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Comorbid Depression and Substance Use on College Campuses: A Review

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ABSTRACT
Mental health problems on college campuses have been rising in recent years, with universities unable to meet the high need for services. Especially problematic are comorbid disorders. Individuals diagnosed with two or more disorders often experience worse outcomes than those diagnosed with a single disorder. Depression and substance use disorder (SUD)care among the most common mental health problems in college students. Comorbid SUD and depression are especially common, and is associated with poor academic performance, dropout, and even suicide. There are three theories of the etiology of comorbid conditions: depression can cause SUD (e.g., I am depressed, so I use substances to cope, and develop an SUD because of my depression); SUD can cause depression (chronic substance use leads to social, psychological, or neurological deficits that lead to depression); or SUD and depression are two manifestations of an underlying neurological deficit (e.g., I have a neurological deficit that causes both my SUD and my depression). In the present review, I evaluate the empirical evidence supporting each of these theories. I then discuss the current treatment practices used to treat depression and SUD in college students, as well as harm-reduction techniques to mitigate the harms associated with substance use. I also discuss the clinical implications of these etiological theories on the treatment of comorbid SUD and depression in college students.

Keywords: *Comorbid Disorders, Substance Use, Depression, College Students, Mental Health, Harm Reduction*

1. INTRODUCTION

In a college student population, both depression and substance use disorders are highly prevalent and are associated with problems ranging from academic stress to attempt suicide. Substance use by college students has risen in the last 20 years, including excessive use of drugs and alcohol on college campuses. Drug use rates have been increasing among adolescents and college students since the mid-1990s, and the trend continued throughout the end of the century despite various prevention efforts [1]. Equally concerning are the trends in depression. According to a Healthy Minds Study, past-year therapy or counseling raised from 13.2% in 2007 to 23.9% in 2017 among all students, and there is a significant increase in past-year treatment from 42.4% to 53.3% among students with depression [2]. Both substance use and depression are on the rise in U.S colleges.

2. DEPRESSION & COLLEGE STUDENTS

Depression is often a chronic repetitive pattern that impairs the quality of life of the individuals and their families. The rate of depression in university students is substantially higher than the rate among the general population [3]. Additionally, the rate at which college students seek mental health services has dramatically increased in the past decade [4]. In 2001, research reported that 53% of college students experience depressive symptoms and 9% had considered committing suicide [5]. Beyond depressive symptoms, the rates of depression diagnoses have continued to rise in college student populations in the last decade as well [6]. Coupled with a rising increase in symptoms and diagnoses is an equally large rise in the need for treatment. The mental health of university students is an area of increasing worldwide concern as this population is particularly prone to depression related to academic pressures, obstacles to goal achievement, environmental changes, and dramatic life changes [7]. Lack of adequate treatment for depression leads to tangible, poor long-term outcomes. Depression in college students is associated with lower academic performance [8], early dropout from university [9], and even suicidal ideation, attempt, or completion [10]. Campus resources are often unable to meet the increasing demands from the student body. Depression is among the most prevalent and debilitating mental health problems in this population.

3. SUBSTANCE USE AND COLLEGE STUDENTS

The prevalence rates of substance use behaviors such as tobacco, alcohol, and marijuana use have been well-documented among college students [11]. Current estimates indicate that approximately 32% of college students meet the criteria for past-year alcohol abuse and 6% meet the criteria for alcohol dependence [12]. Risky drug use behaviors, such as binge-drinking are also relatively common with 44.4% of college students reporting past-month binge drinking episodes [11]. Beyond alcohol, the prevalence of past-year illicit substance use was 39.6% among college students [13].There are decades of research attempting to understand why college students use substances at such high rates. Individuals typically enter college in late adolescence or early adulthood. This developmental period is associated with heightened risk-taking behaviors and impulsivity [14]. Impulsivity is defined as "actions that are poorly conceived, prematurely expressed, unduly risky, or inappropriate to the situation and that often result in undesirable outcomes", and is believed to play a crucial role in the development and maintenance of substance use disorders [15]. Additionally, the development of a SUD is impacted by the perception of substance use as a normative behavior among college students, the subjective effects that substances have on improving social and romantic situations, and the perception that using substances is a sign of maturity [16]. Overall, substance use is highly prevalent on college campuses due to perceived social norms, relatively low impulse control among the student body, and motivation to use substances for a variety of personal, social, and academic reasons. Similar to depression, alcohol and drug use are associated with negative consequences including poor academic performance [17], early dropout from university [18], and increased risk of mental health disorders [19].

