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RESEARCH ARTICLE

Effects of Differential Stress and Mental Health on Self-Perceived Substance Use Problems among College Students

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Abstract
Substance use among college students is often seen as a coping mechanism for some students who are prone to extreme stress, depression, or anxiety. Multiple forms of stress become the leading factors that are significant predictors of substance use. This study tests the effects of college stressors, depression, and anxiety on substance use among college students. The results are based on the data that were collected using a 101-item questionnaire administered to 302 college students at a public university in the Midwest U.S.A. Using Logistic Regression as the primary data analysis technique, the findings of this study show that social stressors and time management stressors are the most significant predictors associated with substance use among college students. On the other hand, students scored very low on both depression and anxiety scales. These findings suggest that, in this context, depression and anxiety were not significant predictors associated with substance use among college students.

Keywords: substance use, college stress, anxiety, depression.

INTRODUCTION

College is often a stressful time for many students. Being away from home and taking responsibly for their well-being can be stressful and, at the same time, a source of anxiety and even depression. Additionally, the expectation to do well in academia, the competitive nature of academia, coupled with high performance demands and fear of failure, can create a chronic state of psychological distress (Beiter, Nash, McCrady, et al., 2015; Pascoe, Hetrick, & Parker, 2020). Because of the interaction effects that stress, anxiety, and depression have on each other, students who are affected by these factors – those with poor coping mechanisms especially – could turn to substances use such as smoking marijuana, drinking alcohol, or using illicit drugs (Sun, Buys, Stewart, & Shum, 2011; Voelker, 2004; Mahmoud, Staten, Hall, & Lennie, 2012; Pettit & DeBarr, 2011; Rice, & Van Arsdale, 2010; Baghurst & Kelley, 2015; Beiter, Nash, McCrady, Rhoades, et al., 2015). Moreover, research shows that the most commonly used substances that are found on college campuses are alcohol and gateway drugs such as marijuana, followed by tobacco and then other hardcore illicit drugs (Rimsza & Moses, 2005). Prescription medication, cocaine, heroin, and LSD are the second category of drugs used by college students but not nearly comparable to the use of alcohol and marijuana. It is noteworthy that substance abuse does not include cases involving a single event where a college student experiments with alcohol for a single night or one-time use of marijuana. Substance abuse refers to the chronic use of alcohol, drugs, smoking, etc. resulting from some form of addiction (American Psychiatric Association, 2013; Kaminer & Winters, 2011; Volkow, Koob, & McLellan, 2016). This refers to instances where a student feels they cannot function without a certain substance and they continue to drink alcohol or use illicit drugs to "get high" multiple times a week, despite negative consequences to one's health and social life. For the purpose of this study, substance use is defined as continuous use or dependency on addictive substances such as drugs, alcohol, chewing tobacco or smoking, as self-perceived by students based on their own assessment of weather such use constitutes a problem in their lives.

Statistically, the prevalence of substance use among college students remains alarmingly high (Schulenberg, Patrick, Johnson, et al., 2021). It is estimated that more than one-third of college students have some type of substance use problems (Batts, 2015; Knight, Wechstler, Seibring, et al., 2002; Arria, Caldeira, Bugbee, et al., 2013; Schulenbert et al., 2021). Consequentially, substance use is frequently associated with the emergence of negative thought patterns, maladaptive behaviors, and actions (Swicher, Shute, & Bibeau, 2018; Dyer, Easey, Heron, et al., 2019; Levy

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& Williams, 2018). The negative consequences of substance use (i.e., use of alcohol, marijuana, etc.) may lead to interpersonal problems, mental health issues, and in some worst-case scenarios, it could result in potential death (White & Hingson, 2013; Cranford, Eisenbert, & Serras, 2009; Hingson, Heeren, Zakocs, et al., 2002; Oster-Aaland, Lewis, neighbors, et. al., 2009). Furthermore, research shows that alcohol and illicit drugs often cause people to think negatively about themselves and certain types of situations, which may lead to stress, depression, and anxiety (Allen, 1995; Mason, Kosterman, Haggerty, et al., 2008). Building on this existing literature, the current study, thus, focuses on examining the associative effects of stress, depression, and anxiety on substance use among college students.

