8

Marijuana Use Prevention

Best Practices Bibliography

What does the research say about marijuana use prevention in college?
While much research has been done on prevention of alcohol use in college, information and data on collegiate marijuana use is harder to find.

Below is a list of articles and other resources pertaining to marijuana use and prevention in a college context. Articles were chosen for relevancy, timeliness, and usefulness in a college environment. They pertain to a wide range of topics, such as marijuana use among specific populations (e.g. athletes or LGBT students) and specific strategies used to address prevention.

Included with the citations are either the authors' abstracts (whole or excerpted), or brief descriptions of the resources. Main topic categories are noted, with the following key:

- 🛠 TOOLS (e.g. FOR SCREENING)
- ✪ STRATEGIES
- !! HIGH-RISK POPULATIONS
- ®Ⓟ RISK AND PROTECTIVE FACTORS
- ☑ EFFECTS OF MARIJUANA
- § LEGAL ISSUES

Alexander, D. (2003). A marijuana screening inventory (experimental version): description and preliminary psychometric properties. *The American Journal of Drug and Alcohol Abuse, 29(3)*, 619–646.

🛠 *Abstract:* "Marijuana use prevalence, culturally confusing messages about marijuana risks, assessment dilemmas, and current screening inadequacies justify developing a marijuana specific screening inventory for assessment purposes. This article describes the Marijuana Screening Inventory (MSI-X) and its preliminary psychometric reliability, factor analyses, and factor structure."

Allen, J., & Holder, M. D. (2014). Marijuana use and well-being in university students. *Journal of Happiness Studies, 15*(2), 301–321.

!! ☑ *Abstract:* "The present study investigated the relationships between the frequency of marijuana use, negative consequences resulting from drug use, well-being, and personality. ...Frequency of marijuana use was not associated with well-being. However, negative consequences resulting from drug use were positively correlated with negative well-being, and negatively correlated with positive well-being. ...After controlling for personality, negative consequences did not explain any further variance in positive well-being, but explained a small amount of variance in negative well-being."

Agrawal, A., Budney, A. J., & Lynskey, M. T. (2012). The co-occurring use and misuse of cannabis and tobacco: a review. *Addiction, 107*(7), 1221–1233.

!! ®Ⓟ *Abstract:* "Cannabis and tobacco use and misuse frequently co-occur. This review examines the epidemiological evidence supporting the life-time co-occurrence of cannabis and tobacco use and outlines the mechanisms that link these drugs to each other. Mechanisms include (i) shared genetic factors; (ii) shared environmental influences, including (iii) route of administration (via smoking), (iv)

co-administration and (v) models of co-use. We also discuss respiratory harms associated with co-use of cannabis and tobacco, overlapping withdrawal syndromes and outline treatment implications for co-occurring use."

Agrawal, A., Madden, P. A., Bucholz, K. K., Heath, A. C., & Lynskey, M. T. (2008). Transitions to regular smoking and to nicotine dependence in women using cannabis. *Drug and Alcohol Dependence*, *95*(1), 107–114.

!! ®Ⓟ *Abstract:* "In a sample of 3787 female twins (age range 18–29 years), we examined, using discrete-time survival analyses, whether women who reported cannabis use were at increased risk for regular cigarette smoking and progression to nicotine dependence. ...After controlling for a large number of potential covariates, we found that women who used cannabis were at 4.4 and 2.8 increased hazards for transitioning from initiation to regular smoking and from regular smoking to nicotine dependence, respectively."

Amos, A., Wiltshire, S., Bostock, Y., Haw, S., & McNeill, A. (2004). 'You can't go without a fag… you need it for your hash'—a qualitative exploration of smoking, cannabis and young people. *Addiction*, *99*(1), 77–81.

!! ®Ⓟ *Abstract:* "Aims: To examine the relationship between smoking tobacco and cannabis use among smokers in their mid-to-late teens. Design and participants: Two qualitative studies in Scotland. One study used semistructured paired interviews involving 99 16–19-year-old smokers, the other comprised eight focus groups involving 46 15–16-year-old smokers. Measurement: The interviews and focus groups explored the role and meaning of smoking in the participants' lives, smoking histories and future cessation intentions and how these related to other aspects of their lives, particularly cannabis use. Findings: Cannabis use was regarded as an important and enjoyable aspect of many of the participants' lives. Importantly, cannabis use and cigarette smoking were linked inextricably. Several reported how smoking joints had been a 'gateway' to smoking cigarettes. While most wanted to quit smoking cigarettes, cannabis use reinforced their cigarette smoking and few wanted to stop using cannabis.

Arria, A. (2014). Beyond alcohol violations: Strengthening campus systems to connect high-risk drinkers to SBIRT and other services [PowerPoint slides]. Retrieved from http://marylandcollaborative.org/beyond-alcohol-violations-strengthening-campus-systems-to-connect-high-risk-drinkers-with-sbirt-other-services/

🛠 !! *Summary:* PowerPoint presentation by Amelia Arria, the Director of the Center on Young Adult Health and Development, University of Maryland School of Public Health. An overview of the findings from *College Drinking in Maryland: A Status Report*, the presentation provides helpful information on screening for college students' alcohol use, which could be applied to programs focusing on marijuana use.

Aselton, P. (2012). Sources of stress and coping in American college students who have been diagnosed with depression. *Journal of Child and Adolescent Psychiatric Nursing*, *25*(3), 119–123.

!! ®Ⓟ *Abstract:* "**Purpose:** The study aims to explore the sources of stress in American college students who had been treated for depression and to discern their coping mechanisms. **Organizing framework:** A phenomenological approach using Seidman's guide to in-depth qualitative interviews using a three-part approach was used in the study. **Method:** Online in-depth interviews utilizing e-mail with asynchronous communication were used. **Findings:** Sources of stress included roommate issues, academic problems, financial and career concerns, and pressure from family. Exercise, talking to friends, self- talk, deep breathing, journaling, marijuana use, and listening to music were common coping mechanisms. **Conclusions:** College students who have been treated for depression are under increasing stress today from a variety of sources. Nonmedical methods of coping were often cited as more effective than medication therapy.

Babson, K. A., Boden, M. T., & Bonn-Miller, M. O. (2013). Sleep quality moderates the relation between depression symptoms and problematic cannabis use among medical cannabis users. *The American Journal of Drug and Alcohol Abuse, 39*(3), 211–216.

!! ®Ⓟ *Abstract*: **Objectives:** This study sought to extend research on the relation between depression symptoms and problematic cannabis use by evaluating the potential moderating role of perceived sleep quality among medical cannabis users. **Methods:** This employed a cross-sectional design. The sample consisted of 162 adults (mean age = 42.05 years, SD = 14.8; 22% female), with current recommendations from a doctor for medical cannabis, recruited from a medical cannabis dispensary. **Results:** Consistent with previous research, individuals with heightened depression symptoms had greater problematic cannabis use. In addition, perceived sleep quality moderated this relation, such that depression symptoms differentially related to problematic cannabis use as a function of perceived quality of sleep ($\Delta R^2 = .03$, $p = .02$). Participants with higher levels of depression and good perceived sleep quality had the greatest rates of problematic cannabis use."

Bachhuber, M. A., Saloner, B., Cunningham, C. O., & Barry, C. L. (2014). Medical cannabis laws and opioid analgesic overdose mortality in the United States, 1999-2010. *JAMA Internal Medicine*, *174*(10), 1668-1673.

§ *Abstract:* **Objective:** To determine the association between the presence of state medical cannabis laws and opioid analgesic overdose mortality. …**Design, Setting, and Participants:** A time-series analysis was conducted of medical cannabis laws and state-level death certificate data in the United States from 1999 to 2010; all 50 states were included. ...**Conclusions and Relevance:** Medical cannabis laws are associated with significantly lower state-level opioid overdose mortality rates. Further investigation is required to determine how medical cannabis laws may interact with policies aimed at preventing opioid analgesic overdose."

Batalla, A., Bhattacharyya, S., Yücel, M., Fusar-Poli, P., Crippa, J. A., Nogué, S., … & Martin-Santos, R. (2013). Structural and functional imaging studies in chronic cannabis users: a systematic review of adolescent and adult findings. *PloS one*, *8*(2), e55821.

☑ *Abstract:* "**Background**: ...We conducted a systematic review to assess the evidence of the impact of chronic cannabis use on brain structure and function in adults and adolescents. **Methods:** Papers published until August 2012 were included from EMBASE, Medline, PubMed and LILACS databases following a comprehensive search strategy and pre-determined set of criteria for article selection. Only neuroimaging studies involving chronic cannabis users with a matched control group were considered. **Results:** One hundred and forty-two studies were identified, of which 43 met the established criteria. Eight studies were in adolescent population. Neuroimaging studies provide evidence of morphological brain alterations in both population groups, particularly in the medial temporal and frontal cortices, as well as the cerebellum. These effects may be related to the amount of cannabis exposure. Functional neuroimaging studies suggest different patterns of resting global and brain activity during the performance of several cognitive tasks both in adolescents and adults, which may indicate compensatory effects in response to chronic cannabis exposure."

Beck, K. H., Caldeira, K. M., Vincent, K. B., O'Grady, K. E., Wish, E. D., & Arria, A. M. (2009). The social context of cannabis use: relationship to cannabis use disorders and depressive symptoms among college students. *Addictive Behaviors*, *34*(9), 764-768.

!! ☑ *Abstract:* Few studies have investigated the association between the social context of cannabis use and cannabis use disorder (CUD). This longitudinal study of college students aimed to: develop a social context measure of cannabis use; examine the degree to which social context is associated with the transition from non-problematic cannabis use to CUD; and, examine the association between social context of cannabis use and depressive symptoms. The analytic sample consisted of 322 past-year cannabis users at baseline. Four distinct and internally consistent social context scales were found (i.e., social facilitation, emotional pain, sex seeking, and peer acceptance). Persistent CUD (meeting DSM-IV criteria for CUD at baseline and 12 months later) was associated with using cannabis in social facilitation or emotional pain contexts, controlling for frequency of cannabis use and alcohol use quantity. Students with higher levels of depressive symptoms were more likely to use cannabis in an emotional pain or sex-seeking context. These findings highlight the importance of examining the social contextual factors relating to substance use among college students.

Berg, C. J., Buchanan, T. S., Grimsley, L., Rodd, J., & Smith, D. (2011). Personality characteristics and health risk behaviors associated with current marijuana use among college students. *Open Journal of Preventive Medicine*, *1*(03), 101.

!! ®℗ Abstract: "...The current study aimed to examine personality factors and health risk behaviors associated with marijuana use. Methods: We administered an online survey to six colleges in the Southeast. Overall, we recruited 24,055 college students, yielding 4840 responses (20.1% response rate), with complete data from 4,401 students. Results: Current (past 30 day) marijuana use was reported by 13.8% of our sample. Users either reported infrequent use of marijuana (i.e., between 1 and 5 days; 52.3%) or very frequent use of marijuana (i.e., between 26 and 30 days; 18.2%). Mutlivariate analyses modeling correlates of marijuana use (Nagelkerke R2 = 0.323) indicated that significant factors included being younger ($p < 0.001$), being male ($p = 0.002$), being Black ($p = 0.002$), attending a four-year college ($p = 0$ .00 5), being a nondaily ($p < 0.001$) or daily smoker ($p < 0.001$) vs. a nonsmoker, other tobacco use ($p < 0.001$), greater alcohol use ($p < 0.001$), greater perceived stress ($p = 0.009$), higher levels of sensation seeking (<0.001) and openness to experiences ($p = 0.02$), and lower levels of agreeableness ($p = 0.01$) and conscientiousness ($p < 0.001$).

Bertholet, N., Faouzi, M., Studer, J., Daeppen, J. B., & Gmel, G. (2013). Perception of tobacco, cannabis, and alcohol use of others is associated with one's own use. *Addiction Science & Clinical Practice*, *8*(1), 15.

®℗ *Abstract:* "**Background:** ...We studied the prevalence of misperceptions of use for tobacco, cannabis, and alcohol and whether the perception of tobacco, cannabis, and alcohol use by others is associated with one's own use. **Methods:** Participants (n = 5216) in a cohort

study from a census of 20-year-old men (N = 11,819) estimated the prevalence of tobacco and cannabis use among peers of the same age and overestimated, accurately estimated, or underestimated substance use by others. Regression models were used to compare substance use by those who overestimated or underestimated peer substance with those who accurately estimated peer use. Other variables included in the analyses were the presence of close friends with alcohol or other drug problems and family history of substance use. ...**Conclusions**: Perceptions of substance use by others are associated with one's own use. In particular, overestimating use by others is frequent among young men and is associated with one's own greater consumption. This association is independent of the substance use environment, indicating that, even in the case of proximity to a heavy-usage group, perception of use by others may influence one's own use. If preventive interventions are to be based on normative feedback, and their aim is to reduce overestimations of use by others, then the prevalence of overestimation indicates that they may be of benefit to roughly half the population; or, in the case of cannabis, to as few as 20%. Such interventions should take into account differing strengths of association across substances."

Bonn-Miller, M. O., Zvolensky, M. J., & Bernstein, A. (2007). Marijuana use motives: Concurrent relations to frequency of past 30-day use and anxiety sensitivity among young adult marijuana smokers. *Addictive Behaviors, 32*(1), 49-62.

!! ®Ⓟ *Abstract:* "The present investigation examined two theoretically relevant aspects of marijuana motives using the Marijuana Motives Measure (MMM) [Simons, J., Correia, C. J., Carey, K. B., & Borsari, B. E. (1998). Validating a five-factor marijuana motives measure: Relations with use, problems, and alcohol motives. *Journal of Counseling Psychology* 45, 265–273] among 141 (78 female) young adults (M_{age} = 20.17, S.D. = 3.34). The first objective was to evaluate the incremental validity of marijuana motives in relation to frequency of past 30-day use after controlling for the theoretically relevant factors of the number of years using marijuana (lifetime), current levels of alcohol, as well as tobacco smoking use. As expected, coping, enhancement, social, and expansion motives each were uniquely and significantly associated with past 30-day marijuana use over and above the covariates; conformity motives were not a significant predictor. A second aim was to explore whether coping, but no other marijuana motive, was related to the emotional vulnerability individual difference factor of anxiety sensitivity (fear of anxiety). As hypothesized, after controlling for number of years using marijuana (lifetime), past 30-day marijuana use, current levels of alcohol consumption, and cigarettes smoked per day, anxiety sensitivity was incrementally and uniquely related to coping motives for marijuana use, but not other motives. These results are discussed in relation to the clinical implications of better understanding the role of motivation for marijuana use among emotionally vulnerable young adults."

Bonn - Miller, M. O., & Zvolensky, M. J. (2009). An evaluation of the nature of marijuana use and its motives among young adult active users. *The American Journal on Addictions, 18*(5), 409-416.

!! ®Ⓟ Abstract: "The present investigation examined marijuana use, abuse, and dependence in relation to self-reported marijuana use behaviors and motives, as well as concurrent cigarette and problematic alcohol use among a sample of young adult current marijuana users (n = 200; 44.5% women; Mage = 21.48, SD = 6.54). Preliminary results broadly indicated that more severe forms of marijuana use (eg, dependence) were associated with a more problematic pattern of marijuana use behavior, polysubstance use, and greater motivation to use marijuana for multiple reasons. Results are discussed in relation to better understanding the underlying nature of marijuana use and its disorders among young adults.

Boynton Health Service. (2013). University of Minnesota. Health and Health Related Behaviors: Minnesota Postsecondary Lesbian, Gay, and Bisexual Students. *College Student Health Survey Report.* http://www.bhs.umn.edu/surveys/survey-results/2007-2011_LGB_CSHSReport.pdf. Accessed July 2014.

!! Summary: Results of the College Student Health Survey, from 2007 to 2011, concerning LGB students and their health and substance use.

Buckman, J. F., Yusko, D. A., Farris, S. G., White, H. R., & Pandina, R. J. (2011). Risk of marijuana use in male and female college student athletes and nonathletes. *Journal of Studies on Alcohol and Drugs, 72*(4), 586.

!! ®Ⓟ *Abstract:* **Objective:** ...The present study examined risk factors that can drive or curb marijuana use in college athletes and nonathletes. **Method:** Logistic regressions, performed separately for men and for women, assessed the relationship of past-year marijuana use to sensation seeking, negative mood, perceptions of peer marijuana use, motivations for marijuana use, and stress related to body image and academics in athletes (233 men, 156 women) and nonathletes (184 men, 313 women). Risk factors also were compared for male past-year marijuana users who reported using (*n* = 26) or not using (*n* = 61) the substance during their competitive season. **Results:** For athletes and nonathletes of both genders, being White, being past-year cigarette smokers, having higher sensation-seeking scores, and having exaggerated perceptions of student use norms were associated with past-year marijuana use. Enhancement motivations for use were higher

among athletes compared with their same-gender nonathlete peers. In women, but not in men, greater body image stress and lower academic stress were associated with past-year marijuana use. Male athletes who continued using marijuana into their competitive season demonstrated a qualitatively different risk profile compared with athlete past-year users who reported no in-season use, including greater coping motivations for marijuana use.

Buckner, J. D., & Schmidt, N. B. (2008). Marijuana effect expectancies: Relations to social anxiety and marijuana use problems. *Addictive Behaviors, 33*(11), 1477–1483.

!! ®Ⓟ *Abstract:* "We examined relations between marijuana effect expectancies, social anxiety, and marijuana among undergraduates (**N** = 337). Social anxiety was related positively to Negative Expectancies and negatively to Tension Reduction Expectancies. Among socially anxious individuals, greater belief that marijuana produces Cognitive and Behavioral Impairment was associated with greater marijuana use rates. Negative Expectancies mediated the social anxiety–marijuana problems link."

