Using the Socio-ecological Model to Explore Facilitators and Deterrents of Tobacco Use Among Airmen in Technical Training

Kathleen J. Porter, PhD, RD; Rebecca A. Krukowski, PhD†; Gloribel Bonilla, MPH‡; Lisa McKenna, MS§; Col Gerald W. Talcott, USAF (Ret.)‖; Melissa A. Little, PhD, MPH¶*

ABSTRACT

Introduction:

Military personnel have some of the highest rates of tobacco use in the USA. Within the Air Force, a common point of Airmen's (re-)initiation of tobacco use is during technical training once the tobacco ban has been lifted. Unfortunately, little is known about what factors facilitate and deter tobacco use during technical training. The socio-ecological model, which emphasizes multiple levels of influence on behavior (e.g., personal, intrapersonal, and environmental), provides a strong and comprehensive basis for which to explore factors that may impact tobacco use during technical training.

Materials and Methods:

Twenty-two focus groups were conducted among Airmen ($n = 10$), Military Training Leaders (MTLs, $n = 7$), and Technical Training Instructors (TTIs, $n = 5$). Semi-structured focus group protocols were developed based on the socio-ecological model and included questions intended to elicit factors that facilitated and deterred tobacco use during technical training. Focus groups were transcribed and then coded using a hybrid deductive-inductive process.

Results:

At the personal level, five factors were identified that influenced tobacco use: choice, fit with lifestyle, associations with the tobacco experience, association with military job outcomes, and association with health outcomes. Three interpersonal level factors were identified: peer influence, leadership influence, and normative beliefs. There were two influential environmental level factors: pricing and promotion and access to tobacco. Except for normative beliefs, all personal, interpersonal, and environmental-level factors were discussed as having aspects that could either facilitate or deter tobacco use. Normative beliefs, an interpersonal-level factor, were only discussed as a facilitator of tobacco use.

Conclusions:

Taken together, study findings can be used to enhance the effectiveness of tobacco prevention and cessation programs for Air Force Technical Trainees. Specific strategies to support the reduction of tobacco use among Airmen are presented.

INTRODUCTION

Military personnel have among the highest rates of tobacco use in the USA, with 24.4% of new Air Force recruits reporting tobacco use before enlistment.[1] This rate is 5% higher than the national prevalence among U.S. adults.[2] Even more concerning, 29.6% of new Airmen report tobacco use 1 year after enlistment,[3] demonstrating the prevalence of tobacco use actually increases during the first year in the Air Force. These high rates of tobacco use are in stark contrast to Airmen's intentions. Throughout the eight and a half weeks of Basic Military Training (BMT) and the first 4 weeks of technical training, Airmen are required to abstain from tobacco. During the first week of technical training, 63% of Airmen are "completely confident" they will remain tobacco free 1 year later.[4] Unfortunately, 62.6% of former smokers return to cigarettes and 12.6% of never users initiate regular cigarette use; for 54.2% of Airmen, this relapse/initiation occurs during technical training once the ban is lifted.[5] These high rates of relapse and initiation occur despite rigorous anti-tobacco regulations, suggesting that there is something unique about the training environment facilitating this use. Considering ~220,000 new recruits enter the military annually,[6] this is a significant public health concern.

Unfortunately, little is known regarding the factors in technical training facilitating such high rates of tobacco use after

*Department of Public Health Sciences, University of Virginia, School of Medicine, Christiansburg, VA 24073, USA

†Department of Preventive Medicine, The University of Tennessee Health Science Center, Memphis, TN 38105, USA

‡Health System West Complex MSB, University of Virginia Cancer Center, Charlottesville, VA 22903, USA

§Department of Social Work, The University of Texas at San Antonio, San Antonio, TX 78207, USA

‖Department of Public Health Sciences & Center for Addiction and Prevention Research, University of Virginia, School of Medicine, JBSA-Lackland, TX 78236, USA

¶Department of Public Health Sciences, University of Virginia, School of Medicine, Charlottesville, VA 29903, USA

