



Smoking cessation methods among homeless youth in a Midwestern city

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ABSTRACT

Introduction: Nearly three times as many homeless youth smoke cigarettes in the United States (US) compared to the general population of youth. Few studies have focused on how to help homeless youth quit smoking. As part of a series of studies to develop a smoking cessation intervention for homeless youth, this study aimed to describe methods used in past quit attempts by homeless youth.

Methods: Recruited from a drop-in center in the Midwestern US, the analytic sample was comprised of 32 unaccompanied homeless youth aged 14–24 who smoked combustible tobacco at some point in the past week. In-person qualitative interviews were conducted to understand prior quit attempt experiences of homeless youth.

Results: Twenty-two youth (69%) were willing to quit smoking in the next 30 days. Most previous quit attempts were unassisted (78%). Participants frequently reported engaging in distracting behaviors (e.g., video games) or thoughts (e.g., remaining positive). Nicotine replacement therapy (NRT) was another popular method (38%), but with mostly negative reactions. While less common, vaping and use of cannabis to substitute cigarettes was reported in a notable fraction of youth (28%), primarily 18–24 years of age.

Conclusions: Youth are primarily engaging in non-evidence-based strategies to quit smoking. Existing evidence-based treatments are often underutilized or not used according to instructions, and youth who do use evidence-based treatments do not find them useful. Future research should explore effective cessation treatment among homeless youth that can ideally be provided at shelters and drop-in centers.

Implications: Existing evidence-based treatments are underutilized by homeless youth in this study. Most homeless youth are willing to quit in the next month and are interested in trying behavioral counseling and monitored use of NRT. Drop-in centers may be an effective location from which to develop and offer targeted smoking cessation interventions for homeless youth.

1. Introduction

Despite decades of decline in prevalence of tobacco use, it remains the leading cause of preventable death and disease in the United States (US), resulting in approximately 480,000 deaths each year (U.S. Department of Health and Human Services, 2014). Among US youth, cigarette smoking has declined since the mid-1990's (Miech et al., 2019). However, disparities in tobacco use among vulnerable populations persist. An estimated one in 10 youth and one in 30 young adults experienced a period of homelessness in 2017 (Morton, Dworsky, & Matjasko, 2018). Studies have shown that nearly 70% of homeless youth in the US smoke combustible tobacco (Wenzel, Tucker, Golinelli, Green, & Zhou, 2010), which is almost three times higher than the national estimate for the general population of youth (Baer, Ginzler, & Peterson, 2003; Bousman, Blumberg, & Shillington, 2005; Miech et al., 2019; Wenzel et al., 2010). Due to unstable living conditions,

victimization, abuse, and other adverse exposures, relief of stress and anxiety is often cited as the main reason for smoking in this population (Chen, Nguyen, Malesker, & Morrow, 2016; Pateman, Ford, & Fitzgerald, 2016).

Behavioral (e.g., physician advise, telephone counseling) and pharmacological interventions (e.g., nicotine replacement therapy (NRT), varenicline or bupropion) have been demonstrated through randomized controlled trials and other strong observational studies to promote smoking cessation among adults, and are thus evidence-based recommendations from the US Preventive Services Task Force (Patnode et al., 2015). A recent Cochrane review evaluating the evidence on smoking cessation interventions among young people (< 20 years old) concluded that, while evidence is limited, behavioral interventions (particularly group counseling and computer interventions) were effective in promoting smoking cessation (Fanshawe et al., 2017), but the evidence was less clear regarding pharmacological interventions.

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While research has explored smoking cessation among homeless adults, very few studies have examined smoking cessation methods or interventions among homeless youth. In a sample of 292 homeless youth smokers in Los Angeles County, about 80% of those who had made an attempt to quit in the past did so with no help from medicine, counseling, or other evidence-based resources (Tucker, Shadel, Golinelli, Ewing, & Mullins, 2015). Despite this, more than half of the sample expressed interest in cessation treatment options. Studies of homeless adult smokers have found that the environment in homeless shelters is not often conducive to smoking cessation, with limited non-smoking areas to convene, exchanging of tobacco among residents and staff, and the perception of tobacco use as a low priority issue for this population (Businelle, Poonawalla, & Kendzor, 2015; Garner & Ratschen, 2013; Stewart, Stevenson, Bruce, Greenberg, & Chamberlain, 2015; Vijayaraghavan, Hurst, & Pierce, 2016). One qualitative study of homeless adult smokers found that, similar to youth, nearly all participants tried quitting smoking in the past using self-generated, non-evidence-based interventions, including behavioral (exercise, screen time) and cognitive (recalling positive aspects of quitting) strategies (Collins, Orfaly, & Wu, 2018). Personal choice and willpower have been described as important factors when quitting in this population (Pateman et al., 2016).

