

Lifetime associations between cannabis, use, abuse, and dependence and panic attacks in a representative sample

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Abstract

Background: The present investigation evaluated lifetime associations between cannabis use, abuse, and dependence and panic attacks after controlling for alcohol abuse, polysubstance use, and demographic variables.

Methods: Data for this study were obtained as part of a large statewide survey, the Colorado Social Health Survey (CSHS). Participants were contacted using randomly sampled household addresses (72% response rate) and interviews took place in participants' homes. Participants consisted of a representative sample from the Colorado general adult population ($n = 4745$; 52% female). The *Diagnostic Interview Schedule* was administered to obtain diagnoses.

Results: After controlling for polysubstance use, alcohol abuse, and demographic variables, lifetime history of cannabis dependence, but not use or abuse, was significantly related to an increased risk of panic attacks. Additionally, among participants reporting a lifetime history of both panic attacks and cannabis use, the age of onset of panic attacks ($M = 19.0$ years of age) was significantly earlier than for individuals with a lifetime panic attack history but no cannabis use ($M = 27.6$ years of age).

Conclusions: Structured interview data suggest lifetime cannabis dependence is significantly associated with an increased risk of panic attacks.

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1. Introduction

Cannabis is one of the most commonly used recreational drugs in the world (Patton et al., 2002). Estimates derived from large-scale drug surveys in the United States (US), for example, suggest that 21 million individuals have used cannabis at least once in their lives (Office of Applied Studies [SAMHSA], 2002). Moreover, over 50,000 adolescents initiate cannabis use on a yearly basis

(Office of Applied Studies [SAMHSA], 2002). Recent US epidemiologic data suggest approximately 4% of adults have used cannabis in the past year (Compton et al., 2004); similar findings have been reported outside of the US (Fergusson and Horwood, 2000; Swift et al., 2001). Moreover, rates of cannabis abuse and dependence are on the rise (Compton et al., 2004). Aside from being common, cannabis use is associated with a variety of adverse events. For instance, cannabis use has been reported as a contributing factor in emergency room visits (Office of Applied Studies, 2003), physical health disorders (e.g., cancer of the respiratory tract and lungs; Cohen, 1981; Farrow et al., 1987), fatal automobile

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accidents (Ameri, 1999), impaired educational attainment (Lynskey and Hall, 2000), and reduced workplace productivity (Lehman and Simpson, 1992).

There also is a growing scientific appreciation that cannabis use and its disorders (i.e., abuse, and dependence) may be related to the onset and maintenance of certain psychiatric symptoms and conditions (Tunving, 1985). The vast majority of investigations in this domain have centered on depressive symptoms or problems (Chen et al., 2002; Degenhardt et al., 2003; Green and Ritter, 2000; Kouri et al., 1995; Patton et al., 2002). The depression-cannabis literature has found relations between these factors, however, the strength of such associations is markedly attenuated after controlling for common variables (e.g., gender; Degenhardt et al., 2001). Though less well developed compared to the depression-cannabis literature, researchers have begun to focus on the relation between cannabis and anxiety symptoms and panic attacks (Hall et al., 1994). These anxiety-oriented studies have found that cannabis use can acutely precipitate heightened levels of anxiety and panic attacks among certain individuals (Abel, 1971; Gale and Guenther, 1971; Hall et al., 1994; Hollister, 1986; Szuster et al., 1988; Thomas, 1996).

Although promising, previous work addressing associations between cannabis and anxiety-relevant factors has been limited in at least four important methodological respects. First, past work has infrequently distinguished anxiety symptoms from panic attacks. Thus, it is unclear whether cannabis use or its disorders is, specifically, related to panic attacks. Panic attacks reflect a distinct emotional process that can be readily distinguished from states of anxiety (Barlow et al., 1994; Mineka et al., 1998). Moreover, panic attacks often maintain unique relations to substance use problems as well as behavioral disorders more generally compared to anxiety symptoms (Baillie and Rapee, 2005; Goodwin and Hamilton, 2001). Therefore, panic attacks are not the equivalent of anxiety symptoms and may theoretically relate in unique ways to substance use behavior. To unambiguously clarify whether cannabis use and severity of such use is related to panic attacks, it is important to employ contemporary diagnostic standards for defining panic episodes.

Second, previous studies have infrequently demarcated between cannabis use severity when examining relations to anxiety-relevant symptoms and problems. For example, past research has not distinguished between cannabis use and dependence in the study of panic attacks. According to the Diagnostic Statistical Manual of Mental Disorders-IV (American Psychiatric Association (APA, 1994), cannabis use reflects a history of having used the drug, whereas abuse reflects repeated instances of use under hazardous conditions, clinically-relevant impairment or legal problems related to cannabis use. Cannabis dependence is further distinguished by

evidence of increased tolerance, compulsive use, impaired control and continued use despite physical and psychological problems cause by or exacerbated by such drug use (APA, 1994). There are important distinctions between cannabis use, abuse, and dependence. For example, many individuals use cannabis, but significantly fewer will ever meet lifetime diagnostic criteria for cannabis dependence (Anthony et al., 1994; National Survey on Drug Abuse, 2004). As an additional example, those who are dependent on cannabis compared to those who are not demonstrate greater levels of clinically-significant impairment in life activities (e.g., interpersonal, family, financial; Stephens et al., 1993), are more apt to seek treatment for their drug use (SAMHSA, 2001), and experience withdrawal symptoms during periods of drug abstinence (Budney and Moore, 2002; Budney et al., 2003; Budney et al., 1999).

The differences in the associated features and problems related to specific patterns of cannabis use (i.e., use, abuse, and dependence) are theoretically relevant to better understanding linkages to panic attack incidence. Indeed, previous research on panic vulnerability suggests that severity of substance use patterns may modulate panic processes (McCabe et al., 2004; Stewart et al., 2001; Zvolensky et al., 2003a). In the case of cannabis, specifically, research suggests that more frequent or heavier users report higher overall levels of anxiety symptoms and disorders compared to non-users and those experimenting with the drug (Bonn-Miller et al., 2005; Degenhardt et al., 2001; Fergusson and Horwood, 1997; Milich et al., 2000; Thomas, 1996; Troisi et al., 1998; Zvolensky et al., in press). Other studies in this same domain indicate that cannabis users who are dependent compared to those who are not report that using the drug helps reduce anxiety and bodily tension in the short-term (Gruber et al., 1997). Though it is presently empirically unclear how heavier cannabis use may engender risk for panic attacks, existing drug-panic models suggest that repeated affect-relevant learning with aversive interoceptive cues may be a key risk mechanism (Zvolensky et al., 2005; Zvolensky et al., 2003b). As one illustrative example, cannabis-related withdrawal symptoms among those dependent on the drug (Budney and Moore, 2002) may be a formative panic-relevant learning experience in the sense that the individual is repeatedly exposed to aversive internal sensations (e.g., nervousness, irritability, bodily tension); basic research suggests that in this type of situation, an organism learns to associate such stimuli with decreasing drug levels and anxiety-relevant reactions (Spencer et al., 1988). Thus, cannabis withdrawal symptoms may theoretically increase the chance of panic-relevant learning, as individuals experience more intense interoceptive sensations and have the opportunity to misinterpret them as personally dangerous (e.g., “I am losing control”), potentially leading to a panic attack (Clark,

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