4. DEPRESSION & SUBSTANCE USE IN COLLEGE STUDENTS

Depression and substance use disorders are highly prevalent in the general population and often co-occur within the same individual [20] . Comorbid SUD and depression is common among patients seeking treatment for substance use [21]. In the general population, the prevalence of a current SUD in persons with depression ranges from 8.5 to 21.4%, with a lifetime prevalence of comorbid SUD ranging from 27 to 40% [22]. Depression is associated with substance use among college students [23]. Co-occurrence of these disorders among young people is common and has been associated with significantly higher rates of academic problems, disability and professional help-seeking [24]. College students with greater depressive symptomatology are more prone to use alcohol, tobacco, cannabis, cocaine, other amphetamines, sedatives, and hallucinogens [19]. Those with a diagnosis of major depressive disorder are also more likely to drink more alcohol compared to those without a diagnosis of depression [25]. Individuals with comorbid mood disorder and SUD have more negative outcomes compared with having either a mood or SUD diagnosis alone [21]. Moreover, the combination of depression and SUD can intensify subjective stress and place emerging college students at increased risk for suicide attempts [26]. The comorbidity of SUD and depression, two debilitating psychiatric conditions, have multiplicative negative impacts on college students ranging from poor academic performance to self-harm, and even suicide.

5. EXPLANATORY MODELS OF COMORBIDITY

There are four plausible explanations, three of which have been empirically evaluated to explain how comorbid conditions arise: 1) Disorder A causes Disorder B, 2) Disorder B causes Disorder A, 3) Disorder A and Disorder B are both manifestations of the same underlying cause, or 4) the disorders are unrelated and just happen to co-occur by chance (not subject to empirical analysis). A review paper from 1998 [27] assessed the evidence supporting and refuting three neurobiological explanatory models for the high comorbidity between depression and substance use disorders. Markou and colleagues concluded that depression and substance use are not neurobiologically independent; individuals with either disorder share neurobiological abnormalities. The high comorbidity between depression and drug dependence may reflect an attempt to self-medicate with drugs of abuse, and neural mechanisms mediate specific core symptoms of both depression and drug dependence that reflect alterations in reward and motivational processes [27]. Neurobiological findings support two hypotheses that 1) drug abuse and depression are different symptomatic expressions of the same pre-existing neurobiological abnormalities, and/or 2) repeated drug administration leads to neurological changes that have some shared elements with the neurological abnormalities seen in depression [27]. Below, we present more recent evidence surrounding each of the three empirically testable hypotheses for the comorbidity between depression and substance abuse and how they are applied in college student populations

5.1 Self-Medication Hypothesis

The self-medication hypothesis was developed by Edward Khantzian in the 1990s. The main tenet of this idea is that substance addictions function as a compensatory means to self-soothe distressful psychological states [28]. This hypothesis states that substance users suffer intolerable and overwhelming emotions that cannot be controlled without the intervention of psychoactive substances [28]. In this model of substance use, drugs become addictive because they have the power to alleviate, eliminate, or

alter a person's emotional state [28]. The self-medication hypothesis derives originally from clinical observations of patients with substance use disorders – patients regularly reported using different classes of drugs to specifically alter painful affect states [28]. Under this theoretical framework, substances are coping mechanisms that are used to deal with the symptoms of pre-existing mood/anxiety disorders, and then as substance use becomes the primary coping strategy over time, it can develop into an independent, but co-occurring, substance use disorder [29].

The self-medication hypothesis was controversial because it suggested that SUD, which had traditionally been treated as primary to other disorders, may be secondary to psychiatric symptoms [30]. Clinically, the self-medication hypothesis would predict an earlier diagnosis of depression as a precursor to the later development of a SUD. Depression is indeed a well-studied risk factor for later SUD diagnosis in adolescents [31]. The association between depressive symptoms in adolescents and later substance use is moderated by impulsivity; youth who have high levels of depression are more likely to use substances later on, particularly if they are also highly impulsive [32]. However, there is also evidence in the opposite direction supporting the claim that SUD predates the later development of depression which is discussed in the following section.