Buckner, J. D., Bonn-Miller, M. O., Zvolensky, M. J., & Schmidt, N. B. (2007). Marijuana use motives and social anxiety among marijuana-using young adults. *Addictive Behaviors, 32*(10), 2238–2252.

!! ®Ⓟ *Abstract:* "...the present investigation examined the relations among marijuana use motives, marijuana use and problems, and social anxiety in 159 (54.7% female) young adults (M_{age} = 18.74, SD = 1.20). As expected, after covarying for a number of variables related to both marijuana use and social anxiety (e.g. gender, alcohol use problems, anxiety sensitivity), social anxiety predicted greater numbers of marijuana use problems. Interestingly, social anxiety was not related to marijuana use frequency. Also consistent with prediction, social anxiety was a significant predictor of coping and conformity motives for marijuana use above and beyond relevant variables. Finally, coping motives for marijuana use mediated the relation between social anxiety and marijuana use problems."

Buckner, J. D., Mallott, M. A., Schmidt, N. B., & Taylor, J. (2006). Peer influence and gender differences in problematic cannabis use among individuals with social anxiety. *Journal of Anxiety Disorders, 20*(8), 1087–1102.

!! ®Ⓟ *Abstract:* "The present study examined the role of a well-established risk factor for cannabis use, peer influence, on the relationship between symptoms of SAD and CUD in a non-referred sample (**N** = 123). Lifetime symptoms of SAD and CUD were assessed using a structured diagnostic interview. SAD symptoms were significantly correlated with CUD symptoms and this relationship was moderated by peer use of both alcohol and cannabis. Further, a gender effect indicated that the relationship between symptoms of SAD and CUD occurred only in women."

Calderia, K. M., Arria, A. M., O'Grady, K. E., Vincent, K. B. and Wish, E. D. (2008). The occurrence of cannabis use disorders and other cannabis-related problems among first-year college students. *Addictive Behaviors, 33*:397–411.

!! ☑ ®Ⓟ *Abstract:* "This study reports the prevalence of cannabis use disorders (CUD) and other cannabis-related problems in a large cohort (*n* = 1253) of first-year college students, 17 to 20 years old, at one large public university in the mid-Atlantic region of the U.S. Interviewers assessed past-year cannabis use, other drug use, and cannabis-related problems (including DSM-IV criteria for CUD). The prevalence of CUD was 9.4%$_{wt}$ among all first-year students and 24.6% among past-year cannabis users (*n* = 739). Of those endorsing any CUD criteria, 33.8% could be classified as diagnostic orphans. Among 474 "at-risk" cannabis users (≥ 5 times in the past year), concentration problems (40.1%), driving while high (18.6%) and missing class (13.9%) were among the most prevalent cannabis-related problems, even among those who endorsed no CUD criteria. Placing oneself at risk for physical injury was also commonly reported (24.3%). A significant proportion of cannabis-using college students meet diagnostic criteria for disorder. Even in the absence of disorder, users appear to be at risk for potentially serious cannabis-related problems. Implications for prevention, service delivery, and future research are discussed."

Chen, C. Y., Storr, C. L., & Anthony, J. C. (2009). Early-onset drug use and risk for drug dependence problems. *Addictive Behaviors*, *34*(3), 319–322.

!! ☑ ®Ⓟ *Abstract:* "There is substantial evidence that alcohol, tobacco, and cannabis dependence problems surface more quickly when use of these drugs starts before adulthood, but the evidence based on other internationally regulated drugs (e.g., cocaine) is meager. With focus on an interval of up to 24 months following first drug use, we examine drug-specific and age-specific variation in profiles of early-emerging clinical features associated with drug dependence. Based upon the United States National Surveys on Drug Use and Health (NSDUH) conducted in 2000–2002, the risk of experiencing drug dependence problems was robustly greater for adolescent recent-onset users of

cocaine, psychostimulant drugs other than cocaine, analgesics, anxiolytic medicines, inhalants drugs, and cannabis, as compared to adult recent-onset users (odds ratio = 1.5–4.3, **p** < 0.05). This was not the case for the NSDUH hallucinogens group (e.g., LSD). The adolescent onset associated excess risk was not constant across all clinical features. Our evidence suggests promoting earlier detection and interventions, as well as greater parent and peer awareness of drug dependence clinical features that may develop early among young people who have just started using drugs."

Chiesa, A., & Serretti, A. (2014). Are mindfulness-based interventions effective for substance use disorders? A systematic review of the evidence. *Substance Use & Misuse*, *49*(5), 492-512.

Abstract: "The aim of this article is to review current evidence on the therapeutic efficacy of mindfulness-based interventions (MBIs) for substance use and misuse (SUM). A literature search was undertaken using four electronic databases and references of retrieved articles. ...Current evidence suggests that MBIs can reduce the consumption of several substances including alcohol, cocaine, amphetamines, marijuana, cigarettes, and opiates to a significantly greater extent than waitlist controls, non-specific educational support groups, and some specific control groups. Some preliminary evidence also suggests that MBIs are associated with a reduction in craving as well as increased mindfulness."

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological assessment*, *6*(2), 117.

Abstract: "A 4-factor measure of drinking motives based on a conceptual model by M. Cox and E. Klinger (see PA, Vol 75:32975; see also 1990) is presented. Using data from a representative household sample of 1,243 Black and White adolescents, confirmatory factor analyses showed that the hypothesized model provided an excellent fit to the data and that the factor pattern was invariant across gender, race, and age. Each drinking motive was related to a distinct pattern of contextual antecedents and drinking-related outcomes, and these relationships did not generally vary across demographic subgroups. Results support both the conceptual validity of Cox and Klinger's model and the utility of this measure for clinical and research purposes across a diverse range of adolescent populations."

Cranford, J. A., Eisenberg, D., & Serras, A. M. (2009). Substance use behaviors, mental health problems, and use of mental health services in a probability sample of college students. *Addictive Behaviors*, *34*(2), 134-145.

!! ®Ⓟ *Abstract:* "This research examined 1) the prevalence of substance use behaviors in college students, 2) gender and academic level as moderators of the associations between mental health problems and substance use, and 3) mental health service use among those with co-occurring frequent binge drinking and mental health problems. As part of the Healthy Minds Study, a probability sample of 2843 college students completed an Internet survey on mental health problems, substance use behaviors, and utilization of mental health care. Response propensity weights were used to adjust for differences between respondents and non-respondents. ...(from body of paper) None of the bivariate or multivariate associations between mental health problems and marijuana use were significant."

de Dios, M. A., Herman, D. S., Britton, W. B., Hagerty, C. E., Anderson, B. J., & Stein, M. D. (2012). Motivational and mindfulness intervention for young adult female marijuana users. *Journal of Substance Abuse Treatment*, *42*(1), 56-64.

Abstract: "This pilot study tested the efficacy of a brief intervention using motivational interviewing (MI) plus mindfulness meditation (MM) to reduce marijuana use among young adult females. Thirty-four female marijuana users between the ages of 18 and 29 were randomized to either the intervention group (**n** = 22), consisting of two sessions of MI-MM, or an assessment-only control group (**n** = 12). The participants' marijuana use was assessed at baseline and at 1, 2, and 3 months posttreatment. Fixed-effects regression modeling was used to analyze treatment effects. Participants randomized to the intervention group were found to use marijuana on 6.15 (**z** = −2.42, **p** = .015), 7.81 (**z** = −2.78, **p** = .005), and 6.83 (**z** = −2.23, **p** = .026) fewer days at Months 1, 2, and 3, respectively, than controls. Findings from this pilot study provide preliminary evidence for the feasibility and effectiveness of a brief MI-MM for young adult female marijuana users."

DeJong, W., & Langford, L. M. (2002). A typology for campus-based alcohol prevention: Moving toward environmental management strategies. *Journal of Studies on Alcohol and Drugs*, (14), 140.

Abstract: "**Objective:** This article outlines a typology of programs and policies for preventing and treating campus-based alcohol-related problems, reviews recent case studies showing the promise of campus-based environmental management strategies and reports findings from a national survey of U.S. colleges and universities about available resources for pursuing environmentally focused prevention. ...**Results:** Recent case studies suggest the value of environmentally focused alcohol prevention approaches on campus, but more rigorous research is needed to establish their effectiveness. The administrators' survey showed that most U.S. colleges have not yet installed the basic infrastructure required for developing, implementing and evaluating environmental management strategies."

Degenhart, L., Hall, W. and Lynskey, M. (2003). Exploring the association between cannabis use and depression. *Addiction, 98:* 1493–1504.

!! ☑ ®Ⓟ *Abstract:* "**Aim:** To examine the evidence on the association between cannabis and depression and evaluate competing explanations of the association. **Methods:** A search of Medline, Psychinfo and EMBASE databases was conducted. All references in which the terms 'cannabis', 'marijuana' or 'cannabinoid', and in which the words 'depression/depressive disorder/depressed', 'mood', 'mood disorder' or 'dysthymia' were collected. Only research studies were reviewed. Case reports are not discussed. **Results:** There was a modest association between heavy or problematic cannabis use and depression in cohort studies and well-designed cross-sectional studies in the general population. Little evidence was found for an association between depression and infrequent cannabis use. A number of studies found a modest association between early-onset, regular cannabis use and later depression, which persisted after controlling for potential confounding variables. There was little evidence of an increased risk of later cannabis use among people with depression and hence little support for the self-medication hypothesis. There have been a limited number of studies that have controlled for potential confounding variables in the association between heavy cannabis use and depression. These have found that the risk is much reduced by statistical control but a modest relationship remains. **Conclusions:** Heavy cannabis use and depression are associated and evidence from longitudinal studies suggests that heavy cannabis use may increase depressive symptoms among some users. It is still too early, however, to rule out the hypothesis that the association is due to common social, family and contextual factors that increase risks of both heavy cannabis use and depression."

Degenhardt, L., Hall, W., & Lynskey, M. (2003). Testing hypotheses about the relationship between cannabis use and psychosis. *Drug and Alcohol Dependence, 71*(1), 37–48.

!! ☑ ®Ⓟ Abstract: "*Aim*: To model the impact of rising rates of cannabis use on the incidence and prevalence of psychosis under four hypotheses about the relationship between cannabis use and psychosis. *Methods:* The study modelled the effects on the prevalence of schizophrenia over the lifespan of cannabis in eight birth cohorts... It derived predictions as to the number of cases of schizophrenia that would be observed in these birth cohorts. ...*Results:* There was a steep rise in the prevalence of cannabis use in Australia over the past 30 years and a corresponding decrease in the age of initiation of cannabis use. There was no evidence of a significant increase in the incidence of schizophrenia over the past 30 years. Data on trends the age of onset of schizophrenia did not show a clear pattern. Cannabis use among persons with schizophrenia has consistently been found to be more common than in the general population. *Conclusions:* Cannabis use does not appear to be causally related to the incidence of schizophrenia, but its use may precipitate disorders in persons who are vulnerable to developing psychosis and worsen the course of the disorder among those who have already developed it."

Degenhardt, L., & Hall, W. (2006). Is cannabis use a contributory cause of psychosis? *Canadian Journal of Psychiatry. Revue Canadienne de Psychiatrie*, *51*(9), 556–565.

!! ☑ ®Ⓟ *Abstract:* "Objective: To assess whether cannabis use in adolescence and young adulthood is a contributory cause of schizophreniform psychosis in that it may precipitate psychosis in vulnerable individuals. ...Results: Evidence from 6 longitudinal studies in 5 countries shows that regular cannabis use predicts an increased risk of a schizophrenia diagnosis or of reporting symptoms of psychosis. These relations persist after controlling for confounding variables, such as personal characteristics and other drug use. The relations did not seem to be a result of cannabis use to self-medicate symptoms of psychosis."

Denering, L. L., & Spear, S. E. (2012). Routine use of screening and brief intervention for college students in a university counseling center. *Journal of Psychoactive Drugs, 44*(4), 318–324.

🛠 !! ✪ *Abstract:* "This study provides preliminary evidence of the effectiveness of the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) and ASSIST-linked brief intervention in a college mental health clinic. Data are from a single group, pre-post evaluation study (2006–2009) at a university counseling center. Students deemed to be at risk for substance use problems were offered the ASSIST and the ASSIST-linked brief intervention. Staff therapists administered the ASSIST and intervention as part of routine care; 453 students (ages 18–24) participated in the evaluation and completed baseline and six-month follow-up interviews. Changes in alcohol and marijuana use were examined by McNemar's test of proportions and by paired t-tests for means. Slight reductions in the rates and number of days (in the prior 30 days) of binge drinking and marijuana use were found."

Ehrlich, Jennifer (2015, June 1). Minnesota medical marijuana: What you need to know. *MPR News.* Retrieved from: http://www.mprnews.org/story/2015/06/01/minnesota-medical-marijuana.

§ *Summary:* News article about medical marijuana in Minnesota.

Eisenberg, M. E., & Wechsler, H. (2003a). Social influences on substance-use behaviors of gay, lesbian, and bisexual college students: findings from a national study. *Social Science & Medicine, 57*(10), 1913-1923.

!! ®Ⓟ *Abstract:* "The goal of this paper is to describe the relationships of two different aspects of the campus social environment, namely the campus resources for gay, lesbian, and bisexual (GLB) students and the campus-wide behavioral norms of substance use, to the individual substance-use behaviors of college students with same-sex experiences. Individual-level data come from 630 college students reporting same-sex experience, who were part of a national random sample returning questionnaires. Current cigarette smoking and binge drinking were examined. College-level data regarding the campus resources designed for GLB students were collected and used with campus-wide substance-use norms to predict individual substance use in logistic regression analyses. One-third to one-half of students reported current smoking and binge drinking, by sex and sex-partner category. The presence of GLB resources was inversely associated with women's smoking and directly associated with men's binge drinking behaviors. The proportion of students reporting same-sex behavior on campus was directly associated with these same outcomes, and behavioral norms were not associated with either outcome."

Eisenberg, M., & Wechsler, H. (2003b). Substance use behaviors among college students with same-sex and opposite-sex experience: results from a national study. *Addictive Behaviors, 28*(5), 899-913.

!! ®Ⓟ *Abstract:* "*Objectives:* This study seeks to describe the population of college students with same-sex sexual experience and determine if these students report more substance use than their peers with only opposite-sex experience. *Methods:* Questionnaires were completed by a national random sample of college students on 119 campuses in 1999. A total of 10,301 sexually active students were categorized as having only opposite-sex, only same-sex, or both-sex partners, and their smoking, binge drinking, and marijuana use behaviors were compared. *Results:* Students who report same-sex sexual experiences comprise 6.1% of respondent. Women with both-sex partners were approximately twice as likely to smoke, binge drink, and use marijuana as women with only opposite-sex partners (OR=1.41–2.78), but women with only same-sex partners were not at increased risk for these behaviors. Men with both-sex partners were less likely to binge drink (OR=0.54) than men with only opposite-sex partners."

Elliott, J. C., & Carey, K. B. (2012). Correcting exaggerated marijuana use norms among college abstainers: A preliminary test of a preventive intervention. *Journal of studies on alcohol and drugs*, *73*(6), 976.

🛠 ✪ *Abstract:* **Objective:** ...The purpose of this pilot study was to evaluate the efficacy of the Marijuana eCHECKUP TO GO (e-TOKE) for Universities & Colleges program in (a) correcting descriptive norms, (b) correcting injunctive norms, and (c) preventing initiation of marijuana use in a group of college-age abstainers. ...**Results:** Participants receiving the e-TOKE program estimated lower descriptive norms than the control group ($p < .01$), and fewer believed friends disapproved of their choice to abstain ($p < .05$). However, rates of use/initiation did not differ between the two conditions ($p = .18$).

Elliott, J. C., Carey, K. B., & Vanable, P. A. (2014). A preliminary evaluation of a web-based intervention for college marijuana use. *Psychology of Addictive Behaviors*, *28*(1), 288.

🛠 ✪ *Abstract:* One popular but understudied program is The Marijuana eCHECKUP TO GO (e-TOKE) for Universities & Colleges (San Diego State University Research Foundation, 2009). The aim of the present study was to evaluate its short-term effectiveness in changing marijuana involvement and perceived norms in undergraduates. ...Assessment reactivity analyses yielded no significant differences by assessment condition. Individuals completing the e-TOKE program reported less extreme descriptive norms ($ps < 0.01$) but no decrease in marijuana use frequency, problems, abuse or dependence symptoms, or changes in injunctive norms ($ps > 0.10$). Thus, e-TOKE reduces perceptions of others' use, but this study did not provide evidence for its utility in changing personal use and problem indicators in the short-term. "

Filbey, F., & Yezhuvath, U. (2013). Functional connectivity in inhibitory control networks and severity of cannabis use disorder. *The American Journal of Drug and Alcohol Abuse*, *39*(6), 382-391.

☑ *Abstract:* "**Background:** Loss of control is a prominent feature of cannabis use disorders (CUD) and involves orchestrated activity from several brain inhibitory control networks. **Objectives***:* In this study, we determined the associations between inhibitory control network activation and connectivity and CUD severity. **Methods:** To that end, we compared cannabis-dependent ($N = 44$) vs. nondependent ($N = 30$) users during a Stop Signal Task. First, we compared differences in neural response during response inhibition via general linear model analysis within a priori regions of interest. Second, we examined functional connectivity via psychophysiological interaction (PPI) analysis between the right frontal control network (seed region) and inhibitory control networks. **Results:** There was no significant difference in network activation between cannabis-dependent and nondependent users in any of the inhibitory control networks. However, preliminary findings using the PPI

analysis showed that during successful response inhibition, cannabis-dependent users had greater connectivity between right frontal control network and substantia nigra/subthalamic nucleus (STN) network compared to nondependent users (small volume correction, FWE-corrected $p < 0.05$). Further, multiple regression analyses on the PPI maps showed modulatory effects of age of onset and quantity of cannabis use in the nondependent users. **Conclusions:** Taken together, these findings suggest that functional connectivity between frontal control and substantia nigra/STN networks during response inhibition is sensitive to the effects of CUD severity unlike behavioral task performance and neural activation in inhibitory control networks. Further, modulators of this connectivity, such as onset and quantity of cannabis use, show attenuated effects with progression of CUD."

