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Vaporized nicotine use among patients in HIV care who smoke tobacco: perceived health effects and effectiveness as a smoking cessation tool

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Abstract

Evidence suggests adverse health effects from vaporized nicotine (VN) use, such as electronic “e” cigarettes, and limited efficacy to aid tobacco cessation. People with HIV (PWH) smoke tobacco at higher rates than the general population, with greater morbidity, highlighting the necessity of effective tobacco cessation tools. PWH may be more vulnerable to adverse effects of VN. Using semi-structured 1:1 interviews, we examined health beliefs regarding VN, patterns of use, and perceived effectiveness for tobacco cessation among PWH in HIV care at 3 geographically diverse U.S. sites. PWH (n=24) had limited understanding of VN product content or health effects, presuming VN less harmful than tobacco cigarettes (TC). VN failed to adequately replicate the psychoactive effects or desired ritual of smoking TC. Concurrent TC use, and continuous VN use throughout the day, was common. Satiety using VN was elusive, and consumption quantity difficult to track. VN had limited desirability and durability as a TC cessation tool among the interviewed PWH.

Keywords

tobacco cessation; e-cigarettes; HIV infected patients

Introduction

Vaporized or “vaped” nicotine (VN), through use of electronic “e”-cigarettes (EC) and electronic nicotine delivery systems (ENDS) has grown since introduction into the U.S. in 2007 (Bao, Xu, Lu, Snetselaar, & Wallace, 2018; Centers for Disease Control and Prevention, 2019; McMillen, Gottlieb, Shaefer, Winickoff, & Klein, 2015) with use estimated among 3.2% of adults (Centers for Disease Control and Prevention, 2020a; Villarroel, 2020), ENDS use electrically heated coil to vaporize a liquid of propylene glycol and glycerol, often containing nicotine and flavoring, for inhalation (Hartmann-Boyce et al., 2016). Nicotine levels and ingredients within liquids vary (National Institute on Drug Abuse, 2020), however, many contain potentially toxic ingredients (Eaton, 2018). Originally

marketed as a tobacco cessation tool, multiple systemic reviews show lack of efficacy of VN for this purpose (Bozier et al., 2020; Kalkhoran & Glantz, 2016); one noted significantly less tobacco cessation among VN users compared to non-users (Kalkhoran & Glantz, 2016). Known health effects of VN use include elevated risk for chronic obstructive pulmonary disease (COPD) (Johns Hopkins Medicine, 2020), asthma (Johns Hopkins Medicine, 2020), myocardial infarction (Alzahrani, Pena, Temesgen, & Glantz, 2018), and lung injury and death (Centers for Disease Control and Prevention, 2020b). In the U.S., up to half of users continue to also smoke tobacco cigarettes (TC)(Centers for Disease Control and Prevention, 2020a); concurrent use of both VN and TC is believed to increase risk of COPD sixfold (Johns Hopkins Medicine, 2020) .

The extent of VN use among people with HIV (PWH) is less well known. One urban U.S. study of men who have sex with men noted higher rates of use among those with HIV (Santos, Tan, Turner, & Raymond, 2019). The use of VN among PWH may also be high elsewhere, given that TC use is higher among PWH compared to those without HIV [40–70% vs. 15%, respectively (Frazier, Sutton, Brooks, Shouse, & Weiser, 2018; Miles et al., 2019)], and given that most who use EC in the U.S. are current or former tobacco smokers (Mayer, Reyes-Guzman, Grana, Choi, & Freedman, 2020). Indeed, among PWH in HIV care in the U.S., high rates of concurrent TC and VN use have been observed (Nance R, 2017). Among PWH, smoking has been associated with poorer immunologic response to antiretroviral therapy (McClean et al., 2022). A review of evidence (Giles, Gartner, & Boyd, 2018) has shown greater harmful effects of smoking among PWH, including elevated risk of smoking-related cancers (Shiels, Cole, Kirk, & Poole, 2009) and cardiac complications (Freiberg et al., 2013). Seventy percent of myocardial infarctions among PWH have been found to be attributable to smoking (Rasmussen et al., 2015) and a triple excess mortality has been estimated compared to those without HIV (Helleberg et al., 2013). These findings raise concerns that VN may result in worse outcomes among PWH, particularly those concurrently using with TC.

