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BRIEF REPORT

Brief report: Synthetic cannabinoid use among military personnel

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Abstract

Background and Objectives: Synthetic cannabinoids (SCs) may function as a marijuana alternative for soldiers subject to frequent drug screens, yet no study has interviewed past military users of SCs.

Methods: Veterans participating in eight US veterans treatment courts were interviewed ($n = 318$; response rate = 54.9%). Thematic analyses were completed.

Results: Sixty-five veterans (21.3%) reported SC use. Three major themes were identified: SCs were not a suitable marijuana replacement, the experience was unpleasant/problematic, and curiosity, sometimes paired with the perception of safely eluding drug screens, facilitated use.

Conclusion and Scientific Significance: While members of the military experimented with SCs, habitual use of SCs within the Armed Forces does not appear widespread. The perception that SCs are excluded from all urinalyses may contribute to experimentation, but the unpleasant experience generally discourages recurrent use.

INTRODUCTION

Hundreds of new psychoactive substances (NPS) emerged in the last two decades; many of which reached users before their legality was established or pharmacological profile understood.[1,2] A large number of NPS are synthetic cannabinoids (SCs), artificial CB1 and CB2 agonists initially marketed as a legal alternative to cannabis in areas where cannabis use was restricted.[1,2] In the United States (US), the appeal of SCs has decreased due to the combination of NPS-controlling legislation and increasingly lenient cannabis policies. However, groups subject to routine drug screens (e.g., athletes, probationers, military service members) may consider SCs attractive for the perceived ability to experience a cannabis-like high with lower risk of detection.[3]

The US military banned SC use before civilian regulation following large groups of SC users being identified on bases and carriers.[4] Case studies highlighted psychosis, tachycardia, stroke, cardiac arrest, seizures, and hyperemesis among those seeking treatment in military medical facilities post-SC use,[5,6] but only two large studies explore SC use in the military, neither of which included detailed qualitative interviews. Walker et al.[7] determined 11.1% of 368 active-duty service members with known substance use issues had used SCs; 7.3% described SCs as their "drug of choice." Within Grant et al.'s[8] convenience sample of young veterans, 17.0% reported SC use. While all routine US military urinalyses assess cannabis use, currently only a portion of samples are evaluated for SCs.[9]

Despite the presumption that frequent drug screens incentivized SC use within the military,[2,3] studies have not included detailed interviews to contextualize SC use. Underappreciated and key issues that must be known to adequately inform policy often only emerge in open interview frameworks. Further, studies allowing SC users to describe their experiences, recovery, and future intentions are rare in general,[10] suggesting that interview data from veterans may assist in developing policies to deter SC use in the broader context. Understanding how SC

experiences are perceived, what factors lead to use changes, and in what circumstances treatment was helpful can illuminate procedures that may lessen the incidence and morbidity of SC use.

METHODS

Military veterans and service members under the supervision of eight veterans treatment courts (VTCs) were recruited to participate in 1- to 2-h interviews about their military experience, criminal justice involvement, and substance use (University IRB-approved protocol FY2016-83). VTCs are a form of problem-solving court specifically designed to meet the needs of current and former military personnel charged with a civilian offense. Of 579 participants in eight VTCs across three US states, 318 agreed to be interviewed (response rate = 54.9%) for a $20 gift card incentive. The sample was predominately male but diverse in race, ethnicity, and service branch (See Table 1). Though military personnel may be hesitant to reveal illicit behaviors, the specialty court culture emphasizes accountability and open communication, which may facilitate willingness to disclose past behaviors. Further, the criminal charge leading to VTC involvement is often linked to substance use, suggesting VTC participants may have disproportionately used SCs.

A research team fully independent of VTCs, criminal justice system, and military conducted the interviews, which were later transcribed verbatim. Each participant was asked if they had used "synthetic marijuana, spice, or K2." Those who had were asked when, why, and how often they used and to describe their experiences. Unscripted questions based on their responses followed. Two research team members read and coded each of the transcripts indicating SC use. Exploratory analysis revealed three prevailing themes.