When applying the self-medication hypothesis to a college student population, prior work has established that those who suffer from mental illness or psychological distress often self-medicate with alcohol or other substances as an inappropriate coping mechanism [33]. The self-medication hypothesis claims that drug preferences may be determined by which symptoms are most pronounced for a specific person at a specific time [28]. College students are likely to misuse prescription as a means of self-medication due to their perceived medical status, safety, purity, and predictable dose dependent response [34]. However, most college students who self-medicate with prescription drugs do so without supervision of a medical professional: they are at high risk for adverse events, such as accidental overdose, suicide, and death [35]. Among college students who identify as heavy drinkers, higher depressive symptoms are associated with more problematic alcohol consumption in the next year, as well as lower self-care, poorer academic performance, and impaired control [36]. In conclusion, there is moderate evidence to support that substance use is a form of self-medication among the college student population dealing with pre-existing psychological disorders such as depression.

5.2 Substance Use Causes Depression in College Students

An alternative theoretical framework to the self-medication hypothesis is that chronic substance use is the cause of psychiatric disorders and symptoms, rather than the effect of pre-existing psychiatric conditions. Prior work has investigated the two most commonly used psychoactive drugs among college students: alcohol and cannabis. Research on the link between cannabis use and the later development of depression is mixed. A 17-year longitudinal study found no evidence of a causal link between adolescent cannabis use and depression during young adulthood [37]. A study evaluating the risk of depression following a stroke found that a diagnosis of alcoholism at any time before the stroke was associated with an increased risk of developing post-stroke depression [38]. Other research found that those diagnosed with alcohol use disorder had a limited capacity to correctly identify affective states in others, which can lead to social deficits and an inability to succeed academically or professionally, both of which are linked to depression [39].

Alcohol is the most common substance of abuse among the college student population [11]. There is sparse literature pointing to alcohol and drug abuse leading to a later depression diagnosis among college students. There is a positive correlation between reported alcohol abuse and self-reported symptoms of depression and other general psychiatric symptoms among college athletes [40]. The same study reported that those with severe symptoms of depression and other psychiatric disorders had a significantly higher rate of alcohol abuse than subjects who had fewer depression symptoms [40]. Epidemiological data reported [41] that there was a modest effect showing that cannabis use in those under 17 years of age is associated with a depression diagnosis at age 17 or older. In a sample of women followed longitudinally from high school to college [42], SUD and depression were frequently comorbidly diagnosed, yet only SUD was associated with a later diagnosis of depression (the data did not support that a depression diagnosis was associated with a later SUD diagnosis). Overall, research relying on this theoretical framework for studying college students has found modest support that chronic substance use leads to a later diagnosis of depression.

5.3 SUD and Depression are behavioral manifestations of a common neurological problem

Lastly, a third theoretical model asserts that depression and substance use disorders are not two independent psychological conditions, but that they are rather symptoms or behavioral manifestations of the same common underlying neurological problem. It is hypothesized that depression and drug dependence are simply different symptomatic expressions of the same neurobiological abnormalities [27]. Clinical evidence shows several commonalities in the neurobiology of the affective symptomatology of both depression and drug dependence. Antidepressant treatments are effective in both improving depressed mood and reducing drug use [27]. This clinical observation supports the hypothesis of common abnormalities for the two disorders. Additionally,

rodent models have shown that medications for depression, specifically a selective serotonin reuptake inhibitor (SSRI), reduces the negative states associated with stimulant withdrawals [43]. Moreover, from an epidemiological perspective, there is a higher degree of comorbidity between depression and drug dependence than would be expected from community rates from these two disorders [27]. A study of adults [44] found that those who experienced adverse childhood events (ACEs) as children were more likely to develop both depression and an SUD as adults, and that the development of depression mediated the link between ACEs and SUD; ACEs were linked to an increased risk of depression, which then increased the risk for SUD. In this framework, we see that the experience of trauma, a third variable, is linked to the later development of co-occurring depression and substance use. Additionally, cross-sectional work in older adults reports that the use of drugs and depressive symptoms exacerbate one another, such that the issue is not necessarily which came first, but how each disorder impacts the other (i.e., continued drug use worsens depressive symptoms, which a person may try to ameliorate via increased drug consumption and so on). Work following those seeking treatment for their addictive behaviors has focused on the role of Alcoholics Anonymous (AA) : higher attendance at AA meetings is concurrently associated with a reduction in drinking and depressive symptoms, although there is evidence that the reduction in drinking is at least partially mediated by the reduction in depressive symptomatology [45]. A recent review paper reported that there is not currently enough research to determine whether or not there is a common neurobiological underpinning that explains comorbid depression and SUD; however, work on the topic has yielded some interesting findings. While there is little research to date to determine the specific neurological deficits that may contribute to both SUD and depression, it is possible that an underlying neuropsychological factor causes the comorbidity of depression and SUD. Future work can help to evaluate the empirical evidence supporting or refuting this hypothesis.