Fischer, B., Jones, W., Shuper, P., & Rehm, J. (2012). 12-month follow-up of an exploratory 'brief intervention' for high-frequency cannabis users among Canadian university students. *Substance Abuse Treatment, Prevention, and Policy*, *7*(1), 15.

Abstract: "...The present study examined 12-month follow-up outcomes for brief interventions (BIs) in a cohort of young Canadian high-frequency cannabis users where select short-term effects (3 months) had previously been assessed and demonstrated. ...N=72 (54 %) of the original sample were retained for follow-up analyses at 12-months where reductions in 'deep inhalation/breathholding' (Q = 13.1; p < .05) and 'driving after cannabis use' (Q = 9.3; p < .05) were observed in the experimental groups. Reductions for these indicators had been shown at 3-months in the experimental groups; these reductions were maintained over the year. Other indicators assessed remained overall stable in both experimental and control groups."

Fischer, B., Dawe, M., Mcguire, F., Shuper, P. A., Jones, W., Rudzinski, K., & Rehm, J. (2012). Characteristics and predictors of health problems from use among high-frequency cannabis users in a Canadian university student population. *Drugs: education, prevention and policy*, *19*(1), 49-58.

Abstract: "**Aims:** Assess key cannabis use, risk and outcome characteristics among high-frequency cannabis users within a university student sample in Toronto, Canada. ...**Findings:** The majority of respondents used cannabis >5 years, almost daily and >1 times/day, socially and medically on occasion. In past 30 days, 79% used cannabis by deep inhalation, 38% drove a car after use, 45% had difficulty controlling or limiting use and 52% experienced negative mental/physical health effects, with few respondents reporting any past treatment. The MLRA identified 'difficulty controlling or limiting use' (OR = 3.40, 95% CI = 1.58–7.30), 'non-white ethnicity' (OR = 2.78, 95% CI = 1.13–6.83), and 'living with others' (OR = 2.37, 95% CI = 1.02–5.55) as independent predictors ($p < 0.01$) of negative health problems."

Ford, D. E., Vu, H. T., & Anthony, J. C. (2002). Marijuana use and cessation of tobacco smoking in adults from a community sample. *Drug and alcohol dependence*, *67*(3), 243-248.

Abstract: "This analysis was based on 431 adults less than 45 years of age who reported recent tobacco smoking in the 1981 baseline interview in the household-based Baltimore Epidemiologic Catchment Area study and were re-interviewed 13 years later. At baseline, 41% of the tobacco smokers reported ever use of marijuana, 27% reported use of marijuana in the previous 30 days, and 9% reported daily use of marijuana for 2 weeks or more in the last 30 days. Marijuana users in the past 30 days at baseline were more likely than nonusers to still be using tobacco at follow-up after adjusting for race, educational level and marital status (OR=1.94, 95% CI=1.03, 3.63). Daily use of marijuana at baseline was even more strongly related to continued tobacco smoking 13 years later. Difficulty in tobacco cessation might be considered one of the most important adverse effects of marijuana use."

Ford, J. A. (2007). Substance use among college athletes: A comparison based on sport/team affiliation. *Journal of American College Health, 55*(6), 367-373.

Abstract: "**Objective:** ...To augment the literature, the author sought to determine which sports/teams are at the greatest risk for substance use. **Participants:** The author used data from the 1999 Harvard School of Public Health College Alcohol Study, a national survey of college and university students in the United States. ...**Results:** Findings indicated that male hockey and female soccer athletes were the most likely to report substance use and that male basketball and cross-country/track athletes reported lower levels of substance use. "

Ford, K. A., Wammes, M., Neufeld, R. W., Mitchell, D., Théberge, J., Williamson, P., & Osuch, E. A. (2014). Unique functional abnormalities in youth with combined marijuana use and depression: an fMRI study. *Frontiers in psychiatry*, *5*.

Abstract: "Here, we utilized passive music listening and fMRI to examine functional brain activation to a rewarding stimulus in 75 participants [healthy controls (HC), patients with major depressive disorder (MDD), frequent MJ users, and the combination of MDD and MJ (MDD + MJ)]. For each participant, a preferred and neutral piece of instrumental music was determined (utilizing ratings on a standardized scale), and each completed two 6-min fMRI scans of a passive music listening task. Data underwent pre-processing and 61

participants were carried forward for analysis (17 HC, 15 MDD, 15 MJ, 14 MDD + MJ). ...Post hoc comparisons showed that the preferred music had significantly greater activation in the MDD + MJ group in areas including the right middle and inferior frontal gyri extending into the claustrum and putamen and the anterior cingulate. No significant differences were identified in MDD, MJ, or HC groups. Multiple regression analysis showed that activation in medial frontal cortex was positively correlated with amount of MJ use, and activation in areas including the insula was negatively correlated with BDI score. Results showed modulation in brain activation during passive music listening specific to MDD, frequent MJ users. This supports the suggestion that frequent MJ use, when combined with MDD, is associated with changes in neurocircuitry involved in reward processing in ways that are absent with either frequent MJ use or MDD alone."

Gearson, M., Allard, J. L., and Towvim, L. G. (2010). Impact of Smoke-Free Residence Hall Policies: the Views of Administrators at 3 State Universities. *Journal of American College Health, 54*:3, 157-165.

✪ *Abstract:* "To understand the impact of smoke-free residence hall policies, we conducted key informant interviews and gathered archival data at 3 large state universities. The implementation of smoke-free residence hall policies imposed little economic burden. We noted positive impacts in several key areas, including decreased damage to residence hall buildings, increased student retention, and improved enforcement of marijuana policies. Increased costs, such as the purchase of outdoor cigarette receptacles, were outweighed by the benefits."

Gold, G. J., & Nguyen, A. T. (2009). Comparing entering freshmen's perceptions of campus marijuana and alcohol use to reported use. *Journal of Drug Education*, *39*(2), 133-148.

!! ®Ⓟ *Abstract:* "Use of marijuana and alcohol among current college students (**N** = 1101) was compared to the perceptions and use of entering freshmen (**N** = 481) surveyed before the start of classes. Entering freshmen significantly misperceived campus norms for marijuana use, over-estimating that almost every student used in the last 30 days, **p** < .001. Perceptions of alcohol use were relatively accurate. These discrepancies in perception could account for why 40.5% of entering students perceived the campus atmosphere to be promoting marijuana use, whereas only 16.2% perceived the campus atmosphere to be promoting alcohol use."

Grossbard, J., Hummer, J., LaBrie, J., Pederson, E., & Neighbors, C. (2009). Is substance use a team sport? Attraction to team, perceived norms, and alcohol and marijuana use among male and female intercollegiate athletes. *Journal of Applied Sport Psychology, 21*(3), 247- 261.

!! ®Ⓟ *Abstract:* "This research examined the role of attraction to one's team in predicting alcohol and marijuana use among intercollegiate athletes. ...We investigated the influence of attraction to one's team above and beyond the influence of gender and perceived norms, and attraction to team as a moderator of these relationships. Attraction to one's team accounted for significant variance in marijuana use, and alcohol-related consequences after controlling for alcohol consumption. Regression analyses revealed significant interactions between gender, attraction to team, and norms in predicting alcohol and marijuana use. Stronger attraction to one's team may increase alcohol use but decrease marijuana use among male athletes, suggesting the importance of attraction to team when developing interventions for athletes."

Grossbard, J. R., Mastroleo, N. R., Kilmer, J. R., Lee, C. M., Turrisi, R., Larimer, M. E., & Ray, A. (2010). Substance use patterns among first-year college students: Secondary effects of a combined alcohol intervention. *Journal of Substance Abuse Treatment*, *39*(4), 384-390.

🛠 !! ✪ *Abstract:* "This study explored secondary effects of a multisite randomized alcohol prevention trial on tobacco, marijuana, and other illicit drug use among a sample of incoming college students who participated in high school athletics. Students (**n** = 1,275) completed a series of Web-administered measures at baseline during the summer before starting college and 10 months later. Students were randomized to one of four conditions: a parent-delivered intervention, a brief motivation enhancement intervention (Brief Alcohol Screening and Intervention for College Students [BASICS]), a condition combining the parent intervention and BASICS, and assessment-only control. A series of analyses of variance evaluating drug use outcomes at the 10-month follow-up assessment revealed significant reductions in marijuana use among students who received the combined intervention compared to the BASICS-only and control groups. No other significant differences between treatment conditions were found for tobacco or other illicit drug use."

Grossman, S. J., & Smiley, E. B. (1999). APPLE: Description and evaluation of a substance abuse education and prevention program for collegiate athletes. *The Journal of Primary Prevention, 20*(1), 51-59.

🛠 !! ✪ Abstract: "...The Athletic Prevention Programming and Leadership Education (APPLE) model is a substance abuse prevention program designed specifically for use in collegiate athletic departments. APPLE offers departments an environmental approach to

education and programming regarding alcohol and other drugs. In this article we offer a brief overview of the APPLE model and report on progress in substance abuse education and programming among athletic departments who have participated in the APPLE program."

Gulliver, A., Farrer, L., Chan, J. K., Tait, R. J., Bennett, K., Calear, A. L., & Griffiths, K. M. (2015). Technology-based interventions for tobacco and other drug use in university and college students: a systematic review and meta-analysis. *Addiction Science & Clinical Practice, 10*(1), 5.

Abstract: "**Background:** ...This paper comprises a systematic review and meta-analysis of published randomized trials of technology-based interventions evaluated in a tertiary (university/college) setting for tobacco and other drug use (excluding alcohol). It extends previous reviews by using a broad definition of technology. **Methods:** PubMed, PsycInfo, and the Cochrane databases were searched using keywords, phrases, and MeSH terms. Retrieved abstracts (n = 627) were double screened and coded. Included studies met the following criteria: (1) the study was a randomized trial or a randomized controlled trial (RCT); (2) the sample was composed of students attending a tertiary (e.g., university, college) institution; (3) the intervention was either delivered by or accessed using a technological device or process (e.g., computer/internet, telephone, mobile short message services [SMS]); (4) the age range or mean of the sample was between 18 and 25 years; and (5) the intervention was designed to alter a drug use outcome relating to tobacco or other drugs (excluding alcohol). ...**Conclusions:** Although technological interventions have the potential to reduce drug use in tertiary students, very few trials have been conducted, particularly for substances other than tobacco. However, the improvement shown in abstinence from tobacco use has the potential to impact substantially on morbidity and mortality."

Hall, W., & Degenhardt, L. (2009). Adverse health effects of non-medical cannabis use. *The Lancet, 374*(9698), 1383-1391.

☑ *Abstract:* "For over two decades, cannabis, commonly known as marijuana, has been the most widely used illicit drug by young people in high-income countries, and has recently become popular on a global scale. Epidemiological research during the past 10 years suggests that regular use of cannabis during adolescence and into adulthood can have adverse effects. Epidemiological, clinical, and laboratory studies have established an association between cannabis use and adverse outcomes. We focus on adverse health effects of greatest potential public health interest—that is, those that are most likely to occur and to affect a large number of cannabis users. The most probable adverse effects include a dependence syndrome, increased risk of motor vehicle crashes, impaired respiratory function, cardiovascular disease, and adverse effects of regular use on adolescent psychosocial development and mental health."

Haney, M. (2005). The marijuana withdrawal syndrome: diagnosis and treatment. *Current Psychiatry Reports, 7*(5), 360-366.

☑ *Abstract:* " A subset of marijuana smokers develop a cannabis use disorder and seek treatment for their marijuana use on their own initiative. A less well-known consequence of daily, repeated marijuana use is a withdrawal syndrome, characterised by a time-dependent constellation of symptoms: irritability, anxiety, marijuana craving, decreased quality and quantity of sleep, and decreased food intake. Treatment studies show that the rates of continuous abstinence are low (comparable to relapse rates for other abused drugs), and more treatment options are needed. The objective of this review is to update clinicians on the current state of marijuana research and to describe features of marijuana withdrawal to facilitate the diagnosis and treatment of cannabis use disorders."

Harder, V. S., Morral, A. R., & Arkes, J. (2006). Marijuana use and depression among adults: Testing for causal associations. *Addiction, 101*(10), 1463-1472.

!! ®Ⓟ *Abstract:* "**Aim:** To determine whether marijuana use predicts later development of depression after accounting for differences between users and non-users of marijuana. **Design:** An ongoing longitudinal survey of 12 686 men and women beginning in 1979. **Setting:** The National Longitudinal Survey of Youth of 1979, a nationally representative sample from the United States. **Participants:** A total of 8759 adults (age range 29–37 years) interviewed in 1994 had complete data on past-year marijuana use and current depression. **Measurements:** Self-reported past-year marijuana use was tested as an independent predictor of later adult depression using the Center for Epidemiologic Studies—Depression questionnaire. Individual's propensity to use marijuana was calculated using over 50 baseline covariates. **Findings:** Before adjusting for group differences, the odds of current depression among past-year marijuana users is 1.4 times higher (95% CI: 1.1, 1.9) than the odds of depression among the non-using comparison group. After adjustment, the odds of current depression among past-year marijuana users is only 1.1 times higher than the comparison group (95% CI: 0.8, 1.7). Similarly, adjustment eliminates significant associations between marijuana use and depression in four additional analyses: heavy marijuana use as the risk factor, stratifying by either gender or age, and using a 4-year lag-time between marijuana use and depression. **Conclusions:** After adjusting for differences in baseline risk factors of marijuana use and depression, past-year marijuana use does not significantly predict later development of depression."

Harris, K. M., & Edlund, M. J. (2005). Self-medication of mental health problems: New evidence from a national survey. *Health Services Research, 40*(1), 117-134.

!! ®Ⓟ *Abstract:* "Data were collected from samples of youth (ages 11–18; *N* = 38,268) and young 10 adults (ages 18–24; *N* = 602) across 30 Tennessee counties using surveys and telephone interviews conducted in 2006–2008. Data were analyzed using hierarchical nonlinear modeling to determine: (1) which risk and protective factors predicted alcohol and marijuana use, and (2) whether predictors differed as a function of developmental period. Findings provide preliminary evidence that prevention efforts need to take into consideration the changing environment and related influences as youth age, especially as they move from a more protected community environment to one where they live somewhat independently. Implications and limitations are discussed."

Harris Abadi, M., Shamblen, S. R., Thompson, K., Collins, D. A., & Johnson, K. (2011). Influence of risk and protective factors on substance use outcomes across developmental periods: A comparison of youth and young adults. *Substance Use & Misuse, 46*(13), 1604-1612.

®Ⓟ *Abstract:* Data were collected from samples of youth (ages 11–18; N = 38,268) and young 10 adults (ages 18–24; N = 602) across 30 Tennessee counties using surveys and telephone interviews conducted in 2006–2008. Data were analyzed using hierarchical nonlinear modeling to determine: (1) which risk and protective factors predicted alcohol and marijuana use, and (2) whether predictors differed as a function of developmental period. Findings provide preliminary evidence that prevention efforts need to take into consideration the changing environment and related influences as youth age, especially as they move from a more protected community environment to one where they live somewhat independently. Implications and limitations are discussed.

Hartman, R. L., & Huestis, M. A. (2013). Cannabis effects on driving skills. *Clinical Chemistry, 59*(3), 478-492.

☑ *Abstract:* "...We review and evaluate the current literature on cannabis' effects on driving, highlighting the epidemiologic and experimental data. Epidemiologic data show that the risk of involvement in a motor vehicle accident (MVA) increases approximately 2-fold after cannabis smoking. The adjusted risk of driver culpability also increases substantially, particularly with increased blood THC concentrations. Studies that have used urine as the biological matrix have not shown an association between cannabis and crash risk. Experimental data show that drivers attempt to compensate by driving more slowly after smoking cannabis, but control deteriorates with increasing task complexity. Cannabis smoking increases lane weaving and impaired cognitive function. Critical-tracking tests, reaction times, divided-attention tasks, and lane-position variability all show cannabis-induced impairment. Despite purported tolerance in frequent smokers, complex tasks still show impairment. Combining cannabis with alcohol enhances impairment, especially lane weaving. "

Helmkamp, J. C., Hungerford, D. W., Williams, J. M., Manley, W. G., Furbee, P. M., Horn, K. A., & Pollock, D. A. (2003). Screening and brief intervention for alcohol problems among college students treated in a university hospital emergency department. *Journal of American College Health, 52*(1), 7-16.

🛠 !! ✪ *Abstract:* "The authors evaluated a protocol to screen and provide brief interventions for alcohol problems to college students treated at a university hospital emergency department (ED). Of 2,372 drinkers they approached, 87% gave informed consent. Of those, 54% screened positive for alcohol problems (Alcohol Use Disorders Identification Test score < 6). One half to two thirds of the students who screened positive drank 2 to 3 times a week, drank 7 or more drinks per typical drinking day, or had experienced alcohol dependence symptoms within the past year. Ninety-six percent of screen-positive students accepted counseling during their ED visit. Three quarters of those questioned at 3-month follow-up reported that counseling had been helpful and that they had decreased their alcohol consumption. The prevalence of alcohol problems, high rates of informed consent and acceptance of counseling, and improved outcomes suggest that the ED is an appropriate venue for engaging students at high risk for alcohol problems."

Homel, J., Thompson, K., & Leadbeater, B. (2014). Trajectories of Marijuana Use in Youth Ages 15-25: Implications for Postsecondary Education Experiences. *Journal of Studies on Alcohol and Drugs, 75*(4), 674.

