

Timing, Source, & Location of Tobacco Use During Technical Training in the U.S. Military: An Opportunity for Military Policy and Prevention of New & Emerging Products

Fahey, MC ¹, Talcott, GW ^{2,3}, McMurry T ², Klesges RC ², Tubman D ², Krukowski RA⁴, Little MA ^{2,3}

¹University of Memphis, Memphis, TN

² University of Virginia School of Medicine, Charlottesville, VA

³ Wilford Hall Ambulatory Surgical Center, Joint Base San Antonio-Lackland AFB, TX

⁴ University of Tennessee Health Science Center, Memphis, TN

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Corresponding author: Margaret C. Fahey, mcfahay@memphis.edu; 400 Innovation Drive Memphis, TN

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Structured Summary

Introduction. The U.S. military is at high risk for tobacco use, particularly during the first year of military service. Technical Training follows an 8 ½ week tobacco ban during Basic Military Training and is a vulnerable time for personnel to both re-initiate 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 (e.g., electronic 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. Further, this study will examine differences in demographic characteristics and prior tobacco history in relationship to these tobacco behaviors.

Material and Methods. Participants were United States 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 (i.e., first month vs. after), how (i.e., “bummed” from another Airmen, bought on or off base, received from the internet or event) and where (i.e., 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-Man 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, electronic-cigarettes, cigarillos/little cigars and hookah were more likely to be bought off base, and first used at a specialty store (i.e., vape shop, hookah bar, or cigar lounge).

Discussion. 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 electronic cigarettes. Future policies might consider addressing the density of off base tobacco retailers to reduce the high rates of tobacco use in this population.

The United States (U.S.) military is a population at high risk for tobacco use.^{1,2} Rates of cigarette and smokeless tobacco use in the military have far exceeded civilian use;¹⁻³ and, this disparity is similarly seen among new and emerging products [i.e., electronic cigarettes (e-cigarettes), hookah] as well.^{4,5} Given that more than 170,000 individuals are recruited,⁶ 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 for military personnel to both initiate and re-initiate tobacco use and may offer a critical time for policy intervention.⁸⁻¹²

During the Air Force recruitment year, after an 8 ½ week tobacco ban during Basic Military Training (BMT), Air Force personnel continue to the second phase of training (i.e., Technical Training) lasting between two weeks to 18-months depending on career field. Despite forced cessation during BMT and the first four weeks of Technical Training,¹³ most Airmen re-initiate tobacco immediately after the ban during Technical Training.^{8,11,12,14} Additionally, previous research indicates that 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 the cost of tobacco products, to reduce smoking among civilian populations.¹⁵ However, military personnel have historically had access to discounted tobacco products on base,¹⁶ perhaps contributing to elevated rates of tobacco use.¹⁷ In response, a recent military policy¹⁸ requires that the pricing of tobacco products on base match the prevailing local price in the community including applicable taxes. Yet, it is unclear if this recent policy will be effective for users of new and emerging products (e.g., e-cigarettes), who might be just as 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 tobacco products when informing military policy. Thus, more detailed information is needed regarding when, how, and where Airmen are using tobacco during Technical Training, particularly among users of these new and emerging products.

To inform future military tobacco interventions and policy, this study will use exploratory analyses to examine when (i.e., first month vs. after), how (i.e., “bummed” from another Airmen, bought on or off base, received from the internet or event) and where (i.e., smoke pits, on or off base, bar or club, friend’s house, cigar lounge, hookah bar, or vape shop) Airmen use tobacco during Technical Training across multiple products. Further, this study will explore differences across demographic characteristics and prior tobacco history in relationship to these tobacco behaviors during Technical Training.

Methods

Participants

Participants were United States Air Force recruits completing Technical Training at Joint Base San Antonio-Lackland Air Force Base (2017-2018). Of Airmen approached for the current study (N=3,347), 89.6% ($n=2,999$) consented and 99.0% ($n=2,969$) met eligibility requirements (≥ 18 years of age). Of these Airmen, 87.9% ($n=2,611$) were retained for 3-month 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 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: (1) Brief Tobacco Intervention + Airmen's Guide to Remaining Tobacco Free, (2) Airmen's Guide to Remaining Tobacco Free, (3) *National Cancer Institute's Clearing the Air* pamphlet. All Airmen received one of these interventions because it was considered part of Air Force Training. More information about these interventions can be found elsewhere.²⁴ No differences by intervention were found in the prevalence of tobacco use at follow-up.²⁴ Thus, all participants, regardless of randomization group, are included in the present study. At follow-up, during the last week of Technical Training (3-months after tobacco intervention), consented participants completed a follow-up questionnaire about their 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 products (i.e., cigarettes/roll your own cigarettes, smokeless tobacco/snus, cigars, little cigars/cigarillos, pipe, e-cigarettes, and hookah). Responses included: *Never*, *less than monthly*, *monthly*, *weekly*, and *daily*. Because of the forced tobacco ban at baseline, the assessment measured Airmen's tobacco use prior to BMT. Regular tobacco use was defined as at least monthly use of that product; given that this is a common definition of regular use among young adults and military personnel.^{25,26} Re-initiators at follow-up were defined as Airmen who reported regular use of at least one tobacco product prior to BMT and reported any use (either

