you can just get yourself used to it, you can [stop] smoking’.

(Tom, 45, M, cNRT, S)

‘It has [helped] to a point ... well, I haven’t actually given up—I’ve cut back. So, my objective is [still] to eradicate cigarettes’.

(Julien, 49, M, cNRT, S)

For those smoking at the time of interviewing, NVP-facilitated smoking cessation was also considered acceptable, and useful for managing nicotine cravings, including in cases where the participant relapsed to smoking.

‘I stopped smoking with it, but only used it now and again. I probably went up to about seven months ... with the vapour (sic)’.

(Isaac, 66, M, NVP, S)

‘I hadn’t been using the vape for a while, and I just picked up smoking again. And I think that’s because I’ve had it work, and then my anxiety (returned) ... it was a good thing to have, on one hand, once leaving a facility...’.

(Acacia, 41, NB, NVP, S)

Use of NVPs was also highly valued for smoking cessation when the participant had abstained from smoking at the time of interview, highlighting vaping cessation is the next step for them.

‘The endgame, the end result is (that) I don’t want to be vaping, I don’t want to be smoking tobacco, I don’t want to be drinking alcohol’.

(Omar, 69, M, NVP, NS)

‘I’ve broken that habit, and this is the first time that I’ll never go back to a cigarette ... hopefully by the end of the year or closer to the following, I won’t even be having to vape’.

(Bruce, 52, M, NVP, NS)

3.2 | Theme 2: Perceived effectiveness

Following the intervention period, most participants viewed NVPs as more positive than continued smoking and an acceptable approach to cessation. This included participants stopping NVP post intervention and those who continued with NVP.

‘I haven’t smoked in about 3 or 4 weeks now [It’s] curious to me, the vape has helped me out so much ... Last week I thought about going to get a pack of ciggies. I thought, “What am I thinking?” I just grab the vape, and I’m not gonna go [do] that’.

(Cole, 43, M, NVP, NS)

'It did [help]. Like, it was actually—'cause I was in a detox [withdrawal] facility and went to rehab—for the first few days [post-discharge], there were people smoking around me and I was quite content "smoking" on my vape'.

(Ravi, 32, M, NVP, S)

'So, the cutting down (vape), I didn't manage to do. [But] the stopping the tobacco—absolutely, 100% ... Like I never bought cigarettes, nothing'.

(Amy, 38, F, NVP, NS)

However, for a small number of participants, NVP use was not viewed as effective.

'It just leaves you with the desire to smoke, because ... the vapor comes out of your mouth, but you don't get the same effect ... I'm still smoking a packet a day as a result'.

(Wade, 54, M, NVP, S)

cNRT participants were less consistently positive about this cessation mode. It was considered positive that cNRT was available in different forms (e.g., patch, inhaler), giving participants some autonomy, though expected and perceived effectiveness varied.

'Well, I can tell you I was smoking 40 cigarettes a day ... and now I'm completely off it ... Look, to be honest if you put a patch on in the morning, that's it'.

(Zeke, 48, M, cNRT, NS)

'I guess the inhaler it does well. I mean, [with] the patches I don't like the idea of having constant nicotine in my system'.

(Rion, 29, M, cNRT, S)

Participants reported some caution about the likelihood of the randomly allocated pharmacotherapy provided to be successful in helping them quit.

'I didn't know. I was a bit sceptical [on] whether it actually worked or not, but I think it definitely does work'.

(Ben, 30, M, cNRT, S)

Barriers to smoking cessation were experienced by participants using both NVP and cNRT. For the NVP group, this mainly related to a period of adjustment to the different experience provided by the

device compared to smoking. For those using cNRT, barriers largely related to perceived side effects or costs of products, that may affect ceasing nicotine use overall.

'It is quite a different feeling in the lungs ... rather than like a cigarette ... Like, I'm very accustomed to it, but switching to the vape, it did take me a while to adjust ...'

