

When, How, & Where Tobacco Initiation and Relapse Occur During U.S. Air Force Technical Training

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ABSTRACT

Introduction

Military personnel are at high risk for tobacco use, particularly during the first year of military service. Technical Training follows an 8½ week tobacco ban during basic military training and is a vulnerable time for personnel to both reinstate and initiate tobacco use. Thus, this can be a crucial time to promote tobacco policies and interventions. However, there is limited research examining when, how, and where personnel access tobacco during the first year of service, particularly among users of newer products (eg, electronic cigarettes[e-cigarettes]). Thus, the purpose of the current study is to explore the timing, source, and location of tobacco use during Technical Training across all types of products. Furthermore, this study will examine differences in demographic characteristics and prior tobacco history in relationship to these tobacco behaviors.

Materials and Methods

Participants were U.S. Air Force recruits completing Technical Training (2017–2018). Protocol was approved by the Institutional Review Board at the 59th Medical Wing of the U.S. Air Force. During the first week of Technical Training, Airmen were consented to participate in the study and completed a questionnaire about demographics and tobacco use history. Next, Airmen were randomized to receive one of three tobacco prevention interventions as part of military training. At a 3-month follow-up, during the last week of Technical Training, consented participants completed a questionnaire about current tobacco use. Airmen reported when (ie, first month vs. after), how (ie, “bummed” from another airman, bought on or off base, received from the internet or event), and where (ie, designated smoking areas on base, off base, bar or club, friend’s house, cigar lounge, hookah bar, or vape shop) they used tobacco during Technical Training. Descriptive statistics were used to examine these behaviors across all tobacco products. Additionally, Wilcoxon–Mann–Whitney and Kruskal–Wallis tests compared differences in demographic characteristics and baseline tobacco use in relationship to these tobacco behaviors.

Results

No significant differences were found when comparing prior users and first-time users in relationship to tobacco behaviors during Technical Training; however, significant differences in educational background and age were found in regard to the source and location of tobacco use. Additionally, how and where Airmen first used tobacco during Technical Training differed across products. Cigarettes and smokeless tobacco were equally likely to be bought on or off base and most commonly first used at a designated smoking area on base. However, e-cigarettes, cigarillos/little cigars, and hookah were more likely to be bought off base, and first used at a specialty store (ie, vape shop, hookah bar, or cigar lounge).

Conclusions

Tobacco use behaviors during Technical Training differed depending on the type of product. Specifically, new and emerging products were more likely to be bought off base and first used at a specialty store. Thus, military policies regulating on base tobacco pricing might not reduce the growing prevalence of e-cigarettes. Future policies might consider addressing the density of off-base tobacco retailers to reduce the high rates of tobacco use in this population.

INTRODUCTION

U.S. military personnel are at high risk for tobacco use.^{1,2} Rates of cigarette and smokeless tobacco use in the military far exceed civilian use^{1–3}; and this disparity is similarly seen among newer products (ie, electronic cigarettes [e-cigarettes], hookah)⁴ compared to civilians⁵ as well. Given that > 170,000

voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI 40–402.

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individuals are recruited⁶ and 250,000 leave the military annually,⁷ tobacco prevention in this population can significantly impact both military and civilian sectors. Importantly, the first year of service is a particularly vulnerable time to both initiate and reinstate tobacco and may offer a critical time for policy and behavioral intervention.^{8–12}

During the Air Force recruitment year, after an 8 ½ week tobacco ban during basic military training (BMT), trainees continue to the second phase (ie, Technical Training) lasting between 2 weeks and 18 months depending on career. Despite forced cessation during BMT and the first 4 weeks of Technical Training,¹³ most reinstate tobacco immediately after the ban during Technical Training.^{8,11,12,14} Additionally, high rates of never users (7.9–12.4%) initiate tobacco products during Technical Training as well.^{11,12,14}

Research supports policy-based interventions, particularly increasing tobacco costs, to reduce smoking among civilians.¹⁵ However, military personnel have historically received discounted tobacco products on base,¹⁶ perhaps contributing to elevated rates of use.¹⁷ In response, a recent military policy¹⁸ requires the pricing of tobacco products on base match the prevailing local price in the community including applicable taxes. Yet, it is unclear if this policy will be effective for users of newer products, who might be more likely to buy products off base¹⁶ or on the internet.¹⁹ Additionally, research on tobacco use during the recruitment year has focused only on cigarette^{8–12,20} or smokeless tobacco use.^{14,21} Given the growing prevalence of e-cigarettes,^{22,23} and high rates of dual (two products) and poly (three or more products) use among trainees,^{2,5} it is important to account for all products when informing policy and intervention efforts. More detailed information is needed regarding when, how, and where Airmen use different tobacco during Technical Training.