College Stress

College stress is a multifaceted emotional strain (Li, Yang, Zhou, et al., 2022; Barbayannis, Bandair, Zheng, et al., 2022). In many cases, students face a combined number of stressors that include all areas of their lives. Academia, finances, time management, social, and familial stressors are among those categories of stress that are present among most college students (Avdija, 2018). For college freshmen, familial stressors are more pronounced than other forms of stressors (Avdija, 2023; 2018). Nonetheless, all forms of stress can be toxic if poorly managed. Family-related stress can be manifested in the form of broken quality of relationships between the family and the student, which correlates with emotional stress (Yazedjian, Toews, & Navarro, 2009; Putwain, Woods, & Symes, 2010). In other words, a good quality relationship between the family and the student acts as a stress-reducing factor (Anders, 2011), which can help eliminate one of many stressors that students experience in college. However, college stress extends well beyond family-related stress. Most university programs are academically demanding and mandate students to participate in volunteer hours, extra-curricular activities, and heavy coursework. Many college students work part-time or full-time jobs, adding to their class-work requirements and this, in turn, can cause time-management problems, among other things. Extensive exposure to academic, social, and extracurricular involvement required of college students may also lead to elevated levels of stress among students and many of them turn to substance use, as a coping mechanism to escape this college life reality (Lofgran, 2019; Sinha, 2001; Misra & McKean, 2000).

According to Ford and Arrastia (2008), college environment is a relative factor for increased substance use, especially as it relates to alcoholic beverage consumption (e.g., binge drinking in particular). Students tend to use alcohol and recreational drugs to help calm down and chill out after a demanding week. However, other substance use efforts relate to stress as well. Many students misuse prescription drugs to gain a competitive frame among their peers and continue to perform at a more satisfactory level (Arria & DuPont, 2010). Some studies have suggested that as many as one in five students admits to having used prescription medications inappropriately (as cited in Watkins, 2016; see DeSantis, Webb, & Noar, 2008; McCabe et al., 2005). Among college-age students, many of the most commonly misused prescription drugs are referred to as "study drugs," which are used to decrease stress by promoting awareness and increasing cognitive recital. Students often rely on these substances to make them "get into the zone" (Susman, Pentz, Spruijt-Metz, & Miller, 2006; Teter, McCable, LaGrange, et. al., 2006; Watkins, 2016). The reality is that by using those drugs as a means of reducing stress or increasing cognitive performance, students increase the probability of developing dependency or addition (Johnston et al., 2007 Lakhan & Kirchgessner, 2012; Teter, McCabe, Cranford, et al., 2006; Weyandt, Oster, Marraccini, et al., 2013).

Depression and Anxiety as the Stress-Response States

Depression is known as "one of the key stress-response states that leads to emotional exhaustion" (Avdija, 2013, p. 2). Among college students, depression is considered a contributing factor to substance use, as students may turn to drugs as a coping mechanism to manage emotional distress and negative mood states (Cranford et al., 2009; Gulec, Kilic, Ozturk, et al., 2021). It should be noted, however, that research studies in this area have produced mixed results. Generally speaking, students who exhibit poor physical and mental health are more likely to engage in substance use and alcohol consumption (Ford & Arrastia, 2008; Gulec at al., 2021; Eisenbert, Golberstein, & Gollust, 2007). On the other hand, there are studies that have concluded that only a small percentage of students with depression or suicidal thoughts receive any form of psychiatric intervention (Garlow, Rosenberg, Moore, et al., 2008; Lipson, Gaddis, Heinze, et al., 2016). This creates an issue because many students abuse drugs to cope with the depression often resulting in the misuse of prescription medications (Maier, Liechti, Herzig, & Schaub, 2013). The misuse of these types of drugs can have severe consequences due to side-effects (Oberleitner, Tzilos, Zumberg, & Grekin, 2011). One of the side-effects of this type of misuse is suicidal thoughts and even suicide, which is considered the second most common cause of death among college-age adults (Turner, Leno, & Keller, 2013; Kurt, 2015). Further, it is estimated that as many as one out of ten college students considers suicide at some point during college years (as cited in Kurt, 2015), and according to the American College Health Association (2012), more than six percent of students seriously considered thinking about committing suicide. To better understand the severity of this problem, it is important to note that a student's mental health declines with drug and alcohol use. In short, these studies show that there is a direct relationship between drug use and depression. Thus, suicide risk/depression increases among students who use or misuse drugs (Turner, Lynch, & Ma, 2018; Kurt, 2015). It should be noted, however, that depression and anxiety can also occur as the result of withdrawal from substance use (Koychev & Ebmeier, 2015). So, in cases in which substance use comes first, depression and anxiety are the manifestation effects of withdrawal from substance use and not necessarily the cause of substance use (Brady & Sinha, 2005; Schuckit, 2006; Volkow et al., 2016).