(Ravi, 32, M, NVP, S)

'... if you wear it [patch] for the first 15 minutes, it gives you a bit of a high ... and I kind of found myself getting somewhat addicted to that high. It was ... an odd side effect'.

(Zeke, 48, M, cNRT, NS)

'Just because of the affordability of it ... They're very expensive in the chemist if you want to give up smoking'.

(Lisa, 49, F, cNRT, S)

Participants indicated that the subjective experience of using either NVP or cNRT could be improved by considering personal preference for device or product flavours.

'You could certainly change that liquid you put in that,'cause ... it's got a really glycerine type taste to it ...'.

(Casey, 47, F, NVP, NS)

'Maybe [include] flavours in the inhalers ...'.

(Tom, 45, M, cNRT, S)

'I like the fact that it [oral spray] was flavoured, and that it gave you some sort of, yeah, oral satisfaction'.

(Rion, 29, M, cNRT, S)

'... [It's] really good, because you can use it straight—you don't have [the] flavours or anything with it. That was an extra advantage to it too'.

(Cole, 43, M, NVP, NS)

3.3 | Theme 3: Nicotine usage pattern and perceived self-efficacy

Some participants described that their allocated nicotine product did not deliver enough nicotine to manage

cravings, while others found product strength suitable. Overall, product nicotine strength was mostly satisfactory for curbing participants' nicotine cravings and withdrawal. NVP group participants preferred to reduce the nicotine concentrations over time, which was not commonly described by cNRT participants.

'I'm [now] making a mixture of 5 mg[ml] ... and 2.5 mg[ml] ... and I'm leaning towards the 2.5 mg[ml] as much as I can. So, I'm doing the reduction thing ...'.

(Omar, 69 M, NVP, NS)

'I can control the strength of what I'm having ... and I can make it [with] less nicotine, which I do quite a lot ... I can reduce it from 2 [mg/ml] to 1.5 [mg/ml] and stuff like that. I actually have decreased my nicotine level'.

(Amy, 38, F, NVP, NS)

However, some participants noticed a progressive increase in their use of nicotine in the NVP condition, particularly those previously smoking very frequently, and this was not noted for those using the cNRT approach. Rather, the opposite—infrequent use—was reported as a cessation barrier for cNRT. This was also described in relation to perceptions of their self-efficacy in adhering to the cessation approach.

'I'd find myself actually [using it] more ... with a cigarette, you kind of smoke your cigarette until it's finished ... but with a vaporiser, it doesn't finish but you'll end up sitting there smoking it for longer and smoking more'.

(Ravi, 32, M, NVP, S)

'I've not been using the nicotine replacement stuff as much as I should. And ... I'm back to using cigarettes'.

(Brian, 39, M, cNRT, S)

'I thought it would help heaps, and it did. But in the back of my mind, I'm thinking I'll probably never give up cigarettes, or never give up nicotine'.

(Brian, 39, M, cNRT, S)

3.4 | Theme 4: Supportive behavioural counselling

Participants in both groups were provided access to Quitline support. As part of the larger trial, counsellors had received

bespoke training in how to support trial participants in quitting smoking regardless of intervention group. Participants were broadly satisfied with the service, although participants using NVP described receiving less help with their product, relative to participants using cNRT, and noted that their use of other addiction counselling services also met their quitting support needs.

'They were more interested in my smoking in general ... I think their main focus was ... you know, tobacco ... so, I know they've got nicotine replacement stuff, but I don't think they do vape'.

(Acacia, 41, F, NVP, S)

'I didn't really need so much of their help ... it wasn't because of them; it was just because ... I was having quite a lot of help at that particular stage [for] other issues'.

(Sarah, 71, F, cNRT, S)

A key barrier to Quitline engagement for participants in both groups post-discharge was the often complex and stressful life events of participants, which made it difficult to commit to receiving scheduled counselling calls, or they transitioned into different types of AOD treatment.