6. POLICY IMPLICATIONS

College counseling is "a professional relationship that empowers individuals, families, and groups to accomplish mental health, wellness, educational, and career-goals" [46]. It is well-documented that there is an increasing complexity of mental health problems accompanied with a greater utilization of counseling services within the college population [2]. Depression is one of the most common mental health issues one college campuses [3]. The current best practices for mental health issues for college students is to seek help from the college counseling center. College counseling services are similar to more traditional mental health counseling; they often include personal counseling for students, workshops focused on prevention and remediation, couples counseling, and structured group therapy [47]. Several standard treatments for depression are provided at college campuses that follow best practices in the medical and mental health fields, such as cognitive behavioral therapy, group counseling, and psychopharmacological interventions. College students who seek depression treatment tend to report higher academic performance based on the association between reductions in depressive symptoms and higher academic performance and likelihood of persisting in college [48]. However, the combination of increased prevalence of mental health issues among college students, the greater utilization of counseling services, and the lack of staffing to meet these needs, counseling centers are either referring students with more serious issues to outside providers or placing students on waitlists for services [49]. Studies report that better outcomes are associated with several key characteristics of counseling services: "in-house" programs (i.e., on the physical college campuses), provision of consistent adequate financial and administrative support [49], the development of reliable partnerships and referral systems with off-campus service providers, and proper staffing of the counseling center [50].

The use of alcohol, traditional and alternative tobacco products, marijuana, and nonprescription drugs remain a serious threat for college students [13]. Additionally, non-medical prescription drug use has been increasing in the last two decades and is particularly prevalent on college campuses [34]. An implication for treatment is to focus on reducing the number of drinking occasions, or reduce the volume of alcohol consumed while drinking, rather than focusing on abstinence. Some colleges have utilized a web-based alcohol intervention program, serving as an effective screening tool to provide information about alcohol and health risk factors [51]. At a 30-day follow-up, a study shows [51] that students who received an online intervention program reported a reduction in the number of binge drinking episodes and alcohol problems. Other work has found that mass media campaigns can be effective in correcting the misconceptions of the college drinking norm and reducing on-campus alcohol consumption [52]. Also, colleges can implement methods for restricting access to alcohol and alter the culture of college drinking [52].

SUD (e.g., clinically impaired substance use) is prevalent among college students and often comorbid with mood disorders [21]. Two in five college students meet DSM-5 criteria for a SUD, and among those that do, only 1-2% are expected to achieve long term abstinence or remission [13]. This number is dismal: however, there is an alternative to treating SUD on college campuses (and elsewhere) with a binary system of abstinence versus failure. Harm reduction measures are aimed at reducing the negative harms associated with behaviors, such as substance use. Examples of harm reduction measures for college student drinking emphasize the importance of using protective behavioral strategies (PBS), such as alternating alcoholic and non-alcoholic drinks, using designated drivers, or avoiding drinking games that are designed to promote rapid intoxication [53]. This distinction is important, as students who utilize PBS are at lower risk of experiencing the negative harms associated with drinking and other drug

behaviors, such as injury, and are long-term at lower risk for problematic alcohol use [54].

Since the notion of SUD is best conceptualized as a chronic illness, the concept of "Recovery Programs" guides SUD services. A more recent form of treatment for SUD on college campuses are on campus sober living or recovery programs. One example of such a program is called The Haven, which offers weekly randomized drug and alcohol testing with lab analysis, frequent one-on-one meetings with clinical addiction counselors, and coordination with independent treatment providers, and all these services help current students to seek long term treatment for their SUD. The program allows students experiencing SUD to sustain their recovery progress without being forced to postpone or give up on their educational goals [55].