Thus, to inform future military tobacco interventions and policy, the purpose of this study is to explore when (ie, first month vs. after), how (ie, “bummed” from another airman, bought on or off base, received from the internet or promotional event), and where (ie, smoke pits, on or off base, bar or club, friend’s house, cigar lounge, hookah bar, or vape shop) Airmen use tobacco and nicotine containing products during Technical Training. Furthermore, this study will explore differences across demographic characteristics and prior tobacco history in relationship to these tobacco behaviors.

METHODS

Participants

Participants were U.S. Air Force Airmen (called airman regardless of gender or rank) completing Technical Training at Joint Base San Antonio-Lackland Air Force Base (2017–2018). Of Airmen approached ($n = 3,347$), 89.6% ($n = 2,999$) consented and 99.0% ($n = 2,969$) met eligibility (≥ 18 years of age). Of these, 87.9% ($n = 2,611$) were retained for 3-month follow-up. Airmen were not retained if they were no longer in the military, had failed all or portions of their

Technical Training, or were in the process of being cleared to be stationed overseas (ie, thus, attending a medical exam) at time of follow-up. Protocol was approved by the Institutional Review Board at the 59th Medical Wing of the U.S. Air Force.

Procedure

During the first week of Technical Training, Airmen provided consent and completed baseline measures. Next, Airmen were randomized to receive one of three tobacco prevention interventions: (1) Brief Tobacco Intervention + Airmen’s Guide to Remaining Tobacco Free, (2) Airmen’s Guide to Remaining Tobacco Free, or the (3) *National Cancer Institute’s Clearing the Air* pamphlet. All Airmen received one of these interventions as part of training requirements. More information about these interventions can be found elsewhere.²⁴ At 3-month follow-up, consented participants reported current tobacco use.

Measures

Demographics

Airmen reported age, gender, marital status, educational background, race, and ethnicity.

Tobacco Use

At baseline and follow-up, Airmen responded to how often they used/use tobacco. Responses included: *Never*, *less than monthly*, *monthly*, *weekly*, and *daily*. Because of the forced tobacco ban, the assessment measured use before BMT. Regular tobacco use was defined as at least monthly use of that product; given that, this is a common definition among young adults and military personnel.^{25,26} Reinitiators were Airmen who regularly used at least one product at baseline and subsequently used (either monthly or less than monthly) at least one product at follow-up. Initiators were those who reported using tobacco *never* or *less than monthly* at baseline and reported any use of at least one product at follow-up.

Timing of Tobacco Use

At follow-up Airmen were asked, “Remember that tobacco was banned during the first part of Technical Training. When did you start or restart using tobacco since starting Technical Training?”

Source of Tobacco Use

At follow-up Airmen were asked, “If you used tobacco products since starting Technical Training, where did you get the first tobacco product that you used?”

Location of Tobacco Use

At follow-up Airmen were asked, “Where were you when you first used a tobacco product during Technical Training?”

TABLE I. Sample Characteristics ($N = 2,969$)

Age M (CI)	19 (18.21)
Sex (male) N (%)	2075 (70.2)
Race N (%)	
Black/African American	581 (20.0)
White	1835 (63.2)
Multiple	48 (6.2)
Other	179 (6.2)
Hispanic N (%)	630 (23.1)
Married	271 (9.2)
Education N (%)	
High school diploma/GED	1,873 (63.6)
Vocational training	43 (1.5)
Some college/associates	863 (29.3)
Bachelor's degree or higher	168 (5.7)
Military rank N (%)	
Active duty	2,577 (87.4)
Guard	264 (8.9)
Reserve	109 (3.7)
Prior tobacco use N (%)	
Any	1,161 (39.4)
Cigarettes	458 (15.5)
E-cigarettes	715 (24.2)
Smokeless tobacco	397 (13.4)
Cigars	336 (11.4)
Cigarillos/little cigars	515 (17.4)
Pipe	55 (1.9)
Hookah	270 (9.1)

Note. M , mean; CI, confidence interval; %, percent.