!! ®Ⓟ *Abstract:* "**Objective:** This study examined associations between longitudinal trajectories of marijuana use from adolescence to young adulthood and postsecondary education (PSE) experiences. Outcomes examined included the type of PSE undertaken, the timing of enrollment, and the likelihood of dropping out. **Method:** Participants (*N* = 632; 332 females) were from the Victoria Healthy Youth Survey, a five-wave multicohort study of young people interviewed biennially between 2003 and 2011. Latent class growth analysis was used to identify distinct trajectories of the frequency of marijuana use from ages 15 to 25. Logistic regression analyses evaluated class membership as a predictor of the three PSE outcomes, with sex, maternal education, family structure, high school grades, and conduct problems controlled for. **Results:** Three trajectory groups of marijuana use were identified: abstainers (31%), occasional users (44%), and frequent users (25%). Compared with abstainers, frequent users had the lowest high school grades and the most conduct problems and were least likely to enroll in

PSE, especially in a university. Occasional users did not differ from abstainers on high school grades or conduct problems and were no less likely than abstainers to enroll in PSE. However, they delayed enrollment longer and were more likely to drop out of PSE."

Kaynak, Ö., Meyers, K., Caldeira, K. M., Vincent, K. B., Winters, K. C., & Arria, A. M. (2013). Relationships among parental monitoring and sensation seeking on the development of substance use disorder among college students. *Addictive Behaviors*, *38*(1), 1457–1463.

!! ®Ⓟ *Abstract:* "Substance use disorder is a serious health problem that tends to manifest in late adolescence. Attempting to influence targetable risk and protective factors holds promise for prevention and treatment. Survey data from 1253 college students (48.5% male, 26.9% non-White) were used to investigate the independent and combined effects of two prominent factors, sensation seeking and parental monitoring, on the probability of alcohol and/or cannabis dependence during the first year of college. In multivariate analyses that controlled for high school use, gender, race, mother's education, and importance of religion, retrospective reports by the student of parental behavior during the last year of high school indicated that higher levels of parental monitoring had a direct effect on reducing risk for alcohol dependence during the first year of college, but not on cannabis dependence. High levels of sensation seeking were associated with increased risk for both alcohol and cannabis dependence."

Kilmer, J. R., Hunt, S. B., Lee, C. M, and Neighbors, C. (2007). Marijuana use, risk perception, and consequences: Is perceived risk congruent with reality? *Addictive Behaviors, 32:*3026– 3033.

®Ⓟ *Abstract:* "The present study evaluates differences in risk perception related to marijuana use as a function of past use and, among those who report marijuana use, as a function of frequency of use and having experienced a consequence in the past. Participants were 725 incoming first year college students in a longitudinal study examining the efficacy of a marijuana prevention program. Analyses of cross-sectional data indicated that risk perception was greater among non-users of marijuana than for those who reported marijuana use (and, in turn, who were more likely to have actually experienced a drug-related consequence). Among marijuana users, risk perception was not influenced by the frequency of marijuana use nor was it influenced by the actual experience of a drug-related consequence. The findings suggest that for abstainers, perceived risk and the potential consequences of marijuana use may serve a protective role against the initiation of marijuana use. For those who use marijuana, intervention efforts utilizing motivation enhancement approaches could explore the discrepancy between perceived risks and actual experienced consequences."

Kouri, E., Pope, H. G., Yurgelun-Todd, D., & Gruber, S. (1995). Attributes of heavy vs. occasional marijuana smokers in a college population. *Biological Psychiatry*, *38*(7), 475–481.

!! ®Ⓟ *Abstract:* "We sought to assess whether college students who smoked marijuana heavily were distinguishable from students who had used the drug only occasionally. We compared 45 long-term heavy marijuana smokers (individuals who had smoked daily for at least 2 years) with 44 "occasional" smokers (individuals who had never smoked more than 10 times in a month at any time in their lives), drawn from the student populations at two Boston-area colleges. Measures included a questionnaire covering a range of demographic, drug use, and subjective items; the Rand Mental Health Inventory; and both the Axis I and Axis II sections of the Structured Clinical Interview for DSM-III-R. Heavy smokers reported higher rates of use of other substances, especially hallucinogens and cocaine, and they described greater subjective impairment of memory and motivation than occasional smokers; however, on a wide range of demographic, family background, and mental health measures, the heavy smokers proved almost indistinguishable from occasional smokers. Even the heaviest college marijuana smokers exhibit few demographic or psychiatric features that distinguish them from students who smoke only occasionally."

Kristjansson, S. D., Agrawal, A., Lynskey, M. T., & Chassin, L. A. (2012). Marijuana expectancies and relationships with adolescent and adult marijuana use. *Drug and Alcohol Dependence*, *126*(1), 102–110.

!! ®Ⓟ *Abstract:* "**Background:** ...Much expectancy research has been conducted in the context of alcohol; however, less is known about the structure of expectancies for marijuana and their associations with marijuana use outcomes. **Methods:** The data are taken from waves 3 and 4 of a longitudinal high-risk study of parents and adolescent offspring. Of those families who were retained at wave 3, 225 were high-risk and 205 were matched controls (low-risk). In the present study, we examine the factorial structure of marijuana expectancies (wave 3) in the offspring (using an instrument adapted from the alcohol literature) and test whether expectancies mediate the associations of familial risk for substance use, lifetime marijuana use in adolescence (wave 3) and current use in young adulthood (wave 4; reported approximately 5 years later). **Results:** We quantified four marijuana expectancy factors similar to those identified in previous studies when the offspring were adolescents (*Mn* age = 15.2) and results of our mediation models suggest that negative marijuana expectancies (but not positive expectancies) together with lifetime adolescent marijuana use completely mediated the association between familial risk and current use of marijuana during young adulthood (*Mn* age = 20.2). **Conclusion:** Familial risk for current marijuana use in young adulthood appears to

be transmitted through two orthogonal, prospective pathways. One pathway involves marijuana use during adolescence, and the second pathway involves reduced expectancies that using marijuana will result in cognitive and behavioral impairments."

Lai, S., Lai, H., Page, J. B., & McCoy, C. B. (2000). The association between cigarette smoking and drug abuse in the United States. *Journal of Addictive Diseases*, *19*(4), 11-24.

!! ®Ⓟ *Abstract:* "Cigarette smoking has been identified as an independent risk factor for many human diseases. However, the association between cigarette smoking and illegal drug use has not been thoroughly investigated. We have analyzed the 1994 National Household Survey on Drug Abuse to clarify whether cigarette smoking has any effect on the initiation of illegal drug use. Data from 17,809 respondents completing the 1994 "new" (1994-B) questionnaire were analyzed. Logistic regression analyses were performed with the use of statistical package SU-DAAN, taking into consideration the multistage sampling design. The results show that those who had smoked cigarettes were far more likely to use cocaine (OR = 7.5; 95% CI: 5.7-9.9), heroin (OR = 16.0; 95% CI: 6.8-37.9), crack (OR = 13.9; 95% CI: 7.9-24.5) and marijuana (OR = 7.3; 95% CI:6.2-8.7). The associations are consistent across age-strata and remain after adjusting for race and gender. This study suggests that cigarette smoking may be a gateway drug to illegal drug use."

LaBrie, J. W., Grossbard, J. R., & Hummer, J. F. (2009). Normative misperceptions and marijuana use among male and female college athletes. *Journal of Applied Sport Psychology*, *21*(S1), S77-S85.

!! ®Ⓟ *Abstract:* "...This research assessed the frequency of marijuana use and perceptions of gender-specific marijuana use among intercollegiate athletes from two National Collegiate Athletic Association (NCAA) Division 1 universities. Normative data were gathered in a live setting. Male athletes reported significantly greater marijuana use than female athletes and the overall sample reported higher prevalence of use than national averages for college athletes and non-athletes. Gender-specific perceptions among male and female athletes exceeded actual self-reported use, and perceived marijuana use among male athletes was strongly associated with personal use. The findings demonstrate the salience of group-specific marijuana norms and present implications for normative feedback interventions among college athletes."

Langford, L., & DeJong, W. (2008). Strategic Planning for Prevention Professionals on Campus. A Prevention 101 Series Publication. *Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention*.

🛠 ✪ *Abstract:* "...To support campus leaders addressing AODV [alcohol and other drug abuse] problems among their students, this publication describes a strategic planning process for designing, implementing, and refining AODV programs and policies. The planning process described herein is grounded in a prevention approach called "environmental management", which focuses on addressing various factors in the environment that contribute to AODV-related problems. This is not a detailed manual, but a basic introduction to the elements and purposes of sound intervention planning, consistent with the U.S. Department of Education's principles of effectiveness for prevention programs."

Larimer, M. E., Kilmer, J. R., & Lee, C. M. (2005). College student drug prevention: A review of individually-oriented prevention strategies. *Journal of Drug Issues*, *35*(2), 431-456.

🛠 ✪ *Abstract:* "The current paper highlights the college years as a risk period for development, continuation, and escalation of illicit substance use and substance use disorders and reviews the literature related to the prevention and treatment of these disorders in college populations. Despite widespread implementation of college drug prevention programs, a review of the literature reveals few controlled trials targeting this population. However, alcohol prevention has been extensively studied, and many efficacious interventions for college drinking share theoretical and methodological underpinnings with interventions shown to be efficacious in drug prevention and treatment with other populations (i.e., school-based prevention, adolescent and adult drug treatment). These interventions could be adapted to target drug prevention on college campuses. Barriers to implementation and evaluation of these interventions on campus are discussed, and suggestions are made for future research and programmatic directions. "

Lee, C. M., Neighbors, C., & Woods, B. A. (2007). Marijuana motives: Young adults' reasons for using marijuana. *Addictive Behaviors*, *32*(7), 1384-1394.

☑ ®Ⓟ *Abstract:* "Previous research has evaluated marijuana motives among adolescents and emerging adults using a predetermined set of motives, largely adapted from the alcohol literature. This research was designed to identify marijuana motives from the perspective of the user. Recent high school graduates who reported using marijuana (N = 634) provided self-generated reasons for using. The most frequently reported reasons included enjoyment/fun, conformity, experimentation, social enhancement, boredom, and relaxation.

Regression analyses revealed that experimentation was consistently associated with less use and fewer problems whereas enjoyment, habit, activity enhancement, and altered perception or perspectives were associated with heavier use and more problems."

Lee, C. M., Neighbors, C., Kilmer, J. R., & Larimer, M. E. (2010). A brief, web-based personalized feedback selective intervention for college student marijuana use: a randomized clinical trial. *Psychology of Addictive Behaviors*, *24*(2), 265.

Abstract: "The current study was designed to evaluate a brief, web-based personalized feedback intervention for at-risk marijuana users transitioning to college. All entering first-year students were invited to complete a brief questionnaire. Participants meeting criteria completed a baseline assessment (N = 341) and were randomly assigned to web-based personalized feedback or assessment-only control conditions. Participants completed 3-month (95.0%) and 6-month (94.4%) follow-up assessments. Results indicated that although there was no overall intervention effect, moderator analyses found promising effects for those with a family history of drug problems and, to a smaller extent, students who were higher in contemplation of changing marijuana use at baseline. Implications of these findings for selective intervention of college marijuana use and web-based interventions in general are discussed."

Lee, C. M., Kilmer, J. R., Neighbors, C., Atkins, D. C., Zheng, C., Walker, D. D., & Larimer, M. E. (2013). Indicated prevention for college student marijuana use: a randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *81*(4), 702.

Abstract: "**Objective:**...The present study evaluated the efficacy of an in-person brief motivational enhancement intervention for reducing marijuana use and related consequences among frequently using college students. **Method:** Participants included 212 college students from 2 campuses who reported frequent marijuana use (i.e., using marijuana at least 5 times in the past month). Participants completed Web-based screening and baseline assessments and upon completion of the baseline survey were randomized to either an in-person brief intervention or an assessment control group. Follow-up assessments were completed approximately 3 and 6 months post-baseline. Marijuana use was measured by number of days used in the past 30 days, typical number of joints used in a typical week in the last 60 days, and marijuana-related consequences. **Results:** Results indicated significant intervention effects on number of joints smoked in a typical week and a trend toward fewer marijuana-related consequences compared with the control group at 3-month follow-up."

Lenné, M. G., Dietze, P. M., Triggs, T. J., Walmsley, S., Murphy, B., & Redman, J. R. (2010). The effects of cannabis and alcohol on simulated arterial driving: influences of driving experience and task demand. *Accident Analysis & Prevention*, *42*(3), 859-866.

Abstract: "This study compared the effects of three doses of cannabis and alcohol (placebo, low and high doses), both alone and in combination, on the driving performance of young, novice drivers and more experienced drivers. Alcohol was administered as ethanol (95%) mixed with orange juice in doses of approximately 0, 0.4 and 0.6 g/kg. Cannabis was administered by inhalation of smoke from pre-rolled cannabis cigarettes (supplied by the National Institute of Drug Abuse, USA). Active cigarettes contained 19 mg delta-9-THC. Using a counterbalanced design, the simulated driving performance of 25 experienced and 22 inexperienced drivers was tested under the nine different drug conditions in an arterial driving environment during which workload was varied through the drive characteristics as well as through the inclusion of a secondary task. High levels of cannabis generally induced greater impairment than lower levels, while alcohol at the doses used had few effects and did not produce synergistic effects when combined with cannabis. Both cannabis and alcohol were associated with increases in speed and lateral position variability, high dose cannabis was associated with decreased mean speed, increased mean and variability in headways, and longer reaction time, while in contrast alcohol was associated with a slight increase in mean speed. Given the limitations of the study, it is of great interest to further explore the qualitative impairments in driving performance associated with cannabis and alcohol separately and how these impairments may manifest in terms of crash characteristics."

Lewis, T. F. (2007). Perceptions of risk and sex-specific social norms in explaining alcohol consumption among college students: Implications for campus interventions. *Journal of College Student Development*, *48*(3), 297-310.

Abstract: "The aim of this study was to expand the assessment of two explanatory models of drinking behavior—perceptions of risk and social norms—and determine their relationship to dimensions of alcohol involvement in a multivariate evaluation. The Alcohol and Drug Survey was administered to a sample (N = 235) of college students from a university in the Southeast. Results from the canonical correlation analysis revealed that perceived normative beliefs of closest friends of the same sex best explained dimensions of alcohol involvement. Perceptions of risk were associated with drinking involvement, although the direction of relationships was unexpectedly positive. Implications for campus interventions are discussed."

Leyden, Q. (2013). Alcohol, Tobacco, and Marijuana Expectancies in College Students With and Without a Substance-Dependent First-Degree Relative (Doctoral dissertation).

!! ®Ⓟ *Abstract:* "**Objective:** The purpose of this study was to examine the positive and negative expectancies regarding the effects of alcohol, cigarettes, and marijuana, as well as substance use, in college students who do and do not report a family history of substance dependence. **Participants:** 270 undergraduates (59.3% female and 39.6% male) between the ages of 18-25 enrolled in General Psychology at a rural mid-Atlantic university. **Methods:** Participants completed paper-and-pencil questionnaires that measured both positive and negative expectancies about alcohol, tobacco, and marijuana. Participants also completed a questionnaire about family history and their own substance use. This measure contained open-ended questions designed for participants to provide more in-depth opinions about their family members' impact on their substance use decision-making. **Results:** Students who reported having a parent who smokes cigarettes had significantly more positive expectancies regarding the effects of cigarettes than those who did not. These students also endorsed more frequent cigarette smoking than students whose parents did not smoke. Students who reported having a biological first-degree relative who is a habitual marijuana smoker had more positive expectancies about the effects of marijuana than those who did not. These students had higher rates of lifetime marijuana use than their counterparts without a similar relative. Students who reported having at least one substance-dependent, biological first-degree relative had more negative same-day alcohol expectancies than those who did not. Hypothesized differences in positive alcohol expectancies were not found between students who reported having a substance-dependent biological first-degree relative and those who did not."

Lisha, N. E., & Sussman, S. (2010). Relationship of high school and college sports participation with alcohol, tobacco, and illicit drug use: A review. *Addictive Behaviors, 35*(5), 399-407.

!! ®Ⓟ *Abstract:* "This study provides an exhaustive review of 34 peer-reviewed quantitative data-based studies completed on high school and college sports involvement and drug use. The studies reviewed suggest that participation in sport is related to higher levels of alcohol consumption, but lower levels of both cigarette smoking and illegal drug use."

Lundahl, B., & Burke, B. L. (2009). The effectiveness and applicability of motivational interviewing: A practice-friendly review of four meta-analyses. *Journal of Clinical Psychology, 65*(11), 1232-1245.

Abstract: "This article reviews the research support for Motivational interviewing (MI) so that practitioners can make informed decisions about the value and applicability of clinical work. We highlight the evidence from the three published meta-analyses of MI and a recent meta-analysis that we completed. MI is significantly (10–20%) more effective than no treatment and generally equal to other viable treatments for a wide variety of problems ranging from substance use (alcohol, marijuana, tobacco, and other drugs) to reducing risky behaviors and increasing client engagement in treatment. Although most client-related variables are unrelated to outcomes (e.g., age, gender, severity), some decisions about treatment format (e.g., individual vs. group) are important. For example, relying solely on group-delivered MI appears to be less effective than one-on-one MI, whereas delivering MI with problem feedback is likely to generate better outcomes for some problems than MI alone."

Lynskey, M., & Hall, W. (2000). The effects of adolescent cannabis use on educational attainment: a review. *Addiction*, *95*(11), 1621-1630.