monthly or less than monthly) of at least one tobacco product at follow-up. Initiators were defined as those reported using tobacco *never* or *less than monthly* at baseline and reported any use of at least one tobacco 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?” Responses were categorized as: *During Week 0 - 4 of Technical Training* and *After Week 4 of Technical Training*.

Source of tobacco use. At follow-up Airmen responded to the question, “If you used tobacco products since starting Technical Training, where did you get the first tobacco product that you used?” Responses included: (1) *I “bummed” it from another Airmen*, (2) *I bought it on base*, (3) *I bought it off base*, (4) *I bought it off the internet*, (5) *I got it free or discounted from a tobacco promotion on the internet*, and (6) *I got it free or discounted from a tobacco promotion at an event*. The three final options were combined due to infrequency of responses.

Location of tobacco use. At follow-up Airmen were asked, “Where were you when you first used a tobacco product during Technical Training?” Responses included: (1) *smoke pit (i.e., designated smoking area on base)*, (2) *on base (but not at a smoke pit)*, (3) *at a bar or club*, (4) *at a friend’s house or apartment*, (5) *at a cigar lounge, hookah bar, or vape shop*, and (6) *Other*.

Analysis

Descriptive statistics were observed to examine the prevalence of tobacco use behaviors (i.e., timing, location, source) during Technical Training. Wilcoxon-Mann-Whitney and Kruskal-Wallis tests were run to compare differences in demographic characteristics and baseline tobacco use (i.e., non-users vs. users) in relationship to these tobacco behaviors (i.e., timing, location, source). Further, descriptive statistics (i.e., counts, percentages) were used to examine

differences across all tobacco products in relationship to these tobacco behaviors during Technical Training.

Results

Participant demographic characteristics and rates of baseline tobacco use are found in Table 1. At baseline, 39.4% ($n=1161$) reported regular use of any tobacco product and during Technical Training, 21.3% ($n=552$) used tobacco (either monthly or less than monthly). Specifically, 37.4% ($n=432$) of prior tobacco users re-initiated and 6.4% ($n=116$) of prior non-users 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% regularly used pipes.

Timing of Tobacco Use

Of all those using tobacco during Technical Training, across all products, 11.3% initiated prior to week four, 56.5% initiated after week four and 32.2% did not respond. No differences in tobacco use timing were found across demographic characteristics and between initiators and re-initiators.

Comparisons across tobacco products. Across all tobacco products, most Airmen reported using after week four compared to before week four or not responding (Table 2). However, a higher prevalence of smokeless tobacco users (16.7%) initiated in the first month of Technical Training, 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

Of all tobacco users during Technical Training, most commonly (33.2%), Airmen bought tobacco products off base, 17.0% “bummed” products from another Airman, 15.2% bought on

base, 1.3% received products from the internet or event, and 33.3% did not respond (Table 3). Source differed by age ($p=.006$); specifically, a lower mean age [Mean (M) = 19.1 (1.2)] was found among Airmen who received products from the internet or at an event compared to other sources. A difference in educational background was found ($p=.028$). Specifically, “bumming” tobacco was more common (22.7%) among those who received more education than a high school education/GED compared to those with less education (13.7%). 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 demographic characteristics were found. No differences between initiators and re-initiators were found in tobacco source.

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%, 28.7%, respectively) (Table 3). For e-cigarette users, buying off base was the most common source (37.2%). Among smokeless tobacco users, buying on base and off base were the most common (28.0%, 28.5%, respectively). Among cigarillo/little cigar users, Airmen most commonly bought off base (36.3%) and this was similarly found among hookah users (40.3%). Finally, pipes were most commonly reported to be “bummed” or bought off base (28.6%, 28.6%, respectively).

Location of Tobacco Use at Follow-Up

Of tobacco users during TT, 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 ($p<.001$); specifically, the highest mean age was among those who used tobacco at a bar or club [$M = 21.8$ (2.6)]. Location also differed by

education ($p=.013$). Those with more than a high school diploma/GED were more likely to report a bar or club (8.7%) than those with less education (3.5%).