Despite this, little is known regarding reasons for initiation, perceived health risks/ benefits, context surrounding use, actual use behavior, and perceived effectiveness as a TC cessation tool among PWH. We interviewed PWH with experience using VN to 1) understand motivations for initiating/using VN; 2) characterize patterns of use, including concurrent use with TC; 3) describe perceived effectiveness for smoking cessation, and 4) illustrate health beliefs surrounding VN.

Methods

Study design

We designed and conducted 1:1 interviews with PWH in accordance with the principles of Grounded Theory, an inductive process which uses purposive sampling and an iterative data coding process in order to generate hypotheses (Glaser, 1967).

Study population and recruitment

We approached PWH 18 for 1:1 interviews at 3 clinics in 2018 within the Centers for AIDS Research Network of Integrated Clinical Systems (CNICS): Fenway Health-Boston, MA; 1917 Clinic at the University of Alabama-Birmingham; and Madison Clinic at Harborview Medical Center/University of Washington-Seattle. Patients complete a pre-visit electronic assessment of patient reported outcomes (PROs)(Crane et al., 2007). Measures include domains relevant to PWH health including nicotine use. Patients indicating past-year VN use were eligible. We recruited a convenience sample of PWH by telephone. Site Institutional Review Boards approved study activity.

Patient Interviews

A multidisciplinary team of HIV care providers and researchers designed an interview guide querying key areas of interest regarding VN: 1) nomenclature, methods of use, and general product knowledge, 2) reasons for starting VN, 3) user experience, 4) patterns of use, including concurrent use with TC/other substances, 5) perceived health effects, 6) social dimensions of use, and 7) cessation attempts. Interviews were ~60 minutes. We offered \$60 compensation. Trained qualitative researchers conducted interviews.

Interview coding and analysis

An independent transcription agency transcribed interview audio recordings. Two trained qualitative researchers coded transcripts using Dedoose software (Sociocultural Research Consultants LLC, 2014). Coders independently sub-coded within each interest area using an open-coding process on a subset of 50% of transcripts. We achieved consensus on the final set of sub-codes through facilitated discussion.

Two analysts independently coded transcripts using these sub-codes. We addressed and reconciled differences in interpretation during a weekly meeting. We evaluated thematic saturation, the point at which no new themes emerge from additional interviews, after coding the 15th and 20th interviews. The qualitative project leader summarized emergent themes found within the coded categories. Study interviewers confirmed whether new themes had emerged from the yet-to-be transcribed interviews. We conducted four additional interviews upon finding saturation after the 20th; for which we determined that no new themes had emerged; we then ceased recruitment.

Results

All participants (n=24) were current or recent TC smokers (see Table 1). Table 2 illustrates individual reasons for initiating VN use, typical context for use, concurrence with smoking TC, and TC/VN cessation. Participants enumerated in Table 2 are associated with numbers in parentheses after each excerpt [e.g., participant #2 is “(P2)”].

Nine participants (38%) reported having since stopped VN. Of these, 8 had returned to smoking TC (89%); one quit both. Seventeen (71%) still currently smoked TC. Of those, eleven (65%) reported reducing use while VN; 42% reported both currently smoking TC and VN.

Nomenclature

Participants used the word “vape” as both noun and verb, however if referring to both action and object in same sentence, terminology was typically “smoking a vape”. EC use was referred to as “vaping” or “smoking” EC. “E-cig” or “e-cigarette” was often used as a catch-all term, even when referring to the use of ENDS/VN and not the actual cigarette. No participants used the terms “vaporized nicotine” or “ENDS”.

Methods of use

All used cartridge-based nicotine vaping devices. Several had started vaping using EC, but typically later moved on to vape cartridges, desiring a stronger effect. No one described sustained use of EC.

Context for use

The range of circumstances surrounding use resembled that of TC: during breaks at work, while driving, while waiting outside, etc. (see Table 2). Among several participants, VN was a means for eliminating or reducing indoor tobacco smoke.

Reasons for starting

Nearly all started vaping for health-related reasons (see Table 2); 59% had the goal of quitting TC entirely, while 41% wished to cut down. For approximately half of participants, co-workers, family, and friends motivated the switch from TC to vaping. Most perceived vaping as a safer alternative to smoking TC, as well as a smoking cessation tool:

I heard they were healthier for you because there was less nicotine and stuff in them, less carcinogens, chemicals. *Cisgender male, 36 (P1)*

In addition to lower cost and better flavor relative to TC, convenience and lack of smell were key reasons for using VN. While health reasons related to quitting TC were the primary driver for starting to vape nicotine, other reasons included lower cost, better flavor, and desire to avoid TC smell permeating home, their car, or workplace.