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restrictions are lifted, including non-cigarette tobacco products that are growing in popularity.[1] In previous studies, Airmen were more likely to initiate cigarette and smokeless tobacco use following the ban in technical training if they reported prior tobacco use, stronger intentions to resume tobacco, lower perceived harm of tobacco, beliefs that tobacco products assist with weight management, and lower agreement with military tobacco restrictions.[7,8] Given that most active duty personnel report that the majority of their friends used cigarettes (73.1%) and smokeless tobacco (61.2%),[9] and only 50% felt that the leadership at their installation discouraged smoking,[9] it is also critical to understand how interpersonal factors might influence tobacco use during this high-risk period. Airmen were also more likely to initiate cigarettes if they perceived smoking to be normative among their peers,[10] their roommate smoked,[10] or their Military Training Leaders (MTLs) or Technical Training Instructors (TTIs) used tobacco.[10,11] These studies were limited to cigarettes and smokeless tobacco and did not examine the range of tobacco products used by Airmen. Given the recent rise in e-cigarette use among Airmen,[1] studies are needed to examine the factors leading to this high rates of use as well.

Environmental factors may also be critical, as smoke breaks are commonly used for having regular periods for relaxation during the duty day,[12,13] and tobacco products are seen as a way to bond with peers and supervisors.[13] Additionally, recent policies have been enacted to reduce tobacco use among military personnel, but it is unclear whether they will be effective for this high-risk group of trainees and acceptable to military leaders, since they have concerns that extreme restrictions would interfere with military personnel's right to choose to use tobacco.[14] For instance, the DoD recently implemented a policy requiring DoD stores to set all tobacco prices equal to prevailing local prices, adjusted for state and local taxes,[15] while another policy removed e-cigarettes from DoD stores.[16] However, it is unclear how impactful these policies will be on new and emerging tobacco products (e.g., hookah, e-cigarettes), given that recent data suggests that Airmen in technical training do not purchase these products on base.

The current study builds on this previous work by examining how the military training environment influences tobacco use during this high-risk period following the removal of tobacco restrictions, using the socio-ecological model. This model proposes that individual behaviors are shaped by personal, interpersonal, and environmental (e.g., sociocultural, policy, and physical-environmental) factors. The current study will examine how these three levels of influence are related to the disconnect between Airmen's desire to remain tobacco free following the ban and their actual behavior and lays the foundation for proposing policies and interventions for preventing the use of tobacco use during technical training.

METHODS

This study is a qualitative exploration of facilitators and deterrents to tobacco use among Airmen in technical training (to be called Airmen moving forward) from the perspectives of Airmen, MTLs, and TTIs. Data were collected as part of a larger study exploring factors predicting tobacco use among Airmen during technical training. Study procedures were approved by the 59th Medical Wing Institutional Review Board.

Participants and Recruitment

Between July 2018 and February 2019, Airmen, MTLs, and TTIs from the five largest technical training schools (Fort Sam Houston, Goodfellow, Keesler, Lackland, Sheppard) where the majority of non-prior service Airmen undergo training were recruited into this study. Military Training Leaders are active duty supervisors of Airmen, ensuring they are where they are supposed to be and dispensing disciplinary action. Technical Training Instructors are responsible for teaching the specific skills required for that career field; TTIs can be active duty or civilians. Airmen were recruited voluntarily during their last week of technical training. Military Training Leader and TTI volunteers were recruited by the senior MTL at each base. Participants had to be at least 18 years of age and could be either a tobacco or non-tobacco user.

Focus Group Procedures

Focus group protocols were developed for Airmen and for MTLs and TTIs. To understand the tobacco experience for Airmen during technical training, the questions targeted the following domains: personal experience with tobacco, facilitators of tobacco use on base, deterrents to tobacco use on base, and strategies to reduce tobacco use among technical trainees.

Focus groups were conducted in pairs by five trained non-military researchers in a private room without supervisory personnel present in order to promote an open and unbiased environment. Each focus group contained one moderator and at least one note taker. Participants were provided with an informational consent letter and verbally consented to participate. Focus groups generally contained seven participants, ranged from 4 to 11 participants, and took on average 45 min to complete. Participants were provided with food during the focus group. Responses were anonymous and audio recorded.