Comparisons across tobacco products. Of first-time cigarette use and smokeless tobacco use during Technical Training, most Airmen either reported *other* location or did not respond (48.5%; 55.9%, respectively). These responses were followed by using at a designated smoking area (24.8%, 16.1%, respectively) (Table 4). Among first time e-cigarette use, cigarillo/little cigar use, and hookah use, Airmen most commonly reported other location or did not respond (53.5%; 56.8%; 42.6%, respectively) followed by using at a cigar lounge, hookah bar, or vape shop (24.2%; 18.8%, 36.4%, respectively).

Discussion

Current results extend previous literature by examining when, how, and where Airmen first used tobacco during Technical Training. In this sample, tobacco use during Technical Training was common (21.3%); specifically, 37.4% of prior users re-initiated tobacco use and 6.4% of prior non-users initiated. However, these rates were much lower compared to previous tobacco studies during the first year of military service.^{8,9,11,12,14} Perhaps, tobacco use was lower given than all Airmen in this study 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 the current study evaluated tobacco use only at three months after BMT, dissimilarly from previous studies evaluating tobacco at a one-year follow-up,^{8,9,11,12,14} current rates might not represent those who used tobacco later on in training.

In regard to the timing of tobacco use, most Airmen, across the use of all products, used tobacco after the first month of Technical Training. However, using tobacco prior to when the tobacco ban was lifted (i.e., in the first month of Technical Training), rather than later, was most common among users of smokeless tobacco (16.7%) and hookah (16.3%) compared to other products. Perhaps, these products were easier to access and use during periods of forced abstinence. Surprisingly, prior tobacco users were not significantly more likely to re-initiate tobacco sooner during Technical Training compared to first time users. Thus, previous tobacco history might not help predict which Airmen are more likely to use when tobacco is prohibited.

How and where Airmen first used tobacco during Technical Training differed across products. Specifically, 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 (i.e., 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 tobacco initiation and continued use.^{27,28,29} Although these studies have more commonly examined cigarettes, some research indicates a link between e-cigarette retailer density and an increased likelihood of e-cigarette use among high school students.³⁰ Thus, current findings highlight the importance of examining how the tobacco-built environment off base impacts tobacco behaviors of personnel. Perhaps, regulating tobacco retail density around base might decrease the prevalence of new and emerging products among recruits.

There were no significant differences between prior tobacco users and non-users in how and where Airmen first used tobacco. However, there were differences in educational background and age. Specifically, those with a high school diploma/GED more commonly bought on base, particularly at designated smoking areas, compared to those with more education. Perhaps, the new policy¹⁸ regulating on base tobacco pricing will be more impactful for recruits with lower educational backgrounds. Further, 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.

Although, in the overall sample, a small prevalence of Airmen (1.3%) reported first accessing their products from the internet or at an event, receiving tobacco from these sources was associated with younger age. This finding is consistent with research indicating trends of increasing online tobacco discounts and advertisements targeting youth.^{31,32} Further, the internet is becoming an increasingly popular place to buy e-cigarettes, which is the most common tobacco product used by youth.^{23,33,34} These e-cigarette advertisements are largely unregulated by the FDA;^{33,35} however, the FDA might consider restricting targeted marketing for military populations. There is a long history of tobacco companies promoting a military tobacco culture with targeted advertisements, discounts, and promotions.^{36,37} Given that this population is vulnerable for high rates of tobacco use,^{1,2} online advertisement regulations might help prevent tobacco use disparities among these new and emerging products.

There are several limitations that are important to address. A high percentage of Airmen did not respond to follow-up questions; perhaps, given military policy regarding data. Although uncommon, commanders have privileges to obtain survey responses. Thus, it was possible for Airmen to receive consequences for reporting tobacco use in the first month of Technical Training, prior to the lifting of the tobacco ban. Thus, there are likely differences among Airmen

who were more likely to respond to all tobacco behavior questions. Additionally, the current study was embedded within a randomized trial. Although there were no differences between cessation interventions and tobacco use outcomes,²⁴ it is possible that we observed less tobacco use in the current study as a result of the tobacco education participants received.

Conclusion

Current differences across products in how and where Airmen used tobacco during Technical Training, indicate that military tobacco policies should adapt to address behaviors among users of new and emerging products. Specifically, e-cigarette and hookah users were more likely to buy products off base, most commonly at a hookah shop or vape shop. Thus, future military policies might consider regulating the density of off base tobacco retailers to address the high rates of tobacco use among recruits.

Table 1.

Sample Characteristics (N=2,969)	
Age <i>M (CI)</i>	19 (18,21)
Sex (<i>male</i>) <i>N (%)</i>	2075 (70.2)
<u>Race</u> <i>N (%)</i>	
Black/African American	581 (20.0)
White	1835 (63.2)
Multiple	48 (6.2)
Other	179 (6.2)
Hispanic <i>N (%)</i>	630 (23.1)
Married	271 (9.2)
<u>Education</u> <i>N (%)</i>	
High school diploma/GED	1873 (63.6)
Vocational training	43 (1.5)
Some college/Associates	863 (29.3)
Bachelor's degree or higher	168 (5.7)
<u>Military Rank</u> <i>N (%)</i>	
Active Duty	2577 (87.4)
Guard	264 (8.9)
Reserve	109 (3.7)
<u>Prior Tobacco Use</u> <i>N (%)</i>	
Any	1161 (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

Table 2.

