

Lived experiences of stigma and altered self-perceptions among young people who are addicted to ENDS: a qualitative study from Aotearoa New Zealand

Anna Graham-DeMello ¹, Carissa Sanders,¹ Renee Hosking,¹ Lani Teddy,¹ Jude Ball ¹, Karine Gallopel-Morvan ², Yvette van der Eijk ³, David Hammond,⁴ Janet Hoek ¹

► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/tc-2024-058946>).

¹Department of Public Health, University of Otago Wellington, Wellington, New Zealand

²Ecole des hautes études en santé publique, Université de Rennes, Rennes, France

³Saw Swee Hock School of Public Health, National University of Singapore, Singapore

⁴School of Public Health and Health Systems, University of Waterloo, Waterloo, Ontario, Canada

Correspondence to

Professor Janet Hoek;
janet.hoek@otago.ac.nz

Received 26 July 2024

Accepted 22 October 2024



© Author(s) (or their employer(s)) 2024. No commercial re-use. See rights and permissions. Published by BMJ Group.

To cite: Graham-DeMello A, Sanders C, Hosking R, et al. *Tob Control* Epub ahead of print: [please include Day Month Year]. doi:10.1136/tc-2024-058946

ABSTRACT

Introduction Rising use of electronic nicotine delivery system (ENDS) among young people, especially those who have never smoked, has received considerable attention from the health community. However, fewer studies have examined the mental health impacts of ENDS use. We addressed this gap by exploring the stigma, altered self-perceptions and negative affect experienced by adolescents who assessed themselves as addicted to using ENDS.

Methods We interviewed 20 adolescents aged 16–18 who lived in Aotearoa New Zealand and assessed themselves as moderately or highly addicted to ENDS use. Using in-depth, semistructured qualitative interviews, we explored participants' experiences of addiction and its effects on their well-being. We interpreted the data using an inductive reflexive thematic analysis approach.

Results We identified four key themes. First, addiction to ENDS use adversely affected participants' physical and mental health. Second, addiction greatly diminished the pleasurable effects ENDS use first provided and participants who initially enjoyed using ENDS now felt unable to stop. Third, participants felt judged, stigmatised and belittled by others who did not understand their struggle with addiction. Fourth, they experienced several negative emotions, including self-blame, regret, disappointment and embarrassment that diminished how they saw themselves.

Conclusions We extend earlier studies by probing the mental health burden ENDS use imposes on young people, offer new insights into how they experience addiction and outline potential policy responses. Measures reducing young people's access to ENDS are urgently needed alongside empathetic, youth-oriented cessation support.

INTRODUCTION

Although envisaged as an alternative to smoking that could complement nicotine replacement therapy, electronic nicotine delivery system (ENDS) use has increased rapidly among young people who have never smoked.^{1,2} Regulatory loopholes, aggressive industry marketing, sleek product design, high nicotine content and enticing flavours have created highly appealing products^{3–5} with powerful addictive potential.⁶

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Although young people typically start using electronic nicotine delivery system (ENDS) socially, many quickly become addicted to nicotine and struggle to quit.
- ⇒ Research, to date, has generally concluded that people who smoke and move to exclusive ENDS use will face fewer risks; however, few studies have considered the risks addiction poses, particularly to young people who have never smoked regularly.

WHAT THIS STUDY ADDS

- ⇒ Young people who view themselves as addicted to ENDS experience considerable mental distress, which undermines their well-being.
- ⇒ Addiction led to feelings of judgement and stigma that fostered negative emotions, including self-blame, intense regret, disappointment and embarrassment.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Stronger regulation is required to reduce ENDS' widespread availability and appeal, thus decreasing uptake and the rapid pathway to addiction young people experience.
- ⇒ As well as stronger policy, governments need to develop empathetic and youth-specific cessation programmes that support young people who are addicted to ENDS to stop using these products.

While transitioning fully from smoking to ENDS use may reduce the risks faced by people who smoke, ENDS uptake among people who do not smoke may present harms.^{6,7} Most research has examined physical harms,⁶ including immune system suppression,⁸ oral health problems,⁹ acute cardiovascular dysfunction,¹⁰ vulnerability to lung inflammation¹¹ and more severe asthma symptoms.¹² However, the mental health impacts potentially faced by young people who become addicted to using ENDS, which include increased psychological distress,¹³ anxiety and negative self-view,⁸ have received less attention.

This research gap may reflect the inconsistent measures used to estimate addiction prevalence,

including time since waking to ENDS use and usage frequency.¹⁴ The 2023 US National Youth Tobacco Survey, which surveys students aged 11–18, revealed that 25.2% of current ENDS users reported using ENDS daily.¹⁵ However, recent waves found overall declines in ENDS use, with differing trajectories for middle and high school cohorts.¹⁶ Findings from Aotearoa New Zealand (henceforth Aotearoa) show stable prevalence among adolescent students (aged 14–15) in recent years, with reported daily ENDS use at 10% overall (though 22% among rangatahi Māori, the indigenous youth of Aotearoa).¹⁷ However, among those who use ENDS daily, the proportion that has never smoked rose from 20% in 2019 to 40% in 2023,¹⁸ and estimates of ENDS use among 15–17 years show ever, regular and daily use has continued to rise.¹⁹

