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Cannabis Use and Perceptions Among Current and Former Military Service Members

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ABSTRACT

Background: Research indicates separation from the military may result in increased risk of alcohol use. However, there is little data on cannabis use among military service members, particularly when examining the period after separation from military service. This research examines cannabis-related perceptions and use among U.S. Army Reserve/National Guard (USAR/NG) current and former soldiers. **Methods:** Data come from Operation: SAFETY (Soldiers And Families Excelling Through the Years), an ongoing study examining health among male and female USAR/NG soldiers. The current sample was comprised of 401 current and former USAR/NG soldiers. Logistic regression models examined the associations between past-year cannabis use, military status (i.e., current versus former), attitudes towards recreational cannabis, perceived ease of access, and perceived risk of cannabis use, while controlling for age, problematic alcohol use, and current cigarette smoking. **Results:** Overall, 7.4% of current and 20.3% of former military service members used cannabis in the past year. Favorable attitudes towards cannabis use and perceived ease of accessing cannabis were associated with increased odds of use among all soldiers. In adjusted models, former military members had greater odds (AOR = 5.28, 95% CI = 2.16, 12.87) of past-year cannabis use compared to current service members. **Conclusions:** Findings indicate that separation from the military may be an important risk factor to consider when assessing cannabis use in the military. Additional research is needed to examine socioenvironmental factors (e.g., access to post-deployment support services and healthcare, state legalization laws, other behavioral health conditions) that contribute to former service members' cannabis use.

Key words: = cannabis; separation from military; reserve soldiers

Separation from military service has long been recognized as a stressful life event, associated with adverse health consequences (McNeil & Giffen, 1967; Parker, et al., 2019). Despite the known stressors associated with military separation, a limited research base has examined the relationship between separation from military service and risks for substance use. In qualitative interviews, military service members indicated the transition out of the military was difficult and accompanied by heavier alcohol and illicit drug use, as well as use of a broader range of substances (Vest, et al., 2021). Quantitative data also indicates a higher risk for military service members' substance use upon separation from military service, including problematic alcohol use (Porter, et al., 2020; Vest, et al., 2018) and cigarette smoking (Nieh, et al., 2020). Additional cross-sectional data indicates that former military service members had higher odds of cigarette smoking, nicotine dependence, nonmedical use of prescription painkillers, illicit drug use, drug dependence, and alcohol problems, compared to currently serving military service members (Hoopsick, et al., 2017).

One of the main limitations of the extant literature on separation from military service and substance use is that most publications have focused on alcohol use or have combined cannabis with the greater category of illicit drug use (e.g., Hoopsick et al., 2017). Accurate surveillance and measurement is vital to understanding cannabis use correlates and trends. Given the rapid changes in the socioenvironmental landscape of

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cannabis use, it is no longer sufficient to measure cannabis as one among many illicit substances. To our knowledge, only one study directly examines cannabis use in relation to separation from military service and data from this small cohort of Operation Enduring Freedom or Operation Iraqi Freedom veterans indicated that cannabis use increased after separation from military service (Golub & Bennett, 2014). This study was limited, however, by its focus on low-income and minority soldiers living in a single city, which limits generalizability. Despite these emergent findings, the literature regarding substance use and dependence among those who have left the military is limited, particularly when examining cannabis use outcomes among reserve component service members.

Understanding cannabis use among military personnel is important for a number of reasons. First, there is a growing demand to increase access to medicinal cannabis for U.S. veterans (Loflin et al., 2019). Cannabis is being used among civilians to treat a number of health conditions that are prevalent among military service members, including conditions like chronic pain, traumatic brain injury, and posttraumatic stress disorder (Loflin et al., 2019). Despite being used medicinally, and that the mode of use (e.g., inhalation, transdermal, etc.) can effect the therapeutic and abuse potential of cannabis (Bonn-Miller et al., 2019), little is known about how military service members typically use cannabis products. Second, cannabis is the most common illicit substance used among military recruits (Golub & Bennett, 2014). Whereas the prevalence of cannabis use decreases when currently serving compared to new recruits, cannabis remains the most prevalent drug identified in drug testing among current soldiers (Golub & Bennett, 2014; Larson, et al., 2016). Finally, the general U.S. public opinion of cannabis use has shifted. For example, more citizens believe it should be legalized (Pew Research Center, 2019) and fewer citizens consider cannabis use risky (Pacek, et al., 2015). However, it is less clear if military service members' perspectives mirror these changing societal views, underscoring the need for greater surveillance and monitoring of cannabis-related perceptions among military personnel.