Currently, college students do not have adequate access to efficacious mental health care for substance use disorder. Students who experience depression or start substance use during early ages in college appear to have a more severe course of illness [25]. Common screening measures could offer relatively quick and reliable clinical information regarding the presence of a potential substance use disorder [56]. Currently, colleges seem to offer very few intensive treatment programs for students with SUD; there are two primary current practices that have been empirically validated. One is to periodically screen students for SUD symptoms, and the second is to integrate college recovery communities into "sober" on-campus housing, as discussed above. Early identification and thorough assessments of college students with mental health problems and substance use are critical in order to provide adequate services and to ensure better outcomes, such as graduation [25]. Some students who experience problems related to depression and substance use are not using readily available college treatment services, and the lack of engagement in these services could negatively affect academic performance, matriculation, and missed opportunities to prevent disorder progression [21]. When college students have been diagnosed with comorbid SUD and depression, students are more willing to receive treatment for emotional problems than for alcohol problems [21]. Research has found that when some colleges provide a telephone offer for a free on-campus clinic appointment, few students are interested in receiving treatment for alcohol use problems, but more are interested in an appointment for emotional problems [21]. Overall, utilizing depression treatment may be a viable way to increase treatment seeking rates in hazardous drinking college students [21].

Colleges essentially have three choices when treating students who present with comorbid SUD and depression: 1) they can treat the depression first, and the SUD second (or never if symptoms dissipate upon treatment completion for depression), 2) they can treat the SUD first, and depression second (or never, if symptoms dissipate upon treatment completion for SUD), or 3) can treat both disorders simultaneously in one therapeutic model. These three pathways align with the theoretical etiological models of comorbid depression and SUD, such that if depression is believed to cause SUD, a person would best be treated with the first option in which they receive treatment for depression, and SUD symptoms are in turn mitigated due to the reduction in depressive symptomatology. If it is believed that SUD causes depression, then it follows that treating the SUD first may mitigate the depressive symptoms, reducing or eliminating the need for future depression treatment. Third, if depression and SUD are considered to be two co-occurring manifestations of the same underlying problem, then simultaneous treatment of both disorders would be the best-fitting clinical model for that theoretical model. It is difficult to establish which treatment model a given school should utilize given the evidence in favor of each competing theory: it is entirely possible that the etiology of comorbid depression and SUD is different for different individuals. In that case, each of these three theoretical models may apply to different clinical presentations of the disorders. The following is speculative; the data on treatment-seeking behavior in college students does report that students are more likely to seek care for mood disorder symptoms than substance use, so a reasonable course of action may be to screen students who present to the clinic with mood disorder symptoms for SUD symptomology and combine treatment for SUD and depression as needed on a case-by-case basis. In order to achieve this, many schools would need to adapt their "zero-tolerance" policies for alcohol and drugs in order to give treatment, rather than sanctions, to students with drug and alcohol use problems.

7. CONCLUSION

There is a high prevalence of comorbid depression and substance use in the college student population. The negative impacts on college students include poor academic performance, self-harm, and suicide. We presented three distinct psychological theories to explain the comorbidity of depression and SUD, including self-medication hypothesis, chronic substance use causes depression, and that each disorder is a unique behavioral manifestation of a common neurological problem. There is no reason to believe that comorbid rates SUD and depression will decrease anytime soon, and we need to treat them concurrently rather than separating treatment for each one. College campuses need to provide adequate access to mental health care for substance use disorder and depression. Also, students with depression and SUD are not fully utilizing college treatment services, which is associated with negative effects on academic performance, as well as progression of the disorders. Overall, there is an association between substance use and depression, and the comorbidity of these two psychiatric conditions compound the negative impacts on college students. There are ways to treat these comorbid conditions with some efficacy as compared to no treatment or independent/concurrent treatment; college campuses should aim to follow the guidelines set forth by researchers. Programs should be "in-house" on campuses, staffed appropriately, be

accessible to students, offer privacy (e.g., be combined with other health services so that students seen in the treatment area are not "outed"), and more screening tools should be utilized to identify high-risk students who may need services. The effective treatment of comorbid diagnoses among college students is imperative to the well-being of students and their collegiate environment.

REFERENCES

[1] P. M. O'Malley and L. D. Johnston, Epidemiology of alcohol and other drug use among American college students, Studies on Alcohol Supplement, Alcohol Research Documentation, 63(2), 2002, pp. 23–40.

[2] S. K. Lipson, E. G. Lattie and D. Eisenberg, Increased Rates of Mental Health Service Utilization by U.S. College Students: 10-Year Population-Level Trends (2007–2017), Psychiatric Services, American Psychiatric Association, 70(1), 2019, pp. 60–63. DOI: 10.1176/appi.ps.201800332.