Codebook and Analysis

Transcripts of focus groups were transcribed by Datagain. Transcripts were checked by researchers before coding. The research team used nVivo (v12) software to manage the hybrid deductive-inductive approach coding process.

An initial codebook consisting of known facilitators and deterrents to tobacco use was developed using evidence from

the literature and focus group facilitator notes to identify factors that influence tobacco use among Airmen. These codes were organized into domains of facilitators and deterrents and, within each domain, organized by the level of the socio-ecological model that they reflected.

Coding occurred over three phases. First, each transcript was coded using the code book by two trained research staff members. Coders met to resolve discrepancies and came to agreement. If agreement could not be reached, a third coder was brought in to resolve discrepancies. As new codes were identified, the research team met, thoughtfully discussed these codes, and added them along with definitions to the codebook. Second, after completion of the initial round of coding, two of the researchers reviewed meaning units within each discrete code to ensure that codes stuck to the definitions and to determine whether codes should be merged or further sub-coded. Third, researchers organized the individual codes into categories that reflected the larger factors at each level of the socio-ecological model influencing tobacco use among Airmen.

RESULTS

Participants

Twenty-two focus groups were conducted with Airmen ($n = 10$ focus groups with 83 participants), MTLs ($n = 7$ focus groups with 48 participants), and TTIs ($n = 5$ focus groups with 33 participants). There were two Airmen focus groups and one TTI focus group per base. There was one MTL focus group at four of the bases and three at the fifth because of the size of the base. Of the Airmen focus groups, seven were current tobacco users only, two were non-tobacco users, and one was mixed users and non-users. All the MTL and TTI focus groups had mixed groups of users and non-users. Overall, 72% of participants were tobacco users, and the majority of participants (78%, $n = 141$) were male.

Personal-Level Factors that Facilitate or Deter Tobacco Use among Airmen

Focus group participants identified five factors that facilitated or deterred tobacco use among technical trainees at the personal level: (1) choice, (2) fit with lifestyle, (3) associations with tobacco experience, (4) associations with military job outcomes, and (5) association with health outcomes. Representative quotes for personal-level factors are presented in Table I.

Participants discussed the choice factor in two ways: (1) having the ability to make the choice as to whether or not to use tobacco and (2) not having the choice because their addiction limited their ability to choose. Having the ability to choose was identified as both a facilitator and deterrent. As a facilitator, this factor was contextualized as being able to choose because of legal age, wanting to try tobacco products because of having independence from parents, and seeing this choice as a "freedom" in a situation where they often lack the ability to make their own decisions. As a deterrent, the ability to choose was often discussed as willpower and just not wanting to use tobacco.

In the fit with lifestyle factor, tobacco was associated with alcohol intake (facilitator) and having alternative activities (deterrent). Inconvenience because of not having time or having to go outside to use tobacco, as military facilities are smoke free, was also discussed as a deterrent to some types of tobacco (e.g., burnt tobacco). However, this inconvenience was also then implied to facilitate the use of other types of tobacco products (e.g., smokeless and e-cigarettes) illicitly.

Participants also discussed how Airmen's associations with the tobacco experience impacted Airmen's decisions to use tobacco during technical training. Associations related to tobacco being a stress reducer, a way to combat boredom, and being perceived as exciting facilitated use of tobacco. Finding tobacco use disgusting and having other negative connotations or experiences with tobacco use (e.g., what they learned about tobacco in school, seeing family members' experiences, not being something good for their children to be around) were deterrents to tobacco use.

Tobacco use was impacted by personal associations of its impact on military job outcomes. Participants discussed this factor both as a facilitator and deterrent of use. As a facilitator, Airmen discussed how tobacco use helped them with concentration and wakefulness, particularly while studying. As a deterrent, Airmen discussed how not using tobacco made them more responsible about their work (e.g., not impacting their physical training tests and not requiring others to cover their work during a smoke break).

Associations with health outcomes also influenced tobacco use among Airmen. Participants identified the negative health impacts of tobacco as a deterrent. However, they also discussed the (perceived) differences in health impact between types of tobacco, notably e-cigarettes having less of a health impact than cigarettes, as a facilitator for the use of these products.