'I was going through a lot. I had a lot on my plate, and I basically forgot to use [Quitline]'.

(Tom, 45, M, cNRT, S)

'It was actually 'cause I was in rehab and only allowed my phone at certain times ... I'd often miss their calls and have to call them back ... Absolutely no fault of their own'.

(Ravi, 32, M, NVP, S)

However, Quitline was considered a valuable tool to recommend to people discharged from AOD withdrawal treatment.

'I would have no hesitation in recommending Quitline for someone, but I wouldn't be surprised if it was no help at all ... if it works for you, it works, so give'em a call ... and you know, perhaps the counseling will assist'.

(Wade, 54, M, NVP, S)

'Yeah, Quitline's actually pretty good ... They are helpful, they're pretty onto it, and they're good at what they do ... I actually have recommended it ...'

(Acacia, 41, F, NVP, S)

3.5 | Theme 5: Health and psychosocial changes

Irrespective of their allocated treatment for tobacco smoking cessation, many participants reported health improvements in their breathing and engagement in physical activity relative to when they were smoking tobacco, and some noted this increased their capacity for social participation, that they attributed to the tobacco smoking cessation process.

'I'm able to walk to school to pick [my daughter] up, and able to go to the shops now, which I wasn't before, because of lung capacity and everything'.

(Ash, 48, F, NVP, NS)

'Look ... currently, smoking less is the case right now—definitely positive for my respiratory health. Like, I'm not coughing all the time'.

(Rion, 29, M, cNRT, S)

Financial savings and reduced financial pressure were also noted by participants as a major benefit of cessation in both groups.

'I was paying ... \$69.90 per day for a pack of smokes ... the amount of money that I've saved just [quitting] ... was a bit of [a] motivator, but it wasn't enough to stop me smoking, originally'.

(Daniel, 51, M, cNRT, N)

Some participants also felt that the tobacco cessation program was assisting their progress in ceasing or reducing their drug of concern for which they sought treatment.

'Vaping [at] the reduced level, is helping me in regard to the alcohol situation ... It's very handy to pick up and vape, you know? So overall, I'm suggesting that it's helping reduce the alcohol situation'.

(Omar, 69, M, NVP, NS)

'Just my attitude towards [it]—If I can give up smoking, I can give up drinking'.

(Jason, 39, M, NVP, S)

Psychological benefits mostly related to higher perceived self-efficacy and sense of control achieved via quitting and were described in both cessation approaches.

'Generally, just a little bit more energy ... [a] little bit better mental health'.

(Ronan, 52, M, NVP, NS)

'I feel strong ... like I'll never go back to nicotine ever—[it's] pretty good'.

(Russel, 66, M, cNRT, NS)

Both use of NVPs and cNRT can potentially break the link between social participation and nicotine use.

'[People say] "you're not sociable," or "did you gather with two or three people outside and have a cigarette?" Even if it's cold or freezing—you just want that. And now, no. I don't need to do that, and you become more sociable'.

(Bruce, 52, M, NVP, NS)

'You kind of break that habit of going outside and having a cigarette at work ... hanging out with other smokers ... Whereas, if you're wearing a patch you completely break that habit'.

(Zeke, 48, M, cNRT, NS)

'Whatever it is in a cigarette, [this] is so much better, and the fact is it doesn't smell ... I can do it inside. I don't have to go outside all the time'.

(Erin, 49, F, NVP, S)

However, NVPs may also be suited as a substitute in social situations where others are smoking tobacco nearby.

'Just social [changes], you know. It's easy, plus ... when you go (out), you keep away from people. Well. I did go to pubs around people smoking and things like that ...'.

(Isaac, 66, M, NVP, S)

'Well, when you just want a jag of a cigarette you don't have to light a full one up, you can just have one puff [vape]'.

(Jason, 39, M, NVP, S)

3.6 | Theme 6: Social support for quitting

Both conditions reported social support for their cessation approach, with some differences between approaches. While some participants preferred to keep

their engagement in tobacco cessation discreet, many found that engaging their social networks could be positive and supportive.