As of November 2022, 37 states allow medicinal cannabis use, and 21 states allow recreational use (National Conference of State Legislatures, 2022); at the same time, at the federal level, cannabis continues to be a schedule 1 drug under the 1970 Controlled Substances Act. Schedule 1 drugs are those deemed to have no accepted medical use and high potential for dependency (National Conference of State Legislatures, 2022). Despite evolving state-level legislation regarding both medicinal and recreational use, the military maintains zero tolerance policies for federally illicit substances; using such substances can jeopardize one's military career (Platteborze, et al., 2013).

Over one million individuals are enlisted in a Reserve component of the US military (Office of the Deputy Assistant Secretary of Defense, 2016), but their experiences have been examined less frequently compared to those of active duty soldiers. Research focused on this population is particularly important given that Reserve component soldiers are at greater risk for substance use compared to their active duty counterparts with similar service-related experiences (Cohen, et al., 2015; Thomas et al., 2010). Understanding issues related to cannabis use may be especially relevant to reserve and National Guard soldiers, as they navigate potentially conflicting state-level laws and federal regulations in their roles as citizen soldiers. Reserve component soldiers are civilians who are trained and qualified to be called to active duty military service; they must shift roles between civilians, who may live in a state with legalized markets for cannabis, and soldiers, who must follow federal drug policy.

Despite the changing societal context surrounding cannabis use in the U.S., there has been limited examination of the impacts of leaving military service on cannabis use. Therefore, this study examined cannabis use among male and female US Army Reserve and Army National Guard (USAR/NG) current or former soldiers. Primary aims included (1) estimating the prevalence of cannabis use among a sample of USAR/NG soldiers and describing perceived cannabis risk, attitudes of approval towards recreational cannabis use, and perceived ease of accessing cannabis among all soldiers; and (2) taking these perceptions into account, examining differences in the odds of cannabis use on the basis of military service status (former soldiers compared to currently serving). As mode of

cannabis administration can impact bioavailability, therapeutic potential, and risks associated with use (Bonn-Miller et al., 2019), a secondary aim involved describing modes of cannabis use.

METHODS

Participants & Procedure

Data were drawn from Operation: SAFETY, an ongoing longitudinal study focused on the health of USAR/NG soldies and their spouses/partners. Detailed study recruitment and data collection procedures have been published elsewhere (Devonish et al., 2017; Kozlowski, et al., 2017; Vest, et al., 2017). In brief, participants were recruited during drill weekends from Reserve and National Guard units across New York State and screened for eligibility. To enroll in the study, at least one partner needed to be currently serving in the USAR/NG at the time of the baseline survey and both partners had to be willing to participate. Participants complete annual surveys covering a broad range of topics, including physical and mental health, sleep, substance use, romantic relationships, and military service related information and events. The University at Buffalo as well as the Army Human Research Protections Office, Office of the Chief, Army Reserve and the Adjutant General of the National Guard approved the study protocol. Participants recruited in the parent study were consistent with the military characteristics (i.e., rank enlisted v. officer) of Reserve and Guard soldiers nationally (Office of the Deputy Assistant Secretary of Defense, 2016).

Soldiers in this analysis were 79% male (n = 317) and 21% (n = 84) female with a mean age of 32 years (SD: 6.5). The majority of the sample was non-Hispanic white (80%; n = 319) and 90% had completed some college or had a college degree. On average, soldiers had served 10 years in the military (SD: 6.1). In this sample, 84% (n = 337) of soldiers were currently serving in the USAR/NG and 16% (n = 64) were separated from military service.