The long-term objective of the project of which this study is a part is to develop a contextually targeted smoking cessation intervention for homeless youth (U.S. Department of Health and Human Services, 2020). The aim of the present analysis was to take the first step to explore homeless youth smokers' perspectives on both established smoking cessation interventions and any other strategies they have tried to quit smoking. We also aimed to discover what strategies have been effective in helping these youth quit in the past, and how these experiences may shape desired smoking cessation services in the future.

2. Methods

2.1. Study design

The study consisted of semi-structured face-to-face interviews lasting about 30–60 min conducted by trained staff with homeless youth smokers in a Midwestern city. The study was approved by a university Institutional Review Board.

2.2. Participants

Study participants were recruited from a drop-in center in a metropolitan area in the Midwestern US. This drop-in center for homeless youth (ages 14–24 years) provides case management and requested treatment services, including meeting basic needs (meals, hygiene), promoting health and wellness (addiction services, counseling), and providing connections to employment and education opportunities. Eligible youth for the overall study included those who reported having smoked combustible tobacco, including cigarettes and small cigars, some days or everyday in the past week and met the 2002 McKinney-Vento Act criteria (McKinney-Vento Homeless Assistance Act, 2002) for homelessness (lack a fixed, regular, and adequate nighttime residence; live in a welfare hotel or place without regular sleeping accommodations; or live in a shared residence with other persons due to the loss of one's housing or economic hardship). Additionally, to be included in the present study (a sub-sample of the larger study), participants must have reported a previous quit attempt and discussed methods used to quit. A waiver for parental consent was obtained for youth 14–17 years because of potential troubled parental relationships. Participants were provided a \$25 gift card to a local grocery for participation.

Thirty-six participants were recruited for the overall study, including 11 youth aged 14–17 years and 25 young adults aged 18–24 years. Ninety-two percent ($n = 33$) of the participants reported a past quit attempt, one of which did not discuss past quit methods. This

resulted in 32 youth and young adults (22 willing to quit smoking in the next 30 days, 10 not willing) in the final sample for the present analysis who made a quit attempt and discussed former quit methods.

2.3. Procedures and study instrument

Participants were consented (or assented) at the drop-in center. Then, two researchers conducted face-to-face interviews with participants using an interview guide. Informed by the Capabilities-Opportunity-Motivation theoretical framework for Behavior (COM-B) (Michie, van Stralen, & West, 2011), the guide included questions about psychological, physical, and social factors that have prompted participants in the past or may motivate them to smoke, make a quit attempt, or engage in supported smoking cessation. The COM-B model was used because it explicitly accounts for context in the production of behavior change and has direct applicability for use in homeless youth, where contextual constructs are as salient to behavioral change outcomes as individual constructs. The larger study from which the present analysis stems will examine tobacco use behaviors as they relate to specific COM-B model constructs to inform development of a smoking cessation intervention. A brief demographic and homeless experience form, used in previous studies with homeless youth (Slesnick, Guo, Brakenhoff, & Bantchevska, 2015; Slesnick et al., 2016), was administered following the interview to assess age, race/ethnicity, sexual orientation, gender identity, relationship status, whether the participant has children, education, employment status, and homeless experiences (age at homelessness, length of longest period without shelter).

2.4. Data analysis

Audio-recorded interviews were professionally transcribed. Researchers used ATLAS.ti 8.4.2 software to facilitate coding and analysis. An iterative, team-based approach was employed to develop the codebook, code the interviews, and identify predefined and emerging themes from the raw data. Combinations of two out of three researchers independently coded each quotation of every interview (randomly assigned to coders), and the research team adjudicated disagreements. Two researchers jointly identified themes based on predefined coding groups and themes that emerged during the analysis process. Inter-coder reliability was assessed using the Krippendorff's alpha, which was $\alpha = 0.791$ in this study (Krippendorff, 2004). Quantitative data from the demographic survey were used to characterize the study sample and for descriptive purposes when reporting the qualitative findings.

3. Results

3.1. Sample characteristics & smoking cessation methods used

Thirty-two participants were recruited and interviewed by two researchers between March and September 2018. Participant demographics are summarized in Table 1. Participants were about evenly split by gender, whether they had children, and employment. Most of the participants were 18–24 years old at the time of the interview, identified as Black, were in a relationship but not married with a partner who smokes, and had less than a high school education. Although the majority of the participants were identified as heterosexual, almost one quarter identified as bisexual. The mean age when participants became homeless was 17 years, and the mean length of the longest period without shelter was 15 months. Over two-thirds of the participants were willing to quit combustible tobacco in the next month following the interview.