Perceived health effects/benefits/risks

Health effects of VN were either not known or were presumed to be minimal. By contrast, participants articulated adverse health effects of TC use in vivid detail. It was widely believed that adverse effects from VN paled in comparison to that of TC. By default, VN was regarded as a far healthier option, even when participants knew evidence to be lacking. This disparity in information between the two types of nicotine intake lent confidence to vaping as a healthier activity:

I haven't seen a study that says, “Ooh, e-cigarettes are bad for you,” ...I haven't really did the research on [TC] either...but the commercials tell you every day.
Cisgender male, 43 (P17)

The health impact relative to TCs was often referenced in terms of perceived absence of ‘toxins’ or ‘chemicals’:

... I feel like a lot of the toxins that would be in a regular cigarette aren't in the e-cigarette... *Cisgender male, 29 (P2)*

Some perceived the absence of inhaling burning tobacco smoke from TCs as a health benefit to vaping:

...You're not getting all the chemicals from a cigarette...when you light something on fire...it's different than if you're vaping...there's carcinogens [that] you don't get when you vape. *Cisgender male, 47 (P4)*

There was widespread lack of knowledge regarding what VN products contained. A common misperception was they were devoid of nicotine:

You get the sensation of a real cigarette but you don't get the tar, nicotine, all the side effects that tobacco...you know ingredients they put into it... *Cisgender male, 61 (P19)*

Several participants perceived health effects of vaping in terms of their own health changes and experiences:

...when I was smoking cigarettes I was always coughing. So...I cut back a lot. [Coughing] was very less with the e-cigarette. *Cisgender male, 29 (P2)*

Comparison to TC use

Positive attributes of vaping, beyond perceived health benefits, included ability to customize flavor or nicotine level. Negative attributes included difficulty achieving the desired psychoactive effect, loss of comforting rituals surrounding TC use, and difficulty tracking consumption.

Achieving desired psychoactive effect—Many customized aspects of vaping to approximate the effect of TCs, including selection of the right nicotine level. Some reported needing to adjust inhalation technique, with deeper and/or more frequent inhalation:

[To vape] you need to take a deeper breath from the diaphragm. *Cisgender male, 35 (P16)*

To satisfy that certain [TC] craving...on regular tobacco, I would only need like 2–3 puffs...with vape, it took more. *Cisgender male, 48 (P14)*

Being so used to [TC], sometimes I wish [vape] was a little stronger. So I would smoke it faster...trying to fill that void. *Cisgender male, 56 (P9)*

Difficulty measuring use—Unlike TCs, sessions were not marked by the end of consuming a single unit (a TC), making it difficult to estimate when “finished”. For several participants, vaping was not something you stepped away to do (as with TCs), but rather, a continuous activity throughout the day:

When a [TC] ended, you knew the time was over. With the vape you just lost track of time... *Cisgender male, 43 (P17)*

Some participants fit vaping into the framework of a traditional cigarette break. Yet, a sense of when one is “finished” was still unclear:

...it's a timing thing, because it takes 7 1/2 minutes to smoke [TC] and so I [vape] for about 7 1/2, 10 minutes...you can get a little light-headed and you're just like, “Alright, that's good.”. *Cisgender female, 34 (P8)*

Some found “having had enough” was achieved by a smaller number of deeper inhalations:

You just need a couple of puffs... less than smoking [TC]...[vaping is] a lot smoother so I tend to take bigger puffs... *Cisgender male, 36 (P1)*

Sometimes the onset of symptoms marked the end of a vape session:

You getting to gagging or coughing and you'll know that it's time to back away. *Cisgender female, 45 (P11)*

The concept of tracking how much one had vaped in any given time period was vague.

