



Research Paper

Prospective associations between cannabis use and negative and positive health and social measures among emerging adults

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ABSTRACT

Background: In light of on-going policy changes related to cannabis use in the United States, it is important to examine possible associations between cannabis use and subsequent behaviors of public health interest. This study identified prospective associations between cannabis use during first-year post high-school and a wide range of positive and negative health and social measures one year later.

Methods: Data were from Waves 4 (Time 1; 1st year after high-school) and 5 (Time 2; one year later) of the NEXT Generation Health Study, a national sample of emerging adults in the United States ($n = 1915$; mean age = 20.2; 61% female). Multinomial logistic regressions adjusting for pertinent covariates were conducted to examine odds of substance use, nutrition, physical activity, sedentary behaviors, school performance, family relations, mental health, driving behaviors and health perceptions at Time 2.

Results: Compared with non-use, frequent use (20+ times in the past year) at Time 1 was associated with Time 2 negative health and social measures, including risky driving behaviors (AOR = 1.78, CI-1.45–2.19), depressive symptoms (AOR = 1.68, CI-1.43–1.98), unhealthy weight control behaviors (AOR = 1.55, CI-1.31–1.84), psycho-somatic symptoms (AOR = 1.55, CI-1.30–1.83), and low school achievement (AOR = 1.46, CI-1.23–1.75). Frequent users relative to non-users had a lower probability of being overweight and obese (AOR = 0.75, CI-0.60–0.92).

Regarding positive measures frequent users relative to non-users had a higher probability of meeting recommendation of physical activity (AOR = 1.28, CI-1.09–1.51), but a lower probability of consuming fruits and vegetables (AOR = 0.82, CI-0.70–0.96) or attending college/university (AOR = 0.57, CI-0.44–0.75).

Findings: on occasional cannabis use (1–19 times in the past year) were more similar to frequent cannabis use for negative than positive health and social measures.

Conclusion: Results demonstrate complex prospective patterns in which significant prospective associations with most adverse measures were found for both occasional and frequent users, and with few significant associations of positive health measures mostly among occasional cannabis users.

Introduction

Cannabis is the most common illicit drug used among adolescents and emerging adults (Cerdá, Wall, Keyes, Galea, & Hasin, 2012; Conway et al., 2013; Leite et al., 2015; Lanza, Vasilenko, Dziak, & Butera, 2015; Pacek, Mauro, & Martins, 2015; Wua, Zhua, & Swartz, 2016). Despite a general decline since the peak in the 1970's (Lanza, et al., 2015), an increase among those 18–25 years old was reported for the period 2005–2013 based on the National Surveys on Drug Use (Wua et al., 2016). Prevalence of marijuana use among 18–25 age years old in 2015 was 52% for lifetime, 32% in the past year, and 20% in the past

month (NIDA, 2016). In light of national trends toward legalization, it is concerning that negative consequences of cannabis use may increase following changes in perceived harmfulness and actual use of cannabis (Cerdá et al., 2012; Pacek et al., 2015; Monte, Zane, & Heard, 2015).

Recent studies have documented emerging evidence that policies related to cannabis, including legalization, may contribute to perceptions and actual use of cannabis. Prior to recent policy changes in the United States, an international comparison of adolescents in the United States, Canada, and the Netherlands showed that prevalence of cannabis use did not differ by countries with different cannabis policies (Simons-Morton, Pickett, Boyce, ter Bogt, & Vollebergh, 2010). A more

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recent study conducted in the United States found that states that legalized medical cannabis had higher rates of illegal cannabis use and abuse (Cerdá et al., 2012). In Colorado, cannabis legalization was linked to a decline in perceptions of the risks of cannabis use among teens and adults (Schuermeyer et al., 2014). National data showed a similar pattern, with reductions in the perceived risk of regular cannabis use from 51.3% in 2002 to 40.3% in 2012 (Pacek et al., 2015). Recent study suggested that enforcement of medical marijuana laws is associated with decline probability of obesity (Sabia, Swigert, & Young, 2017). These state- and national-level trends call for empirical research that further our understanding of both negative and positive consequences of cannabis use and the potential benefits and versus risks of legalization (Monte et al., 2015).

Negative health and social measures for cannabis use

Negative health outcomes for cannabis use have been shown in past research for psychological, social, and physical variables (Arria, Caldeira, Bugbee, Vincent, & O'Grady, 2016; Barnwell, Earleywine, & Wilcox, 2006; Fergusson & Boden, 2008; Looby & Earleywine, 2007; Simpson, Janssen, Boyce, & Pickett, 2006; Troup, Andrzejewski, Braunwalder, & Torrence, 2016), although an examination of a wide range of these outcomes in a single study is rare. Relative to non-users, cannabis users reported more depressive symptoms (Looby & Earleywine, 2007; Troup et al., 2016), more psycho-somatic symptoms (Simpson et al., 2006; Osborn et al., 2015), and lower levels of subjective well-being (Barnwell et al., 2006). Among first year college students, heavy and moderate cannabis users, relative to non-users showed poorer physical and mental health outcomes, injuries, illness, emotional problems, and psychological distress (Arria et al., 2016).