☑ *Abstract:* "This paper reviews research examining the link between cannabis use and educational attainment among youth. Cross-sectional studies have revealed significant associations between cannabis use and a range of measures of educational performance including lower grade point average, less satisfaction with school, negative attitudes to school, increased rates of school absenteeism and poor school performance. However, results of cross-sectional studies cannot be used to determine whether cannabis use causes poor educational performance, poor educational performance is a cause of cannabis use or whether both outcomes are a reflection of common risk factors. Nonetheless, a number of prospective longitudinal studies have indicated that early cannabis use may significantly increase risks of subsequent poor school performance and, in particular, early school leaving. This association has remained after control for a wide range of prospectively assessed covariates. Possible mechanisms underlying an association between early cannabis use and educational attainment include the possibility that cannabis use induces an 'amotivational syndrome' or that cannabis use causes cognitive impairment. However, there appears to be relatively little empirical support for these hypotheses. It is proposed that the link between early cannabis use and educational attainment arises because of the social context within which cannabis is used. In particular, early cannabis use appears to be associated with the adoption of an anti-conventional lifestyle characterized by affiliations with delinquent and substance using peers, and the precocious adoption of adult roles including early school leaving, leaving the parental home and early parenthood."

Macleod, J., Oakes, R., Copello, A., Crome, I., Egger, M., Hickman, M., … & Smith, G. D. (2004). Psychological and social sequelae of cannabis and other illicit drug use by young people: a systematic review of longitudinal, general population studies. *The Lancet*, *363*(9421), 1579–1588.

☑ ®Ⓟ *Abstract:* "**Background:** Use of illicit drugs, particularly cannabis, by young people is widespread and is associated with several types of psychological and social harm. These relations might not be causal. Causal relations would suggest that recreational drug use is a substantial public health problem. Non-causal relations would suggest that harm-reduction policy based on prevention of drug use is unlikely to produce improvements in public health. Cross-sectional evidence cannot clarify questions of causality; longitudinal or interventional evidence is needed. Past reviews have generally been non-systematic, have often included cross-sectional data, and have underappreciated the extent of methodological problems associated with interpretation. **Methods:** We did a systematic review of general population longitudinal studies reporting associations between illicit drug use by young people and psychosocial harm. **Findings:** We identified 48 relevant studies, of which 16 were of higher quality and provided the most robust evidence. Fairly consistent associations were noted between cannabis use and both lower educational attainment and increased reported use of other illicit drugs. Less consistent associations were noted between cannabis use and both psychological health problems and problematic behaviour. All these associations seemed to be explicable in terms of non-causal mechanisms."

Magill, M., Barnett, N. P., Apodaca, T. R., Rohsenow, D. J., & Monti, P. M. (2009). The role of marijuana use in brief motivational intervention with young adult drinkers treated in an emergency department. *Journal of Studies on Alcohol and Drugs*, *70*(3), 409.

🛠 ✪ ®Ⓟ *Abstract:* "Objective: The aim of this research was to study marijuana use, associated risks, and response to brief motivational intervention among young adult drinkers treated in an emergency department. Method: Study participants (*N* = 215; ages 18–24) were in a randomized controlled trial for alcohol use that compared motivational interviewing with personalized feedback (MI) with personalized feedback only. Past-month marijuana users were compared with nonusers on demographics, readiness, self-efficacy, and behavioral risk variables. Marijuana use was examined as a potential moderator of alcohol outcomes. Whether marijuana use alone or combined marijuana and alcohol use would be reduced as a result of brief intervention for alcohol was examined at 6 and 12 months. Results: Current marijuana users were younger, were more likely to be white, and reported more alcohol use, other illicit drug use, and more alcohol-related consequences than nonmarijuana users. Marijuana use at baseline did not moderate response to brief alcohol treatment. Marijuana use declined from baseline to 6 months for both treatment groups, but only MI participants continued to reduce their use of marijuana from 6- to 12-month follow-up. Reductions in number of days of use of marijuana with alcohol appeared to be primarily a function of decreased alcohol use."

Marcello, R. J., Danish, S. J., & Stolberg, A. L. (1989). An evaluation of strategies developed to prevent substance abuse among student-athletes. *Sport Psychologist*, *3*(3), 196–211.

✪ !! *Abstract:* "Substance abuse by the collegiate athlete has become a major concern. Drug testing programs are viewed as one method of combatting this problem; however, more emphasis should be placed upon developing effective drug prevention programs. The current study addresses this need by (a) designing a multifocused prevention program specifically for student-athletes based on the previous literature, (b) evaluating its overall effectiveness as well as that of its individual components, and (c) identifying factors associated with pre-intervention usage patterns of student-athletes for the purpose of guiding future program development efforts. Although 110 student-athletes indicated a willingness to participate in the study, only 58 completed the assessment packet. These 58 were randomly assigned to intervention and control conditions. Few differences were found between the treatment and control groups. Perhaps the most important finding was that social-environmental factors and pro-usage attitudes were related to previous patterns of alcohol, drug, and tobacco use prior to the student-athlete's arrival at college. Results are discussed in terms of their impact upon future program development and evaluation."

Massachusetts Department of Public Health Bureau of Substance Abuse Services. Provider Guide: Adolescent Screening, Brief Intervention, and Referral to Treatment Using the CRAFFT Screening Tool. Boston, MA. Massachusetts Department of Public Health, 2009.

🛠 ✪ *Summary*: This document outlines a screening, brief intervention, referral and treatment (SBIRT) paradigm for primary care providers of adolescents, using the CAR, RELAX, ALONE, FORGET, FRIENDS, TROUBLE (CRAFFT) screening tool for alcohol and other drugs.

McCabe, S. E., Morales, M., Cranford, J. A., Delva, J., McPherson, M. D., & Boyd, C. J. (2007). Race/ethnicity and gender differences in drug use and abuse among college students. *Journal of Ethnicity in Substance Abuse*, *6*(2), 75–95.

!! ®Ⓟ *Abstract:* "This study examines race/ethnicity and gender differences in drug use and abuse for substances other than alcohol among undergraduate college students. A probability-based sample of 4,580 undergraduate students at a Midwestern research university completed a cross-sectional Web-based questionnaire that included demographic information and several substance use measures. Male students were generally more likely to report drug use and abuse than female students. Hispanic and White students were more likely to report drug use and abuse than Asian and African American students prior to coming to college and during college. The findings of the present study reveal several important racial/ethnic differences in drug use and abuse that need to be considered when developing collegiate drug prevention and intervention efforts."

McCabe, S. E., Hughes, T. L., & Boyd, C. J. (2004). Substance use and misuse: are bisexual women at greater risk? *Journal of Psychoactive Drugs*, *36*(2), 217–225.

!! ®Ⓟ *Abstract: "*The objective of this study was to compare the prevalence of substance use and alcohol-related consequences among bisexual and heterosexual women. A cross-sectional survey was self-administered to a random sample of undergraduate women. The final sample consisted of 49 self-identified bisexual women and 2,042 self-identified heterosexual women. Bivariate and multivariate results indicated that bisexual women were more likely than heterosexual women to report cigarette smoking, illicit drug use and medically prescribed use of antidepressant prescription medication. Although their drinking behaviors were similar, bisexual women were more likely than heterosexual women to experience adverse alcohol-related consequences. These findings suggest that traditional-age undergraduate women who self-identify as bisexual may be at heightened risk for substance use. However, additional research is needed to replicate these findings with larger samples of bisexual women."

McCabe, S. E., Schulenberg, J. E., Johnston, L. D., O'Malley, P. M., Backman, J. G. and Kloska, D. D. (2005). Selection and socialization effects of fraternities and sororities on US college student substance use: a multi-cohort national longitudinal study. *Society for the Study of Addiction, 100:* 512–524.

!! ®Ⓟ *Abstract:* "**Aims:** To examine how membership in fraternities and sororities relates to the prevalence and patterns of substance use in a national sample of full-time US college students. **Design:** Nationally representative probability samples of US high school seniors (modal age 18 years) were followed longitudinally across two follow-up waves during college (modal ages 19/20 and 21/22). **Setting:** Data were collected via self-administered questionnaires from US high school seniors and college students. **Participants:** The longitudinal sample consisted of 10 cohorts (senior years of 1988–97) made up of 5883 full-time undergraduate students, of whom 58% were women and 17% were active members of fraternities or sororities. **Findings:** Active members of fraternities and sororities had higher levels of heavy episodic drinking, annual marijuana use and current cigarette smoking than non-members at all three waves. Although members of fraternities reported higher levels than non-members of annual illicit drug use other than marijuana, no such differences existed between sorority members and non-members. Heavy episodic drinking and annual marijuana use increased significantly with age among members of fraternities or sororities relative to non-members, but there were no such differential changes for current cigarette use or annual illicit drug use other than marijuana."

McCambridge, J., & Strang, J. (2004). The efficacy of single-session motivational interviewing in reducing drug consumption and perceptions of drug-related risk and harm among young people: results from a multi-site cluster randomized trial. *Addiction*, *99*(1), 39–52.

🛠 ✪ *Abstract:* "**Aim:** To test whether a single session of motivational interviewing (discussing alcohol, tobacco and illicit drug use) would lead successfully to reduction in use of these drugs or in perceptions of drug-related risk and harm among young people. **Design:** Cluster randomized trial, allocating 200 young people in the natural groups in which they were recruited to either motivational interviewing (n = 105) or non-intervention education-as-usual control condition (n = 95). **Setting:** Ten further education colleges across inner London. **Participants:** Two hundred young people (age range 16–20 years) currently using illegal drugs, with whom contact was established through peers trained for the project. **Intervention:** The intervention was adapted from the literature on motivational interviewing in the form of a 1-hour single-session face-to-face interview structured by a series of topics. **...Findings:** ...In comparison to the control group, those randomized to motivational interviewing reduced their of use of cigarettes, alcohol and cannabis, mainly through moderation of ongoing drug use rather than cessation. Effect sizes were 0.37 (0.15–0.6), 0.34 (0.09–0.59) and 0.75 (0.45–1.0) for reductions in the use of cigarettes, alcohol and cannabis, respectively. For both alcohol and cannabis, the effect was greater among heavier users of these drugs and among heavier cigarette smokers. The reduced cannabis use effect was also greater among youth usually considered vulnerable or high-risk according to other criteria. Change was also evident in various indicators of risk and harm, but not as widely as the changes in drug consumption."

McGee, R., Williams, S., Poulton, R., & Moffitt, T. (2000). A longitudinal study of cannabis use and mental health from adolescence to early adulthood. *Addiction, 95*(4), 491–503.

!! ®Ⓟ ☑ *Abstract:* "**Aims**. To examine the longitudinal association between cannabis use and mental health. **Design.** Information concerning cannabis use and mental health from 15 to 21 years was available for a large sample of individuals as part of a longitudinal study from childhood to adulthood. **Participants.** Participants were enrolled in the Dunedin Multidisciplinary Health and Development Study, a research programme on the health, development and behaviour of a large group of New Zealanders born between 1 April 1972 and 31 March 1973. **Measurements.** Cannabis use and identification of mental disorder was based upon self-report as part of a general assessment of mental health using a standard diagnostic interview. Daily smoking and alcohol use at age 15 were assessed by self-report. Indices of family socio-economic status, family climate and parent - child interaction were formed using information gathered from parent report and behavioural observations over early childhood. Childhood behaviour problems were assessed by parent and teacher report. Attachment to parents was assessed in adolescence. **Findings.** Cross-sectional associations between cannabis use and mental disorder were significant at all three ages. Both outcome variables shared similar pathways of low socio-economic status and history of behaviour problems in childhood, and low parental attachment in adolescence. Mental disorder at age 15 led to a small but significantly elevated risk of cannabis use at age 18; by contrast, cannabis use at age 18 elevated the risk of mental disorder at age 21. The latter association reflected the extent to which cannabis dependence and other externalizing disorders at age 21 were predicted by earlier level of involvement with cannabis. **Conclusions.** The findings suggest that the primary causal direction leads from mental disorder to cannabis use among adolescents and the reverse in early adulthood. Both alcohol use and cigarette smoking had independent associations with later mental health disorder."

Meier, M. H., Caspi, A., Ambler, A., Harrington, H., Houts, R., Keefe, R. S., … & Moffitt, T. E. (2012). Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proceedings of the National Academy of Sciences*, *109*(40), E2657–E2664.

☑ *Abstract:* "Recent reports show that fewer adolescents believe that regular cannabis use is harmful to health. Concomitantly, adolescents are initiating cannabis use at younger ages, and more adolescents are using cannabis on a daily basis. The purpose of the present study was to test the association between persistent cannabis use and neuropsychological decline and determine whether decline is concentrated among adolescent-onset cannabis users. Participants were members of the Dunedin Study, a prospective study of a birth cohort of 1,037 individuals followed from birth (1972/1973) to age 38 y. Cannabis use was ascertained in interviews at ages 18, 21, 26, 32, and 38 y. Neuropsychological testing was conducted at age 13 y, before initiation of cannabis use, and again at age 38 y, after a pattern of persistent cannabis use had developed. Persistent cannabis use was associated with neuropsychological decline broadly across domains of functioning, even after controlling for years of education. Informants also reported noticing more cognitive problems for persistent cannabis users. Impairment was concentrated among adolescent-onset cannabis users, with more persistent use associated with greater decline. Further, cessation of cannabis use did not fully restore neuropsychological functioning among adolescent-onset cannabis users. Findings are suggestive of a neurotoxic effect of cannabis on the adolescent brain and highlight the importance of prevention and policy efforts targeting adolescents."

Minnesota Legislative Task Force on Medical Cannabis Therapeutic Research. 2014. *A review of medical cannabis studies relating to chemical compositions and dosage for qualifying medical conditions.* Retrieved from: http://www.lcc.leg.mn/mctrtf/meetings/12032014/MDH_dose_comp_rpt.pdf.

☑ § *Summary:* Governmental resource on research on medical cannabis.

Minnesota Legislative Task Force on Medical Cannabis Therapeutic Research. 2015. Implementation of the Minnesota Medical Cannabis Program: Task Force on the Therapeutic Use of Medical Cannabis, Draft Report to the Minnesota Legislature 2015. Retrieved from http://www.lcc.leg.mn/mctrtf/meetings/12032014/Task_Force_Implementation_Report_Draft.pdf

§ *Summary:* Governmental report on medical marijuana.

Minnesota Medical Cannabis Policy. Office of the Revisor of Statutes. Chapter 311 – S.F. No. 2470. Retrieved from: https://www.revisor.mn.gov/laws/?id=311&year=2014&type=0

§ *Summary:* Statute outlining Minnesota medical marijuana legal policy.

National Institute of Health. (2015). Research *Report Series: Marijuana*. Retrieved from http://www.drugabuse.gov/publications/research-reports/marijuana/letter-director

§ *Summary:* Governmental report on marijuana.

Neighbors, C., Foster, D. W., Walker, D. D., Kilmer, J. R., & Lee, C. M. (2013). Social identity as a moderator of the association between perceived norms and marijuana use. *Journal of Studies on Alcohol and Drugs*, *74*(3), 479.

®Ⓟ *Abstract:* "**Objective:** This study extends previous examinations of social influences and marijuana use in considering how heavy marijuana users view themselves relative to their peers. We were specifically interested in evaluating whether (a) heavy-using marijuana users would identify more strongly with other users than with typical students, (b) identification with other marijuana users would be more strongly associated with own use, and (c) the association between perceived norms and marijuana use would be moderated by identification with peers. **Method:** Participants were 107 heavy (five or more times per month) marijuana users who completed an online survey assessing perceived norms for marijuana use, identification with typical students and other marijuana-using students, and marijuana use (frequency of use, joints per week, and hours high). **Results:** Participants unexpectedly identified more strongly with typical students rather than with other marijuana-using students. Identification with other marijuana users was, however, associated with more use. In addition, perceived norms were associated with more use but primarily among those who identified more with other users but not with typical students. **Conclusions:** Heavy marijuana users may be reluctant to identify themselves as users and may prefer to think of themselves as typical students. This may provide clinical opportunities to highlight discrepancies. In addition, identification with other users and lack of identification with typical students may be risk factors for heavier use and good indicators of candidacy for norms-based interventions. In sum, the present findings extend our understanding of the influence of social identity among young adult marijuana users and suggest novel directions for intervention strategies."

Norberg, M. M., Battisti, R. A., Copeland, J., Hermens, D.F., & Hickie, I. B. (2012). Two sides of the same coin: cannabis dependence and mental health problems in help-seeking adolescent and young adult outpatients. *International Journal of Mental Health and Addiction, 10*(6), 818-828.

!! ®Ⓟ ☑ *Abstract:* "The aim of the current study was to delineate the psychiatric profile of cannabis dependent young people (14–29 years old) with mental health problems (**N** = 36) seeking treatment via a research study. To do so, the Structured Clinical Interview for DSM-IV-TR Axis I Disorders and the Structured Clinical Interview for DSM-IV Childhood Diagnoses were used to obtain DSM-IV diagnoses, while a modified Timeline Followback interview and self-reports were used to measure cannabis use, cannabis-related problems, and impairment. Most individuals had at least two Axis I disorders in addition to cannabis dependence. Anxiety disorders were common, with posttraumatic stress disorder, social phobia, and generalised anxiety disorder accounting for the majority of these diagnoses. On average, young people reported a moderate degree of dependence and functional impairment, and a substantial number of cannabis-related problems. Although both males and females reported using similar quantities of cannabis per month, females reported using cannabis more frequently than males. The current data suggest that young people who present for cannabis use treatment in the context of a mental health issue may have a variety of psychiatric problems that need addressed and that males and females may have slightly different profiles. If cannabis use treatments are to advance for this population, more attention needs to be paid to the complex issues that young people present to treatment with."

Norberg, M. M., Kezelman, S., & Lim-Howe, N. (2013). Primary prevention of cannabis use: a systematic review of randomized controlled trials. *PloS One*, *8*(1), e53187.

