


Appeal of novel cessation intervention approaches among young-adult users of traditional and alternative tobacco products

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ABSTRACT

SIGNIFICANCE: Given limited research on young-adult tobacco cessation interventions, we examined preferred tobacco/e-cigarette cessation approaches among young-adult tobacco/e-cigarette users.

METHODS: We analyzed Spring 2020 data from a longitudinal study of young adults (ages 18–34) across 6 metropolitan areas (Atlanta, Boston, Minneapolis, Oklahoma City, San Diego, and Seattle). We examined tobacco/e-cigarette use and self-reported appeal of various intervention approaches, and regarding technology-based approaches, the appeal of types of technology and intervention functions.

RESULTS: In this sample of past 6-month tobacco/e-cigarette users ($M_{\text{age}} = 24.69$; 48.4% male; 73.3% White), 59.6% used e-cigarettes, and 48.2% used cigarettes. The most frequently endorsed *intervention approach* was nicotine replacement therapy (NRT; 72.7%), followed by technology-based programs (70.0%) and oral medications (53.0%). The most frequently endorsed *technology-based approach* was smartphone apps (85.9%), followed by programs involving text-messaging (62.1%), websites (57.1%), social media (48.4%), and video counseling (41.6%). The most frequently endorsed *technology-based program function* was behavioral monitoring (68.3%), followed by earning rewards (60.3%). We identified no differences in approach appeal among subcategories of tobacco/e-cigarette users.

CONCLUSIONS: Findings underscore the promise of technology-based approaches, particularly apps, and text-messaging for tobacco/e-cigarette cessation, and functions like behavioral monitoring and gamification. Additionally, appropriate and effective NRT use for young-adult tobacco/e-cigarette users warrants further research.

KEYWORDS: tobacco control, tobacco use, alternative tobacco products, tobacco cessation, e-cigarette use, young adults

TYPE: Short Report

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Introduction

The past decade has marked a shift in the tobacco market, with increased product diversity and increases in use of e-cigarettes, hookah, cigar products, and smokeless tobacco globally,^{1,2} particularly among young adults.² For example, e-cigarette use (i.e., vaping) in young adults increased from 5.2% in 2014 to 9.3% in 2019.² Using any one tobacco product correlates with increased likelihood of using other tobacco products and marijuana.^{3–6} Unfortunately, there is limited evidence of successful smoking cessation interventions for young adults⁷ and limited intervention research addressing alternative tobacco product use or polytobacco use. This study examined preferred tobacco/e-cigarette cessation approaches among young-adult tobacco/e-cigarette users.

Methods

Study overview

We analyzed data from a two-year, five-wave longitudinal cohort study of young adults (aged 18–34) in 6 cities (Atlanta, Boston, Minneapolis, Oklahoma City, San Diego, and Seattle), described elsewhere.⁸ Participants were recruited via Facebook and Reddit in Fall 2018, using purposive, quota-based sampling to target tobacco and/or e-cigarette users (see Supplementary Figure 1). The baseline sample included 3006 participants. We analyzed data from Wave 4 (W4; Spring 2020), launched in late January 2020 but interrupted in mid-March to add questions assessing appeal of differing intervention strategies. Thus, 1559



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were invited to complete the W4 assessment after these questions were added, of whom 1084 responded (69.5% of the 1559). Analyses focus on 483 participants reporting past 6-month tobacco product or e-cigarette use (44.5% of 1084).

Measures

We assessed participant sociodemographics and past 6-month use of e-cigarettes, cigarettes, large cigars, little cigars/cigarillos, hookah/waterpipe, smokeless tobacco, and marijuana. We also assessed importance of and confidence in quitting all tobacco/nicotine products (0 = not at all to 10 = absolutely) and readiness to quit (in the next month, 6 months, and longer).