When prompted to describe methods used in past quit attempts (“When you’ve tried to quit smoking in the past, how did you try to quit?”), participants described both evidence-based (e.g., nicotine replacement therapy (NRT)) and non-evidence-based strategies, including the use of vape products (all participants who used “vape” products

Table 1
Participant characteristics (N = 32).

	n
Gender	
Male	17 (53.1)
Female	15 (46.9)
Age	
14–17	10 (31.3)
18–24	22 (68.8)
Race/Ethnicity	
White	7 (21.9)
Black	19 (59.4)
Multiracial	3 (9.4)
American Indian	1 (3.1)
Other	2 (6.3)
Sexual Identity*	
Straight	19 (59.4)
Gay	1 (3.1)
Bisexual	7 (21.9)
Pansexual	2 (6.3)
Gender nonconforming	1 (3.1)
Children	
Yes	14 (43.8)
No	18 (56.3)
Marital Status*	
Married, but separated	1 (3.1)
Relationship, not married	21 (65.6)
Single	9 (28.1)
Partner Smokes*	
Yes	16 (50.0)
No	6 (18.8)
No partner	9 (28.1)
Employment*	
Unemployed	14 (43.8)
Part time	11 (34.4)
Full time	7 (21.9)
Education	
< HS	17 (53.1)
GED	2 (6.3)
HS	11 (34.4)
Some college	1 (3.1)
Willing to Quit in Next 30 Days	
No	10 (31.3)
Yes	22 (68.8)
Mean age at homelessness (range)**	17 (5–24)
Mean length (months) of longest time period without shelter (range)*	15 (1–84)

*One participant did not respond to this question.

**Two participants did not respond to this question.

referred to them as such, so we use this term throughout the manuscript instead of “e-cigarettes” or “electronic nicotine delivery systems”) and other substances (Table 2). Below are some themes drawn from interviews with the youth, ranging from use of non-evidence-based approaches to quitting (most frequently discussed method) to use of evidence-based strategies.

3.2. Non-evidence-based strategies

3.2.1. Self-help behaviors

All but one youth aged 14–17 described utilizing a self-help strategy to attempt to quit smoking in the past. Some youth described “going cold turkey,” while others discussed ways that they attempt to distract themselves from the cravings:

I tried to think more positive thoughts. Like when I got the urge to smoke, I was just like, no, get something to drink or watch TV, play the video games, something. I tried to distract myself from it ‘cuz it would just pop into my head like, cigarette, or mild [Black & Mild], or just the image of it. (Female, 14–17, willing to quit)

Young adults (18–24 years) also described engaging in other activities to distract from the urge to smoke, particularly those who

Table 2
Former smoking cessation approaches reported among participants.

Approach	Examples	Participants mentioning this approach
<i>14–17*</i>		
Self-help	<ul style="list-style-type: none"> ● Cold turkey ● Smoking restrictions in home ● Weaning off/cutting down ● Distractions/other activities (e.g., video games, movies, reading, sports) ● Saved money ● E-cigarettes 	10
Vape product	–	2
Other tobacco product or substance	–	0
Nicotine replacement therapy	<ul style="list-style-type: none"> ● Patches ● Gum 	3
Medical treatment	–	0
Behavioral treatment	–	0
Other	<ul style="list-style-type: none"> ● Restricted in a care facility 	1
<i>18–24 (Willing to Quit)</i>		
Self-help	<ul style="list-style-type: none"> ● Cold turkey ● Beverages/candy (e.g., gum, coffee, water) ● Weaning off/cutting down ● Distractions/other activities (e.g., tried not to think about it, sports, creating art) ● Disposed of cigarettes ● E-cigarettes ● Cannabis 	10
Vape product	<ul style="list-style-type: none"> ● E-cigarettes 	2
Other tobacco product or substance	<ul style="list-style-type: none"> ● Cannabis 	1
Nicotine replacement therapy	<ul style="list-style-type: none"> ● Patches ● Gum ● Inhaler 	4
Medical treatment	–	0
Behavioral treatment	<ul style="list-style-type: none"> ● Behavioral counseling 	1
Other	–	0
<i>18–24 (Not Willing to Quit)</i>		
Self-help	<ul style="list-style-type: none"> ● Cold turkey ● Food/candy (e.g., gum) ● Distractions/other activities (e.g., tried not to think about it) ● Saved money ● E-cigarettes ● Cannabis 	5
Vape product	<ul style="list-style-type: none"> ● E-cigarettes 	1
Other tobacco product or substance	<ul style="list-style-type: none"> ● Cannabis 	3
Nicotine replacement therapy	<ul style="list-style-type: none"> ● Patch ● Gum/patch combination 	5
Medical treatment	–	0
Behavioral treatment	–	0
Other	–	0

*Only one youth aged 14–17 was not willing to quit smoking, so we have pooled all youth ages 14–17 together.

expressed a willingness to quit in the next month. Activities included participating in sports, creating art, sleeping, and simply trying to keep one’s mind off of smoking. One participant engaged in more extreme measures to restrain himself:

I used to lock myself in my room and just not go out, ‘cuz if I went out I was gonna go get a cigarette or go take a bathroom break. But I’d basically lock myself, secluded myself, into my room with my video game and that’s how I’ve tried to get over it. (Male, 18–24, willing to quit)

Many of the young adult participants mentioned using some type of food or beverage to replace smoking, including chewing gum,

sunflower seeds, hard candy, coffee, and increased water intake. They pursued this strategy because, as one participant put it, “my mouth was always doing something” (Male, 18–24, willing to quit). Several participants attempted to reduce their cigarette use over time, and several reported planning to try this in future quit attempts as well. Others reported saving money for other priorities (e.g., phone bill). One female participant (18–24 years) who was willing to quit smoking destroyed her pack of cigarettes and disposed of them.