[3] A. K. Ibrahim, et al., A systematic review of studies of depression prevalence in university students, Psychiatric Research, Elsevier, 2013, pp. 391–400. DOI: 10.1016/j.jpsychires.2012.11.015.

[4] R. Beiter, et al., The prevalence and correlates of depression, anxiety, and stress in a sample of college students, 2014. DOI: 10.1016/j.jad.2014.10.054.

[5] S. R. Furr, et al., Suicide and depression among college students: A decade later, Professional Psychology: Research and Practice, American Psychological Association, 32(1), 2001, pp. 97–100. DOI: 10.1037/0735-7028.32.1.97.

[6] R. P. Gallagher, National Survey of College Counseling Centers 2013, Section One: 4-Year Directors, The International Association of Counseling Services (IACS), 2014.

[7] C. Saravanan and R. Wilks, 'Medical Students' Experience of and Reaction to Stress: The Role of Depression and Anxiety, 2014. DOI: 10.1155/2014/737382.

[8] V. M. DeRoma, J. B. Leach and J. P. Leverett, The relationship between depression and college academic performance, College Student Journal, Project Innovation (Alabama), 43(2), 2009, pp. 325–335.

[9] S. O'Keeffe, et al., Predicting dropout in adolescents receiving therapy for depression, Psychotherapy Research, Routledge, 28(5), 2018, pp. 708–721. DOI: 10.1080/10503307.2017.1393576.

[10] D. Eisenberg and J. L. Hefner, Prevalence and Correlates of Depression, Anxiety and Suicidality Among University Students, Article in American Journal of Orthopsychiatry, 2007. DOI: 10.1037/0002-9432.77.4.534.

[11] H. Wechsler, et al., Trends in college binge drinking during a period of increased prevention efforts: Findings from 4 Harvard school of public health college alcohol study surveys: 1993–2001', the American College Health Association, Taylor & Francis Group, 50(5), 2002, pp. 203–217. DOI: 10.1080/07448480209595713.

[12] K. S. DeMartini, L. M. Fucito and S. S. O'Malley, Novel Approaches to Individual Alcohol Interventions for Heavy Drinking College Students and Young Adults, Current Addiction Reports, Springer, 2015, pp. 47–57. DOI: 10.1007/s40429-015-0043-1.

[13] B. J. Arterberry, et al., DSM-5 substance use disorders among college-age young adults in the United States: Prevalence, remission and treatment, American College Health. Routledge, 2019. DOI: 10.1080/07448481.2019.1590368.

[14] V. M. Gonzalez, B. Reynolds and M. C. Skewes, Role of impulsivity in the relationship between depression and alcohol problems among emerging adult college drinkers, Experimental and Clinical Psychopharmacology, 2011. DOI: 10.1037/a0022720.

[15] S. H. Kollins, Delay discounting is associated with substance use in college students, Addictive Behaviors, 2003, DOI: 10.1016/S0306-4603(02)00220-4.

[16] M. J. Paschall and R. L. Flewelling, Postsecondary education and heavy drinking by young adults: The moderating effect of race, Studies on Alcohol, Alcohol Research Documentation, 63(4), 2002, pp. 447–455. DOI: 10.15288/jsa.2002.63.447.

[17] T. Mekonen, et al., Substance Use as a Strong Predictor of Poor Academic Achievement among University Students, Psychiatry Journal, Hindawi Limited, 2017, pp. 1–9. DOI: 10.1155/2017/7517450.

[18] P. Valkov, School dropout and substance use: Consequence or predictor? Trakia Journal of Science, Trakia University, 16(2), 2018, pp. 95–101. DOI: 10.15547/tjs.2018.02.004.

[19] K. S. Walters, et al., Substance Use, Anxiety, and Depressive Symptoms Among College Students, Journal of Child and Adolescent Substance Abuse, Routledge, 27(2), 2018, pp. 103–111. DOI:

10.1080/1067828X.2017.1420507.

[20] J. D. Swendsen and K. R. Merikangas, The comorbidity of depression and substance use disorders, Clinical Psychology Review, Elsevier, 20(2), 2000, pp. 173–189. DOI: 10.1016/S0272-7358(99)00026-4.

[21] D. W. Capron, et al., Treatment Seeking among College Students with Comorbid Hazardous Drinking and Elevated Mood/Anxiety Symptoms, Substance Use and Misuse, Taylor and Francis Ltd, 53(6), 2018, pp. 1041–1050. DOI: 10.1080/10826084.2017.1392982.