To assess appeal of intervention approaches, we asked past 6-month tobacco/e-cigarette users, “If you were to consider attempting to quit tobacco use/vaping, indicate which of the following approaches would be most appealing to you. Please rank your top 3 choices (Give a 1 to the approach that would be the most appealing, a 2 to the second...)” Response options are listed in Table 1 under “intervention approaches.” Using the same ranking instructions, we also asked, “Of the following technology-based programs, indicate which of the following would be most appealing” (response options: Table 1 “types of technology-based approaches”) and “Indicate which of the following functions to help quit tobacco use or vaping would be most appealing” (response options: Table 1 “technology-based program functions”).

Data analysis

Descriptive statistics were used to characterize participants and their reactions to intervention approaches for the 3 items (i.e., all approaches, technology-based strategies, and program functions), reporting the proportion that endorsed each: (a) among the top 3, and (b) as #1. Bivariate analyses were also conducted to explore differences in appeal of intervention approaches among subgroups of users of different tobacco products/e-cigarettes (i.e., e-cigarette/cigarette co-users, e-cigarette users, and cigarette users). We used SPSS v26.⁴³

Results

In this sample ($M_{\text{age}} = 24.69$; 48.4% male; 73.3% White), 73.3% used e-cigarettes and 58.0% cigarettes (Table 1); 193 (40.0%) were e-cigarette/cigarette users, 161 (33.3%) e-cigarette but not cigarette users, and 87 (18.0%) cigarette but not e-cigarette users (with only 42 not using either). On average, users reported greater confidence in quitting ($M = 7.26$) than importance of quitting ($M = 5.59$); 44.7% reported no interest in quitting.

The most frequently endorsed intervention approach (i.e., ranked first, second, or third) was nicotine replacement therapy (NRT; 72.7%), followed by technology-based programs (70.0%) and oral cessation medications (53.0%). Similarly, NRT was most frequently ranked as most appealing (i.e., ranked

#1; 32.5%), followed by technology-based programs (32.3%) and oral medications (13.9%; not shown in tables). The most frequently endorsed type of technology-based approach was smartphone apps (85.9%), followed by text-message-based programs (62.1%), web-based programs (57.1%), social media-based programs (48.4%), and video counseling (41.6%). Apps were most commonly ranked first (54.8%). The most frequently endorsed technology-based program function was behavioral monitoring (68.3%), followed by earning rewards (60.3%). Behavioral monitoring was most frequently ranked first (48.4%); 28.7% ranked earning rewards first. We identified no differences in approach preferences among subcategories of tobacco/e-cigarette users.

Discussion

Our sample reflects similarities to young-adult cigarette smokers in a national study that found that, compared to older adults, younger adults were less interested in and more confident about quitting.⁹ Of the approaches assessed in this study, we found no differences among subgroups of tobacco/e-cigarette users in their reported appeal of various cessation approaches; however, polytobacco use rates were high (~80% of the sample). Current findings indicated relatively high interest in NRT despite low cessation motivation and prior findings indicating little young-adult use of pharmacotherapy.⁹

Technology-based interventions were highly endorsed. Given that > 95% of young adults own smartphones,¹⁰⁻¹² COVID-19 prompted increased use of telehealth,¹³ and many young-adult tobacco users may have contraindications for NRT or oral medications¹⁴; young-adult cessation interventions should leverage young-adult use of technology/smartphones^{10,15} and technology’s capacity and scalability.^{13,16}

A 2019 review of young-adult smoking cessation interventions found support for quitline counseling and text-message programs for short-term cessation.⁷ Current findings underscore the relevance of these findings for the broader young-adult tobacco/e-cigarette user population. For example, Truth’s *This is Quitting* is a nationally available text-messaging vaping cessation program for youth and young adults, showing high levels of reach and engagement.^{17,18} Our findings also suggest the timeliness of advancing such programs to capitalize on smartphone technology, via apps, video counseling, and other functionality.

Relatedly, results also suggest the appeal and potential utility of behavioral self-monitoring and rewards/incentives for participating in such programs and progressing toward cessation. The aforementioned review⁷ documented the utility of social cognitive theory,¹⁹ which highlights behavior change mechanisms such as outcome expectancies and self-monitoring—relevant to these preferred program functions.