These variations and the risk that proxy indices may not detect young people who consider themselves addicted,¹⁶ suggest an urgent need to apply valid measures of addiction among this population group. Simple, easily administered self-report measures can provide valuable insights into how respondents assess their addiction, and support more detailed qualitative and clinical analyses of young people's experiences.²⁰

Of the few studies examining how young people experience addiction or dependency, US and Canadian surveys have reported on associated symptoms (eg, strong cravings, concentration difficulties, inability to quit).^{21–22} Studies examining mental health effects have tentatively reported that ENDS use (and dependency) may trigger pre-existing susceptibilities to anxiety and depression.^{23–25}

Our earlier work examined the evolution of young people's ENDS practices, including motivation to experiment²⁶ and trajectories from trial to self-described addiction.²⁷ These studies described vaping's initially rewarding experiences and explained how these were transitory and diminished as addiction evolved. However, we lack detailed information on young people's lived experiences of ENDS addiction or policy responses to their predicament. Of the international studies we identified, two focused on dependency symptoms^{28–29} and one probed perceptions of anti-nicotine advertising.³⁰ A further study reported reasons underlying quit attempts among young people (USA; various regions), though text data were limited³¹ or did not probe how respondents processed their experiences.³² None of the studies we retrieved investigated the stigma or mental burden that addiction may place on young people or how policy-makers could reduce this burden.

We addressed this knowledge gap by exploring how young people viewed and experienced addiction to ENDS use and how addiction affected their mental well-being, experiences of judgement and stigma, and self-perceptions.

METHODS

Recruitment and participants

Study participants were 20 adolescents aged 16–18 who considered themselves addicted to ENDS use, lived in Aotearoa and could participate in an online or in-person interview. Because parental permission is required to interview youth under 16, we sampled only people who could consent on their own behalf. Our sample included young people in their final secondary school years, which allowed us to explore ENDS use experiences before youth enter a work, university or alternative setting. We initially recruited using social media (eg, community Facebook groups) and community advertising, then used snowball sampling to prioritise recruitment of Māori and Pacific young people.

People who responded to recruitment advertisements were directed to an online eligibility survey that explored their ENDS use history and experiences of addiction (see online supplemental file 1). We assessed addiction using the single-item self-reported E-Cigarette Addiction Severity Index (EASI) and included people whose scores indicated moderate to heavy addiction.²⁰

JH and AG-D contacted potential participants to assess their interest in participating, ensure their eligibility, answer questions and establish rapport. Of these people, we recruited 20 participants, 15 of whom were interviewed online (5 were interviewed in person on the University of Otago premises). Online supplemental file 2 presents our recruitment flow chart and details of the process followed.

Interviews

Our semistructured interview guide examined how young people's ENDS use trajectory had evolved; we probed their experiences of addiction, and how these experiences had affected them. JH, AG-D, CS and RH conducted interviews (54–77 min) during November and December 2023 (only interviewers and interviewees were present). After conducting 20 interviews (one of which involved a friendship pair, where we interviewed two participants together at their request),²⁶ we had sufficient 'information power' to identify themes that represented participants' experiences.³³ With participants' permission, we audio recorded each interview and used an online service (Rev.com) to transcribe the files; we assigned each participant a pseudonym to keep responses confidential. All participants could review and request edits to their transcript (none requested changes). Online supplemental file 3 contains the interview guide and outlines the approach taken.

Data analysis

We initially analysed participants' experiences of addiction using inductive reflexive thematic analysis.³⁴ To ensure sensitivity to cultural nuances, a Māori member of the research team reviewed transcripts from Māori participants and guided appropriate interpretation of these. We wrote summary and analytical notes to identify and compare response patterns, and consider how our experiences and values could affect data interpretation, given our status as Pākehā (white), middle-class researchers who have not experienced nicotine addiction.

We developed our coding framework iteratively and used NVivo V.20 (Release 1.7.1) to manage the data; AG-D, CS and JH independently coded three transcripts before meeting to discuss and agree on an initial framework; we repeated this process several times as we identified and nuanced themes.

To draw on international best practice and incorporate diverse perspectives on our research question, we established an advisory group comprising academics with expertise in youth smoking and ENDS use. Members of this group provided feedback on the study protocol, early findings and advanced versions of the manuscript; study participants were not approached to provide such feedback.

RESULTS

We first outline participants' characteristics (see table 1) before presenting four addiction-related themes. To address our research questions, we focused on addiction, though note that participants discussed multiple harms from ENDS use, including financial and environmental risks. Although we probed ENDS uptake, we do not discuss these findings as we have reported on similar themes elsewhere.²⁷ Participant pseudonyms have been

Table 1 Characteristics of study participants (n=20)