Measures

Past year cannabis use. The NIDA Modified ASSIST 2.0 (Alcohol, Smoking, and Substances Involvement Screenting Test; (WHO Assist Working Group, 2002) was used to assess use of cannabis in the past year with the item, "In the past year, which of the following substances have you used? - Cannabis?" Responses were coded to create a binary variable of past year cannabis use.

Past 90 day cannabis use. The NIDA Modified ASSIST 2.0 (Alcohol, Smoking, and Substances Involvement Screenting Test; (WHO Assist Working Group, 2002) was used to assess use of cannabis in the past 90 days with the item, "In the past three months, how often have you used any cannabis?" Responses ranged from "never" to "daily or almost daily" and were coded to create a binary variable of past 90 day cannabis use.

Military status. Participants were asked annually to report whether they were ever in the military and if so, whether they are currently serving. Responses were categorized into current soldiers or former soldiers. Civilians were not included in these analyses.

Perceptions of cannabis use. Perceptions of cannabis use were measured using three questions:

1. Soldiers' attitudes towards recreational cannabis use was assessed using the item: "How do you feel about adults using marijuana for recreational use?" Response options were: strongly disapprove, disapprove, neither disapprove nor approve, approve, strongly approve.
2. Perceived risk of cannabis use was assessed with the item, "How much risk do you believe there is in smoking marijuana once or twice a week?" with the response options of: no risk, slight risk, moderate risk, great risk.
3. Perceived ease of access to obtain cannabis was assessed with the item, "How difficult would it be for you personally to obtain marijuana, if you wanted to?" Response options were: probably impossible, very difficult, fairly difficult, fairly easy, very easy.

Problematic alcohol use. The Alcohol Use Disorders Identification Test (AUDIT) was used to assess problematic alcohol use (Saunders, et al., 1993). The AUDIT consists of 10 items rated on a four-point scale from 0 (never) to 4 (daily or almost daily), with scores ranging from 0 - 40. The current analyses used AUDIT total score as a continuous variable in adjusted models.

Current cigarette use. Because the co-use of tobacco and cannabis is more common than cannabis use alone (Smith et al., 2019), adjusted

analyses also control for current cigarette smoking. Current use of cigarettes was assessed with the item, "In your entire life, have you ever smoked 100 cigarettes?" Participants who responded "Yes" were asked, "Do you currently smoke cigarettes?" Responses were coded to create a binary variable of current cigarette use.

Age. Soldiers self-reported age.

Modes of cannabis use. Soldiers' modes of using cannabis were assessed with two items. First, soldiers were asked, "Have you ever used cannabis, marijuana, marijuana concentrates, marijuana waxes, THC, or hash oils in an electronic product such as an e-cigarette, vape, mod, personal vaporizer, e-hookah, or hookah pen?" Response options were no or yes. Participants who responded yes were asked, "How would you describe your usual marijuana or cannabis use? Would you say…" and participants were presented with the following response options: I only smoke cannabis; I smoke and vape cannabis, but I smoke cannabis more often; I smoke and vape cannabis about the same amount; I smoke and vape cannabis, but I vape cannabis more often; I only vape cannabis.

Statistical Analyses

All analyses used Stata version 17.0 software (Stata Corporation, College Station, TX). Descriptive statistics were used to characterize the study sample, including perceptions of cannabis use, routes of administration, and prevalence of cannabis use. To examine the association between past year cannabis use and military status, we used multivariable logistic regression analyses to produce adjusted odds ratios. Final models were adjusted for age, problematic alcohol use, current combustible cigarette use, perceived cannabis risk, attitudes of approval towards recreational cannabis use, and perceived ease of access.