Analysis

Descriptive statistics were observed to examine prevalence of tobacco use behaviors (ie, timing, location, source) during Technical Training. Wilcoxon-Mann-Whitney and Kruskal-Wallis tests compared differences in demographics and baseline tobacco use (ie, nonusers vs. users) in relationship to these outcomes (ie, timing, location, source). Furthermore, descriptives (ie, counts, percentages) were used to examine differences across all tobacco products in relationship to these tobacco behaviors.

RESULTS

Participant demographic characteristics and tobacco use are found in Table I. At baseline, 39.4% ($n = 1161$) reported regular use of any tobacco product, and during Technical Training, 21.3% ($n = 552$) used tobacco. Specifically, 37.4% ($n = 432$) of prior tobacco users reinitiated and 6.4% ($n = 116$) of prior nonusers initiated. Most commonly during Technical Training, 13.6% used e-cigarettes, 7.7% used cigarettes, 7.1% used smokeless tobacco, 6.7% used cigarillos/little cigars, 5.2% used cigars, 4.9% used hookah, and 0.3% used pipes.

Timing of Tobacco Use

Of all those using tobacco during Technical Training, across all products, 11.3% initiated before week 4 (despite the tobacco ban during this time), 56.5% initiated after week

4 and 32.2% did not respond. No differences in tobacco use timing were found across demographic characteristics, including gender, and between initiators and reinitiators.

Comparisons Across Tobacco Products

Across all tobacco products, most Airmen reported using after week 4 compared to before week 4 or not responding (Fig. 1). However, a larger majority of smokeless tobacco users (16.7%) initiated in the first month of Technical Training compared to other products, followed by hookah users (16.3%), cigarette users (15.8%), e-cigarette users (11.1%), cigarillo/little cigar users (9.8%), and pipe users (2.9%).

Source of Tobacco Use

Among all tobacco users during Technical Training, Airmen most commonly (33.2%) bought products off base, while 17.0% “bummed” products from another airman, 15.2% bought on base, 1.3% received products from the internet or a promotional event, and 33.3% did not respond. Sources differed by age ($p = 0.006$); specifically, Airmen who received products from the internet or at a promotional event were younger [Mean (M) = 19.1 (1.2)] compared to other sources. In addition, “bumming” tobacco was significantly more common (22.7%) among those who received more education than a high school education/GED (general educational development) compared to those with less education (13.7%) ($p = 0.028$). Additionally, buying on base was more common (18.1%) among those with a high school diploma/GED compared to those with more education (10.6%). No other differences in demographics (including gender), as well as previous tobacco history, were found.

Comparisons Across Tobacco Products

Among cigarette users at follow-up, Airmen were most commonly and relatively equally likely to “bum,” buy on base, or buy off base (22.3, 24.8, and 28.7%, respectively) (Fig. 2). For e-cigarette users, buying off base was most common (37.2%). Among smokeless tobacco users, buying on base and off base were the most common sources (28.0 and 28.5%, respectively). Among cigarillo/little cigar users, Airmen were most likely to buy off base (36.3%) and this was also seen among hookah users (40.3%). Pipes were most commonly reported to be “bummed” or bought off base (28.6 and 28.6%, respectively).

Location of Tobacco Use at Follow-Up

Among all tobacco users during Technical Training, 18.5% first used at a cigar lounge, hookah bar, or vape shop, 12.3% at a designated smoking area, 5.4% at a bar or club, 4.7% on base (but not a designated smoking area), 2.2% at a friend's house, and 56.9% reported other location ($n = 142$) or did not respond ($n = 172$). Location differed by age ($p < 0.001$); specifically, the highest mean age was among those who used