Characteristic	Number
Age	
16	9
17	9
18	2
Gender Identity	
Girls/women	16
Boys/men	4
Ethnicity (identification with multiple ethnicities possible)	
New Zealand European	18
Māori	13
Pacific	3
No. days used ENDS in past 30	
<20	0
20–24	2
25–29	1
Every day	17
Time to first ENDS use after morning waking	
Within 5 min	11
6–30 min	5
31–60 min	4
ENDS use pattern	
Uses occasionally during the day	1
Uses in short bursts several times a day	3
Puffs on a vape regularly throughout the day	16
Smoking status (cigarettes)	
Never smoked cigarettes	10
Formerly smoked cigarettes (does not anymore)	4
Currently smokes cigarettes	6
Occasionally	5
Regularly	1
E-Cigarette Addiction Severity Index- EASI [†]	
Self-reported: 0%–100% scale	
On a scale of 0%–100% (not addicted to extremely addicted), how addicted to e-cigarettes do you think you are?	
<50%	1
50%–75%	7
>75%	12
E-cigarette Dependence Scale	
I find myself reaching for my e-cigarette without thinking about it.	
Never or rarely†	1
Sometimes	3
Often or almost always†	16
I drop everything to go out and get e-cigarettes or e-juice.	
Never or rarely†	9
Sometimes	3
Often or almost always†	8
I vape more before going into a situation where vaping is not allowed.	
Never or rarely†	2
Sometimes	2
Often or almost always†	16
When I haven't been able to vape for a few hours, the craving gets intolerable.	
Never or rarely†	4
Sometimes	6
Often or almost always†	10

*We followed Vogel *et al* in interpreting EASI scoring, with scores >50% signalling at least moderate addiction²⁰; we considered those scoring >75% to be more heavily addicted. One of our participants self-assessed below 50% on EASI (45%); we considered the person eligible because: (a) this score falls close to 50%, (b) the participant's responses to the E-cigarette Dependence Scale (a 4-item questionnaire probing the strength of dependency-specific symptoms and behaviours) signalled a strong degree of dependency and (c) the participant's responses were highly similar to those of other participants.

†Signals that question responses (only one of which was selected by each participant) have been combined here for reporting purposes.
ENDS, electronic nicotine delivery system.

used for all quotations presented; we also present age, gender identity, ethnicity and cigarette smoking status alongside each quote. Online supplemental file 4 presents additional quotations that amplify the themes presented.

Breathlessness, stress, insomnia: addiction's impact on health and well-being

Many participants described how using ENDS had reduced their fitness and sporting performance. Pleasure once gained from intense aerobic workouts had waned or disappeared; Tui commented: 'It's been quite heart-breaking... I used to be super fit... really good cardio... nowadays... I can't [even] walk anywhere without losing my breath, getting a stitch'. (Tui, 17F, NZE/Māori, never smoked) Breathlessness had led Emilie to stop playing basketball and Rangī felt unfit and nostalgic when diving for kina [sea eggs]: 'I can only hold my breath for 20 seconds... I used to be able to do nearly a minute... it was so good.' (Rangī, 16M, NZE/Māori, never smoked) Alongside reduced fitness, several participants experienced negative health effects that they associated with ENDS. Elise reported concerning cardiovascular symptoms: 'Every single time I vape, my heart will get so sore... beating a lot' while Tama worried about longer-term outcomes: 'What's happening with my physical [health]... that's one of the biggest stresses I have... [the] effect it's gonna have on my future'. (Elise, 17F, NZE/Māori, never smoked; Tama 16M, NZE/Māori, smokes intermittently) Loss of stamina closed sporting opportunities, affected participants' mental well-being and created anxiety about future health risks.

Although several participants hoped that using ENDS would help them manage anxiety and stress, many instead found it aroused the very feelings they hoped it would reduce. Trina explained: 'It's quite a lot, mentally... I'm [now] getting more anxious and stressed because I can't [always] have [a puff] when I need it... It's actually... caused [me] more anxiety and stress.' (Trina, 16F, NZE/Māori, smokes intermittently) However, a minority found ENDS had helped them manage acute anxiety or panic attacks; Awhi explained. 'It became... [the] object I relied [on]... [In those moments it was] like taking a deep breath, and [then] coming out again [on the other side].' (Awhi, 16F, NZE/Māori/Samoan, smokes intermittently) While the mechanical process of using ENDS offered a minority a calming routine, cravings intensified the anxiety several participants experienced.

Cravings also affected some participants' ability to focus, particularly at school; Tama noted: '[I] start fidgeting with things and going off task'. (Tama, 16M, NZE/Māori, smokes intermittently) Thoughts about ENDS could become all-consuming; Tamsin explained: '[In class] you see words on paper, but [nothing goes] into your head... the only thing [you're thinking] is, 'I need a puff, otherwise [I'll] get mad'... [After taking a bathroom break to use ENDS] you're completely fine... like hitting the reset button on a slow computer.' (Tamsin, 16F, NZE, never smoked) Needing to use their device also disrupted several participants' sleep routine; they felt overstimulated or woke with intense cravings. Cara explained: '[When I vape just before bed]... the nicotine keeps [me] awake... Pretty much every night... I wake up [to] have a puff... [It] takes me... [one or] two hours to get back to sleep... definitely not [getting enough sleep].' (Cara, 18F, NZE, never smoked) Managing nicotine withdrawal left participants feeling they had lost control and some found it spawned a negative downward spiral.