‘It’s not like, “oh, what are they having?,” everybody knows if you’re having that you’re probably controlling your nicotine [use].’

(Priya, 60, F, NVP, NS)

‘Really supportive, they were so shocked because ... [I] was a heavy smoker, and to see me not rolling cigarettes all the time. So, people were really surprised I wasn’t smoking tobacco ... I had a lot of support and encouragement to stick with the vaping.’

(Amy, 38, F, NVP, NS)

‘It (cNRT) wasn’t a thing, wasn’t a conversation, or anything’.

(Lisa, 49, F, cNRT, S)

Notably, this support was qualified for some participants, given the relative recency of people using NVPs for tobacco cessation compared to cNRT, and media coverage of vaping.

‘People [say] they haven’t been around long and there’s not a whole lot of research on them. We haven’t seen long-term effects ... but other than that, people were very supportive of me quitting smoking’.

(Ravi, 32, M, NVP, S)

3.7 | Theme 7: Recommending use in AOD treatment contexts

Most participants in both the cNRT and NVP groups noted they would recommend their allocated approach to people leaving AOD withdrawal treatment, given their own smoking cessation experience.

‘I recommend them all actually, because each individual is different’.

(Lisa, 49, F, cNRT, S)

‘I’d pretty much recommend it to everyone ... Because once you start smoking you start drinking, and you start doing other things ...’.

(Jason, 39, M, NVP, S)

3.8 | Theme 8: Continued access and use

Participants were asked if they would continue using the product that they were allocated beyond the 12-week intervention period, and their reasons for this. cNRT participants largely reported not wanting to do this, due to cost barriers.

‘Oh yeah, I used it all up mate but, you know, I guess like I couldn’t afford it ‘cause I’ve got a family’.

(Cane, 34, M, cNRT, S)

Some participants in the NVP condition described stopping use of NVP after the intervention, when they had e-liquid remaining, emphasising they intended to cease NVP use entirely once they no longer needed to manage nicotine cravings.

‘I plan to be done before I use it up ... I have no intention of purchasing any more [NVP liquid].’

(Omar, 69, M, NVP, NS)

A key theme for the NVP condition was that Australia’s prescription access model for NVPs can be a barrier to this cessation approach, sometimes causing some to relapse to tobacco smoking or illegal purchasing of e-liquids. However, after completing the intervention, some participants resorted to illegal methods of accessing e-liquids, as they perceived barriers to prescription access.

‘I was like, “can I buy some [nicotine] liquid, you know, for my vape?” ... They were like, “oh, no, we don’t sell that.” ... That’s when I went to my GP ... but he couldn’t get it either because only certain GPs can do it ... I had to go back to tobacco ...’.

(Amy, 38, F, NVP, NS)

‘A lot of the [people] in the trial have difficult lives, different lives ... Well, there’s no way they’re gonna do it [prescription access], like the amount of time I’ve spent—and I get really frustrated’.

(Erin, 49, F, NVP, S)

Given that participants led complex lives, there was a need for healthcare professionals in a position to provide access to NVP-facilitated cessation to be aware that their clients find the process for legally obtaining NVPs very difficult to navigate.

'They're not gonna be able to like hunt down things ... you know, going to a GP to do this ... So, there's just too many barriers for lots of people together, including myself ... and if I can't do it, it's like near impossible. It's impossible for them to do it'.

(Erin, 49, F, NVP, S)

4 | DISCUSSION

This study has shown that providing nicotine, in either cNRT or NVP forms with Quitline support is acceptable and appreciated by AOD service clients, following their discharge from residential treatment. Service clients considered either provided pharmacotherapy to be beneficial for their tobacco cessation, with two key differences. Despite cNRT being considered convenient and effective, it can be seen as expensive to access. Conversely, NVPs were seen as convenient and beneficial for tobacco cessation, but difficult to legally access through Australia's prescription model. As this is the only remaining route for NVP-facilitated tobacco cessation in Australia, streamlining AOD service clients' access should be considered in smoking cessation support policies for such priority populations.