Intrapersonal Level Factors that Facilitate or Deter Tobacco Use among Airmen

Three intrapersonal-level factors were identified by participants as impacting tobacco use: (1) peer influence, (2) leadership influence, and (3) normative beliefs about tobacco use in the Air Force. Representative quotes are presented in Table II.

As a facilitator, peer influence was discussed in relation to being around tobacco users made Airmen want to use tobacco, as a means of fitting in, and as a social group activity. As a deterrent, participants spoke about not using tobacco (or hiding their tobacco use) because of embarrassment around admitting to being a tobacco user and their peers not using tobacco.

Participants also discussed the influence of leadership on their tobacco choice. In these discussions, leadership varied

TABLE I. Personal Level Facilitators and Deterrents to Tobacco Use Among Airmen in Technical Training

Factor	Specific facilitators of tobacco use	Specific deterrents to tobacco use
Choice	*Have the ability to make own choices* "They're in a huge environment where they're given more responsibility. Way more than they had when they were in BMT. So when they come here, it's like it's more of an okay, you're on your own, we got to make your own decisions." (*MTL, Goodfellow*) *Habit or addiction (lost choice)* "I know they're in the same boat as me, when we get back from class or wake up in the morning, or after PT [physical training], you want such a high nicotine that you can't sit up." (*Airman, Keesler*)	*Have the ability to make own choices* "It's my own willpower. I decided, hey, I don't need to do it. I can have fun without it." (Airman, Keesler)
Fit with Lifestyle	*Linked with alcohol intake* If I'm drunk, my friends will smoke cigs and I'll just.. I think it's gross but if I'm really drunk, it just happens sometimes. (*Airman, Keesler*)	*Have alternative activities* "I definitely think my consumption went down when I got my car here though. There's a lot more to do with a car." (*Airman, Keesler*) *Inconvenient* "It's definitely a pain in the butt to do it, which is why a lot of people just do it in the rooms. It's inconvenient. I was on crutches for four months. I don't want to pick my butt up and walk 10 minutes that it's going to take me on crutches to get out to a smoking area." (*Airman, Keesler*)
Associations with the Tobacco Experience	*Reduce stress* "… You're stressed because you're here for six to eight months. You're stressed because the course load is hard. You're stressed because of so much. You're stressed because you can't go home and see your family …" (*Airman, Keesler*) *Combats boredom* "I think boredom has a lot to do with it as well, you're bored all the time." (*Airman, Sheppard*) *It's exciting* "People don't smoke hookah for the tobacco. They just smoke it just to smoke it. To do tricks and stuff." (*MTL, Fort Sam*)	*Disgust* "It tastes gross." (*Airman, Goodfellow*) *General negative connotations* "I was just taught that it was bad and growing up, I just associated it with negative things, so I never felt the need to go after it." (*Airman, Keesler*)
Association with Military Job Outcomes	*Improved concentration* "It helps you concentrate. When I'm back home, sometimes with study sessions we'll go to hookah lounges or the vapes, that would help me concentrate more, it kind of woke me up." (*Airman, Keesler*)	*Responsible about work* "….I feel like a lot of people don't smoke because … because we still have to take PT tests and we still have to do PT. The big reason is, the PT tests, we still have to take those and statistics show that smoking affects that. A lot of people don't want bad scores on their PT tests because then there's kind of disciplinary action and stuff." (*Airman, Keesler*)
Association with Health Outcomes	*Some tobacco not as bad as others* "I feel as though vapes have much less of an impact than nicotine from cigarettes." (*Airman, Goodfellow*)	*Health impacts* "I don't want to adversely affect my health." (*Airman, Lackland*)

from MTLs and TTIs (with whom Airmen engaged on a regular basis) to base leadership. Participants discussed leadership as facilitating tobacco use because leaders who they idealized either used tobacco or were neutral on use (i.e., not telling them not to, not talking about tobacco). Conversely, leadership was viewed as deterring use when they enforced the tobacco policies.