The dawning bleakness of ENDS: repulsion and fatalism

Early experimentation with ENDS offered pleasurable new sensations and participants enjoyed the social opportunities that ENDS afforded. However, as addiction took hold, this pleasure disappeared and gave way to feelings of resentment and even disgust. Awhi noted: 'It's not even a fun thing [anymore]... It's just a habit. I got sick of it... [having this] device in your mouth... [to] blow out flavoured smoke... that sounds gross... I really hate it.' (Awhi, 16F, NZE/Māori/Samoan, smokes intermittently) Negative health effects intensified Kaia's dissonance: 'I was like, 'Why am I doing this?' I became... repulsed by vaping... I wasn't gaining anything from [it] and it wasn't... doing me any good.' (Kaia, 17F, NZE/Māori, never smoked) Participants lost the pleasure ENDS once offered; several began to loathe the practice they felt driven to perform and resented the increasing hold ENDS had over them.

Although many participants desperately wanted to quit, the strength of their addiction, alongside ENDS' ubiquity and accessibility, left them feeling doomed to continue. Elise noted: 'All my friends vape, so... there's no point in [giving up] now' and Tamsin explained: 'I'm surrounded by it all the time... my [friends] all do it... it's just so tempting to take a puff.' (Elise, 17F, NZE/Māori, never smoked; Tamsin, 16F, NZE, never smoked) While Leilani believed that using ENDS harmed her, quitting seemed overwhelming and she had resigned herself to an uncertain future: 'I'm... probably slowly killing [my lungs]... killing myself... I'll worry about it [when it happens].' (Leilani, 18F, Cook Island Māori, formerly smoked) Participants who had lost agency over using ENDS felt helpless: 'I try to [not] think about [my situation] much... there's nothing I can do to change [things] (Hana; 17F, NZE/Māori, formerly smoked).' ENDS' normativity had facilitated participants' initiation and uptake but now presented a significant barrier to quitting that threatened their well-being.

Adding insult to injury: the harsh reality of negative outside judgement

Many participants felt judged by adults in their lives, most notably their family, and resented criticisms; Emilie explained: 'I get pissed off [by my parents' opinions]... it's none of their business.' (Emilie, 16F, NZE, formerly smoked) However, others felt family disapproval could reflect deep-seated concern about vaping's effects: '[My grandparents] have expressed their feelings plenty... they want me to look after my health... it's coming from a caring place.' (Cara, 18F, NZE, never smoked) Overall, however, they saw contradictions in adults' positions and felt judged rather than supported.

Several participants felt teachers viewed them negatively because they used ENDS. Elise described how her teachers' antagonism had created a hostile and retaliatory school atmosphere that she resented: '[They would] tell us... how gross [ENDs use] is... [they'd say] 'It's ruining [you]'... [One] term... [they] were so strict... we weren't [even] allowed to go to the bathroom... If they had evidence of you vaping, they'd call your parents and show them the [video] tape.' (Elise, 17F, NZE/Māori, never smoked) Anahera was quick to identify the hypocritical stance she felt had been taken, given that ENDS use also appeared ubiquitous among teachers: '[They] always say it's bad, but we've seen a lot of them vape before... out[side] of school.' (Anahera, 16F, NZE/Māori, smokes intermittently) While teachers may have been following school rules, participants nonetheless felt judged; this feeling elicited strong reactance, and perceived contradictions between what adults said and did intensified the insult participants felt.

Many participants also felt looked down upon by adults in the wider public. Oriana felt aggrieved that people might consider her a 'bad kid' with 'bad parents' while Trina was tired of 'filthy looks' and 'rude' comments in public. (Oriana, 17F, NZE/Māori, never smoked; Trina, 16F, NZE/Māori, smokes intermittently) This anger reflected the helplessness participants felt as they struggled to cope with their predicament; Trina explained: 'It's the worst feeling... I got into it, I know that's my fault, but... it's hard to get out.' (Trina, 16F, NZE/Māori, smokes intermittently) To avoid what they felt were hostile interactions, some participants avoided using ENDS in public or near others, and adopted a 'considerate user' persona. Kaia noted: 'A lot of people shun [it]. So, I wouldn't usually walk down the street with [an ENDS] ... I wait until I'm... somewhere more secluded' (Kaia, 17F, NZE/Māori, never smoked). Participants struggled with perceived judgement and responded by changing their practices to avoid public scrutiny; however, they felt aggrieved at having to manage addiction alongside criticism.

Despite trying to pre-empt judgement, many participants felt self-conscious and worried about how they appeared to others. Elise noted: 'They look at me [as if to say]... 'She's addicted to nic[ot]ine and felt addiction signalled a character weakness. (Elise, 17F, NZE/Māori, never smoked) Others felt 'very, very embarrassed' at the thought someone they knew might see them using an ENDS (Lana, 17F, NZE, never smoked) and thought ENDS had given them a 'bad reputation' (Tui, 17F, NZE/Māori, never smoked). Although Awhi argued that ENDS use 'shouldn't define you as a person', it had come to dominate their external identity and changed how they saw themselves.

Perceptions adults judged them negatively sat uneasily alongside ENDS' widespread acceptance (and endorsement) by participants' peers. Although many said that nearly all their friends used ENDS and thought: 'It'd be kind of hypocritical if [they] viewed me differently when they're all [doing it themselves] (Miguel, 17M, NZE, never smoked), several felt non-ENDS using peers judged them critically, though most brushed these perceptions off as banter or 'a joke' (Hinemoa, 16F, NZE/Māori, never smoked). Nonetheless, a small minority felt deeply affected by peer-to-peer judgement; Tui commented: '[They've said things]... [that made] me feel... less human, because these people are not addicted, and they think that they're better than me.' (Tui, 17F, NZE/Māori, never smoked) ENDS use began as a highly normative social practice but evolved into one that attracted adverse feedback and left participants faced with deeply conflicting social reactions.