[I vape] all day long... with [TC] I could tell you how many milligrams of nicotine I was intaking— [but with vaping] there's just no way to tell. *Cisgender male, 43 (P17)*

On my way home I would vape, before I knew it, it was probably like 20 to 30 puffs...driving and not paying attention. *Cisgender female, 30 (P18)*

My whole family gets one liter and we share it...not really sure how much I myself use. *Cisgender male, 46 (P15)*

Loss of smoking ritual—Participants described a sense of loss of ritual with vaping relative to smoking. While the ritual of smoking TC offered a time-bound break to step away, collect one's thoughts, gain perspective, or socialize, the expedience of vaping diminished this:

...there's something soothing about [TCs]. I think a large part of [what you crave] is the ritual, the muscle memory. *Cisgender male, 34 (P24)*

[With TCs you could] take your coffee outside, have a moment with it...now I don't feel like I have these moments, which are 10-minute, 5-minutes long. [Vaping] only takes quarter of a second. *Cisgender male, 47 (P18)*

...there's a social connection you get when you're a [TC] smoker...those that smoke, you go off to smoke...there's kind of like a bond. It's a little bit different with vaping... you can vape anywhere...you're not really connecting the same way. *Cisgender male, 47 (P4)*

TC cessation attempts

Of those expressing intent to fully quit TC (n=14), 5 stopped, though 4 continued vaping nicotine. Everyone with the goal of at least temporarily reducing TC use did so, though two had returned to smoking TC and vaping concurrently. Perceptions of the effectiveness of VN as a TC cessation tool were mixed. For some, it was effective:

...[VN] does seem like it's at least meeting some of the physiological needs for the nicotine. *Cisgender male, 47 (P4)*

Like here and there I'd have a [TC] just to like – 'I need this today', but most of the time [I would use] just the vape. *Cisgender male, 27 (P8)*

Others gave up on VN, unsatisfied by it, and went back to the TCs.

[The vape] burnt out and it's like, "I'm done with these. They're not giving me what I want...I'll just be very minimal with my cigarettes." *Cisgender female, 57 (P5)*

Some wished to stop vaping, too, with varying degrees of success. VN appeared to be as addictive as TC for some:

I've been trying to stop vaping for a long time now but...it's hard to put it down... it's just like a cigarette. *Cisgender female, 45 (P11)*

Concurrent vaping and TC use

Concurrent vaping and TC use was common. Some vaped to substantially reduce or moderate their TC smoking:

I [vaped] for three days and ...tried to smoke a cigarette...really nasty. Gradually over time...I kinda detached from cigarettes. *Cisgender male, 34 (P24)*

One participant reported an increase in TC smoking since having started vaping:

Sometimes I feel [VN is] hindering me, because I just go back to smoking [TC] twice as much. *Cisgender female, 34 (P21)*

For some the use of TC's was situation-specific:

I guess mood dictates it if I'm a little stressed out I'd rather have a cigarette versus a vape pen. *Cisgender male, 36 (P1)*

I'll catch up with a friend, and [suddenly] we're smoking [TC]. *Transgender female, 32 (P22)*

The concurrence of continued TC use when vaping highlights the difficulty of full tobacco cessation:

I go back and forth with [TC and EC] in the hope of one day stopping....it's a process. If you've been smoking for a long time, it's not gonna happen overnight. *Cisgender male, 56 (P9)*

Discussion

All PWH initiated use of VN to reap health benefits associated with cessation/reduction of TC. Most perceived that any adverse health effects from VN were minimal relative to the well-publicized harms caused by TC. Yet knowledge of ingredients in VN liquid was limited. Several referenced VN liquid as a uniformly "nicotine-free" substance. Participants struggled to quantify their use of VN, in terms of determining how much was 'enough' in a vape session, and in estimating amount of VN liquid consumed. The efficacy of VN toward

TC cessation goals is unclear. While a few participants reported full TC cessation, many continued to both smoke and vape. While several reported at least a temporary reduction in smoking TC while vaping, its lasting effect appears questionable: PWH reported VN neither adequately approximated the desired psychoactive effects of TC, nor its familiar, comforting rituals.

In addition to the known and emerging health risks associated with VN use (Alzahrani et al., 2018; Centers for Disease Control and Prevention, 2020b; Johns Hopkins Medicine, 2020), our findings raise several concerns regarding the use of VN as a tobacco cessation tool among PWH. First, it is difficult to assess what is actually being consumed. Patients' lack of familiarity with VN products' ingredients, including presence or absence of nicotine, is further complicated by notoriously inaccurate VN liquid ingredient labeling: there have been multiple instances of "nicotine-free" products later found to contain nicotine (Bozier et al., 2020). Second, patients had difficulty self-assessing or regulating quantity used. Many reported not knowing or having only a vague sense of quantity used in a typical vape session, or over time; this was even less clear in the context of sharing VN liquid with other household members. This differs from TC use, which is easier to quantify (e.g., number of cigarettes). Several reported 'continuous' use throughout the day, aided by the convenience of device portability and the opportunity to vape in a broader variety of places.