Lastly, participants discussed normative beliefs about tobacco use in the Air Force as a facilitator of tobacco use. This factor was discussed in three different ways. First, although participants perceived the rate of tobacco use in the military to be higher than civilian rates, they estimated rates of tobacco use in technical training to be considerably higher than actual rates (perceived rate of 40%-90%). Second, they shared the perception that they can get away with using tobacco even when it is not permitted and strategies that can be employed to successfully use tobacco in non-sanctioned places (e.g., dorm rooms and classrooms) and at non-sanctioned times (e.g., in uniform, before restrictions are lifted during technical training). Third, in some of these

TABLE II. Interpersonal Level Facilitators and Deterrents to Tobacco Use Among Airmen in Technical Training

Factor	Specific facilitators of tobacco use	Specific deterrents to tobacco use
Peer Influence	*Being near users makes want to use* "That kind of like triggers it, if you just see other people doing it and be like, oh, I want to try it, too. If she's doing it …" (*Airman, Fort Sam*)	*Embarrassed to admit they use tobacco* "Even if they do, I'm not sure they'll admit it in front of their peers. I hid it for a long time. I would be like no, I don't smoke. Nope, I don't. 'Why are you hiding behind a trash can?"' (*MTL, Fort Sam*)
	Wanting to fit in "You need to find a way in to meet people, and an easy route I would see is probably using tobacco products, because they're socializing with people who are also using them." (*Airman, Sheppard*)	*It is not what their social group does* "None of my friends really smoke or use tobacco, so it's like.. it's easier because none of my friends.. they don't smoke either." (*Airman, Keesler*)
	It's a "social (group)" activity "I had a couple friends that actually liked to go to the hookah spot that was down the street over there. They had wanted me to go… it was a cool environment just to hang out in." (*Airman, Keesler*)	
Leadership Influence	*Leaders who use are idealized* "Since he [TTI] does it, why – I can do it too! He's all successful and getting a great career, so I will see, if I do it too, I mean, no negative impacts." (*Airman, Sheppard*)	*Leaders enforce tobacco rules* "… formally we try to have a positive influence with that [tobacco use], especially when they first get here." (*MTL, Lackland*)
	Leaders are neutral on use "They definitely don't like talk about tobacco or anything. And I mean, you couldn't tell if they did or not, or like do something like that." (*Airman, Lackland*)	
Normative Beliefs about Tobacco Use in the Air Force	*Tobacco use is (perceived as) high* "I'd say 90 [% use tobacco]. I have caught so many Airmen smoking in their rooms. They're ridiculous." (*MTL, Sheppard*)	
	You can get away with using when you aren't supposed to "Regardless, none of us really care as long as we don't get caught. That's what it comes down to, if you don't get caught, [they] don't care what you do." (*Airman, Sheppard*)	
	Not as bad as other vices "Nobody views it as a negative thing to smoke. Whereas, some people do view it as a negative thing to drink, especially irresponsibly. So—because if you drink too much and are stupid with it, well, then everybody's coming in the weekend potentially because they made a mistake. But how do you make a mistake with tobacco? There's no really no mistake there, besides your own personal [health]. "(*TTI, Sheppard*)	

discussions, participants identified how this illicit use was tacitly supported by leadership (e.g., MTL/TTI turning a blind eye) or by staff (e.g., staff at the Base Exchange not checking to see if they were in the appropriate phase of training to use tobacco).

Environmental Level Factors that Facilitate or Deter Tobacco Use among Airmen

Two environmental-level factors were identified by participants as impacting tobacco use: (1) pricing and promotion and (2) access to tobacco. Representative quotes for environmental-level factors are presented in Table III.

Pricing and promotion was identified as both a facilitator and a deterrent to tobacco use among Airmen. The cost of tobacco was discussed as a facilitator because of the relatively low cost of products and the lower cost on base. Cost was discussed as a deterrent in terms of the long-term financial costs (i.e., thinking about the total cost of tobacco products over a month versus a single purchase), the variability of cost by location, and the impact of promotion. Specifically, participants identified promotions that impacted the cost of tobacco (e.g., specific military promotions and food deals at local hookah bars—a popular place for studying). They also discussed how social media promoted tobacco use (e.g., seeing pictures of vape clouds on Instagram), which led to increased interest in using tobacco.