[22] L. L. Davis, et al., Substance Use Disorder Comorbidity in Major Depressive Disorder: A Confirmatory Analysis of the STAR*D Cohort, American Journal on Addictions, John Wiley & Sons, 15(4), 2006, pp. 278–285. DOI: 10.1080/10550490600754317.

[23] P. Pedrelli, et al., Gender differences in the relationships among major depressive disorder, heavy alcohol use, and mental health treatment engagement among college students, Studies on Alcohol and Drugs, 2016. DOI: 10.15288/jsad.2016.77.620.

[24] D. I. Lubman, et al., The impact of co-occurring mood and anxiety disorders among substance-abusing youth, 2007, DOI: 10.1016/j.jad.2007.01.011.

[25] P. Pedrelli, et al., College students: Mental health problems and treatment considerations, Academic Psychiatry, Springer, New York, 2015, pp. 503–511. DOI: 10.1007/s40596-014-0205-9.

[26] B. L. Greenfield, et al., The impact of depression on abstinence self-efficacy and substance use outcomes among emerging adults in residential treatment', Psychology of Addictive Behaviors, NIH Public Access, 26(2), 2012, pp. 246–254. DOI: 10.1037/a0026917.

[27] A. Markou, T. R. Kosten and G. F. Koob, Neurobiological Similarities in Depression and Drug Dependence: A Self-Medication Hypothesis, Neuropsychopharmacology, 1998.

[28] E. J. Khantzian, The Self-Medication Hypothesis of Substance Use Disorders: A Reconsideration and Recent Applications, Harvard Review of Psychiatry, 4(5), 1997, pp. 231–244. DOI: 10.3109/10673229709030550.

[29] S. Turner, et al., Self-medication with alcohol or drugs for mood and anxiety disorders: A narrative review of the epidemiological literature, Depression and Anxiety, Blackwell Publishing, 35(9), 2018, pp. 851–860. DOI: 10.1002/da.22771.

[30] A. W. Blume, Schmaling, K. B. and Marlatt, G. A., Revisiting the self-medication hypothesis from a behavioral perspective, Cognitive and Behavioral Practice, Association for Advancement of Behavior Therapy, 7(4), 2000, pp. 379–384. DOI: 10.1016/S1077-7229(00)80048-6.

[31] M. A. Diego, T. M. Field and C. E. Sanders, Academic performance, popularity, and depression predict adolescent substance use, Adolescence, 2003.

[32] J. W. Felton, et al., Impulsivity Moderates the Relat ion between Depressive Symptoms and Substance Use a cross Adolescence, Clinical Child and Adolescent Psych ology, 2020. DOI: 10.1080/15374416.2018.1537189.

[33] J. A. Ford, and R. D. Schroeder, Academic strain a nd non-medical use of prescription stimulants among col lege students, Deviant Behavior, Taylor & Francis Grou p, 2009, pp. 26–53. DOI: 10.1080/01639620802049900.

[34] R. A. Friedman, The changing face of teenage drug abuse - The trend toward prescription drugs, New England Journal of Medicine. Massachusetts Medical Society, 2006, pp. 1448–1450. DOI: 10.1056/NEJMp068010.

[35] K. J. Zullig and A. L. Divin, The association between non-medical prescription drug use, depressive symptoms, and suicidality among college students, Addictive Behaviors, Pergamon, 37(8), 2012, pp. 890–899. DOI: 10.1016/j.addbeh.2012.02.008.

[36] S. F. Acuff, et al., Depressive symptoms as predictors of alcohol problem domains and reinforcement among heavy drinking college students, Psychology of Addictive Behaviors, 2018. DOI: 10.1037/adb0000397.

[37] V. S. Harder, E. A. Stuart and J. C. Anthony, Adolescent cannabis problems and young adult depression: Male-female stratified propensity score analyses, American Journal of Epidemiology, Oxford Academic, 168(6), 2008, pp. 592–601. DOI: 10.1093/aje/kwn184.

[38] H. Naess, et al., Mild depression in young adults with cerebral infarction at long-term follow-up: A population-based study, European Journal of Neurology, 2005. DOI: 10.1111/j.1468-1331.2004.00937.x.

[39] M. Monnot, et al., Altered emotional perception in alcoholics: Deficits in affective prosody comprehension, Alcoholism: Clinical and Experimental Research, 2001. DOI: 10.1111/j.1530-0277.2001.tb02222.x.