✪ *Abstract:* "A systematic review of primary prevention was conducted for cannabis use outcomes in youth and young adults. The aim of the review was to develop a comprehensive understanding of prevention programming by assessing universal, targeted, uni-modal, and multi-modal approaches as well as individual program characteristics. Twenty-eight articles, representing 25 unique studies, identified from eight electronic databases (EMBASE, MEDLINE, CINAHL, ERIC, PsycINFO, DRUG, EBM Reviews, and Project CORK), were eligible for inclusion. Results indicated that primary prevention programs can be effective in reducing cannabis use in youth populations, with statistically significant effect sizes ranging from trivial (0.07) to extremely large (5.26), with the majority of significant effect sizes being trivial to small. Given that the preponderance of significant effect sizes were trivial to small and that percentages of statistically significant and non-statistically significant findings were often equivalent across program type and individual components, the effectiveness of primary prevention for cannabis use should be interpreted with caution. Universal multi-modal programs appeared to outperform other program types (i.e, universal uni-modal, targeted multi-modal, targeted unimodal). Specifically, universal multi-modal programs that targeted early adolescents (10–13 year olds), utilised non-teacher or multiple facilitators, were short in duration (10 sessions or less), and implemented boosters sessions were associated with large median effect sizes. While there were studies in these areas that contradicted these results, the results highlight the importance of assessing the interdependent relationship of program components and program types. Finally, results indicated that the overall quality of

included studies was poor, with an average quality rating of 4.64 out of 9. Thus, further quality research and reporting and the development of new innovative programs are required."

Owen, K. P., Sutter, M. E., & Albertson, T. E. (2014). Marijuana: respiratory tract effects. *Clinical Reviews in Allergy & Immunology*, *46*(1), 65-81.

☑ *Abstract:* Marijuana is the most commonly used drug of abuse in the USA. It is commonly abused through inhalation and therefore has effects on the lung that are similar to tobacco smoke, including increased cough, sputum production, hyperinflation, and upper lobe emphysematous changes. However, at this time, it does not appear that marijuana smoke contributes to the development of chronic obstructive pulmonary disease. Marijuana can have multiple physiologic effects such as tachycardia, peripheral vasodilatation, behavioral and emotional changes, and possible prolonged cognitive impairment. The carcinogenic effects of marijuana are unclear at this time. Studies are mixed on the ability of marijuana smoke to increase the risk for head and neck squamous cell carcinoma, lung cancer, prostate cancer, and cervical cancer. Some studies show that marijuana is protective for development of malignancy. Marijuana smoke has been shown to have an inhibitory effect on the immune system. Components of cannabis are under investigation as treatment for autoimmune diseases and malignancy. As marijuana becomes legalized in many states for medical and recreational use, other forms of tetrahydrocannabinol (THC) have been developed, such as food products and beverages. As most research on marijuana at this time has been on whole marijuana smoke, rather than THC, it is difficult to determine if the currently available data is applicable to these newer products."

Park, A., Sher, K. J., and Krull, J. L. (2008). Risky drinking in college changes as fraternity/sorority affiliation changes: A person-environment perspective. *Psychology of Addictive Behavior, Vol 22* (2): 219-229.

!! ®Ⓟ *Abstract:* "This study aimed to resolve the direction of the relation between Greek affiliation and substance use by taking advantage of the quasi-experimental nature of change in college fraternity/sorority affiliation. Precollege individual differences and college substance use were examined as a function of time-varying Greek status to characterize self-selection (by which heavy substance users opt into Greek systems) and socialization (by which Greek systems foster heavy substance use). Prospective data on continuously enrolled college students (N=2,376), assessed at precollege and in the first 6 semesters of college, were used. Latent class analysis indicated 4 discrete groups of status: constant Greek members (30%), constant nonmembers (64%), late joiners (2%), and droppers (4%). Random coefficient models demonstrated disaffiliation with Greek systems is associated with decreases in risky drinking and alcohol-conducive environmental factors (peer norms and alcohol availability), whereas affiliation is associated with increases, indicating Greek socialization via sociocognitive and physical environments. Future Greeks differed from nonmembers in diverse individual characteristics and heavier substance use at precollege, suggesting multiple selection paths into Greek systems. Findings suggest a reciprocal relation between Greek environment and individuals in determining the trajectories of college drinking and heterogeneity in drinking as functions of changes in Greek affiliation."

Patton, G. C., Coffey, C., Carlin, J. B., Degenhardt, L., Lynskey, M., & Hall, W. (2002). Cannabis use and mental health in young people: cohort study. *BMJ, 325*(7374), 1195- 1198.

!! ☑ *Abstract:* "**Objective:** To determine whether cannabis use in adolescence predisposes to higher rates of depression and anxiety in young adulthood. **Design:** Seven wave cohort study over six years. **Setting:** 44 schools in the Australian state of Victoria. **Participants:** A statewide secondary school sample of 1601 students aged 14-15 followed for seven years. **Main outcome measure:** Interview measure of depression and anxiety (revised clinical interview schedule) at wave 7. **Results:** Some 60% of participants had used cannabis by the age of 20; 7% were daily users at that point. Daily use in young women was associated with an over fivefold increase in the odds of reporting a state of depression and anxiety after adjustment for intercurrent use of other substances (odds ratio 5.6, 95% confidence interval 2.6 to 12). Weekly or more frequent cannabis use in teenagers predicted an approximately twofold increase in risk for later depression and anxiety (1.9, 1.1 to 3.3) after adjustment for potential baseline confounders. In contrast, depression and anxiety in teenagers predicted neither later weekly nor daily cannabis use. **Conclusions:** Frequent cannabis use in teenage girls predicts later depression and anxiety, with daily users carrying the highest risk. Given recent increasing levels of cannabis use, measures to reduce frequent and heavy recreational use seem warranted."

Pinchevsky, G. M., Arria, A. M., Caldeira, K. M., Garnier-Dykstra, L. M., Vincent, K. B., & O'Grady, K. E. (2012). Marijuana exposure opportunity and initiation during college: Parent and peer influences. *Prevention Science*, *13*(1), 43-54.

!! ®Ⓟ *Abstract*: "Marijuana is the most prevalent illicit drug used by adolescents and young adults, yet marijuana initiation is rarely studied past adolescence. The present study sought to advance our understanding of parent and peer influences on marijuana exposure opportunity and incident use during college. A sample of 1,253 students was assessed annually for 4 years starting with the summer prior to college entry. More than one-third (38%wt) of students had already used marijuana at least once prior to college entry; another 25%wt initiated use after starting college. Of the 360 students who did not use marijuana prior to college, 74% were offered marijuana during

college; of these individuals, 54% initiated marijuana use. Both low levels of parental monitoring during the last year of high school and a high percentage of marijuana-using peers independently predicted marijuana exposure opportunity during college, holding constant demographics and other factors (AOR = 0.92, 95% CI = 0.88–0.96, p < .001 and AOR = 1.11, 95% CI = 1.08–1.14, p < .001, respectively). Among individuals with exposure opportunity, peer marijuana use (AOR = 1.04, 95% CI = 1.03–1.05, p < .001), but not parental monitoring, was associated with marijuana initiation. Results underscore that peer influences operate well into late adolescence and young adulthood and thus suggest the need for innovative peer-focused prevention strategies. Parental monitoring during high school appears to influence exposure opportunity in college; thus, parents should be encouraged to sustain rule-setting and communication about adolescent activities and friend selection throughout high school."

Piontek, D., Kraus, L., & Klempova, D. (2008). Substance Abuse Treatment, Prevention, and Policy. *Substance Abuse Treatment, Prevention, and Policy*, *3*, 25.

Abstract: "The purpose of this paper is to summarize the psychometric properties of four short screening scales to assess problematic forms of cannabis use: Severity of Dependence Scale (SDS),Cannabis Use Disorders Identification Test (CUDIT), Cannabis Abuse Screening Test (CAST) and Problematic Use of Marijuana (PUM). Methods: A systematic computer-based literature search was conducted within the databases of PubMed, PsychINFO and Addiction Abstracts. A total of 12 publications reporting measures of reliability or validity were identified: 8 concerning SDS, 2 concerning CUDIT and one concerning CAST and PUM. Studies spanned adult and adolescent samples from general and specific user populations in a number of countries worldwide. Results: All screening scales tended to have moderate to high internal consistency (Cronbach's α ranging from .72 to .92). Test-retest reliability and item total correlation have been reported for SDS with acceptable results. Results of validation studies varied depending on study population and standards used for validity assessment, but generally sensitivity, specificity and predictive power are satisfactory. Standard diagnostic cut-off points that can be generalized to different populations do not exist for any scale. Conclusion: Short screening scales to assess dependence and other problems related to the use of cannabis seem to be a time and cost saving opportunity to estimate overall prevalences of cannabis-related negative consequences and to identify at-risk persons prior to using more extensive diagnostic instruments. Nevertheless, further research is needed to assess the performance of the tests in different populations and in comparison to broader criteria of cannabis-related problems other than dependence."

Pol, P., Liebregts, N., Graaf, R., Have, M., Korf, D. J., Brink, W., & Laar, M. (2013). Mental health differences between frequent cannabis users with and without dependence and the general population. *Addiction*, *108*(8), 1459–1469.

Abstract: "**Aims:** To compare the prevalence of mental disorders between frequent cannabis users with and without dependence and the general population. **Design:** Cross-sectional comparison of interview data. **Setting:** Enriched community sample of frequent cannabis users and a representative sample of non-users and non-frequent users from the general population. **Participants:** A total of 521 young adult (aged 18–30 years) frequent cannabis users, 252 of whom were with DSM-IV cannabis dependence (D+) and 269 without DSM-IV cannabis dependence (D−), and 1072 young adults from the general population. **Measurements:** Multinomial logistic regression was used to compare groups regarding the presence of DSM-IV mental disorders. Detailed measures of cannabis use, childhood adversity and other substance use were considered confounders. **Findings:** Compared with the general population, externalizing disorders were more prevalent in D− [odds ratio (OR) = 8.91, *P* < 0.001] and most prevalent in D+ (OR = 17.75, *P* < 0.001), but internalizing disorders were associated only with D+ (mood OR = 4.15, *P* < 0.001; anxiety OR = 2.20, *P* = 0.002). Associations were attenuated (and often became non-significant) after correction for childhood adversity and substance use other than cannabis. However, the prevalence of mental disorders remained higher in D+ compared with D− (OR = 2.40, *P* < 0.001), although cannabis use patterns were remarkably similar. **Conclusions:** Cannabis use patterns, childhood adversity and the use of other substances are similar in dependent and non-dependent frequent cannabis users. With the exception of more externalizing disorders, the mental health condition of non-dependent frequent cannabis users is similar to that of the general population, whereas it is worse in dependent frequent cannabis users."

Ramo, D. E., Liu, H., and Prochaska, J. J. (2012). Tobacco and marijuana use among adolescents and young adults: A systematic review of their co-use. *Clinical Psychology Review*, *32*: 105–121.

Abstract: "Tobacco (TOB) and marijuana (MJ) are the most widely used drugs among adolescents and young adults. The literature on their co-use, however, has not been systematically reviewed. We identified 163 English language articles published from 1999 to 2009 examining TOB and MJ co-use, correlates or consequences of co-use, or interventions for prevention or cessation of co-use with participants aging 13–25 years. Most studies (**n** = 114, 70%) examined TOB and MJ co-use, and 85% of relationships studied indicated a significant association. Fifty-nine studies (36%) examined correlates or consequences of co-use. Factors consistently associated with increased likelihood of co-use, defined as significant associations in at least four studies, were African–American ethnicity, mental and physical health characteristics (e.g., high-intensity pleasure temperament), and school characteristics (e.g., good grades). The only consistent consequence of

co-use was exacerbation of mental health symptoms. Few studies examined prevention (**n** = 3) or cessation (**n** = 2) interventions for TOB and MJ co-use, and the findings were stronger for prevention efforts. A sufficient literature base has documented that TOB and MJ use are strongly related in young people, yet few consistent correlates and consequences of co-use have been identified to inform intervention targets."

Reed, E., Prado, G., Matsumoto, A., & Amaro, H. (2010). Alcohol and drug use and related consequences among gay, lesbian and bisexual college students: Role of experiencing violence, feeling safe on campus, and perceived stress. *Addictive Behaviors, 35*(2), 168–171.

!! ®Ⓟ *Abstract:* "**Objective:** To examine differences between gay, lesbian, and bisexual (GLB) and non-GLB university students in alcohol and other drug use (AOD) and related consequences as well as the relevance of violence, perceived safety, and stress to any such differences in AOD use and related concerns. **Methods:** A random representative sample of university students (*n* = 988) were recruited via email for an online survey. Linear regression models assessed associations between identifying as GLB and AOD use and related consequences. **Results:** Regression models (adjusted for gender) indicated that, in comparison to heterosexual students, GLB students were more likely to report recent illicit drug use (AOR = 2.0; 95% CI: 1.1–3.9), more frequent negative AOD consequences (β = 5.5, SE = 1.4, $p < 0.0001$), and having seriously thought about/attempted suicide due to AOD use in the past year (AOR = 6.6; 95% CI: 3.0–14.3). Study findings also suggested that violence, safety, and stress variables partially contribute to AOD use and related concerns among GLB students. **Conclusions:** Findings highlight the need for future efforts to investigate and address mechanisms, including aspects of campus life, which contribute to AOD related risks among GLB students."

Richter, K. P., Kaur, H., Resnicow, K., Naxir, N., Mosier, M. C., and Ahluwalia, J. S.. (2005). Cigarette smoking among marijuana users in the United States. *Substance Abuse, 25*:2, 35–43.

!! ®Ⓟ *Abstract:* "The vast majority of drug users smoke cigarettes. Most use marijuana and no other illicit drug. We analyzed adult responses to the 1997 NHSDA (n = 16,661) to explore relationships between marijuana use and cigarette smoking. Multivariate analyses controlled for other illicit drug use and other potential covariates. Nearly three-quarters of current marijuana users (74%) smoked cigarettes. Compared to nonusers, the adjusted odds of being a smoker were 5.43 for current marijuana users, 3.58 for past year marijuana users, and 2.02 for former marijuana users. Odds for cigarette smoking among current poly-drug users, compared to nonusers, were 2.3 to 1. Level of cigarette smoking was directly associated with frequency of marijuana use. Nationwide, an estimated 7 million adults smoke both substances and are at increased risk for respiratory illnesses and mortality. Cigarette smoking is a major co-morbidity of marijuana use and smoking cessation should be addressed among marijuana users in addition to their other illicit drug involvement."

Ridner, S. L., Frost, K., & LaJoie, A. S. (2006). Health information and risk behaviors among lesbian, gay, and bisexual college students. *Journal of the American Academy of Nurse Practitioners, 18*(8), 374–378.

!! ®Ⓟ *Abstract:* "**Purpose:** To describe differences in alcohol use, marijuana use, and smoking behaviors between lesbian, gay, and bisexual (LGB) and heterosexual college students, and determine whether there was a difference in the health information each group received. **Data sources:** A random sample of 3000 college students aged 18–24 years who were currently enrolled at a southeastern metropolitan university on a full-time basis were invited to participate. The final sample (*n*= 772) consisted of heterosexuals (*n*= 731) and LGB (*n*= 41) college students. Gay and bisexual men (*n*= 20) and lesbian and bisexual women (*n*= 21) were compared to heterosexual college students. **Conclusions:** Lesbian/bisexual women were 4.9 times more likely to smoke, 10.7 times more likely to drink, and 4.9 times more likely to use marijuana than heterosexual women. Gay/bisexual men did not significantly differ from heterosexual men. There was no difference in the health information on alcohol and drug prevention the groups received. Gay/bisexual men were less likely (*p*= .02) compared to heterosexual men to have received tobacco prevention information. **Implications for practice:** Advanced practice nurses must ensure that every patient receives preventive services and anticipatory guidance at every visit. LGB clients in particular need health assessments and interventions appropriate to their individual risk profiles."

Riggs, N. R., & Pentz, M. A. (2009). Long-term effects of adolescent marijuana use prevention on adult mental health services utilization: The Midwestern Prevention Project. *Substance Use & Misuse, 44*(5), 616–631.

☑ ✪ *Abstract:* "Evaluated were effects of a drug abuse prevention program, previously shown to prevent marijuana use in adolescence, on adulthood mental health service use. Analyses were conducted on 961 6th (41%) and 7th (59%) grade participants randomly assigned to intervention or control groups at baseline in 1984. These participants were followed-up through 2003 representing 15 waves of data collection. Eighty-five percent of participants were Caucasian and 56% were female. The hypothesis was that direct program effects on early adulthood mental health service use would be mediated by program effects on high school marijuana use trajectories. Structural equation models, imputing for missing data, demonstrated that MPP (Midwestern Prevention Project) program effects on mental health were

mediated by the marijuana use growth curve intercept. Findings support the role of early adolescent drug use prevention programs in impacting later mental health problems. The study's limitations are noted."

Rockafellow, B. D., & Saules, K. K. (2006). Substance use by college students: The role of intrinsic versus extrinsic motivation for athletic involvement. *Psychology of Addictive Behaviors, 20*(3), 279–287.

!! ®Ⓟ *Abstract:* "Certain types of athletic involvement may confer risk for substance use by college students. This study investigated whether motivational factors play a role in the relationship between athletic involvement and substance use. Intercollegiate athletes (n=98) and exercisers (n=120) were surveyed about substance use and motivation for athletic involvement. Athletes and exercisers who were extrinsically motivated had significantly higher rates of alcohol use than their intrinsically motivated counterparts. Results suggest that college students who are extrinsically motivated for involvement in physical activity/athletics--particularly those involved in team sports--may be in need of targeted prevention efforts. "

Rosario, M., Schrimshaw, E. W., & Hunter, J. (2004). Predictors of substance use over time among gay, lesbian, and bisexual youths: An examination of three hypotheses. *Addictive Behaviors, 29*(8), 1623–1631.