RESULTS

Estimate the Prevalence of Cannabis Use and Cannabis-Related Perceptions

The first aim was to characterize the prevalence of USAR/NG service members' cannabis use. Among all current and former service members, nearly 1 in 10 service members (9.5%) had used cannabis in the past year (7.4% of current and 20.3% of former soldiers). Among service members reporting past year use, 3.5% had used in the past 90 days. (see Table 1). We also sought to characterize military service members' perceptions of cannabis use. Perceived risk of cannabis use were fairly low among all soldiers. Over one-third (36.7%; 36.2% of current and 39.1% of former soldiers) indicated there is no risk to smoking cannabis one or two times per week. Perceptions of the ease of accessing cannabis were high; nearly two-thirds (62.3%; (62.6% current; 60.9% former)) of soldiers indicated it would be fairly easy or very easy to personally obtain cannabis, if they wanted to. Finally, 31.4% (32.0% current; 28.1% former) of soldiers approved or strongly approved of recreational cannabis use (see Table 1). There were no significant differences in perceived risk, perceived ease of access, or attitudes of approval between current and former USAR/NG service members.

Examine for Differences in the Odds of Cannabis Use on the Basis of Military Service Status

The second study aim was to examine differences in the odds of cannabis use on the basis of military service status (specifically examining former soldiers compared to those currently serving). In unadjusted models, former soldiers had higher odds of past-year cannabis use, compared to currently serving service members (Odds Ratio (OR) = 3.18, 95% Confidence Interval (CI) = 1.53, 6.62; see Table 2). When taking into account cannabis-related perceptions, the adjusted odds ratio (AOR) of past year cannabis use was significantly higher for former soldiers compared to current soldiers (AOR = 5.28, 95% CI = 2.16, 12.87). Soldiers indicating it was easier to obtain cannabis had higher odds of past year use (AOR = 2.26, 95% CI = 1.38, 3.72), and soldiers who indicated greater approval for recreational cannabis use had higher odds of past year cannabis use (AOR = 1.82, 95% CI = 1.19, 2.77; see Table 2). Soldiers who endorsed problematic alcohol use had higher odds of past year cannabis use (AOR = 1.11, 95% CI = 1.03, 1.19). Past year cannabis use was also associated with age, with lower odds of using for older service members (AOR = 0.91, 95% CI = 0.84, 0.98). There was no significant associations between past year use and perceived risk of cannabis use (AOR = 0.94, 95% CI = 0.52, 1.69) or current cigarette smoking (AOR = 0.40, 95% CI = 0.10, 1.60; Table 2).

Table 1. *Baseline demographics and current substance use of U.S. Army Reserve/ National Guard soldiers (n = 401)*

	% or *M*	n or SD
Former soldiers	16.0%	64
Years Served	9.5	6.1
Sex		
Male	79.1	317
Female	21.0	84
Race/ethnicity		
Non-Hispanic White	79.6	319
Non-Hispanic Black	5.0	20
Hispanic	8.7	35
Other	4.7	19
Education		
High School or less	10.0	40
Some College	57.1	229
College Degree	32.9	132
Median Household Income	$60,0000 to $79,999	
Age	31.9	6.5
Current smoking	10.0	40
Past-year cannabis use	9.5%	38
Past 90-day cannabis use	3.5%	14
No risk of using cannabis 1-2 times/week	36.7%	147
Fairly or very easy to obtain cannabis	62.3%	250
Strongly approve or approve of recreational cannabis use	31.4%	126

Table 2. *Odds of Past Year Cannabis Use among U.S. Army Reserve/National Guard Soldiers*

	OR	95% CI	AOR	95% CI
Former soldier (v. current)	3.18**	1.53, 6.62	5.28***	2.16, 12.87
Risk of using cannabis 1-2 times/week			0.94	0.52, 1.69
Ease of obtaining cannabis			2.26**	1.38, 3.72
Approval of recreational cannabis use			1.82**	1.19, 2.77
Problematic alcohol use			1.11*	1.03, 1.19
Current cigarette smoking			0.40	0.10, 1.60
Age			0.91*	0.84, 0.98