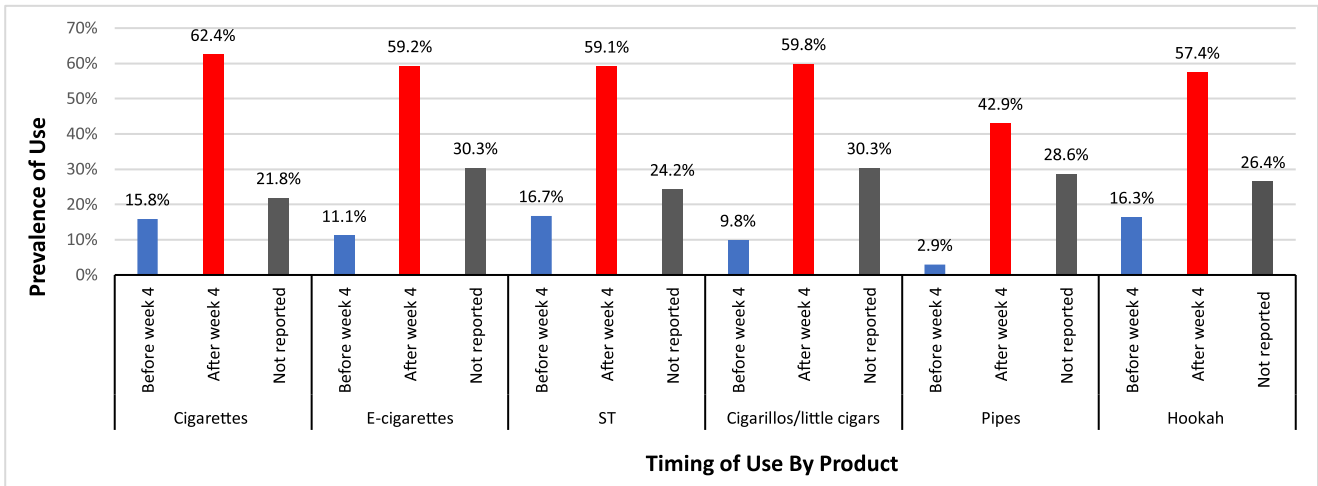


FIGURE 1. Timing of tobacco use during Technical Training across products.

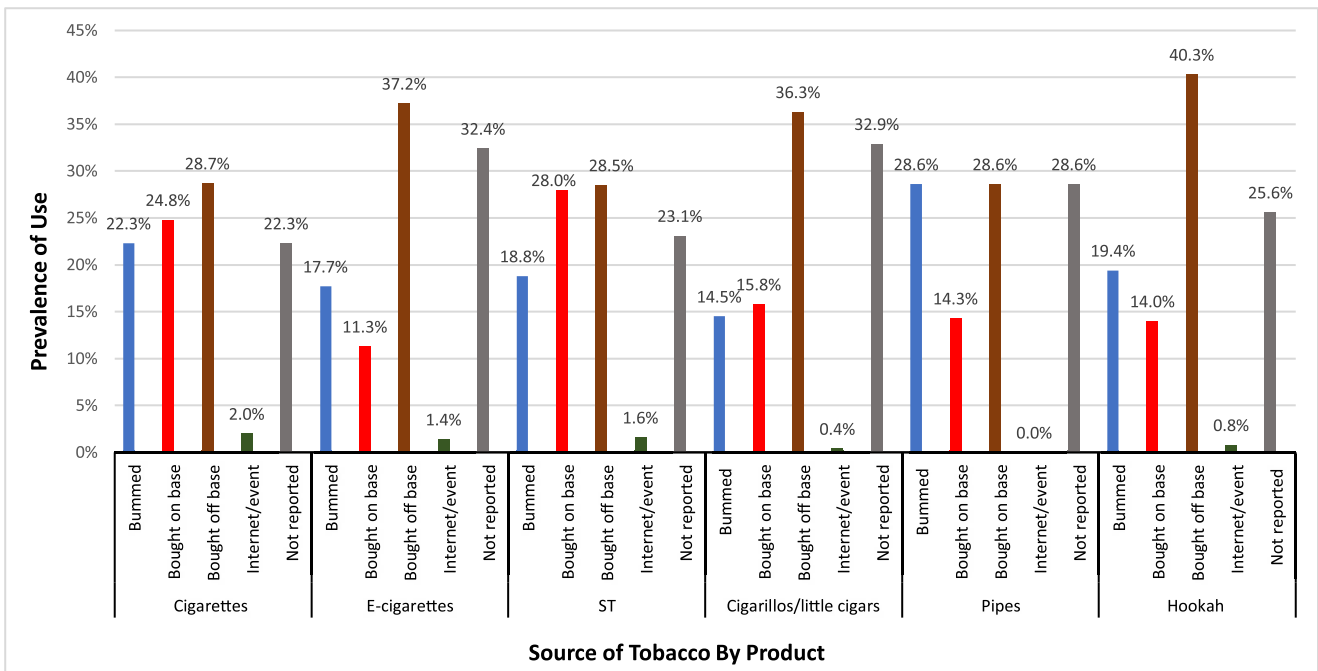


FIGURE 2. Source of tobacco use during Technical Training across products.

tobacco at a bar or club [M = 21.8 (2.6)] compared to other locations. Location also differed by education ($p = 0.013$). Those with more than a high school diploma/GED were more likely to report initiation at a bar or club (8.7%) than those with less education (3.5%). Those with a high school/GED more commonly reported first using at a designated smoking area (14.0%) compared to those with more education (9.2%). No other differences in demographics (including gender) and prior tobacco history were found.