3.2.2. Vape products

Several participants (mostly young adults) reported using a vape product to quit smoking cigarettes. Perceptions about vaping’s efficacy were mixed:

Yeah, I was able to vape a little bit, but it was nothing like- It’s different. Yeah, it was nothing like a cigarette. (Male, 14–17, not willing to quit)

I’m also vaping- Which is way healthier than smoking cigarettes ‘cuz it’s just you get the nicotine but it’s not as much nicotine as actual. My mom, my aunt, my birth mom, and my grandma and grandpa, they all vape. (Female, 18–24, willing to quit)

There was some interest by a few participants to try vape products for future quit attempts and to be able to lower the nicotine content to zero and get completely off of tobacco products:

I know a lot of people go to vaping with no nicotine. Just to get off smoking. They liked us a session of just having something to smoke, that’s what they liked. So vaping helps some, with no nicotine. Some people put nicotine in there, but that’s still the same thing. (Female, 14–17, willing to quit)

I think that the vaping is super popular right now. And it’s helped a lot of people get off from smoking cigarettes. And then eventually completely quit altogether. (Male, 18–24, willing to quit)

Another participant predicted vaping may be more effective than nicotine patches because he has seen some people wear multiple patches at once to absorb a higher level of nicotine, assuming vape products deliver nicotine more efficiently than patches:

I: So do you think that the vaping would actually be better than the patch or the gum?

P: Mm-hm. ‘Cuz some people, I’ve seen people wear two, three patches. (Male, 18–24, willing to quit)

3.2.3. Other tobacco products and substances

Due to the prevalence of poly-tobacco use in this population (Kish, Reitzel, Kendzor, Okamoto, & Businelle, 2015; Neisler, Reitzel, & Garey, 2018), we expected to hear participants discuss use of other tobacco products (other than vaping) to quit smoking combustible tobacco. However, no participants reported doing so.

No youth ages 14–17 reported using another substance to quit smoking. A few young adults 18–24 years of age reported using cannabis to quit smoking, all but one of which were unwilling to quit smoking in the next month. One participant discussed using cannabis as a substitute for smoking as well as for other substances:

Smoke weed really helps. I will just smoke weed and I’ll stop whatever drug I’m on. (Male, 18–24, not willing to quit)

Another participant expressed concern that no matter what quit method someone uses to stop smoking cigarettes, even if they succeed in quitting smoking, “everybody’s just gonna resort to weed at that point” (Male, 18–24, not willing to quit).

3.3. Evidence-based strategies

3.3.1. Nicotine replacement therapy

A little less than half of the participants reported having tried NRT

in a past quit attempt, including patches and gum (or both). The majority referred to NRT negatively, reporting either bad taste or feeling sick after using: “I was gonna say, cuz the patch makes people sick and the gum just makes you throw up.” (Female, 14–17, willing to quit). However, some participants did not know what NRT was when the interviewer asked about it, and for those who knew what it was, it was uncertain if they understood how to use it as directed:

I mean, it was like 15 min later. I think that’s enough of this. Take it off. (Male, 18–24, not willing to quit)

I tried gum before, but I didn’t know you were supposed to spit the liquid out. I swallowed it and it made me sick to stomach. And I was like nope, not doing that no more. (Female, 18–24, willing to quit)

Whether as a result of using incorrectly or for other reasons, most of the youth who had tried NRT reported that it did not work well for them to help them quit smoking: “I’ve tried a patch and the Nicoderm patch was trash. It was trash. For me, it was trash cuz it wasn’t helping” (Male, 18–24, not willing to quit). Despite it not working for many participants, participants seemed to understand the value of NRT as a user-friendly evidence-based smoking cessation aid: “[...] the patch and stuff, you really can’t do nothing but put it on your skin, so I would encourage that. And gum, all you can do is chew it, so” (Female, 18–24, willing to quit). When asked if NRT should be given to youth at the drop-in center, most agreed that it should, but some believed it should be monitored so that people use it correctly and do not use too much at once:

I: So what are some of the things that we should be thinking about in terms of trying to use nicotine replacement therapy or another type of medication for youth here?

P: I don’t know. I’ve never been on the patch or anything. I’ve never tried that.

I: Sure, do you foresee maybe any issues if we would try to offer some of that stuff here?

P: Yes cuz people, that just makes me think of the news and stuff that happened on the news. [...] They do overboard stuff, so you really wanna be careful with that. (Female, 14–17, willing to quit)

3.3.2. Medical treatment

No one mentioned having tried medical treatment (i.e., varenicline, bupropion) in a former quit attempt. Many participants were unaware that medical treatment was an option, and some expressed concerns about it being given to youth at a drop-in center and were worried about possible side effects:

I mean, side effects, that’s what I worry about. What are the side effects of the pills? (Female, 18–24, willing to quit)

In addition to potential side effects of the medicine, others were concerned about people abusing the pills or even trying to sell them for profit.