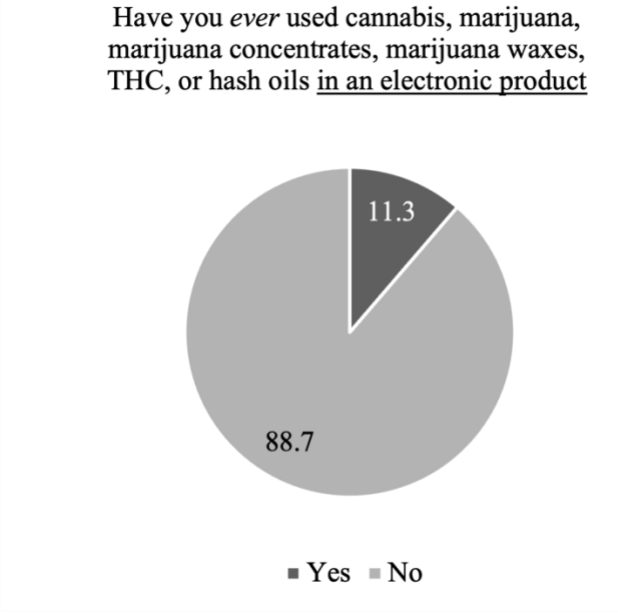
Note. OR = odds ratio; AOR = adjusted odds ratio; CI = Confidence Interval.
*$p < .05$. **$p < .01$. ***$p < .001$

Describe Modes of Cannabis Use

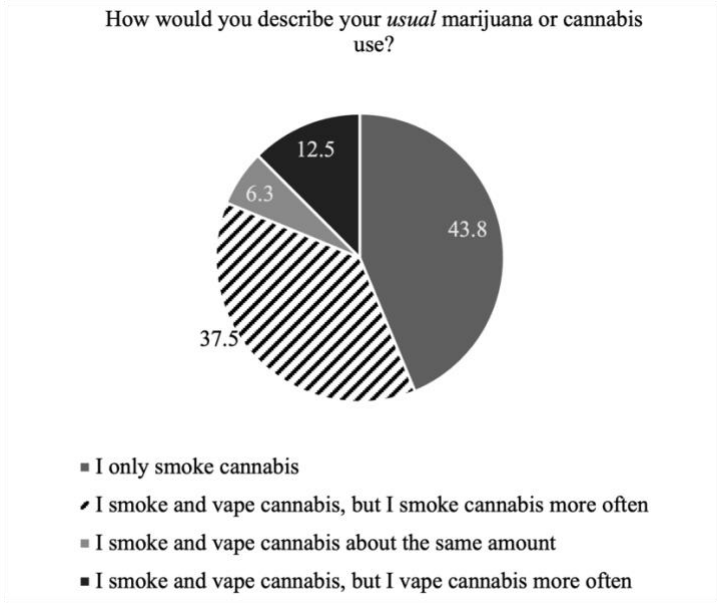
A secondary aim was to describe USAR/NG soldiers' experiences with how they have used cannabis. When asked if they had *ever* used cannabis, marijuana concentrates, THC, marijuana concentrates or hash oils in an electronic product, a little more than 10% of service members had done so (see Figure 1a). Respondents who answered yes to that question were then asked to describe their *usual* use. Typical use was described by 44% of service members as only smoking cannabis. An additional 37% of service members typically smoke and vape, but usually smoke cannabis more often, whereas 12.5% said they smoke and vape, but typically vape cannabis more often. Only 6% of service members stated they usually smoke and vape cannabis equally (see Figure 1b).

Figure 1

(A) Electronic administration of cannabis use



(B) Electronic administration of cannabis use



DISCUSSION

National Guard and Reserve soldiers, in their roles as citizen soldiers, must negotiate competing norms and legal landscapes between military and cilivian societies. Notwithstanding the changing societal context surrounding cannabis use in the United States, there has been limited examination of the impacts of USAR/NG soldiers leaving military service on cannabis use. Findings indicate that separation from the military may be an important risk factor to consider when assessing cannabis use among Reserve component soldiers. Former soldiers had significantly higher odds of past year cannabis use when compared to current soldiers, which persisted when considering key covariates.