'I don't recognise myself': altered self-view and lost identity

Perceived external judgement exacerbated the negative feelings participants had about themselves. Realising they were addicted came as an unwelcome surprise and gave rise to intense self-blame; Oriana said: 'I used to be very proud of [my long-distance running and fitness]... I've... let [vaping] take that away... and very [quickly]... I'm quite disappointed in myself for that... I was warned... [but I] started [vaping] anyway.' (Oriana, 17F, NZE/Māori, never smoked) Participants initially felt immune to warnings about ENDS's addictiveness and mistakenly believed they would retain control and use their devices as they wished when socialising. Hinemoa reflected: '[I never thought] this would... happen to me... But, at the end of the day... it's nobody else's fault.' (Hinemoa, 16F, NZE/Māori, never smoked) Many participants blamed themselves for the predicament they were in. However, few considered how companies manufacturing and promoting ENDS had deliberately targeted them via attractive

product packaging, appealing flavours and cheap devices. Even fewer considered whether inadequate regulation had failed them.

Many participants deeply regretted having tried using ENDS; Rangi commented: 'There [are so many] downsides... If I [could change things], I would 100% [never] touch a vape... I would pay thousands if I could go back and tell myself 'Don't do that'.' (Rangi, 16M, NZE/Māori, never smoked) Some desperately wished to return to the past when they did not use ENDS: 'If I had never taken [that first] puff... I wouldn't [be getting] angry... or upset or irritated [every day]... I'd just be normal' (Hana, 17F, NZE/Māori, formerly smoked). ENDS's initial excitement and promise of stronger social connections and new sensations had instead left participants feeling diminished.

Several felt guilty about how ENDS use affected their personal health and family relationships. Kaia blamed herself because her unthinking use signalled that she had lost the control she expected to retain: 'It's quite bad... it's that guilty [feeling] again because... [my ENDS use is] at the point where it's become habit... [I just] reach for it... muscle memory.' She blamed herself for teetering between guilt and anxiety when her device ran out: 'I feel guilty... when one [device] dies and I [become] anxious [about]... need[ing] another.' (Kaia, 17F, NZE/Māori, never smoked) ENDS use had created a negative emotional spiral, leaving some participants unable to return to their preuse normality.

A minority outlined ENDS's serious effects on their mental health. Tui's reduced fitness had led her to withdraw from sport, which had previously supported her self-confidence and mental well-being: 'Since I've been [doing less sport]... [I] care less about how I feel... about how I [see] myself. It's... been the cause of my depression, really...' (Tui, 17F, NZE/Māori, never smoked). Trina mourned her lost identity: 'I personally just don't even look at myself anymore, because I don't recognise myself... it takes a [big toll]... [on] self-image...' (Trina, 16F, NZE/Māori, smokes intermittently). The negative emotions participants experienced were antithetical to the social benefits they expected to enjoy and several grieved for an identity (and feelings of self-worth) that ENDS use had taken from them.

DISCUSSION

In line with findings from earlier studies, participants' initial experiences involved pleasure, mood management and easier social connections.^{35 36} However, these feelings quickly diminished and, once addiction took hold, gave way to profound regret, self-blame and disappointment. Participants' fitness, overall health and sleep quality had declined, and many felt they had ceded control to nicotine addiction. Addiction heightened their sensitivity to perceived judgement from others and provoked harsh self-criticism as they realised how using ENDS had altered, and at times obliterated, the identity they had hoped to assume. Overall, participants' responses revealed their loneliness in facing addiction and many felt the adults closest to them did not offer support or understanding. These strikingly negative experiences reflected participants' feelings as they grappled with addiction.

Our work complements earlier studies that found associations, though not causal relationships, between ENDS use and significantly greater odds of short or insufficient sleep^{25 26} and depression and suicide-related outcomes,³⁷ relative to non-users. Experiences of lost control and negative judgement weighed heavily on participants and reduced their mental well-being and self-image. While earlier studies have reported associations between ENDS use and compromised mental health,^{24 25} ours is

the first in-depth exploration of how young people experience these negative effects.

Earlier studies have drawn on social identity theory to explain cigarette smoking uptake as a response to normative social group practices that create bridging and bonding social capital.^{38 39} Because ENDS initiation typically occurs socially, social identity theory may also help explain how ENDS use strengthens connections between peer group members and facilitates movement into new social groups.^{39 40} Previous studies also reveal similarities in the emotional trajectories of people experiencing addiction, whether to cigarettes or ENDS. These studies document regret,⁴¹ strong perceived stigma and judgement,⁴²⁻⁴⁴ and a potentially damaging loss of self-efficacy,⁴⁵ though few studies provide specific insights into young people's responses. Our participants did not anticipate that ENDS use would rapidly evolve from a casual social practice to an action driven by their overwhelming need for nicotine. Far from enhancing their social identity, ENDS use disrupted participants' everyday lives, diminished their interpersonal connections and reduced feelings of self-worth. They struggled to reconcile their earlier impressions of ENDS use with their lived experience of addiction, which undermined their overall well-being.