‘Cuz if you give them a pill to help them stop smoking they’re probably going to try to sell them to get high or something. (Male, 18–24, not willing to quit)

3.3.3. Behavioral treatment

One participant reported receiving behavioral treatment in a previous quit attempt. This participant did not report a positive experience associated with this treatment:

Yeah they offered counseling. We had counseling once a week. We had levels every week on Wednesdays and I hate it. They were just there to brainwash you. (Male, 18–24, willing to quit)

Despite this one negative experience, other participants described being interested in smoking cessation counseling in the future, particularly at the drop-in center. When participants discussed what they

would like out of counseling, many of them described needing help finding alternative coping strategies besides smoking to deal with their stress and to identify triggers: “Certain triggers for people that need to smoke like stress, anxiety, seeing people smoking or being offered it” (Male, 18–24, willing to quit). Many felt it would be useful to meet in a group setting, but many others wanted individual assistance with whatever challenges they were facing:

You gotta like talk to them individually. Figure out when they smoke cigarettes, why they smoked cigarettes, how they're feeling when they smoke that cigarette, like whatever the situation is, it's different. (Male, 18–24, willing to quit)

3.4. Other approaches

One participant quit because tobacco use was restricted at an in-patient care facility.

3.5. What “Worked” to help homeless youth quit smoking

Despite what strategy was used, many participants did not believe they could succeed at quitting unless they had a strong motivation to quit – “if they're not in any way trying then I don't think it would, I think it would be a complete waste of time” (Female, 18–24, willing to quit).

Youth ages 14–17 described succeeding in quitting by distracting themselves with other activities like playing video games, and most participants mentioned the need for structured activities at the drop-in center that they can engage in instead of smoking. In addition, both cutting down on cigarettes and vaping were described as working for a bit, but not in the long-term. For one participant, cutting down only worked until anger interfered because smoking helps with anger management: “You think you bought a smoke, nope, and then when it's necessary like I get really, really mad to the point I'm about to snap like punch on somebody. It kinda calms me down a little bit.” (Female, 14–17, willing to quit).

Vaping was described as not satisfying cravings and not being similar enough to cigarettes to substitute them well. There were similar opinions about NRT; however, some participants believed in the potential for NRT if use is monitored at the drop-in center:

And I definitely think you guys should not just give it away, just give it to people just because they're smoking? Because everybody's bodies are different, you never know. But I definitely think you all should have a setting where you guys check and see if that person could take that too. (Female, 18–24, willing to quit)

Most young adults 18–24 who were not willing to quit in the next month did not report successful quit attempts. However, chewing gum and sunflower seeds were described as working for a bit, in one case resulting in a participant quitting for one year, and cannabis “really helps” to stop smoking. Young adults willing to quit in the next month reported more successful quit attempts:

So, chewing gum and not smoking cigarettes, for those two days that I'll chew on a gum that kind of took it off my system a little bit. (Female, 18–24, willing to quit)

Chewing gum “was just calming” and hard candy sometimes worked depending on the participant's level of frustration (if frustration was high, it was less effective). Quitting cold turkey was not a successful strategy because after a couple of days, participants described “crashing hard” and needing to smoke again. No young adults reported success with NRT:

I tried the patch for like two days, sucked. It just sucks. It sucks, it really do sucks, if you hear anybody just about to get the NicoDerm patch I wouldn't recommend it, at all, it doesn't work. Well, I'll tell you what, it might work, depending on who the person is. I will say

it might work, depending on who the person is. Me personally, It's not gonna work. (Male, 18–24, not willing to quit)

4. Discussion

Consistent with other research, the majority of homeless youth in this study were interested in quitting, but did not report much success with the treatment options available to them (Tucker et al., 2015). Youth were overwhelmingly trying non-evidence-based methods of quitting over evidence-based treatments, which is likely due to either a lack of access to such treatments or a lack of knowledge of what evidence-based treatments are and whether the treatments are available to them. This is consistent with evidence showing that unassisted quitting (including quitting cigarettes all at once, or cold turkey, and reducing cigarettes smoked) is the most popular method used in quit attempts among young adults in the US (Caraballo, Shafer, Patel, Davis, & McAfee, 2017; Soulakova & Crockett, 2017; Watkins, Thrul, Max, & Ling, 2019). Engaging in behaviors to distract from cravings was common and reported to be an effective strategy in the short term in this study, as all of the participants eventually returned to smoking. Cold turkey did not result in long-term success for these youth, which is consistent with other studies (Collins et al., 2018). Despite this, many participants believed moving forward that they could wean themselves off of cigarettes.