Comparisons Across Tobacco Products

Among cigarette and smokeless tobacco users, most reported first using at *other* locations or did not respond (48.5 and

55.9%, respectively), which was followed by using at a designated smoking area (24.8 and 16.1%, respectively) (Fig. 3). Among e-cigarette users, cigarillo/little cigar users, and hookah users, Airmen most commonly reported first using at *other* locations or did not respond (53.5, 56.8, and 42.6%, respectively) followed by using at a cigar lounge, hookah bar, or vape shop (24.2, 18.8, and 36.4%, respectively).

DISCUSSION

Results extend previous literature by examining when, how, and where Airmen first used tobacco during Technical Training. In this sample, tobacco use was common (21.3%); specifically, 37.4% of prior users reinitiated tobacco use

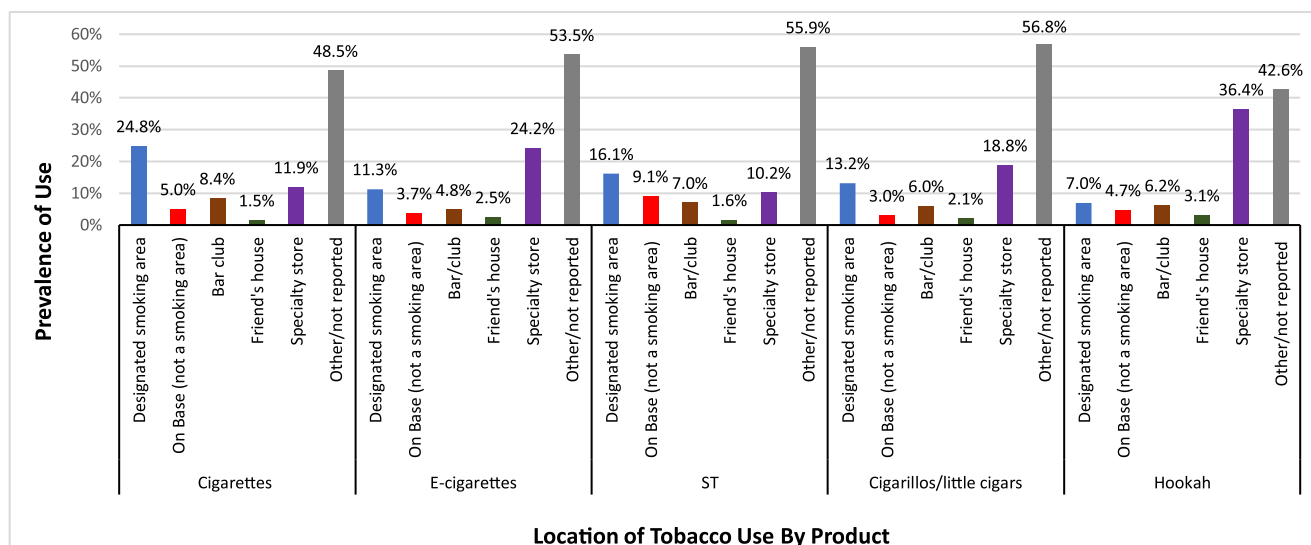


FIGURE 3. Location of tobacco use during Technical Training across tobacco products.

and 6.4% of prior nonusers initiated. However, rates were much lower compared to previous studies.^{8,9,11,12,14} Perhaps current tobacco use was lower because all Airmen were randomized to receive one of three tobacco prevention interventions. Although the Brief Tobacco Intervention was not more effective than control conditions at reducing tobacco prevalence in the long-term,²⁴ Airmen in this condition had a delayed timing of tobacco use during Technical Training.²⁴ Because this study evaluated tobacco use only at 3 months after BMT, dissimilarly from studies evaluating tobacco at a 1-year follow-up,^{8,9,11,12,14} current rates might not represent those who used tobacco later in training.