Depression, as a mental disorder, is closely related to anxiety (Kessler, Chiu, Demler et al., 2005; Wittchen, 2002; Etkin & Wager, 2007). Often depression and anxiety are not mutually exclusive and can co-exist in many individuals. Similar to depression-related mental disorder, the anxiety-related mental disorder often goes undiagnosed as well (Koychev & Ebmeier, 2015; Garlow; et al., 2008). It is not a surprise for college students to start using prescription drugs to combat anxiety or depression, and in that process, they become addicted to those very same prescription drugs. The use of prescription drugs then acts as a facilitator and increases the use of alcohol consumption, marijuana, and other illicit drugs (Arria, Caldeira, Kasperski, et al., 2011). Interestingly enough, many students state that they use alcohol to combat anxiety and then use prescription drugs to combat the effects of the alcohol (Ham, Zamboanga,

Bacon, et al., 2008; Watkins, 2016). This produces a tautological effect that ultimately leads to addiction.

Another aspect of anxiety that may not directly relate to stress of the academic demands associated with attending college is social anxiety (SA). Being grouped in a small community of college-age students may invoke social anxiety among many students who fear peer scrutiny (Lesure-Lester, 2001; Buckner et al., 2012). There is evidence to support the notion that alcohol consumption reduces subjective experiences related to social anxiety (Book & Randall, 2002; Buckner et al., 2012; Ham et al., 2008). However, one study suggests that approximately half of their sample reported feeling embarrassed due to their involvement with drug or alcohol in some form (Palmer, McaMahon, Moreggi et al., 2012). Still, many students view drug use as an adaptive coping mechanism to manage their anxiety (Buckner et al., 2012).

The Present Study

This study has two objectives. The first objective is to examine the effects of stress on substance use among college students, by examining five unique types of college stressors, measured with composite measures. The second objective is to examine the effects of depression and anxiety on substance use among college students, while controlling for the effects of demographic variables such as age, gender, race, class standing, and employment status. This study has been approved by the Institutional Review Board (IRB).

MATERIALS AND METHODS

Dependent Variable (the Effect)

The dependent variable in this study is substance use among college students. This includes anything that is considered illegal and illicit, ranging from alcohol use to illicit drugs – measured as a self-perceived problem by students. In this study, this variable was measured dichotomously with *Yes*|*No* binary response categories, coded 0 for *No* and 1 for *Yes*. The current study measured substance use from a self-reported questionnaire that was administered to 302 college students as part of a larger study on college stress. Respondents were asked to indicate whether or not they have problems with substance use. Student responses were collected anonymously, and participants voluntarily disclosed any self-perceived problems with substance use issues.

Although self-reported measures are commonly used in college and university research, and are generally preferable to administrative data -- which capture only incidents formally reported to authorities and therefore underestimate typical substance use -- we acknowledge the use of a single-item measure represents a limitation of this study. A single dichotomous item does not capture the frequency, severity, or type of substance use, nor does it allow for differentiation across substances. As a result, the measure may oversimplify a complex behavior and limit the depth and precision of the findings.

Despite this limitation, the self-reported measure used in the current study offers meaningful strengths. Self-report data are widely regarded as an effective approach for assessing substance use among college students because they capture behaviors that may not be documented through official channels. By including all students rather than only those with reported incidents, this approach provides a broader and more inclusive representation of substance use within the university population; thus, allowing for the identification of students who perceive substance use as a problem. This measure is therefore suited to the study's broader objective of examining associations of factors related to substance use, and it offers a useful foundation for future research employing more detailed, multi-item assessments.

Independent Variables (the Cause)

The main independent variables in this study include differential college stress, depression, and anxiety. Demographic variables (e.g., age, gender, race, marital status, class standing, and employment) are primarily used as control variables. College stress, the main predictor of substance use in this study, is a multilayered and a very complex variable. As a construct, college stress has five core dimensions: 1) financial-related stress, 2) time management-related stress, 3) social stress, 4) academic stress, and 5) family-related stress. In this study, college stress was measured using Avdija's (2018) *Perceived Stress Inventory* (PSI). The PSI has a total of 48 items, with five sub-scales, measuring the above five types of college stress. As outlined in Table 1 below, financial-related stress was measured using a 7-item scale (with Cronbach's Alpha = .89), time management-related stress was measured using a 9-item scale (with Cronbach's alpha = .87), social stress was measured using a 12-item scale (with Cronbach's Alpha = .82), academic stress was measured using a 13-item scale (with Cronbach's Alpha = .90), and family-related stress was measured using a 7-item scale with Cronbach's Alpha = .73. The responses on the stress scales were measured using a 10-point Likert scale, ranging from 0 (*No stress*) to 10 (*High stress*).