!! ®Ⓟ *Abstract:* "Gay, lesbian, and bisexual (GLB) youths report elevated levels of substance use relative to heterosexual youths, but reasons for this disparity have received scant attention. This report longitudinally examined three hypothesized explanations for cigarette, alcohol, and marijuana use among 156 GLB youths. Counter to two hypotheses, neither a history of childhood sexual abuse nor recent experiences of gay-related stressful life events were associated with increased substance use over time. However, the hypothesis concerning the coming-out process was supported by significant nonlinear associations of involvement in gay-related (recreational and social) activities with changes in alcohol use at 12 months and changes in marijuana use at 6 months and 12 months. Specifically, as involvement in gay-related activities increased, alcohol and marijuana use was found to initially increase, but then, substance use declined as involvement in gay-related activities continued to increase. These findings offer a potential explanation for high levels of substance use among GLB youths and suggest potential areas for intervention to prevent or decrease substance use among these youths."

Saitz, R., Palfai, T. P., Freedner, N., Winter, M. R., Macdonald, A., Lu, J., ... & Dejong, W. (2007). Screening and brief intervention online for college students: the ihealth study. *Alcohol and Alcoholism*, *42*(1), 28–36.

🛠 ✪ *Abstract:* "**Aims:** To test the feasibility of online alcohol screening and brief intervention (BI) by comparing (i) two approaches to inviting all students to be screened, and (ii) a minimal versus a more extensive BI. **Methods:** Freshmen students at one university were randomized to receive one of two types of email invitations to an online anonymous: (i) general health assessment, or (ii) alcohol-specific assessment. All were linked to the same alcohol screening survey. Those with unhealthy alcohol use (AUDIT ≥8) were randomly assigned to minimal or more extensive online alcohol BI. **Results:** In both invitation groups (4008 students), 55% of students completed the online screening. Overall, 37% of men and 26% of women had unhealthy alcohol use. Compared to minimal BI, more extensive BI was associated with intention to seek help among men and with a greater increase in readiness to change among women. One month after BI, 75% of students completed another assessment, 33% of women and 15% of men with unhealthy alcohol use at baseline no longer had unhealthy alcohol use. There were no significant differences on drinking measures by BI randomization group. **Conclusions:** Over half of an entire freshman class of college students were reached by email and completed alcohol screening and brief intervention. Even an alcohol-specific invitation did not deter students. Although brief interventions that differed had some gender specific effects on readiness to change and intention, in general, unhealthy alcohol use decreased after brief intervention. Web screening and brief intervention show promise for addressing unhealthy alcohol use by college students."

Scott-Sheldon, L. A. J., Carey, K. B., and Carey, M. P. (2008). Health behavior and college students: Does Greek affiliation matter? *Journal of Behavioral Medicine, 31:* 61–70.

!! ®Ⓟ *Abstract:* "The college years offer an opportunity for new experiences, personal freedom, and identity development; however, this period is also noted for the emergence of risky health behaviors that place college students at risk for health problems. Affiliation with on-campus organizations such as fraternities or sororities may increase a student's risk given the rituals and socially endorsed behaviors associated with Greek organizations. In this study, we examined alcohol and drug use, smoking, sexual behavior, eating, physical activity, and sleeping in 1,595 college students (**n** = 265 Greek members, **n** = 1,330 non-Greek members). Results show Greek members engaged in more risky health behaviors (e.g., alcohol use, cigarette smoking, sexual partners, and sex under the influence of alcohol or drugs) than non-Greek members. Greek and non-Greek members did not differ in condom use, unprotected sex, eating, and physical activity behaviors. Implications for prevention and intervention strategies among Greek members are discussed."

Shi, Y. (2014). At high risk and want to quit: Marijuana use among adults with depression or serious psychological distress. *Addictive Behaviors*, *39*(4), 761–767.

!! ®Ⓟ *Abstract:* "**Objectives:** This study compared marijuana use characteristics and quit behaviors between adults with and without depression or serious psychological distress (SPD). **Methods:** Drawing data for 39,133 non-institutionalized adults from the 2011 National Survey on Drug Use and Health, we assessed marijuana use status, frequent use, dependence or abuse, and quit behaviors in association with lifetime clinician-identified depression, lifetime and recent major depressive episode (MDE), and recent SPD. **Results:** Adults with depression or SPD were at a significantly higher risk of being lifetime ever users (OR = 1.60–2.08), past year users (OR = 1.67–1.86), frequent users (OR = 1.40–1.62), and dependent or abusing users (OR = 2.32–3.05) compared with adults without these symptoms. Adults with depression or SPD had a lower quit ratio overall, but were equally or even more likely to make quit or self-regulation attempts. Further analysis suggested that adults with recent MDE had the greatest level of quit attempts or self-regulation attempts compared with adults without MDE or with past MDE. **Conclusions:** These findings highlight the need for tailored cessation programs to sustain quit attempts and promote successful quitting among adults with depression or SPD, especially those with recent symptoms."

Simons, J., Correia, C. J., Carey, K. B., & Borsari, B. E. (1998). Validating a five-factor marijuana motives measure: Relations with use, problems, and alcohol motives. *Journal of Counseling Psychology*, *45*(3), 265.

🛠 *Abstract:* "This study adapted and extended M. L. Cooper's (1994) Drinking Motives Measure to examine marijuana motives among 299 college students. An exploratory factor analysis supported the hypothesized 5-factor marijuana motives model, resulting in enhancement, conformity, expansion, coping, and social motives. Analyses supported the internal consistency and concurrent validity of the 5 marijuana motives. Marijuana motives were significant predictors of marijuana use and added to the prediction of use-related problems above and beyond the contribution of lifetime use. Motives and gender interacted in predicting use and use-related problems. Parallel regression analyses revealed that marijuana and alcohol motives predicted comparable amounts of variance in use and use-related problems. However, different patterns of relations emerged across drugs, supporting the discriminant validity of the marijuana and alcohol motives. "

Smedslund, G., Berg, R. C., Hammerstrøm, K. T., Steiro, A., Leiknes, K. A., Dahl, H. M., & Karlsen, K. (2011). Motivational interviewing for substance abuse. *The Cochrane Library*.

🛠 ✪ *Abstract:* "**Objectives:** To assess the effectiveness of motivational interviewing for substance abuse on drug use, retention in treatment, readiness to change, and number of repeat convictions. **Search methods:** We searched 18 electronic databases, 5 web sites, 4 mailing lists, and reference lists from included studies and reviews. Search dates were November 30, 2010 for Cochrane Library, Medline, Embase and PsychINFO. **Selection criteria:** Randomized controlled trials with persons dependent or abusing substance. Interventions were MI or motivational enhancement therapy. The outcomes were extent of substance abuse, retention in treatment, motivation for change, repeat conviction. **Data collection and analysis:** Three authors independently assessed studies for inclusion, and two authors extracted data. Results were categorized into (1) MI versus no-treatment control, (2) MI versus treatment as usual, (3) MI versus assessment and feedback, and (4) MI versus other active treatment. Within each category, we computed meta-analyses separately for post-intervention, short, medium and long follow-ups. **Main results:** We included 59 studies with a total of 13,342 participants. Compared to no treatment control MI showed a significant effect on substance use which was strongest at post-intervention SMD 0.79, (95% CI 0.48 to 1.09) and weaker at short SMD 0.17 (95% CI 0.09 to 0.26], and medium follow-up SMD 0.15 (95% CI 0.04 to 0.25]). For long follow-up, the effect was not significant SMD 0.06 (95% CI-0.16 to 0.28). There were no significant differences between MI and treatment as usual for either follow-up post-intervention, short and medium follow up. MI did better than assessment and feedback for medium follow-up SMD 0.38 (95% CI 0.10 to 0.66). For short follow-up, there was no significant effect. For other active intervention there were no significant effects for either follow-up. There was not enough data to conclude about effects of MI on the secondary outcomes."

Smit, F., Bolier, L., & Cuijpers, P. (2004). Cannabis use and the risk of later schizophrenia: a review. *Addiction, 99*(4), 425–430.

!! ®Ⓟ ☑ *Abstract:* "**Aim:** To study the role of cannabis use in the onset of symptoms and disorders in the schizophrenia spectrum. **Design:** Review of five population-based, longitudinal studies on the relationship between cannabis use and problems ranging from the experience of psychotic symptoms to hospitalization with a confirmed diagnosis of schizophrenia. Several hypotheses are examined that may explain this relationship: (1) self-medication; (2) effects of other drugs; (3) confounding; (4) stronger effect in predisposed people, and (5) etiological hypothesis. **Findings:** Hypotheses 1 and 2 can be dismissed; hypothesis 3 is still open to debate, and converging evidence is found for hypotheses 4 and 5—antecedent cannabis use appears to act as a risk factor in the onset of schizophrenia, especially in vulnerable people, but also in people without prior history. **Conclusion:** There is an intrinsic message here for public health, but how that message is to be translated into action is not immediately clear."

Stein, M. D., Hagerty, C. E., Herman, D. S., Phipps, M. G., & Anderson, B. J. (2011). A brief marijuana intervention for non-treatment-seeking young adult women. *Journal of Substance Abuse Treatment*, *40*(2), 189-198.

Abstract: "We randomized 332 women, 18–24 years old, who were not explicitly seeking treatment for their marijuana use to either a two-session motivationally focused intervention or an assessment-only condition. Assessed by timeline follow-back methodology, participants reported using marijuana 57% of days in the 3 months prior to study entry. Intervention effects on the likelihood of marijuana use were not statistically significant at 1 month (odds ratio [OR] = 0.77, **p** = .17), significant at 3 months (OR = 0.53, **p** = .01), and no longer significant at 6 months (OR = 0.74, **p** = .20). Among the 61% of participants endorsing any desire to quit using marijuana at baseline, significant intervention effects on the likelihood of marijuana use days were observed at 1 month (OR = 0.42, **p** = .03), 3 months (OR = 0.31, **p** = .02), and 6 months (OR = 0.35, **p** = .03). A two-session brief motivational intervention reduced marijuana use among young women not seeking treatment. Women with a desire to quit showed a greater and more durable response."

Steinberg, K. L., Babor, T. F., Miller, M., Kadden, R., Duresky, D., & Stephens, R. (2005). *Brief counseling for marijuana dependence: a manual for treating adults*. Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.

Annotation: "Based on the research protocol used by counselors in the Federal Marijuana Treatment Project (MTP), which was begun in the late 1990s, this manual provides guidelines for counselors, social workers, and psychologists in both public and private settings who treat adults dependent on marijuana."

Stephens, R. S., Roffman, R. A., Fearer, S. A., Williams, C., & Burke, R. S. (2007). The Marijuana Check-up: promoting change in ambivalent marijuana users. *Addiction*, *102*(6), 947-957.

Abstract: "**Aims** :A brief intervention called the Marijuana Check-up (MCU) was designed to attract adult marijuana users who were experiencing adverse consequences, but who were ambivalent about change and would be unlikely to seek treatment. Our objective was to determine whether the MCU would reach the target population. **Design:** Comparisons were made between those who enrolled in the MCU versus those who were screened but failed to follow through with enrollment on demographic, drug use and stage of change variables. Comparisons were also made between participants in the MCU and participants in a concurrently offered treatment project that targeted marijuana users who wanted to quit. **Setting:** The study took place at the University of Washington in Seattle. **Participants:** Participants were adult marijuana users who telephoned and expressed interest in the MCU (*n* = 587). **Measurement:** Study variables included stage of change, frequency and duration of drug use, DSM-IV cannabis dependence and abuse diagnoses and negative consequences of marijuana use assessed via interviews and questionnaires. **Findings:** Callers to the MCU were near-daily marijuana users, two-thirds of whom were in the pre-contemplation or contemplation stage of change. Participants who enrolled in the MCU reported fewer problems related to marijuana use and less readiness to make changes compared to those enrolled in the treatment study, despite similar levels of drug use."

Tait, R. J., Spijkerman, R., & Riper, H. (2013). Internet and computer based interventions for cannabis use: A meta-analysis. *Drug and Alcohol Dependence*, *133*(2), 295-304.

Abstract: "**Background:** Worldwide, cannabis is the most prevalently used illegal drug and creates demand for prevention and treatment services that cannot be fulfilled using conventional approaches. Computer and Internet-based interventions may have the potential to meet this need. Therefore, we systematically reviewed the literature and conducted a meta-analysis on the effectiveness of this approach in reducing the frequency of cannabis use. **Methods:** We systematically searched online databases (Medline, PubMed, PsychINFO, Embase) for eligible studies and conducted a meta-analysis. Studies had to use a randomized design, be delivered either via the Internet or computer and report separate outcomes for cannabis use. The principal outcome measure was the frequency of cannabis use. **Results:** Data were extracted from 10 studies and the meta-analysis involved 10 comparisons with 4125 participants. The overall effect size was small but significant, *g* = 0.16 (95% confidence interval (CI) 0.09–0.22, *P* < 0.001) at post-treatment. Subgroup analyses did not reveal significant subgroup differences for key factors including type of analysis (intention-to-treat, completers only), type of control (active, waitlist), age group (11–16, 17+ years), gender composition (female only, mixed), type of intervention (prevention, 'treatment'), guided versus unguided programs, mode of delivery (Internet, computer), individual versus family dyad and venue (home, research setting). Also, no significant moderation effects were found for number of sessions and time to follow-up. Finally, there was no evidence of publication bias. **Conclusions:** Internet and computer interventions appear to be effective in reducing cannabis use in the short-term albeit based on data from few studies and across diverse samples."

Taskin, D. (2013). Effects of marijuana smoking on the lung. *Annals of the American Thoracic Society,* Vol. 10, No. (3): 239–247.

☑ *Abstract:* "Regular smoking of marijuana by itself causes visible and microscopic injury to the large airways that is consistently associated with an increased likelihood of symptoms of chronic bronchitis that subside after cessation of use. On the other hand, habitual use of marijuana alone does not appear to lead to significant abnormalities in lung function when assessed either cross-sectionally or longitudinally, except for possible increases in lung volumes and modest increases in airway resistance of unclear clinical significance. Therefore, no clear link to chronic obstructive pulmonary disease has been established. Although marijuana smoke contains a number of carcinogens and cocarcinogens, findings from a limited number of well-designed epidemiological studies do not suggest an increased risk for the development of either lung or upper airway cancer from light or moderate use, although evidence is mixed concerning possible carcinogenic risks of heavy, long-term use. Although regular marijuana smoking leads to bronchial epithelial ciliary loss and impairs the microbicidal function of alveolar macrophages, evidence is inconclusive regarding possible associated risks for lower respiratory tract infection. Several case reports have implicated marijuana smoking as an etiologic factor in pneumothorax/pneumomediastinum and bullous lung disease, although evidence of a possible causal link from epidemiologic studies is lacking. In summary, the accumulated weight of evidence implies far lower risks for pulmonary complications of even regular heavy use of marijuana compared with the grave pulmonary consequences of tobacco."

Thomas, G., Kloner, R. A., & Rezkalla, S. (2014). Adverse cardiovascular, cerebrovascular, and peripheral vascular effects of marijuana inhalation: what cardiologists need to know. *The American Journal of Cardiology*, *113*(1), 187–190.

☑ *Abstract:* "Marijuana is the most widely used illicit drug, with approximately 200 million users worldwide. Once illegal throughout the United States, cannabis is now legal for medicinal purposes in several states and for recreational use in 3 states. The current wave of decriminalization may lead to more widespread use, and it is important that cardiologists be made aware of the potential for marijuana-associated adverse cardiovascular effects that may begin to occur in the population at a greater frequency. In this report, the investigators focus on the known cardiovascular, cerebrovascular, and peripheral effects of marijuana inhalation. Temporal associations between marijuana use and serious adverse events, including myocardial infarction, sudden cardiac death, cardiomyopathy, stroke, transient ischemic attack, and cannabis arteritis have been described. In conclusion, the potential for increased use of marijuana in the changing legal landscape suggests the need for the community to intensify research regarding the safety of marijuana use and for cardiologists to maintain an awareness of the potential for adverse effects."

Tomon, J. E., & Ting, S. R. (2010). Effects of team climate on substance use behaviors, perceptions, and attitudes of student-athletes at a large, public university. *Journal of College Student Development*, *51*(2), 162–179.

!! ®Ⓟ *Excerpt:* "College student-athletes comprise a special group on the college campus owing to their dual roles as students and athletes. Although many positives are associated with being a student-athlete (Nelson & Wechsler, 2001), researchers have found that this population is faced with unique academic, physical, and social stressors that put student-athletes at greater risk for substance use than their nonathlete peers (e.g., Baer, 2002; Hildebrand, Johnson, & Bogle, 2001; Huang, Jacobs, Derevensky, Gupta, & Paskus, 2007; Presley, Meilman, & Leichliter, 2002; Wilson, Pritchard, & Schaffer, 2004). These studies have indicated that college student-athletes binge drink at higher rates than nonathletes and that binge drinking tends to increase as participation in athletics increases. In addition, Leinfelt and Thompson (2004) found that student-athletes were three times more likely to be arrested for alcohol-related behaviors than nonathletes. However, studies comparing the non-medical drug use of student-athletes and their peers have been inconclusive, with Huang and coworkers (2007) and Wechsler, Davenport, Dowdell, and Grossman (1997) finding lower rates of drug use among college student-athletes compared with the findings of Nattiv and Puffer (1991) and Rockafellow and Saules (2006), which showed higher rates of drug use among the student-athlete population. The work of Rockafellow and Saules has suggested that extrinsic motivation within the athletic community may impact the higher rates of substance use among the student-athlete population."