Given that poly-tobacco use is common in both homeless youth and adults (Kish et al., 2015; Neisler et al., 2018; Tucker, Shadel, Golinelli, & Ewing, 2014), it was surprising that other tobacco products were not referred to in this study as a means to quit smoking cigarettes, although many participants referred to co-use of cigarettes and cigars (“FTs” or filter-tipped cigars). Vaping to quit had mixed opinions among these youth. In studies examining quitting among homeless adults, vaping is viewed more positively, with participants reporting that e-cigarettes reduced craving and relieved stress, in addition to being more socially acceptable (Collins et al., 2018; Stewart et al., 2015). Despite only one participant mentioning use of flavored products, it is possible that use of these products may change given the US Food and Drug Administration's new enforcement of unauthorized cartridge-based e-cigarette flavors (U.S. Food Drug Administration, 2020). In addition, although one participant described using nicotine vape products, it is unclear whether reference to vaping was of THC, nicotine, or just flavors, which could have an impact on smoking cessation. Cannabis was reported, mostly among young adults 18–24 years old who were unwilling to quit, as a method of quitting smoking cigarettes that had worked well. By contrast, a recent study found that over 90% of homeless youth in Los Angeles County who were tobacco users were also using cannabis, and co-administration (e.g., blunt) was associated with greater frequency and quantity of cigarette smoking (Tucker, Shadel, Seelam, Golinelli, & Siconolfi, 2020). Due to the illicit nature of cannabis, it is possible that use in our sample was under-reported. Substitution of cigarettes with other tobacco products or substances may be an acceptable strategy socially within this population, but it is important that harm reduction remain the focus instead of putting youth at further risk of negative health (or legal) outcomes (Jenkins, Slemmon, & Haines-Saah, 2017).

Those who had tried NRT reported either borrowing it from a friend or receiving it at an in-patient treatment facility (mental health facility), and it was unclear if the youth were using it properly to be effective. Other studies have found similar dissatisfaction with NRT among homeless adults, with fear of side effects being one major concern (Okuyemi, Goldade, & Whembolua, 2013; Stewart et al., 2015). This reflects the challenges of using NRT as directed in the real world, as opposed to in clinical trials, where NRT has been shown to be effective (among adults) (Patnode et al., 2015). Youth still believed that it would be helpful for NRT to be given to smokers at the drop-in center. Currently, NRT products are not sold to youth under 18 without a

physician prescription. Some drop-in centers provide medical services, including provision of pharmaceuticals (Hishida, 2016). Therefore, it is feasible that NRT could be provided, potentially through a standing order to permit centers to provide NRT without a prescription if this is a legally viable option in one's jurisdiction. Without such an arrangement, barriers persist for homeless youth to access free or reduced cost NRT and receive medical supervision of its use.

No participants had used medical treatment (i.e., bupropion, varenicline), which is consistent with this type of treatment being the most difficult to obtain, needing to be prescribed by a physician, and with it not being recommended for smoking cessation among youth. Due to the fact that this type of treatment is a medicine that is administered by pill, participants had reservations about possible side effects and abuse. If medical treatment is provided at drop-in centers, sufficient care must be taken to prescribe the appropriate medicine and to educate the youth on how to take it. Although behavioral counseling is supported by the strongest evidence compared with other methods (Fanshawe et al., 2017), only one participant had actually received such treatment. There is a clear need for counseling in the homeless youth population, who, in this study, referred often to needing methods to manage stress.

Homeless youth have a great deal of stress, and smoking is a primary coping strategy to reduce stress: "...maybe if I was in an environment where I don't have to worry and stress about a lot of stuff and there's not really anybody smoking, then yeah, I definitely believe I'd go a lot longer without wanting to smoke. Until then I definitely will be smoking" (Male, 18–24, not willing to quit). Interventions may need to address coping strategies, confidence or self-efficacy to quit, and mental health more broadly to succeed in reducing the urge to smoke. There is a clear need to develop targeted smoking cessation interventions for homeless youth, ideally at drop-in centers where they are already obtaining services, that consider their unique social and environmental influences (Pedersen, Tucker, Klein, & Parast, 2018). These influences will be explored in more depth in future analyses of data from the overall study. Drop-in centers are increasingly becoming a location for smoking cessation interventions, but often financial and personnel resources are limited (Shadel, Tucker, Mullins, & Staplefoote, 2014). Although at times a controversial idea among smokers (Collins et al., 2018), instituting smoking bans at shelters has been associated with increased interest in smoking cessation (Businelle et al., 2015; Vijayaraghavan & Pierce, 2015). These considerations should be balanced with the need for creating a safe, non-judgmental environment where homeless youth can have their needs met.