Access to tobacco products was discussed as a facilitator in terms of product availability and having officially sanctioned spaces to use tobacco products. Access to tobacco products was also discussed as a deterrent in regard to policies that

TABLE III. Environmental Level Facilitators and Deterrents to Tobacco Use Among Airmen in Technical Training

Factor	Specific facilitators of tobacco use	Specific deterrents to tobacco use
Pricing and Promotion	*Promotions* "…I know some places give discounts if you're military … you get things like half-price or you can choose like two flavors. (*Airman, Fort Sam*) *Cost* "You get five pods for $15, so it's not bad." (*Airman, Keesler*)	*Cost* "In a way, you do kind of get paid if you don't smoke though. My parents, they both smoked cigarettes and they dropped $100 or $200 on them every month, so that's $100 or $200 that I'm saving because I don't smoke." (*Airman, Keesler*)
Access to Tobacco	*Product Availability* "I think if they were thinking about trying it and they just go to the mini mart, they're like," Oh, it's right there. I'll just get it. I'll try it, 'and they'll just start because it's so easy to get.' (*Airman, Keesler*) *Officially sanctioned spaces* "They do provide facilities where, if you do smoke or whatever, you partake in as far as tobacco … I don't know if accommodate is the right word, but we have designated smoking areas around here." (*MTL, Goodfellow*)	*Policies that limit location of use* "When I was in tech training at Sheppard, … you couldn't smoke on base; you had to go off base, which kind of deterred everyone from smoking a little bit. (*MTL, Lackland*) *Policies that limit when they can use* ". the Trainees, because they are not allowed to smoke in uniform during duty day. So, they have to get to phase two to be able to smoke in civilian clothes. (*MTL, Keesler*)

limit where Air Force personnel can use tobacco. Participants identified that tobacco products were easy to access through vendors on base, immediately off base, and through the mail (e.g., ordering directly through online retailers or receiving the product from a friend or family member). Participants spoke about smoke pits and other designed smoking areas on base. Discussions about policies that impacted the timing of tobacco use (e.g., after the designated period within technical training, not during the duty day when in uniform) always identified these policies as deterrents to use. Although policies that limit the location of use (i.e., use in designated areas, cannot use with 50 feet of buildings),[17] were mostly seen as a deterrent, some felt that they facilitated the illicit use of e-cigarettes, as Airmen recognized that they could get away with using this form of tobacco in their dorms and other non-sanctioned spaces.

DISCUSSION

This current study is one of a handful of studies to simultaneously and comprehensively explore facilitators and deterrents to tobacco use among members of the military at the individual, intrapersonal, and environmental levels.[18,19] To the authors' knowledge, it is the only study to examine these factors with Airmen in technical training, with the intent of specifically understanding factors that impact these new service members' (re)initiation of tobacco products following the ban on tobacco use during BMT and technical training. Findings from this study offer insight into key facilitators of tobacco use and key deterrents of use that could be used to craft programs and policies relevant to both (re)initiation prevention and cessation efforts for Airmen during technical training.

Across the personal, intrapersonal, and environmental factors identified, all but one were discussed as having aspects that both facilitated and deterred tobacco use. This has implications for the focus of tobacco prevention and cessation programs. Specifically, it provides insight into perceptions and attitudes that could be targeted in these programs to make tobacco use less desirable. For example, messaging could focus on the harmful effects of e-cigarettes and smokeless tobacco, how tobacco perpetuates the stress response (rather than helping concentration as Airmen perceived[20]) and statistics about tobacco's negative impact on military job performance (i.e., users are more likely to be discharged early, reduced productivity[21,22]). Importantly, messages related to tobacco's impact on health and military performance have been previously identified as having the potential to influence perceptions and intentions of junior enlisted Airmen.[22,23]

Interestingly, the only factor that was identified solely as a facilitator was normative beliefs. It is unsurprising that the normative beliefs within the Air Force facilitate tobacco use; the Air Force and the military in general have long been associated with tobacco use.[14,24] However, it was surprising that normative beliefs included the acceptability of using tobacco outside of designated places and situations (e.g., before phasing up, in unauthorized areas). This acceptability for breaking policies, while identified for all types of tobacco, was more frequently discussed for new and emerging tobacco products, which are easier to conceal and for which tutorials on how to conceal them are widely available.[25] Although shifting normative beliefs about tobacco use has been a target of anti-tobacco campaigns and policies, targeting the perception that it is acceptable to break Air Force (tobacco) policy directly could provide a new avenue to reduce (re)initiation at this stage of an Airmen's military career.