A recent large cohort study found EC use to be of little benefit for tobacco cessation (Chen et al., 2022). Our interviews point to several possible reasons for this. For many, VN poorly approximated the ritual and desired psychoactive effects of smoking TCs. Achieving satiety, or an approximation of it, required changing intake strategies, often with deeper and/or continuous inhalation which was not desirable. PWH also felt a cherished personal ritual was lost when vaping. Unlike VN, smoking TC was described as having a clear and familiar start and end point that marked the passage of a specific amount of time, such as a break at work; whereas VN can be consumed more quickly and easily, and in a broader variety of contexts or settings, rendering its use to be less of a discrete 'event' to look forward to or experience. PWH also described a loss of social ritual that accompanies TC use, consistent with findings in the general population of smokers who have lamented loss of opportunity for shared introspection, intimacy, and relaxation with others upon cessation (Suarez, 2012). These factors appear to highlight why many continue to smoke TC as well as vape (Centers for Disease Control and Prevention, 2020a). Evidence elsewhere points to compensatory negative behavior, such as increased alcohol consumption, when transitioning from TC to VN (Hershberger, VanderVeen, Karyadi, & Cyders, 2016). There is concern that VN users who quit TC maintain an addiction to nicotine, and have merely modified the drug delivery system; there is substantial evidence of symptoms of dependence on EC (Eaton, 2018) with one randomized controlled trial finding that even among those that stopped smoking tobacco, 80% continued vaping (Hajek et al., 2019).

In addressing VN use among PWH, providers are faced with many blind spots: wide variation in vape product content and toxicity; limited patient knowledge of health effects; consumption that is potentially continuous and difficult to measure; questionable efficacy toward tobacco cessation goals. These combined factors may lead to higher nicotine intake than intended, with unintended health outcomes. Given these ambiguities and the possibility

of exacerbated risks of VN use in the context of an immunocompromised population, providers should initiate detailed discussion with PWH about the use of VN, particularly for PWH wishing to stop smoking TC.

Strengths

We recruited a geographically and ethnically diverse set of participants.

Limitations

News coverage of vaping-related fatalities emerged during the course of the study, potentially influencing perceptions regarding harmfulness.

Conclusion

PWH in HIV care reported that VN had limited effectiveness as a TC cessation tool, failing to adequately replicate the effects or ritual of smoking TC. This often resulted in concurrent use with TC, potentially increasing total nicotine intake. Satiety with VN was difficult to anticipate or achieve, and consumption quantity difficult to track. Knowledge of product ingredients and associated health effects was low. HIV care providers should prioritize querying details of VN use, including frequency, potency, VN/TC co-occurring use, and motivations for use as part of efforts to support nicotine cessation or reduction.

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Table 1.

Interview participant characteristics: patients living with HIV who use vaporized nicotine (n=24)

Characteristics	N (%)
Present sex	
Male	16 (66%)
Female	7 (30%)
Transgender female (male sex at birth)	1 (4%)
Age	
<30	2 (8%)
30–39	10 (41%)
40–49	7 (30%)
50	5 (21%)
Race	
White	11 (46%)
Black	6 (25%)
Asian/Pacific Islander	3 (13%)
Other/unknown	1 (0%)
Latinx	3 (13%)
Most recent CD4 count	
< 200	0 (0%)
200 – 349	0 (0%)
350	22 (91%)
Unknown	2 (8%)
Recent viral load	
0–400	22 (91%)
Over 400	0 (0%)
Unknown	2 (8%)
Years smoked tobacco	
0 to 5	2 (8%)
6 to 10	3 (13%)
11 to 15	5 (21%)
16 to 20	5 (21%)
More than 20	7 (30%)
No data	2 (8%)
Packs per day when smoked	
up to 1/2	8 (33%)
1/2 to 1	9 (38%)
1 to 2	4 (17%)
More than 2	1 (4%)
No data	2 (8%)