Evidence supports that NVPs can be an affordable tobacco cessation tool, compared to cNRT products like patches [25], and that the perceived high costs of some cNRT products can limit access by some people who smoke [26]. That it can be difficult for people in AOD treatment to obtain support to quit this deadly consumer product is concerning, given disproportionately high rates of tobacco-caused diseases. Yet the reality is that cNRT remains considerably cheaper than continued smoking, and legal access to NVPs varies widely in cost. The high acceptability and engagement reported in this study reveals an opportunity for additional smoking cessation support contact in existing services to help meet a clear need. Consistent with earlier work [27, 28], people in both treatment arms were motivated by the possibility of financial savings, yet the cost of cNRT was seen as prohibitive. Similarly, access to nicotine for NVPs was seen as a barrier.

Referrals to Quitline are not standard practice across AOD services [17], although all participants in the current study were referred to Quitline. Some participants who received extensive trial support and were motivated to quit smoking, reported returning to tobacco smoking after completing their cNRT or NVP provisions. Given this, proactive Quitline follow-up should be considered for integration into routine AOD service discharge practice, and should consider commitment to quitting, ability to forward plan, and phone access.

Participants in both conditions reported experiencing health and psychosocial benefits after reducing or

quitting tobacco smoking. These benefits extended to greater capacity for social participation, and positive disruption of social practices associated with tobacco smoking (e.g., contact with people smoking). For some participants, smoking cessation via NVP was supported by other people and was considered a visible signal of and attempt to manage nicotine use. As social support has a role in successful tobacco cessation interventions [29], further research is needed to see if this holds particular importance for people accessing AOD treatment services, given their often complex social needs after discharge.

Perceived benefits in managing nicotine withdrawal and cravings were high for both approaches. The ease of product use was valued, as was the ability to use as needed for short-acting products (i.e., NVP/inhalator), compared to nicotine exposure via NRT (i.e., patches). For some participants, nicotine e-liquid may be consumed at a higher rate than intended. It may be that some people require greater e-liquid access initially, with guidance on how to taper their usage to lower levels.

Using NRT in residential AOD treatment settings is common, as these settings are smoke-free during treatment [30]. Consistent with other research [18, 31], our findings show that NVPs can provide an alternative to cNRT that may be more acceptable for some clients, with participants noting the importance of satisfying both behavioural (e.g., inhalation) and biochemical aspects of smoking. As ability to choose NRT format is highly valued during quit attempts [32], this may fit with therapeutic frameworks that support providing a range of strategies for addressing substance use [33].

Barriers to the access of cNRT and NVP need to be addressed through communication about how access works, through potential financial support for access, and most importantly, through shared decision making and discussion of suitability for different cessation methods [34], and adequate preparation of initial pharmacotherapy supplies. Guidance in navigating subsidised cNRT and Australia's current NVP prescription access model is essential for all people who smoke tobacco. Guidance would particularly benefit AOD service clients, given their complex support needs. Quitline is a potential channel for this information and AOD services can recommend prescribers for nicotine titration and tapering advice. Indeed, the smoking cessation guidelines of the Royal Australian College of General Practitioners provides guidance on NVP access and use in quitting smoking [6].

Quitline behavioural counselling was highly valued as a supportive resource but should ensure participants using NVP receive more explicit guidance on how this cessation approach works. Information could be provided on how to achieve nicotine reduction over time, which may be a goal for some clients, particularly as NVPs are

commonly used for smoking cessation. Participants in the parent trial received one NVP training session while still in treatment [11] but providing 'vape-taper' guidance and behavioural support following discharge from treatment is a necessary consideration.