This study also found that factors influencing tobacco use varied by tobacco product. Inconvenience was identified as a personal-level deterrent for burnt tobacco only as

Airmen needed to walk to designated smoking areas to use. Using e-cigarettes and smokeless tobacco was not identified as inconvenient, which may be because of their more easily being concealed and being able to be used in non-designated areas without being caught. Furthermore, smokeless and e-cigarette use was facilitated by these forms of tobacco being viewed as less harmful or even safe. E-cigarette and hookah use were also facilitated by perceptions of the experience being exciting; the use of burnt and smokeless tobacco were not discussed as being exciting. Lastly, hookah use was discussed within the context of social activities more than other types of tobacco. Programs and policies may need to be tailored to the specific tobacco product in order to be effective with young military personnel. This may be particularly important for e-cigarette, as their use has increased 3-fold among new recruits in recent years.[1]

TABLE IV. Strategies to Support Reducing Tobacco Use Among Airmen in Technical Training

	Identified considerations for tobacco cessation programs and policies			
Strategies (*target population, socio-ecological model levels*)[a]	*Target key facilitators and deterrents across the socio-ecological model*	*Change normative perceptions of tobacco use in Air Force*	*Recognize facilitators and deterrents vary by tobacco type*	*Promote cessation in combination with use restrictions*
Refine tobacco-related educational messages and/or approaches				
Strategy 1. Facilitate discussions of the potential health effects of e-cigarettes (*all, personal)*	X		X	
Strategy 2. Develop and disseminate campaigns to promote knowledge around the impact of all tobacco use on physical fitness test performance (*all, personal)*	X	X	X	
Strategy 3. Execute social norms campaigns that de-normalizes tobacco use in the military by correcting normative beliefs about the frequency of tobacco use (*all, interpersonal)*	X	X		X
Strategy 4. Develop targeted media messages that highlights the amount of time colleagues have to cover for smokers on break (*all, interpersonal)*	X	X	X	
Strategy 5. Develop and share talking papers to increase awareness of the impact that tobacco has on retention, readiness, and health care costs for the DoD (*Commanders, environmental)*	X			X
Enhance anti-tobacco messages coming from leadership				
Strategy 6. Train MTL/TTI on the use of Motivational Interviewing strategies to promote conversations on the negative health effects of tobacco use (*MTL/TTI, personal/interpersonal)*	X			X
Strategy 7. Deliver clear messaging that tobacco use is not recommended at Commander Calls (*all, environmental)*	X	X		X
Enable better enforcement of tobacco control policies				
Strategy 8. Promote cessation during periods of enforced abstinence in Technical Training (*Airmen, all)*	X			X
Strategy 9. Promote awareness of existing DOD and federal tobacco policies (e.g., pricing policies, Tobacco 21). (*all, environmental)*	X	X		
Strategy 10. Enforce tobacco policies and regulations uniformly (*all, environmental)*	X	X		

Abbreviations: MLT, Military Training Leader; TTI, Technical Training Instructor.

[a]Target population [Airmen, MTL/TTI, Commanders, all]; socio-ecological model levels [personal, interpersonal, environmental, all].