The profoundly negative impact experienced by young people underscores the need for robust policy interventions to protect them from aggressive industry practices. Capping retailer numbers (currently around 7500 in Aotearoa), allowing only specialist stores to sell these products, and disallowing any of these stores to operate within 500m of schools and marae (in Aotearoa, sacred communal spaces for Māori), could reduce young people's exposure and access to ENDS, and their use of these products. More rigorous national and local policy enforcement, particularly applying fines and withdrawing retailer licences to sell ENDS, could also help ensure existing regulations (ie, age restrictions) protected young people as intended. Disallowing sales of single-use ENDS products (disposables), as the New Zealand government has committed to, could also reduce access, though the impact of this measure will require close monitoring given how quickly the industry develops alternative products that undermine policy.⁴⁶

In addition, policy-makers need to prioritise developing and evaluating youth-specific cessation programmes. The considerable mental distress and negative self-judgement participants reported makes it crucial that responses to youth ENDS use are empathetic and do not compound these negative emotions (eg, avoid punitive reactions, such as school stand-downs). Our findings could also inform social marketing campaigns to support cessation programmes; for example, relatable and poignant testimonials of stigma and altered self-identity could deter ENDS uptake.

Like all studies, our work has some limitations. We experienced problems with imposter participants that interfered with recruitment, though are confident all participants were eligible (see online supplemental file 2). Despite our efforts to foster greater sample diversity, we had fewer Pacific and male participants relative to other ethnicities and genders. The lead researchers and interviewers were Pākehā (white), and Māori and Pacific participants were not interviewed by people of their own ethnicity. Despite our best efforts, we may have been less sensitive to culturally relevant nuances related to our research questions.⁴⁷ A Māori team member closely analysed responses by ethnicity and found no overt differences between Māori and non-Māori participants. However, higher ENDS use among Māori and Pacific adolescents¹⁸ highlights the need for future research, led by Māori and Pacific investigators, into these young people's

experiences with ENDS addiction, which could disrupt wairua (spiritual well-being) and undermine cultural connections.

Because we purposefully interviewed young people who self-described as addicted to ENDS use, we provide unique insights into their experiences but cannot generalise these to the wider population of young people who use ENDS. In addition, as participants were recruited from across Aotearoa and sample sizes from any one area or urban centre are very small, we do not believe we can comment on regional or community context. A minority reported current cigarette smoking (five occasionally; one regularly), though we did not explore how participants differentiated between the effects ENDS and smoked tobacco had on their health, well-being, or perceptions of stigma. Future research should probe these potentially different effects. Our small purposive sample meant we could not explore differences between participants who had never smoked and those who had; future research could also address this question and probe whether participants' responses vary by location or social setting.

We also note the changing regulatory environment in Aotearoa. For example, the government has reduced permitted nicotine concentrations (from 50 mg/mL down to 20 mg/mL and 28.5 mg/mL for disposable and reusable devices, respectively). However, these changes had not come into effect at the time of interviewing, and more than three-quarters of our participants reported using ENDS with higher nicotine concentrations (40 or 50 mg/mL). Our participants' experiences with addiction may thus differ from those of young people who have only accessed lower nicotine products and may change as new regulations take effect. See online supplemental file 5 for details regarding current vaping regulations in Aotearoa.

Given the distress some participants explained, future research should explore youth-focused programmes young people would find helpful. Future research could also probe the financial and environmental harms ENDS use causes and explore the perceived impact and acceptability of policies such as stewardship programmes proposed for smoked tobacco that require manufacturers to manage product waste.^{48 49} Methodologically, further studies could validate simple measures for assessing ENDS addiction (eg, the EASI scale) and ENDS-related psychological distress; developing common measures could support cross-national comparisons.²⁰

Our findings help develop a platform for this work. We extend earlier studies documenting symptomology by revealing the stigma and mental burden of addiction. Our findings illustrate the harsh external judgement and conflicting internal feelings young people experience, offer new insights into how they process and react to addiction, and underscore the need for a more comprehensive policy response.

X Jude Ball @JudeBall7

Acknowledgements We acknowledge our participants and thank them for their frank and very thoughtful responses.

Contributors All authors contributed substantially to the conception and design of the work, and to analysing and interpreting the data; all were substantially involved in drafting the manuscript and reviewing it critically and approving the final version for publication. All authors agreed to be accountable for all aspects of the work. AG-D is the guarantor.

Funding The Health Research Council of New Zealand funded our research (PI Hoek, programme grant 19/641).

Competing interests No, there are no competing interests.

Patient consent for publication Not applicable.