[40] B. E. Miller, et al., Alcohol misuse among college athletes: Self-medication for psychiatric symptoms?, Drug Education, 2002. DOI: 10.2190/JDFM-AVAK-G9FV-0MYY.

[41] R. De Graaf, *et al.*, Early cannabis use and estimated risk of later onset of depression spells: Epidemiologic evidence from the population-based world health organization world mental health survey initiative, American Journal of Epidemiology, 2010, DOI: 10.1093/aje/kwq096.

[42] U. Rao, S. E.Daley and C. Hammen, Relationship between depression and substance use disorders in adolescent women during the transition to adulthood, the American Academy of Child and Adolescent Psychiatry, 2000. DOI: 10.1097/00004583-200002000-00022.

[43] A. Markou and P. J. Kenny, Neuroadaptations to chronic exposure to drugs of abuse: Relevance to depressive symptomatology seen across psychiatric diagnostic categories, Neurotoxicity Research, 2002. DOI: 10.1080/10298420290023963.

[44] Y. Kim, et al., Adverse childhood experience patterns, major depressive disorder, and substance use disorder in older adults, Aging and Mental Health, 2019. DOI: 10.1080/13607863.2019.1693974.

[45] J. F. Kelly, et al., Mechanisms of behavior change in alcoholics anonymous: Does Alcoholics Anonymous lead to better alcohol use outcomes by reducing depression symptoms?, Addiction, 2010, DOI: 10.1111/j.1360-0443.2009.02820.x.

[46] D. M. Kaplan, V. M. Tarvydas and S. T. Gladding, 20/20: A Vision for the Future of Counseling: The New Consensus Definition of Counseling, Counseling & Development, Wiley Blackwell, 92(3), 2014, pp. 366–372. DOI: 10.1002/j.1556-6676.2014.00164.x.

[47] D. R. Reetz, B. Krylowicz and B. Mistler, The AUCCCD Annual Survey and Report Overview, 2013.

[48] J. A. Cranford, D. Eisenberg and A. M. Serras, Substance use behaviors, mental health problems, and use of mental health services in a probability sample of college students, Addictive Behaviors, 2009. DOI: 10.1016/j.addbeh.2008.09.004.

[49] J. L. Brunner, et al., College Counseling Today: Contemporary Students and How Counseling Centers Meet Their Needs, College Student Psychotherapy, Routledge, 28(4), 2014, pp. 257–324. DOI: 10.1080/87568225.2014.948770.

[50] J. A. Hardy, et al., Meeting the demand for college student concerns in college counseling centers: Evaluating a clinical triage system, College Student Psychotherapy, Taylor & Francis Group, 25(3), 2011, pp. 220–240. DOI: 10.1080/87568225.2011.581929.

[51] S. T. Walters and C. Neighbors, Feedback intervent ions for college alcohol misuse: What, why and for who m?, Addictive Behaviors, Elsevier Ltd, 30(6), 2005, pp. 1168–1182. DOI: 10.1016/j.addbeh.2004.12.005.

[52] B. Borsari, J. G. Murphy and N. P. Barnett, Predictors of alcohol use during the first year of college: Implications for prevention', Addictive Behaviors, NIH Public Access, 32(10), 2007, pp. 2062–2086. DOI: 10.1016/j.addbeh.2007.01.017.

[53] M. P. Martens, et al., Measuring Alcohol-Related Protective Behavioral Strategies Among College Students: Further Examination of the Protective Behavioral Strategies Scale, Psychology of Addictive Behaviors, 21(3), 2007, pp. 307–315. DOI: 10.1037/0893-164X.21.3.307.

[54] V. S. Grazioli, et al., Alcohol expectancies and alcohol outcomes: Effects of the use of protective behavioral strategies, Studies on Alcohol and Drugs, 2015. DOI: 10.15288/jsad.2015.76.452.

[55] K. S. Harris, et al., Achieving systems-based sustained recovery: A comprehensive model for collegiate recovery communities, Groups in Addiction and Recovery, Taylor & Francis Group, 2(2–4), 2008, pp. 220–237. DOI: 10.1080/15560350802080951.

[56] B. G. Bergman, et al., "The Age of Feeling in-Between": Addressing Challenges in the Treatment of Emerging Adults With Substance Use Disorders, Cognitive and Behavioral Practice, Elsevier, 23(3), 2016, pp. 270–288. DOI: 10.1016/j.cbpra.2015.09.008.