Finally, utilizing the socio-ecological model allowed for the study's findings to go beyond identifying facilitators and deterrents at these three levels that influence tobacco use among Airmen in technical training and to suggest potential interrelationships between existing Air Force policy and individual and interpersonal factors that might unintentionally facilitate tobacco use among Airmen during technical training. This is an important addition to the literature because, while many of the facilitating and deterring factors identified at each of the levels has been found in previous studies in military populations,[7–16,18,19,22,26,27] the potential impact of existing Air Force policy on the facilitation of tobacco use at the individual and interpersonal levels has not been explored. First, tobacco use is perceived as normative behavior within the Air Force, which is contrary to the Air Force's tobacco policies. Second, current Air Force anti-tobacco policies include restricting use of tobacco during the beginning of technical training as well as the duty day. These policies may unintentionally foster "illicit" use of tobacco products, particularly e-cigarettes, as forced abstinence without additional interventions (i.e., abstinence for BMT without cessation services) does not result in sustained abstinence[28] and previous research suggests that access restrictions are only useful for lighter users.[29] Therefore, the restriction may not stop prevent tobacco use but encourage users to seek out ways to use tobacco without being caught. Third, there is a policy of "professionalism" through which MTLs and TTIs are prohibited from using tobacco in front of Airmen. Thus, this policy creates a neutrality around tobacco, and while evidence suggests Airmen not knowing whether their MTLs and TTIs use tobacco is protective against tobacco use, in reality, this policy does not always create this neutrality, as Airmen can tell when their MTL or TTIs use tobacco (e.g., because of smell or seeing smokeless tobacco packed in someone's lip). So, although this policy may limit Airmen from seeing leadership explicitly using tobacco, it neither prevents them from knowing their leadership's tobacco use status nor creates an anti-tobacco norm. Fourth, evidence suggests that Commanders focus on tobacco use as a health concern less than other health behaviors/concerns (i.e., in one content analysis of Commander health messages, tobacco use was mentioned nine times fewer than alcohol abuse).[30] Thus, tobacco may not be viewed by Airmen to be as important to the military as other vices which have more immediate consequences (e.g., binge drinking). This perceived lack of importance may reduce the enforceability of tobacco policies and make Airmen feel as though they are able to use tobacco in unauthorized situations. Additionally, this lack of emphasis on tobacco policies may explain why they are not as well understood as other health-related policies among leadership,[31] which may further impact enforcement.

Taken together, study findings highlight four overarching considerations that should be considered in planning future tobacco cessation programs and policies: (1) target key facilitators and deterrents across levels of the socio-ecological model, (2) change normative perceptions of tobacco use within the Air Force, (3) recognize that facilitators and deterrents vary by tobacco type, and (4) promote cessation in combination with use restrictions. The considerations highlight specific strategies that could be incorporated into Air Force tobacco programs and policies. These strategies reflect three broader categories: (1) refining tobacco-related educational messages and approaches, (2) enhance anti-tobacco messages delivered by leadership to Airmen in technical training, and (3) enabling better enforcement of tobacco control policies. Specific strategies for each of these categories are presented in Table IV. Examples of these strategies include providing education about the harmful effects of e-cigarettes, executing social norms campaigns to correct misperceptions of rates of tobacco use, increasing discussion about tobacco use by leadership by including messages during Commander Calls, and offering tobacco cessation programs during periods of enforced abstinence during technical training.

Study findings need to be interpreted within the context of the study's limitations. First, all focus group participants were military personnel, and therefore, findings may not be generalizable to the civilian population and/or organizations. Second, the study explored the specific Air Force technical training environment, which limits the generalizability of the findings to other branches of the military or to situations that promote tobacco use among permanent party (e.g., deployment).[32] However, focus groups were made up of a relatively broad sample (i.e., tobacco users/non-users, males and females, five bases, different career fields) and included the perspectives of current technical trainees and of their direct supervisors and educators who are at different stages of their careers (i.e., recent enlistees, mid-careers and retirees or those who have separated).

CONCLUSION

Study findings reinforce previous literature about facilitators and deterrents to tobacco use in the military while identifying new evidence that suggests that current tobacco policies may unintentionally facilitate tobacco use among Airmen. These findings highlight the need for Air Force tobacco policies and programs to address key facilitators and deterrents at personal, interpersonal, and environmental levels; de-normalize tobacco use in the Air Force; recognize the differences in facilitators and deterrents by types of tobacco; and promote tobacco cessation in combination with restricting use. These considerations were be used to identify specific, actionable strategies to strengthen existing Air Force tobacco programs and policies.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to disclose.

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