Characteristics	N (%)
Frequency vaping nicotine	
Every day or almost every day	10 (41%)
Once or a few times per week	2 (8%)
Once or a few times per month	1 (4%)
Once or a few times in past 12 months	4 (16%)
Not reported	7 (30%)
Years vaped nicotine	
Less than 1 year	10 (41%)
1–2 years	3 (13%)
2–3 years	2 (8%)
3–4 years	3 (13%)
Not answered	4 (16%)
No data	2 (8%)
Alcohol use	
At risk drinker	8 (33%)
Not at risk drinker	14 (58%)
Unknown	2 (8%)
Current drug use *	
Marijuana	11 (46%)
Methamphetamines	3 (13%)
Cocaine/crack	2 (8%)
Illicit opioids	1 (4%)
Injection drug use history	
Current	2 (8%)
Ever (not current)	6 (25%)
Never	14 (58%)
Unknown	2 (8%)

* multiple categories possible per individual

Table 2. VapORIZED nicotine (VN): reasons for initiation, context for use, cessation, and concurrent tobacco cigarette (TC) use

Participant #	Gender*	Age	Reason_Start	Context for use	Stopped TC?	Reduced TC?	Stopped VN?	Concurrent VN/TC?
1	Male	36	less nicotine and carcinogens than TCs	all day long, when drinking, when can't smoke socially	no	yes	no	yes
2	Male	29	to quit smoking TCs/preserve health, social stigma of TCs, liked VN smell	when drinking, after meals, watching movies	no	yes	no	yes
3	Male	59	to avoid smoking TCs/preserve health while in detox, social pressure	all day long, start in AM until just before bed, something to hold in hands and fidget with	yes	N/A	no	no
4	Male	47	to quit smoking TCs/preserve health	social gatherings and/or in the evenings, "me time", to "de-stress"	yes	N/A	no	no
5	Female	57	to reduce smoking TCs/preserve health	4 puffs per day for nicotine cravings	no	yes	no	yes
6	Male	37	to quit smoking TCs/preserve health	5 or 6 times per day, take a few puffs to reduce stress	yes, then restarted	NA	yes	no
7	Female	50	to reduce smoking TCs/preserve health	VN in morning, TC before bed, smokes pack of TC each day	no	no	yes	no
8	Male	27	to quit smoking TCs/preserve health, liked VN flavor	a few puffs every hour indoors at home for stress and boredom relief	yes, then restarted	N/A	yes	no
9	Male	56	to quit smoking/preserve health, alternative to nicotine, remove smell/discoloration from household, social pressure	after meals, indoors at home	no	yes	no	yes
10	Female	36	to quit smoking TCs/preserve health	driving, boredom, inside house	no	yes	yes	no
11	Female	45	to quit smoking TCs/preserve health after major health problem	all day long	yes	N/A	no	no
12	Male	32	to quit smoking TCs/preserve health, family health crisis	when in places where can't smoke	no	yes	no	yes
13	Female	30	to reduce smoking TCs/preserve health, peer influence, curiosity, desire to avoid smell	at work, in car	no	yes	yes	no
14	Male	48	to not smell like TCs at work (service industry), peer influence	after meal, work break	yes, then restarted	N/A	yes	no
15	Male	46	to quit smoking TCs/preserve health, less chemicals, to not smell like TCs at work (Uber driver), family/peers switched, reduce house smell	at home, in car	yes	N/A	no	no
16	Male	35	healthier than smoking TCs/preserve health, peers started	at home	yes	N/A	no	no

Participant #	Gender*	Age	Reason_Start	Context for use	Stopped TC?	Reduced TC?	Stopped VN?	Concurrent VN/TC?
17	Male	43	to quit smoking/preserve health, had health crisis	all day long	yes	NA	yes	no
18	Male	47	to reduce smoking TCs/preserve health	at home, with coffee	no	yes	no	yes
19	Male	61	to quit smoking TCs/preserve health, alternative to nicotine, peers started	in car, work break, after meals	no	yes	no	yes
20	Male	32	to reduce smoking TCs/preserve health, alternative to nicotine	when doing crystal meth	no	yes	no	yes
21	Female	34	to quit smoking TCs/preserve health, had bad reaction to patch	drinking alcohol, or outside for break	no	no, increased	no	yes
22	Transgender female	32	to reduce smoking TCs/preserve health, alternative to nicotine	all day long, outside, when stressed	no	yes	no	yes
23	Female	44	to quit smoking	all day long, also wakes up at night to vape	no	no	yes	no
24	Male	34	to quit smoking, less coughing, cheaper, peers started	all day long, first thing in AM, after class, on breaks, when anxious, when hungry, when needs to think	yes	N/A	no	no

* cisgender unless specified