4.1. Limitations

This study included a relatively small sample of homeless youth in a Midwestern city so generalizability of the study findings may be limited. Additionally, it is impossible to rule out the role interviewers may have played in influencing the participants' responses, although effort was made to be objective and allow for open-ended responses. Data from this study will be quantitatively validated as a next step. Another limitation relates to the use of cigars in this population, with 10 homeless youth in this study referencing use of "FTs", one of whom described switching to them from cigarettes. At times, it was not clear whether participants were referring to use of "FTs" or cigarettes when discussing their smoking experience, so future studies need to more accurately characterize different types of combustible tobacco products used when studying homeless youth. This is especially important given the ability to purchase small cigars for less money than cigarettes and in packs of 2–3 cigars. Lastly, one out of the two interviewers was also one of the three coders, potentially introducing bias in the coding process. We randomly assigned the transcribed interviews to the coders, so we believe this potential bias has been minimized.

4.2. Conclusions

This is the first paper to examine quit methods used among homeless youth. Homeless youth in a Midwestern city are primarily engaging in self-help strategies to quit smoking and underutilizing existing evidence-based treatments. The primary method that these youth are trying to quit is by "cold turkey", which is not effective for them. Most homeless youth are willing to quit in the next month. These youth are interested in trying evidence-based treatments in future quit attempts, including behavioral counseling and monitored use of NRT. Future studies should explore effective cessation treatment among homeless youth that can ideally be provided at shelters and drop-in centers.

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CRediT authorship contribution statement

Allison M. Glasser: Conceptualization, Validation, Formal analysis, Data curation, Writing - original draft, Writing - review & editing. **Joseph M. Macisco:** Validation, Formal analysis, Investigation, Data curation, Writing - review & editing. **Lauren M. Miller:** Validation, Formal analysis, Investigation, Data curation. **Ellen M. Garbsch:** Writing - original draft, Writing - review & editing. **Amy Wermert:** Project administration, Writing - review & editing. **Julianna M. Nemeth:** Conceptualization, Methodology, Validation, Investigation, Resources, Writing - review & editing, Supervision, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.abrep.2020.100276>.

References

- Baer, J. S., Ginzler, J. A., & Peterson, P. L. (2003). DSM-IV alcohol and substance abuse and dependence in homeless youth. *Journal of Studies on Alcohol*, 64(1), 5–14.
- Bousman, C. A., Blumberg, E. J., Shillington, A. M., et al. (2005). Predictors of substance use among homeless youth in San Diego. *Addictive Behaviors*, 30(6), 1100–1110.
- Businelle, M. S., Poonawalla, I. B., Kendzor, D. E., et al. (2015). Smoking policy change at a homeless shelter: Attitudes and effects. *Addictive Behaviors*, 40, 51–56.
- Caraballo, R. S., Shafer, P. R., Patel, D., Davis, K. C., & McAfee, T. A. (2017). Quit methods used by US adult cigarette smokers, 2014–2016. *Preventing Chronic Disease*, 14, E32.
- Chen, J. S., Nguyen, A. H., Malesker, M. A., & Morrow, L. E. (2016). High-risk smoking behaviors and barriers to smoking cessation among homeless individuals. *Respir Care*, 61(5), 640–645.
- Collins, S. E., Orfaly, V. E., Wu, T., et al. (2018). Content analysis of homeless smokers' perspectives on established and alternative smoking interventions. *International Journal on Drug Policy*, 51, 10–17.
- Fanshawe, T. R., Halliwell, W., Lindson, N., Aveyard, P., Livingstone-Banks, J., & Hartmann-Boyce, J. (2017). Tobacco cessation interventions for young people. *Cochrane Database Systematic Review*, 11, Cd003289.
- Garner, L., & Ratschen, E. (2013). Tobacco smoking, associated risk behaviours, and experience with quitting: A qualitative study with homeless smokers addicted to drugs and alcohol. *BMC Public Health*, 13, 951.
- Hishida, J. (2016). *Engaging youth experiencing homelessness: Core practices & services*. Nashville, TN: National Health Care for the Homeless Council.
- Jenkins, E. K., Slemmon, A., & Haines-Saah, R. J. (2017). Developing harm reduction in the context of youth substance use: Insights from a multi-site qualitative analysis of young people's harm minimization strategies. *Harm Reduction Journal*, 14(1), 53.