RESULTS

Thirteen participants either ended the interview before items on SC use or refused to answer those questions. Of the remaining 305, 65 (21.3%) reported SC use. Use was reported before service by six, during active duty by 25, and after military separation by 43. The majority (58) had not used in the last year; only two used SCs in the last month. The most pervasive comments revolved around (1) SCs being a poor substitute for marijuana, (2) displeasure with SC effects, and (3) use motivated by curiosity paired with low detection risk.

> "It wasn't anything like weed. Shit. It was nasty." *(21y.o., Army)*

> "I didn't like anything about it, the way it made me feel. It was just awful." *(34y.o., Army)*

Without exception, VTC participants viewed SCs as distinct from cannabis. Though some use was because respondents "couldn't find

TABLE 1 Demographic and military service characteristics of participants and users of SCs.

	VTC sample	Users of SCs
Gender		
Male	278 (92.7%)	61 (96.8%)
Female	22 (7.3%)	2 (3.2%)
Race/ethnicity		
Hispanic	80 (26.9%)	10 (15.9%)
Black, non-Hispanic	75 (25.3%)	17 (27.0%)
White, non-Hispanic	125 (42.1%)	29 (46.0%)
Multiracial/other	17 (5.7%)	**7 (11.1%)**
Age		
18–29	53 (17.7%)	18 (28.6%)
30–39	115 (38.3%)	28 (44.4%)
40–49	50 (16.7%)	8 (12.7%)
50+	82 (27.3%)	**9 (14.3%)**
Currently active		
Yes	16 (5.3%)	2 (3.2%)
No	285 (94.7%)	61 (96.8%)
Service branch		
Army	172 (58.1%)	37 (60.7%)
Air Force	26 (8.8%)	5 (8.2%)
Marines	49 (16.6%)	9 (14.8%)
Navy	49 (16.6%)	10 (16.4%)
Length of service		
<5 years	118 (40.0%)	35 (56.5%)
5–10 years	114 (38.6%)	24 (38.7%)
11–20 years	45 (15.3%)	**2 (3.2%)**
More than 20 years	18 (6.1%)	1 (1.6%)
Discharge status		
Other than general or honorable	13 (5.0%)	7 (13.0%)
Honorable	232 (88.5%)	**44 (81.5%)**
General	17 (6.5%)	**3 (5.6%)**

Note: Totals in each demographic grouping do not total the sample size as not all participants provided their gender, race, or service history (similarly, the numbers in each group do not add to 65 SC users for the same reason). Though in some cases, these characteristics could be inferred from other responses or direct observation, we honor respondents' preferences for their substance use not to be linked to their gender, age, or other characteristics. Percentages indicate the portion that provided information on the variable that fall into the category identified by the row header. Bold values indicate that SC use prevalence is significantly different from the reference group for that variable ($p < .05$). The first listed group (e.g., male) serves is the reference group for that variable.

Abbreviations: SC, synthetic cannabinoid; VTC, veterans treatment court.

any weed," participants did not consider SCs an equivalent or suitable replacement. Many described their use driven by a desire for a cannabis-like high but were disappointed SCs did not render a similar experience. One described the effect as more akin to crack than cannabis. Another suggested it was too short-acting for a cannabis alternative, requiring smoking every 30 min to maintain an effect. Others were disappointed, considering SCs so different that the term "synthetic marijuana" was inappropriate.