Our findings suggest some initial recommendations. First, nicotine products for tobacco cessation might be positioned as tools that can increase opportunity for social participation for AOD service clients, as a further incentive for tobacco smoking cessation. Second, given variability in AOD clients' use frequency and titration of nicotine replacement, a measure of nicotine dependence (e.g., Heaviness of Smoking Index [35]) should be administered at initial and subsequent clinical contact to inform client suitability for NVP-facilitated smoking cessation [36]. This will support discussion of potential risks and appropriate nicotine self-titration strategies. Third, as the explicit benefits of satisfying the behavioural aspects of smoking are unclear, this warrants further research, and consideration as to whether NVP use should be permitted in smoke-free AOD treatment settings, given such health services typically restrict vaping. Indeed, offering both cessation approaches at intake may better position service clients to choose the method that suits them best.

5 | LIMITATIONS

The sample was drawn from a randomised controlled trial with provided NRT, and as such is not an observational sample of people self-sourcing cNRT or NVP, and non-contactable participants' experiences may have differed. Research is needed to examine how unique experiences of AOD clients differ from the wider population who smoke and consumer engagement could help capture this. A larger proportion of interviewees were male, which may reflect the demographics of people receiving AOD treatment [37]. The parent trial used unflavoured nicotine vaping liquid, while typical retail NVPs are provided in a range of flavours, though the safety profile of nicotine vaping liquids requires further testing. Finally, interrelation of themes in this study should be examined with people receiving and delivering AOD treatment, particularly for formation of attitudes towards cessation methods.

6 | CONCLUSION

Residential AOD treatment service clients were comfortable using Quitline and either cNRT or NVP for tobacco smoking cessation following discharge. Both pharmacological interventions were viewed by clients as beneficial for managing nicotine cravings and

withdrawal. However, product cost posed a barrier to the use of cNRT for smoking cessation. Difficulty in navigating the Australian prescription access model was a barrier for those wanting to use NVP, a barrier likely shared more widely by people who smoke tobacco. Provision of as wide as possible a range of tobacco smoking cessation aids should be routinely and prospectively offered to AOD clients, to give them every chance of quitting.

AUTHOR CONTRIBUTIONS

Conceptualisation: Billie Bonevski, Amanda Baker, Victoria Manning, Coral Gartner; Natalie Walker, Cathy Segan, Chris Bullen, Linda Bauld, Adrian Dunlop; Methodology: Billie Bonevski, Joshua Trigg, Amanda Baker, Victoria Manning, Coral Gartner, Natalie Walker, Cathy Segan, Chris Bullen, Linda Bauld, Adrian Dunlop; Formal analysis: Joshua Trigg, Edwina Williams, Jane Rich, Billie Bonevski; Resources: Billie Bonevski; Data curation: Jane Rich, Joshua Trigg; Writing-original draft: Joshua Trigg, Jane Rich, Billie Bonevski, Edwina Williams; Writing-review and editing: Jane Rich, Billie Bonevski, Edwina Williams, Amanda Baker, Linda Bauld, Ron Borland, Chris Bullen, Mark Daglish, Adrian Dunlop, Coral Gartner, David Jacka, Dan Lubman, Victoria Manning, Rose McCrohan, Cathy Segan, Natalie Walker; Supervision: Billie Bonevski, Jane Rich; Project administration: Billie Bonevski, Jane Rich, Joshua Trigg; Funding acquisition: Billie Bonevski, Amanda Baker, Victoria Manning, Coral Gartner, Natalie Walker, Cathy Segan, Chris Bullen, Linda Bauld, Adrian Dunlop.

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CONFLICT OF INTEREST STATEMENT

None to declare.