Previous work has posited that the period after leaving the military is one of high stress (McNeil & Giffen, 1967; Parker et al., 2019); this may indicate that former soldiers are using cannabis to readjust to civilian life. In fact, qualitative data indicates that cannabis is used by former soldiers as a sleep aid, for stress relief, and as a coping mechanism (Vest et al., 2021), indicating opportunities exist to better support veterans' transition to civilian life. Despite this, we hypothesize that after leaving the military, random drug monitoring is no longer an issue, which may in turn result in greater drug use. Regardless, future research is needed to examine socioenvironmental factors, including access to post-deployment support services and healthcare, state legalization laws, and other behavioral health conditions to better contextualize former soldiers' cannabis use. Additional research is needed to examine whether separation from the military results in short- or long-term cannabis use risks. This may be particularly urgent in light of recent calls to increase access to medicinal cannabis for U.S. veterans (Loflin et al., 2019).

Understanding USAR/NG soldiers cannabis use may be particularly important in an era of evolving state and federal laws. The United States House of Representatives has been presented with the Marijuana Opportunity Reinvestment and Expungement Act (MORE Act), which would federally decriminalize cannabis use and remove cannabis from the list of scheduled substances under the Controlled Substances Act ("Marijuana Opportunity Reinvestment and Expungement Act - MORE Act," 2021-2022). Longitudinal studies that can examine temporal relationships pre-, during, and post-change to federal laws will be an important contribution of future research.

This research additionally contributes to the literature by assessing soldiers' perceptions of cannabis use. In the combustible cigarette literature, attitudes and perceptions about smoking are strongly correlated with future use

(Song et al., 2009). Although drug use was assessed at only one time point, our results were generally consistent with this, as soldiers' approval of recreational use was associated with higher odds of past-year use. Nearly one-third of soldiers approved or strongly approved of recreational cannabis use. Additionally, perceived risk of cannabis use was fairly low among this sample of soldiers, whereas perceptions surrounding the ease of accessing cannabis were high. Importantly, at the time of data collection, recreational cannabis use was not legal in New York State, where this sample was recruited. Since then, in July 2021, New York State has legalized recreational cannabis use (National Conference of State Legislatures, 2022); we hypothesize these prevalence estimates may change in future survey waves as a result of this change in state law. Future work should consider examining how one's perceptions of cannabis predict future use, particularly post separation from military service.

There is limited available data on the modes of cannabis use among U.S. military service members. In one sample of veteran medical cannabis users, approximately 7.8% administered cannabis by vaping (Loflin et al., 2019). A secondary aim of this study was to describe modes of soldiers' cannabis use. Just over 10% of soldiers had ever used cannabis, marijuana concentrates, THC, marijuana concentrates or hash oils in an electronic product. However, this finding should be interpreted with caution due to the small sub-sample of soldiers who responded to this question. Despite the number of soldiers reporting how they are using cannabis, we chose to include these as preliminary findings, as we think questions of this nature are important for future research teams to consider, as the use of cannabis or related products (e.g., cannabidiol, or CBD) are being promoted directly to the military population through advertisements and price promotions. For example, the online retailer Flower Company offers a U.S. military veteran's cannabis membership program, which provides 30%-50% off products after verifying their veteran status (Flower Company, 2022; Hasse, 2019). Given this, the surveillance and monitoring of modes of cannabis use among military service members is a missed but necessary opportunity, as mode of administration can impact bioavailability, therapeutic potential and risks associated with use (Bonn-Miller et al., 2019).

Limitations

There are several limitations to these findings that should be considered. Results are based on self-reported data. Despite this, we use confidential, self-administered surveys, so common barriers to reporting, such as concerns about privacy, are reduced. In addition, participants were recruited from New York State. However, not all participants currently live in New York, and we are unable to examine and account for the state-level legal landscape of where participants currently live. This will be important for future research to consider. Finally, this study was not specifically designed to study separation from the military; future longitudinal research is needed to better contextualize how leaving the military is associated with cannabis use.

Conclusion

The current research indicate that separation from the military may be an important risk factor to consider when assessing cannabis use. Former soldiers had higher odds of past year cannabis use than current reserve soldiers. Soldiers with more favorable attitudes towards cannabis use and increased perceived ease of accessing cannabis also had higher odds of past year use. Given the forecasted increase in the numbers of former soldiers in the U.S., additional research is needed to examine socioenvironmental factors that contribute to former service members' cannabis use.

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