Ethics approval People interviewed in person gave written consent and online participants gave verbal consent. All participants received a US\$40 gift card to acknowledge their contribution. We received low-risk approval from a departmental ethics reviewer, subsequently endorsed by the University of Otago Human Ethics Committee (reference: D23/305).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as online supplemental information.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

ORCID iDs

Anna Graham-DeMello <http://orcid.org/0000-0001-5549-3269>

Jude Ball <http://orcid.org/0000-0002-4717-5495>

Karine Gallopel-Morvan <http://orcid.org/0000-0003-0152-4079>

Yvette van der Eijk <http://orcid.org/0000-0002-8095-1214>

Janet Hoek <http://orcid.org/0000-0003-4362-1539>

REFERENCES

- Kim J, Lee S, Chun J. An International Systematic Review of Prevalence, Risk, and Protective Factors Associated with Young People's E-Cigarette Use. *IJERPH* 2022;19:11570.
- Njie GJ, Kirksey Jones C, Jacques N, et al. Changes in Tobacco Product Use Among Students Aged 13 to 15 Years in 34 Countries, Global Youth Tobacco Survey, 2012-2020. *Prev Chronic Dis* 2023;20:E68.
- Graham-DeMello A, Hoek J, Drew J. How do underage youth access e-cigarettes in settings with minimum age sales restriction laws? A scoping review. *BMC Public Health* 2023;23:1809.
- Chaffee BW, Couch ET, Wilkinson ML, et al. Flavors increase adolescents' willingness to try nicotine and cannabis vape products. *Drug Alcohol Depend* 2023;246:109834.
- Azagba S, Ebling T, Adekeye OT, et al. Loopholes for Underage Access in E-Cigarette Delivery Sales Laws, United States, 2022. *Am J Public Health* 2023;113:568-76.
- Banks E, Yazidjoglou A, Brown S, et al. Electronic cigarettes and health outcomes: umbrella and systematic review of the global evidence. *Med J Aust* 2023;218:267-75.
- Eltorai AEM, Choi AR, Eltorai AS. Impact of Electronic Cigarettes on Various Organ Systems. *Respir Care* 2019;64:328-36.
- Becker TD, Arnold MK, Ro V, et al. Systematic Review of Electronic Cigarette Use (Vaping) and Mental Health Comorbidity Among Adolescents and Young Adults. *Nicotine Tob Res* 2021;23:415-25.
- Camoni N, Conti G, Esteves-Oliveira M, et al. Electronic Cigarettes, Heated Tobacco Products, and Oral Health: A Systematic Review and Meta-Analysis. *Appl Sci (Basel)* 2023;13:9654.
- MacDonald A, Middlekauff HR. Electronic cigarettes and cardiovascular health: what do we know so far? *Vasc Health Risk Manag* 2019;15:159-74.
- Sommerfeld CG, Weiner DJ, Nowalk A, et al. Hypersensitivity Pneumonitis and Acute Respiratory Distress Syndrome From E-Cigarette Use. *Pediatrics* 2018;141:e20163927.
- Overbeek DL, Kass AP, Chiel LE, et al. A review of toxic effects of electronic cigarettes/vaping in adolescents and young adults. *Crit Rev Toxicol* 2020;50:531-8.
- Cambron C. E-Cigarette Use Is Associated with Increased Psychological Distress among Youth: A Pooled Cross-Sectional Analysis of State-Level Data from 2019 and 2021. *Int J Environ Res Public Health* 2022;19:11726.
- Glantz S, Jeffers A, Winickoff JP. Nicotine Addiction and Intensity of e-Cigarette Use by Adolescents in the US, 2014 to 2021. *JAMA Netw Open* 2022;5:e2240671.
- FDA Center for Tobacco Products. Results from the Annual National Youth Tobacco Survey 2023, Available: <https://www.fda.gov/tobacco-products/youth-and-tobacco/results-annual-national-youth-tobacco-survey> [Accessed 7 Feb 2024].
- Birdsey J, Cornelius M, Jamal A, et al. Tobacco Product Use Among U.S. Middle and High School Students - National Youth Tobacco Survey, 2023. *MMWR Morb Mortal Wkly Rep* 2023;72:1173-82.
- Hoek J, Ball J, Gendall P. Smoking and vaping among 14 to 15 year olds: Government action urgently needed. Public Health Expert Briefing, 2024. Available: <https://www.phcc.org.nz/briefing/smoking-and-vaping-among-14-15-year-olds-government-action-urgently-needed> [Accessed 17 Mar 2024].
- ASH (Action for Smokefree 2025). ASH Year 10 Snapshot Survey 2022: Youth Vaping and Smoking, 2022. Available: <http://ash.org.nz>
- Annual update of key results 2022/23: new zealand health survey. Ministry of Health NZ; 2024. Available: <https://www.health.govt.nz/publication/annual-update-key-results-2022-23-new-zealand-health-survey>