> "Only once, and I hated it. Oh, my God … God, it was horrible." *(55y.o., Army)*

> "It made me very paranoid and uncomfortable, and I quit. That stuff's whack … Take a half a hit and then end up not remembering why you're here or what you're doing." *(44y.o., Air Force)*

Nearly half who had used SCs ($n = 32$) went further than noting the difference and indicated clear disappointment in the experience, describing SCs as "awful," "garbage," "nasty," and "horrible." Disdain was expressed for both the taste ("disgusting," "dirt") and effects. Seizures, paralysis, tachycardia, paranoia, and emesis were reported. Some characterized the effects as so uniquely undesirable that they could not verbally describe them. Another described the high as "terrifying." Two described their SC experiences as demonic; others as "crazy." Only a small number (nine) who used daily/near daily had somewhat positive views on effects, describing the successful amelioration of stress and inducing sleep and relaxation.

The most common SC-use motivation seemed to be curiosity (15), followed by drug testing protocols and the belief that SCs were not included on urinalyses (10). Others discussed boredom (3) and peer pressure (7) as contributing factors. The perceived ability to avoid detection facilitated experimentation to satiate curiosity but displeasure with the experience dissuaded frequent use. Less frequently mentioned and considered beyond the scope of this research note, other themes included use to counteract stress and/or insomnia, use during incarceration, and fear of "bad batches."

> "One person asked me if I did hear about it and told me that it won't show up on no drug test, and I just said, 'Fuck it, let's do it.'" *(27y.o., Navy)*

> "[SCs] wasn't gonna pop on a piss test. Everybody'd just sit there and laugh … We were pretty confident … no one was poppin'." *(28y.o., Marines)*

DISCUSSION

Within a sample of VTC participants, 21.3% reported SC use. Overall prevalence of SC use in the military is likely much smaller as this sample was specifically selected for VTC involvement and past substance use. Of those reporting SC use, only 38.5% confirmed use while active in the military. Whether most only used after military separation or respondents were more hesitant to acknowledge use that may affect their military status is unknown. Regardless, results suggest concerns of military drug testing protocols incentivizing NPS use are overblown. While 10 of the 65 SC users did mention the perceived ability to elude drug screens, other factors (i.e., curiosity) were more common. Even those who did use SCs to replace marijuana rarely progressed to habitual use as they found SCs a poor substitute for marijuana and generally unpleasant. Whether frequent testing for cannabis would increase the use of an alternate substance subjectively considered a sufficient and enjoyable substitute remains unresolved.

Routine drug testing within the military does not appear to excessively encourage use of synthetic alternatives. As such, current programs should continue unencumbered by these concerns. As some respondents falsely believed SCs were never included in urinalyses, it may be critical to educate military personnel about their inclusion on random subsamples of screenings and when SC use is suspected.[9] Healthcare practitioners may deter patients from using SCs by conveying this information and that SCs carry enhanced risk relative to cannabis use (e.g., psychosis, cardiac arrest, stroke, renal damage).[3–6] Highlighting the negative view of SCs held by most users in health education campaigns may be similarly beneficial.

Generalization to other populations must be made cautiously, but it is reasonable to suspect that other groups subject to frequent drug testing (e.g., athletes, individuals under community corrections supervision) are similarly not turning to SCs because they are seen as poor cannabis replacements. We cannot evaluate whether VTC-related urinalyses encouraged SC use as this issue was not explicitly addressed in the interviews; further, testing protocols across the eight sites were not uniform. As only seven reported SC use in the last year, it appears little use occurred while respondents were in contact with a VTC. Within our sample, SCs were viewed not as a replacement to regularly elude military testing, but as a novelty used to satisfy curiosity and boredom, or a mistake only to be made once. Perceived exclusion from drug screens may have contributed to some experimentation, but habitual use evading routine drug screens seems limited due to SCs' undesirable effects.

AUTHOR CONTRIBUTIONS

John Stogner oversaw the study, completed all analyses, and authored the methods, results, and discussion. Orion Santangelo authored the introduction and edited the manuscript. Julie Marie Baldwin was the principal investigator of the multisite evaluation, oversaw data collection, and assisted with final manuscript preparation. Each author certifies that their contributions to this work meet the standards of the International Committee of Medical Journal Editors.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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