- Kish, D. H., Reitzel, L. R., Kendzor, D. E., Okamoto, H., & Businelle, M. S. (2015). Characterizing concurrent tobacco product use among homeless cigarette smokers. *Nicotine & Tobacco Research*, *17*(9), 1156–1160.
- Krippendorff, K. (2004). Measuring the reliability of qualitative text analysis data. *Quality & Quantity*, *38*(6), 787–800.
- McKinney-Vento Homeless Assistance Act, Re-Authorized (2002). Vol 42 USC 11431 et seq 725.
- Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science : IS*, *6* 42–42.
- Miech, R. A., Johnston, L. D., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Patrick, M. E. (2019). *Monitoring the future national survey results on drug use, 1975–2018: Volume I, Secondary school students*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.
- Morton, M. H., Dworsky, A., Matjasko, J. L., et al. (2018). Prevalence and correlates of youth homelessness in the United States. *Journal of Adolescent Health*, *62*(1), 14–21.
- Neisler, J., Reitzel, L. R., Garey, L., et al. (2018). Concurrent nicotine and tobacco product use among homeless smokers and associations with cigarette dependence and other factors related to quitting. *Drug and Alcohol Dependence*, *185*, 133–140.
- Okuyemi, K. S., Goldade, K., Whembolua, G. L., et al. (2013). Motivational interviewing to enhance nicotine patch treatment for smoking cessation among homeless smokers: A randomized controlled trial. *Addiction*, *108*(6), 1136–1144.
- Pateman, K., Ford, P., Fitzgerald, L., et al. (2016). Stuck in the catch 22: Attitudes towards smoking cessation among populations vulnerable to social disadvantage. *Addiction*, *111*(6), 1048–1056.
- Patnode, C. D., Henderson, J. T., Thompson, J. H., Senger, C. A., Fortmann, S. P., & Whitlock, E. P. (2015). Behavioral counseling and pharmacotherapy interventions for tobacco cessation in adults, including pregnant women: A review of reviews for the U.S. preventive services task force. *Annals of Internal Medicine*, *163*(8), 608–621.
- Pedersen, E. R., Tucker, J. S., Klein, D. J., & Parast, L. (2018). Perceived need and receipt of behavioral health services at drop-in centers among homeless youth. *Health Services Research*, *53*(6), 4609–4628.
- Shadel, W. G., Tucker, J. S., Mullins, L., & Staplefoote, L. (2014). Providing smoking cessation programs to homeless youth: The perspective of service providers. *Journal of Substance Abuse Treatment*, *47*(4), 251–257.
- Slesnick, N., Feng, X., Guo, X., et al. (2016). A test of outreach and drop-in linkage versus shelter linkage for connecting homeless youth to services. *Prevention Science*, *17*(4), 450–460.
- Slesnick, N., Guo, X., Brakenhoff, B., & Bantchevska, D. (2015). A comparison of three interventions for homeless youth evidencing substance use disorders: Results of a randomized clinical trial. *Journal of Substance Abuse Treatment*, *54*, 1–13.
- Soulakova, J. N., & Crockett, L. J. (2017). Unassisted quitting and smoking cessation methods used in the United States: Analyses of 2010–2011 tobacco use supplement to the current population survey data. *Nicotine & Tobacco Research*, *20*(1), 30–39.
- Stewart, H. C., Stevenson, T. N., Bruce, J. S., Greenberg, B., & Chamberlain, L. J. (2015). Attitudes toward smoking cessation among sheltered homeless parents. *Journal of Community Health*, *40*(6), 1140–1148.
- Tucker, J. S., Shadel, W. G., Golinelli, D., & Ewing, B. (2014). Alternative tobacco product use and smoking cessation among homeless youth in los angeles county. *Nicotine & Tobacco Research*, *16*(11), 1522–1526.
- Tucker, J. S., Shadel, W. G., Golinelli, D., Ewing, B., & Mullins, L. (2015). Motivation to quit and interest in cessation treatment among homeless youth smokers. *Nicotine & Tobacco Research*, *17*(8), 990–995.
- Tucker, J. S., Shadel, W. G., Seelam, R., Golinelli, D., & Siconolfi, D. (2020). Co-use of tobacco and marijuana among young people experiencing homelessness in Los Angeles County. *Drug and Alcohol Dependence*, *207* 107809.
- U.S. Department of Health and Human Services. (2014). *The health consequences of smoking—50 years of progress: A report of the surgeon general*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- U.S. Department of Health and Human Services. (2020). Project information: Development of a contextually tailored and optimized smoking cessation intervention for homeless youth. https://projectreporter.nih.gov/project_info_description.cfm?projectnumber=1K07CA216321-01A1. Accessed April 10, 2020.
- U.S. Food & Drug Administration. (2020). FDA finalizes enforcement policy on unauthorized flavored cartridge-based e-cigarettes that appeal to children, including fruit and mint. <https://www.fda.gov/news-events/press-announcements/fda-finalizes-enforcement-policy-unauthorized-flavored-cartridge-based-e-cigarettes-appeal-children>. Accessed February 29, 2020.
- Vijayaraghavan, M., Hurst, S., & Pierce, J. P. (2016). Implementing tobacco control programs in homeless shelters: A mixed-methods study. *Health Promot Pract*, *17*(4), 501–511.
- Vijayaraghavan, M., & Pierce, J. P. (2015). Interest in smoking cessation related to a smoke-free policy among homeless adults. *Journal of Community Health*, *40*(4), 686–691.
- Watkins, S. L., Thrul, J., Max, W., & Ling, P. M. (2019). Real-world effectiveness of smoking cessation strategies for young and older adults: Findings from a nationally representative cohort. *Nicotine & Tobacco Research*.
- Wenzel, S. L., Tucker, J. S., Golinelli, D., Green, H. D., Jr., & Zhou, A. (2010). Personal network correlates of alcohol, cigarette, and marijuana use among homeless youth. *Drug and Alcohol Dependence*, *112*(1–2), 140–149.