Timing of Tobacco Use during Technical Training across Tobacco Products

Tobacco Products	Timing in Technical Training		
	Before week 4	After week 4	Not reported
	N (%)	N (%)	N (%)
Cigarettes	32 (15.8)	126 (62.4)	44 (21.8)
Electronic cigarettes	35 (11.1)	210 (59.2)	71 (30.3)
Smokeless tobacco	31 (16.7)	110 (59.1)	45 (24.2)
Cigarillos/little cigars	23 (9.8)	140 (59.8)	71 (30.3)
Pipes	2 (2.9)	3 (42.9)	2 (28.6)
Hookah	21 (16.3)	74 (57.4)	34 (26.4)

Note: Differences in demographic characteristics and tobacco use history were non-significant (p 's >.05)

Table 3.

Source of Tobacco Use during Technical Training across Tobacco Products

	Bummed	Bought on Base	Bought off Base	Internet/Event	Not Reported
Tobacco Products					
Cigarettes <i>N (%)</i>	45 (22.3)	50 (24.8)	58 (28.7)	4 (2.0)	45 (22.3)
Electronic cigarettes <i>N (%)</i>	63 (17.7)	40 (11.3)	132 (37.2)	5 (1.4)	115 (32.4)
Smokeless tobacco <i>N (%)</i>	35 (18.8)	52 (28.0)	53 (28.5)	3 (1.6)	43 (23.1)
Cigarillos/little cigars <i>N (%)</i>	34 (14.5)	37 (15.8)	85 (36.3)	1 (0.4)	77 (32.9)
Pipes <i>N (%)</i>	2 (28.6)	1 (14.3)	2 (28.6)	0 (0.0)	2 (28.6)
Hookah <i>N (%)</i>	25 (19.4)	18 (14.0)	52 (40.3)	1 (0.8)	33 (25.6)
Demographics					
Age <i>M (SD)</i>	20.5 (2.3) **	19.4 (1.7) **	19.6 (1.8) **	19.1 (1.2) **	19.8 (2.4) **
Educational Background <i>N (%)</i>					
More than high school diploma/GED	47 (22.7) *	22 (10.6) *	67 (32.4) *	3 (1.4) *	68 (32.9) *
High school diploma/GED	47 (13.7) *	62 (18.1) *	115 (33.5) *	4 (1.2) *	166 (33.3) *

Note: Differences in other demographic characteristics and tobacco use history were non-significant (p 's > .05); *** p < .001, ** p < .01, * p < .05

Table 4.

Location of Tobacco Use during Technical Training Across Tobacco Products

	Designated Smoking Area	On Base (not a smoking area)	Bar/club	Friend's house	Cigar lounge/ Hookah bar/ Vape shop	Other/ Not reported
Tobacco Products						
Cigarettes <i>N (%)</i>	50 (24.8)	10 (5.0)	17 (8.4)	3 (1.5)	24 (11.9)	98 (48.5)
Electronic cigarettes <i>N (%)</i>	40 (11.3)	13 (3.7)	17 (4.8)	9 (2.5)	86 (24.2)	190 (53.5)
Smokeless tobacco <i>N (%)</i>	30 (16.1)	17 (9.1)	13 (7.0)	3 (1.6)	19 (10.2)	104 (55.9)
Cigarillos/little cigars <i>N (%)</i>	31 (13.2)	7 (3.0)	14 (6.0)	5 (2.1)	44 (18.8)	133 (56.8)
Pipes <i>N (%)</i>	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	(0.0)	7 (100.0)
Hookah <i>N (%)</i>	9 (7.0)	6 (4.7)	8 (6.2)	4 (3.1)	47 (36.4)	55 (42.6)
Demographics						
Age <i>M (SD)</i>	19.4 (1.6) ***	20.2 (2.0) ***	21.8 (2.6) ***	20.1 (2.2) ***	19.6 (1.7) ***	19.8 (2.2) ***
Educational Background <i>N (%)</i>						
More than high school diploma/GED	19 (9.2) *	12 (5.8) *	18 (8.7) *	7 (3.4) *	43 (20.8) *	108 (52.2) *
High school diploma/GED	48 (14.0) *	14 (4.1) *	12 (3.5) *	5 (1.5) *	59 (17.2) *	205 (59.8) *

Note: Differences in other demographic characteristics and tobacco use history were non-significant (p 's > .05); *** p < .001, ** p < .01, * p < .05

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