Despite study limitations (e.g., self-report, limited generalizability, and low response rate relative to other waves [79%-85%]), current findings are important, underscoring the

Table 1. Participant characteristics and assessment of intervention strategies/approaches among past 6-month tobacco/e-cigarette users, n = 483.

PARTICIPANT CHARACTERISTIC	n (%) OR M (SD)
Sociodemographics	
Age, M (SD)	24.69 (4.80)
Male, n (%)*	234 (48.4)
Sexual minority, n (%)	160 (33.1)
Race, n (%)	
White	354 (73.3)
Black	23 (4.8)
Asian	53 (11.0)
Other	53 (11.0)
Hispanic, n (%)	75 (15.5)
Education, n (%)	
< Bachelor's degree	150 (31.1)
≥ Bachelor's degree	333 (58.9)
Employment, n (%)	
Employed	277 (57.3)
Unemployed	159 (32.9)
College student	47 (9.7)
Past 6-month use, n (%)	
E-cigarettes	354 (73.3)
Cigarettes	280 (58.0)
Little cigars/cigarillos	75 (15.5)
Large cigars	71 (14.7)
Hookah	65 (13.5)
Smokeless tobacco	25 (5.2)
Marijuana	298 (62.2)
Cessation-related factors	
Readiness to quit, next 30 days, n (%)	
Next 30 days	89 (18.4)
Next 6 months	94 (19.5)
Beyond 6 months	84 (18.4)
Not considering quitting	216 (44.7)
Importance of quitting, M (SD)	5.59 (3.20)
Confidence to quit, M (SD)	7.26 (2.87)
Intervention assessment— Ranked as one of the top 3 (per assessment)	n (%)
Intervention approaches	
Behavioral	
Technology-based program for quitting tobacco use/vaping (e.g., app or website)	338 (70.0)
In-person counseling for quitting tobacco use/vaping (e.g., from a doctor)	167 (34.8)
Phone call counseling for quitting tobacco use/vaping (e.g., phone voice counseling)	167 (30.0)
In-person group counseling for quitting tobacco use/vaping	124 (25.7)
Pharmacotherapy	
Nicotine replacement therapy (e.g., the nicotine patch or nicotine gum)	351 (72.7)
Oral medications for quitting vaping (e.g., Chantix and Varenicline)	256 (53.0)
Types of technology-based approaches	
Smartphone app for quitting tobacco use/vaping	415 (85.9)
Text-messaging for quitting tobacco use/vaping	300 (62.1)

(Continued)

Table 1. Continued.

PARTICIPANT CHARACTERISTIC	n (%) OR M (SD)
Website program for quitting tobacco use/vaping	276 (57.1)
Social media–based program for quitting tobacco use/vaping	234 (48.4)
Individual video counseling for quitting tobacco use/vaping	201 (41.6)
Technology-based program functions	
Track tobacco use/vaping behavior, mood, and other substance use	330 (68.3)
Earning rewards, points, etc. for successes toward quitting tobacco use/vaping	293 (60.3)
Addresses ways to deal with habitual aspects of tobacco use/vaping	236 (48.9)
Addresses stress as a trigger for tobacco use/vaping	223 (46.2)
Addresses skills involved in quitting tobacco use/vaping	132 (27.3)
Addresses social pressure to vape or social aspects of tobacco use/vaping	85 (17.6)
Stories of others currently trying to quit tobacco/vaping	69 (14.3)
Stories of others who have quit tobacco/vaping	68 (14.1)

promise of technology-based approaches, particularly apps, and text-messaging, and functions like behavioral monitoring and gamification. Additionally, NRT use for young-adult tobacco/e-cigarette users warrants further research, particularly regarding when/how it might be used to effectively support cessation efforts (e.g., among those less motivated to quit and types of behavioral supports needed).

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