Regarding the timing of tobacco use, most Airmen who used tobacco, across all products, did so after the first month of Technical Training. However, using tobacco during the ban was most common among users of smokeless tobacco (16.7%) and hookah (16.3%). Perhaps, these products were easier to access and use during periods of forced abstinence. Surprisingly, prior users were not more likely to reinstate sooner compared to first time users. Previous tobacco history might not help predict which Airmen are more likely to use tobacco when it is prohibited.

How and where Airmen first used tobacco differed across products. Cigarettes and smokeless tobacco were equally likely to be bought on or off base and most commonly first used at a designated smoking area on base. However, e-cigarettes, cigarillos/little cigars, and hookah were more likely to be bought off base, and first used at a specialty store (ie, vape shop, hookah bar, or cigar lounge). These findings suggest the relevance of the tobacco-built environment, off base as well as on base. Extensive literature indicates an association between increased exposure, proximity, and density of retail tobacco marketing and higher likelihood of initiation and continued use.²⁷⁻²⁹ Although studies more commonly examined cigarettes, some research indicates a

link between e-cigarette retailer density and likelihood of use among adolescents.³⁰ Airmen cannot have vehicles during Technical Training; however, many specialty shops remain within walking distance and ride sharing companies provide easily accessible and cheap transportation. Policies regulating the sale of tobacco on base might be insufficient to impact military tobacco rates. Given the unique opportunity of a forced tobacco ban during training, brief tobacco prevention programs might be especially beneficial during this time. Additionally, understanding better how the environment on base promotes tobacco use could be helpful in identifying aspects which perpetuate tobacco culture and policies that might decrease use.

There were no differences between prior tobacco users and nonusers in how and where Airmen first used tobacco. However, there were differences in educational background and age. Those with a high school diploma/GED more commonly bought on base, particularly at designated smoking areas, compared to those with more education. Perhaps, this new policy¹⁸ regulating on base tobacco pricing will be more impactful for recruits with less education. Not surprisingly, first using at bar or club was associated with older age, likely given that these individuals were over the age of 21 years. Despite a previous study finding that male air force trainees were more likely to initiate tobacco than females, and females more likely to reinstate,¹¹ no gender differences were found in the current study. Perhaps, gender does not influence the timing, location, or source of tobacco use during training.

Although, in the overall sample, a small prevalence of Airmen (1.3%) reported accessing their product from the internet or at a promotional event, receiving tobacco from these sources was associated with younger age. This finding is consistent with trends of increasing online tobacco discounts and advertisements targeting youth.^{31,32} The internet is an increasingly popular place to buy e-cigarettes, the most common

product used by youth and young adults.^{23,33,34} E-cigarette advertisements are largely unregulated by the FDA^{33,35}; therefore, the FDA and policy makers might consider restricting targeted marketing for the military. There is a long history of tobacco companies promoting a military tobacco culture with targeted advertisements, discounts, and promotional events.^{36–38} Furthermore, most states with Tobacco 21 laws, restrict tobacco purchases to those under 21 years, but exempt military personnel.³⁹ Thus, there will be growing opportunity for tobacco companies to target personnel between 18 and 21 years. Given that this population is vulnerable for high rates of tobacco use,^{1,2} online advertisement regulations and removal of the military exemption from Tobacco 21 laws might help prevent disparities among newer products.

LIMITATIONS

A high percentage of Airmen did not respond to follow-up questions; perhaps, because of military policy regarding data (ie, commanders have privileges to obtain survey responses). Additionally, time constraints possibly deterred some Airmen from responding. There are likely differences among Airmen who were more likely to respond to all tobacco behavior questions. We also might have missed an important category of response, given that many Airmen reported “other” location. This study was also embedded within a randomized trial. Although there were no differences between interventions and tobacco outcomes,²⁴ it is possible that we observed less tobacco use as a result of the tobacco education Airmen received.

CONCLUSION

How and where Airmen used tobacco during Technical Training was influenced by the product used. For example, users of newer products (ie, e-cigarette and hookah) were more likely to buy off base, specifically at a hookah shop or vape shop. Given the growing popularity of e-cigarettes among young adults, and Tobacco 21 law exemptions of military, current policy regulating on base pricing might be insufficient at decreasing disparities between military and civilian use. Because air force training offers a unique opportunity of forced tobacco abstinence, brief tobacco prevention interventions targeting the use of e-cigarettes can be especially beneficial. The tobacco landscape is vastly changing; thus, future military tobacco policies and interventions need to target and adapt to these behaviors regarding newer products.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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