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APPENDIX

QUALITATIVE INTERVIEW SCRIPT AND TOPIC SCHEDULE

My name is [researcher]. I am calling from the NEAT study and was hoping to ask you a few questions about your involvement in the trial. If you are interested, the interview can be completed over the phone and will take about 20–30 min. The interview will be audio-recorded and transcribed word for word. We will be interviewing other people involved in the trial to collect a wide spread of experiences and we will use that information to guide future practice and to write up and share in scientific journals and conferences. All the information is confidential, which means that you will not be identifiable. We might quote you when we share this information, but we will not use your name, we would just use generic information to describe you, like your age and gender. Are you happy to go ahead with the interview? [yes/no, note participant identifier/date].

1. Have you noticed any changes in your lifestyle or your health? Explore changes in family/friendship/work/study/emotions/lung capacity etc. Explore whether perceptions of changes are positive/negative
2. Was the NVP/cNRT easy to use? (Acceptability/feasibility)
3. Was there enough initial training to use the NVP/cNRT without further training
4. Were you satisfied with the support you received to use the NVP/cNRT throughout the trial?
5. Were you concerned about losing or breaking the NVP/cNRT?
6. Could anything else be done to improve the training or support for using the NVP/cNRT? Were there any points where you felt reluctant to talk to the researchers about your smoking and why?
7. Did the NVP/cNRT help reduce your cravings to smoke tobacco? (Perceived usefulness as a cessation aid)
8. Did you think the NVP/cNRT would work to reduce your cravings when you consented to participate?
9. Was there enough product (e-liquid/cNRT) so that you could use it as much as you pleased?
10. Would you have preferred the NVP/cNRT nicotine content to be stronger/weaker?
11. Do you plan on continuing using the NVP/cNRT? Why? (Query to replace cigarettes or to continue using as cessation aid). How? (Query same as usual or different liquid or device; query point of sale—access to e-liquid; query new prescription access path). Have you considered using any products other than NVP/cNRT as a cessation aid (if so, which)?
12. Could anything be changed to increase the effectiveness of the NVP/cNRT reducing your cravings?
13. Was the NVP/cNRT enjoyable to use? How supportive are those around you of your using NVP/cNRT to quit smoking?
14. What was pleasant/unpleasant about using the NVP/cNRT?
15. Would anything increase your enjoyment of the NVP/cNRT?
16. Was there anything that helped you or stopped you from using the NVP/cNRT? Explore barriers and facilitators to using NVP/cNRT. What did you like most about NVP/cNRT? What did you like least about NVP/cNRT?
17. Will you continue to use NVP/cNRT to help you quit smoking?
18. Would you recommend NVP/cNRT to other people leaving AOD withdrawal services to quit smoking?
19. How do you plan on continuing to access and use NVP/cNRT?
20. Was it easy to speak with people from Quitline?
21. Did you speak with Quitline while in the unit?
22. Was the information they provided relevant to your needs?
23. Did they call at good times for you?
24. Were they able to help you with using the NVP/cNRT?
25. Would anything increase the ease of speaking with Quitline?
26. Did speaking with Quitline help you stay quit?
27. Did they motivate you?
28. Did they teach you anything?
29. Did they suggest you access services to stay quit?
30. Did they suggest you try any behavioural strategies to stay quit?
31. Would it be useful to continue speaking with Quitline?
32. Would you continue speaking to them if you could/would you recommend them to a relative or friend who wanted to quit smoking?
33. Would anything increase the effectiveness of Quitline?
34. Was there anything that helped you or stopped you from using Quitline? Explore barriers and facilitators to using Quitline
35. What did you like most about Quitline? What did you like least about Quitline?
36. Will you continue to speak with Quitline to help you quit smoking?
37. Would you recommend Quitline to other people leaving AOD withdrawal services to quit smoking?
38. How do you plan to continue speaking with Quitline?

39. How effective do you think the following measures would be for helping you to stay Quit? Subsidising access to NVP devices and e-liquids for those leaving AOD services (NVP group). Gradually reducing the

number of places allowed to sell tobacco products to make them less easily available. Reducing the amount of nicotine in cigarettes and tobacco to make them less addictive, relative to NVP/cNRT.