- 20 Vogel EA, Prochaska JJ, Rubinstein ML. Measuring e-cigarette addiction among adolescents. *Tob Control* 2020;29:258–62.
- 21 Lin C, Gaiha SM, Halpern-Felsher B. Nicotine Dependence from Different E-Cigarette Devices and Combustible Cigarettes among US Adolescent and Young Adult Users. *IJERPH* 2022;19:5846.
- 22 Kechter A, Cho J, Miech RA, et al. Nicotine dependence symptoms in U.S. youth who use JUUL E-cigarettes. *Drug Alcohol Depend* 2021;227:108941.
- 23 Parns TA, Valverde R, Park-Lee E, et al. Symptoms of tobacco dependence among middle and high school tobacco users - Data from the 2019-2020 National Youth Tobacco Survey. *Addict Behav* 2023;137:107537.
- 24 Chaiton M, Fan J, Bondy SJ, et al. E-Cigarette Dependence and Depressive Symptoms Among Youth. *Am J Prev Med* 2024;66:104–11.
- 25 Bataineh BS, Wilkinson AV, Sumbe A, et al. The Association Between Tobacco and Cannabis Use and the Age of Onset of Depression and Anxiety Symptoms: Among Adolescents and Young Adults. *Nicotine Tob Res* 2023;25:1455–64.
- 26 Frost K, Graham-DeMello A, Ball J, et al. A Qualitative Analysis of How Underage Adolescents Access Nicotine Vaping Products in Aotearoa New Zealand. *Nicotine Tob Res* 2024;26:1370–6.
- 27 Graham-DeMello A, Sloan O, Frost K, et al. Young people's experiences of addiction to nicotine vaping products: A qualitative analysis from Aotearoa New Zealand. *Drug Alcohol Rev* 2024;43:1710–7.
- 28 Hanafin J, Clancy L. A qualitative study of e-cigarette use among young people in Ireland: Incentives, disincentives, and putative cessation. *PLoS One* 2020;15:e0244203.
- 29 Simpson KA, Kechter A, Schiff SJ, et al. Characterizing symptoms of e-cigarette dependence: a qualitative study of young adults. *BMC Public Health* 2021;21:959.
- 30 Wojtecka A, Kalinowska-Beszczyńska O, Tyrańska-Fobke A, et al. Adolescents' Perceptions and Attitudes towards Traditional and Electronic Cigarettes-Results of Focus Group Interviews. *Int J Environ Res Public Health* 2023;20:1438.
- 31 Amato MS, Bottcher MM, Cha S, et al. "It's really addictive and I'm trapped." A qualitative analysis of the reasons for quitting vaping among treatment-seeking young people. *Addict Behav* 2021;112:106599.
- 32 Crane LA, Asdigian NL, Fitzgerald MD. Looking Cool, Doing Tricks, Managing Stress, and Nicotine Addiction: Youth Perspectives on Nicotine Vaping and Implications for Prevention. *Am J Health Promot* 2023;37:964–74.
- 33 Braun V, Clarke V. To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qual Res Sport Exerc Health* 2021;13:201–16.
- 34 Braun V. Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Couns Psychother Res* 2021;21:37–47.
- 35 Pokhrel P, Herzog TA, Muranaka N, et al. Young adult e-cigarette users' reasons for liking and not liking e-cigarettes: A qualitative study. *Psychol Health* 2015;30:1450–69.
- 36 Hoek J, Thrul J, Ling P. Qualitative analysis of young adult ENDS users' expectations and experiences. *BMJ Open* 2017;7:e014990.
- 37 Jacobs W, Orozco G, Villanueva G, et al. E-Cigarette and Cannabis Use Patterns, Depression, and Suicide Behaviors Among US Youth: Analysis of 2019 Youth Risk Behavior Survey Data. *Am J Health Promot* 2023;37:77–83.
- 38 Tajfel H. Social identity and intergroup behaviour. *Soc Sci Inf* 1974;13:65–93.
- 39 Robertson L, Hoek J, Blank ML. A qualitative analysis of electronic nicotine delivery systems (ENDS) uptake and use among young adult never-smokers in New Zealand. *PLoS ONE* 2022;17:e0268449.
- 40 Kim D, Subramanian SV, Kawachi I. Bonding versus bridging social capital and their associations with self rated health: a multilevel analysis of 40 US communities. *J Epidemiol Community Health* 2006;60:116–22.
- 41 Fong GT, Hammond D, Laux FL, et al. The near-universal experience of regret among smokers in four countries: findings from the International Tobacco Control Policy Evaluation Survey. *Nicotine Tob Res* 2004;6 Suppl 3:S341–51.
- 42 Bell K, McCullough L, Salmon A, et al. Every space is claimed': smokers' experiences of tobacco denormalisation. *Soc Health & Illn* 2010;32:914–29.
- 43 Peretti-Watel P, Legleye S, Guignard R, et al. Cigarette smoking as a stigma: evidence from France. *Int J Drug Policy* 2014;25:282–90.
- 44 Sæbø G, Lund M. Is the perceived public stigma of smokers associated with value opposites? An exploratory cross-sectional analysis of Norwegian data 2011–2013. *Front Sociol* 2023;8:1051189.
- 45 Lozano P, Thrasher JF, Forthofer M, et al. Smoking-Related Stigma: A Public Health Tool or a Damaging Force? *Nicotine Tob Res* 2020;22:96–103.
- 46 Ball J, Katoa L, Hoek J. Specialist vape store audit reveals poor compliance with new e-cigarette regulations. *N Z Med J* 2024;137:72–85.
- 47 Addy N. White Privilege and Cultural Racism. *NZJC* 2008;28:10–23.
- 48 Curtis C, Collins S, Cunningham S, et al. Extended Producer Responsibility and Product Stewardship for Tobacco Product Waste. *Int J Waste Resour* 2014;4:157.
- 49 Curtis C, Novotny TE, Lee K, et al. Tobacco industry responsibility for butts: a Model Tobacco Waste Act. *Tob Control* 2017;26:113–7.