Tucker, J. S., Ellickson, P. L., & Klein, D. J. (2008). Understanding differences in substance use among bisexual and heterosexual young women. *Women's Health Issues, 18*(5), 387–398.

!! ®Ⓟ *Abstract:* "**Background:** Numerous studies have documented higher substance use rates among bisexual than heterosexual young women, although little is known about the developmental factors contributing to these differences. Based on self-reported sexual orientation collected at age 23, this study identified similarities and differences between bisexual and heterosexual women in their substance use at ages 14 and 18, compared these groups at ages 14 and 18 on key psychosocial factors known to predict young adult substance use, and determined whether these psychosocial factors at age 18 could account for sexual orientation differences in substance use at age 23. **Methods:** Longitudinal survey data from a West Coast cohort were used to compare heterosexual (*n* = 1,479) and bisexual (*n* = 141) women on their substance use and psychosocial characteristics. **Results:** During adolescence, bisexual women were more likely to have been current and solitary substance users; reported stronger pro-drug beliefs and lower resistance self-efficacy; perceived greater parental approval of

their substance use; had more exposure to substance-using peers; and reported poorer mental health. By age 23, bisexual women had higher rates of current substance use, greater quantity and frequency of use, and more problematic alcohol and drug use. Differences in problematic use at age 23 could be partially explained by risk factors assessed five years earlier at age 18, particularly pro-drug social influences and beliefs."

Tullis, L. M., Dupont, R., and Frost-Pineda, K. (2003). Marijuana and tobacco: A major connection? *Journal of Addictive Diseases, 22:*3, 51-62.

!! ®Ⓟ *Abstract:* "Smoking among teens and college students is a significant public health challenge. Tobacco, marijuana, and alcohol continue to be the most commonly abused drugs by teens and young adults. Educational efforts have resulted in increased awareness of the mortality and morbidity attributed to smoking, second-hand smoke, and prenatal exposure to tobacco. Short- and long-term consequences of marijuana use are well documented in the literature, but they have received less widespread attention. Even less well known is the relationship between these substances. Does use of one lead to use of the other? Are there synergistic and/or antagonistic effects when these substances are used together? We need answers to these questions to understand the prevalence of use and the impact of these drugs on our nations youth and young adults. The gateway theory of drug use is often used to describe the progression from using alcohol or tobacco, to marijuana, and later use of other drugs like MDMA, cocaine, and heroin. While tobacco use does commonly precede marijuana use, we propose that marijuana may be a "gateway drug" to tobacco smoking. Our research with university students is suggesting that cigarette-smoking initiation often follows or coincides with marijuana use."

University of Minnesota Boynton Health Service (2013). College student health survey report: health and health-related behaviors, Minnesota postsecondary students. 2013. Available at: www.bhs.umn.edu/surveys/survey-results/2013/MNPostsecondary_CSHSReport_2013.pdf. Accessed April 14, 2015.

🛠 ®Ⓟ *Summary:* The College Student Health Survey, administered by Boynton Health Service of the University of Minnesota, is a yearly survey of students at colleges and universities in Minnesota. The survey collects data on health care and insurance, mental health, substance use, safety, finances, nutrition and exercise, and sexual health. Special reports have been developed for LGB students and veterans.

VanLaar, M., VanDorsselaer, S., Monshouwer, K., & DeGraaf, R. (2007). Does cannabis use predict the first incidence of mood and anxiety disorders in the adult population?. *Addiction, 102*(8), 1251-1260.

!! ®Ⓟ ☑ *Abstract:* "**Aims:** To investigate whether cannabis use predicted the first incidence of mood and anxiety disorders in adults during a 3-year follow-up period. **Design and participants:** Data were derived from the Netherlands Mental Health Survey and Incidence Study (NEMESIS), a prospective study in the adult population of 18–64 years. The analysis was carried out on 3881 people who had no life-time mood disorders and on 3854 people who had no life-time anxiety disorders at baseline. **Measurements:** Life-time cannabis use and DSM-III-R mood and anxiety disorders, assessed with the Composite International Diagnostic Interview (CIDI). **Findings:** After adjustment for strong confounders, any use of cannabis at baseline predicted a modest increase in the risk of a first major depression (odds ratio 1.62; 95% confidence interval 1.06–2.48) and a stronger increase in the risk of a first bipolar disorder (odds ratio 4.98; 95% confidence interval 1.80–13.81). The risk of 'any mood disorder' was elevated for weekly and almost daily users but not for less frequent use patterns. However, dose–response relationships were less clear for major depression and bipolar disorder separately. None of the associations between cannabis use and anxiety disorders remained significant after adjustment for confounders. **Conclusions:** The associations between cannabis use and the first incidence of depression and bipolar disorder, which remained significant after adjustment for strong confounders, warrant research into the underlying mechanisms."

Volkow, N. D., Baler, R. D., Compton, W. M., & Weiss, S. R. (2014). Adverse health effects of marijuana use. *New England Journal of Medicine*, *370*(23), 2219-2227.

☑ *Summary:* The article outlines the risks associated with recreational marijuana use, including the risk of addiction and physical and mental effects.

Wahesh, E., Milroy, J. J., Lewis, T. F., Orsini, M. M., Wyrick, D. L., Wahesh, E., ... & Wyrick, D. L. (2013). Hazardous drinking by first-year college-athletes: The differential roles of drinking motives, alcohol consequences, and season status. *Journal of Alcohol and Drug Education, 57*(2), 66-84.

!! ®Ⓟ *Abstract:* "College student-athletes and first-year students are two undergraduate populations at risk for heavy-episodic drinking and alcohol-related negative consequences. In this study, 63 (56% female, 62% Caucasian) first-year student-athletes completed a preliminary questionnaire assessing demographic characteristics, athlete-specific drinking motives, alcohol-related negative consequences,

and season status. Scores of five or more on the AUDIT-C defined the at-risk subsample. Participants who met the criteria for hazardous drinking (n = 19) reported higher levels of alcohol-related negative consequences and drinking motives. A logistic regression, with these variables, successfully distinguished between the two groups. Sport-related coping2, and positive reinforcement drinking motives, emerged as the most robust predictors of hazardous drinking. Implications for screening, prevention, and brief intervention strategies for first-year student-athletes are discussed."

Walters, S. T., & Neighbors, C. (2011). College prevention: a view of present (and future) web-based approaches. *Alcohol Research and Health*, *34*(2), 222.

Summary: This article reviews a number of web-based programs that address substance use among college students. Advantages and disadvantages of programs are addressed, as is the future of web-based programs.

Webb, L., Bertoni, M., Copeland, J. (2015). 20 minutes or less: evidence of the need for a very brief intervention (VBI) for cannabis users. National Cannabis Prevention and Information Centre, bulletin series 23. Retrieved from https://ncpic.org.au/professionals/publications/bulletins/bulletin-23-vbi/..

Summary: This article summarizes the types of brief interventions (BIs) for cannabis users. It outlines the modes of delivery, the evidence of effectiveness, and the future of BIs.

Wechsler, H., Davenport, A. E., Dowdall, G. W., Grossman, S. J., & Zanakos, S. I. (1997). Binge drinking, tobacco, and illicit drug use and involvement in college athletics: A survey of students at 140 American colleges. *Journal of American College Health, 45*(5), 195-200.

®Ⓟ *Abstract:* "Binge drinking (heavy, episodic alcohol consumption), tobacco, and illicit drug use among a random sample of college students at a nationally representative sample of 140 American colleges were examined by means of a mail survey. Students were divided into three groups on the basis of their involvement in athletics: whether they were involved, partly involved, or not involved. In addition, individual correlates of binge drinking among athletically involved students were studied. The survey results indicated that students involved in college athletics engaged in binge drinking and chewed tobacco more often than students not involved in athletics, but were less likely to be cigarette smokers or marijuana users. The strongest predictors of binge drinking among students involved in athletics were residence in a fraternity or a sorority, a party lifestyle, engagement in other risky behaviors, and previous binging in high school. Coaches may play an important role in discouraging substance use and need to be part of campus prevention efforts."

Werch, C. E., Moore, M. J., Bian, H., DiClemente, C. C., Ames, S. C., Weiler, R. M., ... & Huang, I. C. (2008). Efficacy of a brief image-based multiple-behavior intervention for college students. *Annals of Behavioral Medicine*, *36*(2), 149-157.

Abstract: "**Background:** Epidemiologic data indicate most adolescents and adults experience multiple, simultaneous risk behaviors. **Purpose:** The purpose of this study is to examine the efficacy of a brief image-based multiple-behavior intervention (MBI) for college students. **Methods:** A total of 303 college students were randomly assigned to: (1) a brief MBI or (2) a standard care control, with a 3-month postintervention follow-up. **Results:** Omnibus treatment by time multivariate analysis of variance interactions were significant for three of six behavior groupings, with improvements for college students receiving the brief MBI on alcohol consumption behaviors, $F(6, 261) = 2.73$, $p = 0.01$, marijuana-use behaviors, $F(4, 278) = 3.18$, $p = 0.01$, and health-related quality of life, $F(5, 277) = 2.80$, $p = 0.02$, but not cigarette use, exercise, and nutrition behaviors. Participants receiving the brief MBI also got more sleep, $F(1, 281) = 9.49$, $p = 0.00$, than those in the standard care control. **Conclusions:** A brief image-based multiple-behavior intervention may be useful in influencing a number of critical health habits and health-related quality-of-life indicators of college students.

White, H.R., Labouvie, E.W., and Papadaratsakis, V. (2005). Changes in substance use during the transition to adulthood: A comparison of college students and their non-college age peers. *Journal of Drug Issues, 35*(2): 281-305.

®Ⓟ *Abstract:* "This study examines transitions in alcohol, cigarette, and marijuana use and alcohol- and marijuana-related problems from late adolescence through young adulthood. Men and women who attend college are compared to their peers who do not to determine if the situational/socialization effects of college are unique during this developmental period. Prospective data from a community sample were collected at ages 18, 21, and 30 years. ANOVAs revealed that 18 year olds who transition out of high school, regardless of college status, reported higher levels of substance use than their peers who were still in high school. In addition, nonstudents compared to college students reported higher levels of cigarette and marijuana use in adolescence, emerging adulthood, and young adulthood and higher levels of alcohol- and marijuana-related problems in adolescence and young adulthood. Latent growth curve analyses revealed that college status was related to lower levels of alcohol and marijuana problems at age 18, greater increases from ages 18 to 21, and greater decreases from ages 21 to 30

even after controlling for level and growth in use. Overall, the findings suggest that nonstudents may be a more important target group than college students for drug use prevention efforts during emerging adulthood. "

White, H. R., McMorris, B. J., Catalano, R. F., Fleming, C. B., Haggerty, K. P., & Abbott, R. D. (2006). Increases in alcohol and marijuana use during the transition out of high school into emerging adulthood: The effects of leaving home, going to college, and high school protective factors. *Journal of Studies on Alcohol*, *67*(6), 810.

®Ⓟ *Abstract:* "**Objective:** This study examined the effects of leaving home and going to college on changes in the frequency of alcohol use, heavy episodic drinking, and marijuana use shortly after leaving high school. We also examined how protective factors in late adolescence predict post-high school substance use and moderate the effects of leaving home and going to college. **Method:** Data came from subjects (*N* = 319; 53% male) interviewed at the end of 12th grade and again approximately 6 months later, as part of the Raising Healthy Children project. **Results:** Leaving home and going to college were significantly related to increases in the frequency of alcohol use and heavy episodic drinking from high school to emerging adulthood but not to changes in marijuana use. Having fewer friends who used each substance protected against increases in the frequency of alcohol use, heavy episodic drinking, and marijuana use. Higher religiosity protected against increases in alcohol-and marijuana-use frequency. Higher parental monitoring protected against increases in heavy episodic drinking and moderated the effect of going to college on marijuana use. Lower sensation seeking lessened the effect of going to college on increases in alcohol use and heavy episodic drinking. **Conclusions:** To prevent increases in substance use in emerging adulthood, interventions should concentrate on strengthening prosocial involvement and parental monitoring during high school. In addition, youths with high sensation seeking might be targeted for added intervention.**"**

White, H. R., Morgan, T. J., Pugh, L. A., Celinska, K., Labouvie, E. W., & Pandina, R. J. (2006). Evaluating two brief substance-use interventions for mandated college students. *Journal of Studies on Alcohol and Drugs*, *67*(2), 309.

🛠 ✪ *Abstract:* "**Objective:** This study evaluated two brief personal feedback substance-use interventions for students mandated to the Rutgers University Alcohol and Other Drug Assistance Program for Students (ADAPS): (1) a brief motivational interview (BMI) intervention and (2) a written feedback-only (WF) intervention. A key question addressed by this study was whether there is a need for face-to-face feedback in the context of motivational interviewing to affect changes in substance-use behaviors or whether a written personal feedback profile is enough of an intervention to motivate students to change their substance use. **Method:** The sample consisted of 222 students who were mandated to ADAPS, were eligible for the study, and completed the 3-month follow-up assessment. ...**Results:** Students in both interventions reduced their alcohol consumption, prevalence of cigarette and marijuana use, and problems related to alcohol and drug use between baseline and follow-up. There were no differences between the two intervention conditions in terms of any substance-use outcomes."

Yusko, D. A. (2006). Collegiate athletes and substance use: Developing a prevention program. ProQuest.

🛠 ✪ !! *Abstract:* "Research on the comparison of college students and college student-athletes has yielded equivocal results as regards prevalence of alcohol and drug use. Furthermore, few studies have determined whether the risk factors for, or consequences from, alcohol and drug use differ among student-athletes and their peers. The present study compared alcohol and drug use behavior, related problems, and risk factors for substance use in a sample of student-athletes (N=239) and a representative sample of college student non-athletes (N=233). Comparisons of putative predictors of alcohol and drug use for student-athletes and their non-athlete peers were also conducted. Student-athletes were more likely to report heavy episodic drinking patterns and use of performance enhancing drugs. However, despite these differences, the two groups did not differ in terms of negative consequences experienced as a result of use. Further, most of the predictors of alcohol and marijuana use and related problems were similar in nature for student-athletes and their student peers. However, sensation seeking was a stronger predictor of student-athlete alcohol use and using marijuana for enhancement reasons was a stronger predictor for student marijuana use. These results suggest that existing evidence-based alcohol and drug prevention programs may need to be modified to account for the unique needs of student-athletes given their propensity toward heavy episodic drinking and performance enhancing drug use, and the strong association between sensation seeking and alcohol use."

Yusko, D. A., Buckman, J. F., White, H. R., & Pandina, R. J. (2008). Alcohol, tobacco, illicit drugs, and performance enhancers: a comparison of use by college student athletes and non-athletes. *Journal of American College Health*, *57*(3), 281-290.

!! ®Ⓟ *Abstract:* "**Objective:** The authors compared the prevalence and pattern of substance use in undergraduate student athletes and nonathletes from 2005-2006. **Participants:** Authors collected data from male (*n* = 418) and female (*n* = 475) student athletes and

nonathletes from 2005-2006. **Methods:** The authors administered self-report questionnaires to assess prevalence, quantity, and frequency of alcohol and drug use, and to determine patterns of student athletes' alcohol and drug use during their athletic season versus out of season. **Results:** Male student athletes were at high risk for heavy drinking and performance-enhancing drug use. Considerable in-season versus out-of-season substance use fluctuations were identified in male and female student athletes. **Conclusions:** Additional, and possibly alternative, factors are involved in a student athlete's decision-making process regarding drug and alcohol use, which suggests that the development of prevention programs that are specifically designed to meet the unique needs of the college student athlete may be beneficial."

Zalesky, A., Solowij, N., Yücel, M., Lubman, D. I., Takagi, M., Harding, I. H., … & Seal, M. (2012). Effect of long-term cannabis use on axonal fibre connectivity. *Brain*, *135*(7), 2245-2255.

☑ *Abstract:* "Cannabis use typically begins during adolescence and early adulthood, a period when cannabinoid receptors are still abundant in white matter pathways across the brain. However, few studies to date have explored the impact of regular cannabis use on white matter structure, with no previous studies examining its impact on axonal connectivity. The aim of this study was to examine axonal fibre pathways across the brain for evidence of microstructural alterations associated with long-term cannabis use and to test whether age of regular cannabis use is associated with severity of any microstructural change. To this end, diffusion-weighted magnetic resonance imaging and brain connectivity mapping techniques were performed in 59 cannabis users with longstanding histories of heavy use and 33 matched controls. Axonal connectivity was found to be impaired in the right fimbria of the hippocampus (fornix), splenium of the corpus callosum and commissural fibres. Radial and axial diffusivity in these pathways were associated with the age at which regular cannabis use commenced. Our findings indicate long-term cannabis use is hazardous to the white matter of the developing brain. Delaying the age at which regular use begins may minimize the severity of microstructural impairment."

Zvolensky, M. J., Lewinsohn, P., Bernstein, A., Schmidt, N. B., Buckner, J. D., Seeley, J., & Bonn-Miller, M. O. (2008). Prospective associations between cannabis use, abuse, and dependence and panic attacks and disorder. *Journal of Psychiatric Research, 42*(12), 1017- 1023.

!! ®Ⓟ ☑ *Abstract:* "The present study prospectively evaluated cannabis use, abuse, and dependence in relation to the development of panic attacks and panic disorder. Participants at the start of the study were adolescents (**n** = 1709) with a mean age of 16.6 years (SD = 1.2; time 1) and were re-assessed 1 year later (time 2) and then again as young adults (time 3; mean age = 24.2 years, SD = 0.6). Results indicated that cannabis use and dependence were significantly prospectively associated with an increased odds for the development of panic attacks and panic disorder. However, cannabis was not incrementally associated with the development of panic after controlling for daily cigarette smoking. The theoretical and clinical implications of these findings are discussed."