The literature on the associations between cannabis use and weight-related behaviors is less consistent and more controversial. In a longitudinal study, young adult cannabis users in Australia were less likely to be overweight and obese (Hayatbakhsh et al., 2010). Similarly, in a sample of Inuit, past-year cannabis use was associated with a lower likelihood of obesity (Ngueta, Bélanger, Laouan-Sidi, & Lucas, 2015). Among U.S. adults, cannabis use was associated with lower fasting insulin levels, lower insulin resistance, lower BMI, and smaller waist circumferences (Penner, Buettner, & Mittleman, 2013) and as noted before, enforcement of medical marijuana laws found to be associated with decline probability of obesity (Sabia et al., 2017). However, other studies suggested that cannabis use may be associated with increased appetite, “munchies”, overeating and weight gain (Greydanus, Hawver, & Greydanus, 2013; Sidney, 2016). Recent research suggest some confounders in previous studies as acute versus chronic use to be involved in the associations between weight and cannabis use (Sansone & Sansone, 2014). In addition, limited research has been conducted on cannabis use and sedentary behaviors, with one study suggesting a positive association between computer use and ever cannabis use among male adolescents (Lesjak & Stanojevic-Jerkovici, 2015).

Associations with negative social measures for cannabis use have also been documented in past studies. According to the “a-motivational syndrome” theory, cannabis use may underlie symptoms of fatigue and apathy, leading to difficulties with successful progress through life (Barnwell et al., 2006). Indeed, cannabis use was inversely associated with family satisfaction (Jessor, Chase, & Donovan, 1980), and initiation was associated with poorer academic performance (Fergusson & Boden, 2008) and increased rates of school dropout (Lynskey & Hall, 2000). Moreover, Marie and Zölitz (2017) found that the academic performance of students who are no longer legally permitted to buy cannabis increases substantially. In one study, frequent cannabis use, relative to both infrequent use and nonuse, was associated with lower likelihood of earning a bachelor's degree (Maggs et al., 2015), highlighting the importance of differentiating between infrequent versus frequent cannabis use in relation to academic achievement measures. In Homel, Thompson and Leadbeater (2014) frequent users had the lowest

high school grades and the most conduct problems and were least likely to enroll in postsecondary education. Occasional users did not differ from abstainers on high school grades or conduct problems and were no less likely than abstainers to enroll in postsecondary education. Cannabis use is also associated with impaired driving (Li, Simons-Morton, Gee, & Hingson, 2016; Ronen et al., 2010; Robertson, Woods-Fry, & Morris, 2016; Vaca, Li, Hingson, & Simons-Morton, 2016).

Positive health and social measures for cannabis use

There is limited research on associations with positive health of cannabis use, and the findings are mixed. Much of the research has focused on cannabis as a medical treatment to increase appetite (Ko, Bober, Mindra, & Moreau, 2016) or decrease pain (Whiting et al., 2015), decrease PTSD symptoms (Yarnell, 2014), or treat symptoms of ADHD (Milz & Grotenhermen, 2015). Wilens et al. (2007) stated that those with ADHD reported self-medication as their primary reason for cannabis use, while other research, consistent with findings from an online chats study, people reported using cannabis without a prescription because the drug was therapeutic for their ADHD (Mitchell, Sweitzer, Tunno, Kollins, & McClernon, 2016). Few studies that examined happiness as part of quality of life and life satisfaction and found cannabis use does not seem to enhance quality of life (Ventegodt & Merrick, 2003; Fischer, Clavarino, Plotnikova, & Najman, 2015), motivation, happiness, or life satisfaction (Looby & Earleywine, 2007). In one longitudinal study, found that chronic marijuana use in adolescence and emerging adulthood had little effect on life satisfaction in the mid-30s (White, Bechtold, Loeber, & Pardini, 2015). Not surprisingly, the primary motivation for cannabis use among young people is the pleasure of getting high (Rella, 2015).

Research findings on possible associations between cannabis use and fruits and vegetables intake were not consistent. An early study found that adolescent marijuana abusers reported eating more snack foods and less fruit and vegetables than other groups (Farrow, Rees, & Worthington-Roberts, 1987). A study with high school students found no significant associations between cannabis use and fruit and vegetable intake (Arcan, Kubik, Fulkerson, Hannan, & Story, 2011). The findings on physical activity are also mixed. A study of school-aged adolescents from Slovenia reported no association between cannabis use and physical activity (Lesjak & Stanojevic-Jerkovici, 2015). Another study with French university students suggested cannabis might enhance sports performance, especially for participants who practiced more extreme sports as windsurfing, skiing or snowboarding (Lorente, Peretti-Watel & Grelot, 2005 in Gillman, Hutchison, & Bryan, 2015). In contrast, chronic use of cannabis has been associated with reduced physical activity (Greydanus et al., 2013), lower fitness measured by a maximal effort fitness test and increased heart rate at less than maximal exercise levels (Sidney, 2002).

Purpose of the study

The available literature on prospective relationships between cannabis use and health/social measures is limited both by the restricted range of outcomes examined (much less on positive measures) and by the insufficient differentiation by type of users (e.g., occasional vs. frequent users). Utilizing a large and recent national sample of U.S. emerging adults, the purpose of this study was to examine prospective effects of cannabis use frequency at Time 1 on a wide range of health and social behaviors at Time 2. We hypothesized that relative to non-users, occasional or frequent cannabis users would report higher probabilities of negative health or social (sedentary behavior, overweight/obese weight status, unhealthy weight control behaviors, psycho-somatic symptoms, depressive symptoms, distracted driving, risky driving, riding with an impaired driver, and school achievement) and lower probabilities of positive health or social measures (physical activity, fruit and vegetable intake, optimism, happiness and self-

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