The next two independent variables in this study are depression and anxiety. Depression was measured using the Patient Health Questionnaire–8 (PHQ-8), an 8-item self-report measure developed by Kroenke, Strine, Spitzer, Williams, Berry, and Mokdad (2009). The PHQ-8 is widely used in both clinical and research settings to evaluate the frequency of depressive symptoms. Each item reflects a core symptom of depression, such as loss of interest, low mood, or fatigue, etc. Responses were recorded on a 4-point Likert-type scale ranging from 0 (*Not at all*) to 3 (*Every day*). Item scores were summed to produce a total depression score ranging from 0 to 24, with higher scores indicating greater severity of depressive symptoms.

Anxiety was measured using the Beck Anxiety Inventory (BAI), a 21-item self-report instrument developed by Beck and Steer (1990). The BAI is designed to assess the severity of common anxiety symptoms, with an emphasis on physiological and cognitive manifestations of anxiety, such as nervousness, fear, somatic tension, etc. Participants rated the extent to which they were bothered by each symptom on a 4-point Likert scale ranging from 0 (*Not at all*) to 3 (*Severely*). Total scores were calculated by summing all items, yielding a possible range of 0 to 63, with higher scores representing greater levels of anxiety.

Control Variables

As mentioned above, this study includes several self-reported control variables – mainly demographic variables. Control variables include included in the analysis are gender (coded 1= *Male*, 0 = *Female*), race (coded 1 = *Whites*, 0 = *Non-whites*), marital status (coded 1= *Married*, 0 = *Single/Divorce/Separated*), and employment status (coded 1= *Employed*, 0= *Unemployed*). Additionally, class standing

was measured at the ordinal level (coded 1 = *Freshmen*, 2 = *Sophomore*, 3 = *Junior*, and 4 = *Senior*) and age was measured in years.

Participants

The analyses in this study are based on the data that were collected from a sample of 302 university students using a convenience sampling method. Of the 302 students who participated of this study, 6.6% were freshmen, 28.8% were sophomores, 39.1% juniors, and 25.5% seniors. The participants ranged in age from 18 to 49 years old. However, the majority of them were between the ages of 18 and 22 years old (89.7%, *M* = 21.2, *SD* = 3.03). In terms of gender, 44.7% (n = 135) were females and 55.3% (n = 166) were males, which is a fairly representative male/female ratio of all college students at the university. The racial composition of the sample is also a good representation of the university students from which the data came from. The university has approximately 8,000 students total. The descriptive statistics show that 70.2% of the participants were whites, 15.9% African Americans, 4% Hispanic/Latinos, 2.3% Asians, and the rest were other races (7.4%). Race was re-coded into a dichotomous variable with only two categories (Whites 70.2%, coded 1, Non-whites, 29.5% coded 0, with .3% missing cases).

Table 1. Descriptive statistics for all variables included in the analysis of substance use

Independent Variables	Description	Min	Max	Mean	S.D.
Financial stress	7-item scale; Alpha = .89 No stress, *coded 0* ..... High stress, *coded 10*	0	70	40.11	17.38
Time management stress	9-item scale; Alpha = .87 No stress, *coded 0* ..... High stress, *coded 10*	0	90	34.85	17.93
Social stress	12-item scale; Alpha = .82 No stress, *coded 0* ..... High stress, *coded 10*	0	110	23.66	16.88
Academic stress	13-item scale; Alpha = .90 No stress, *coded 0* ..... High stress, *coded 10*	0	130	52.34	26.63
Family stress	7-item scale; Alpha = .73 No stress, *coded 0* ..... High stress, *coded 10*	0	70	17.33	12.64
Depression	8-item scale; Alpha = .88, Likert scale range: Not at all, *coded 0*.....Every day, *coded 3*	0	24	7.13	5.49
Anxiety	21-item scale; Alpha = .93 Not at all, *coded 0*..... Severely, *coded 3*	0	63	11.89	11.62
Control Variables					
Age	Age measured in continuous years	18	49	21.22	3.037
Gender	44.7% were Females (*coded 0*) 55% were Males (*coded 1*)	0	1	.55	.498
Race	29.5% non-whites (*coded 0*) 70.2% whites (*coded 1*)	0	1	.70	.457
Marital status	95.7% single/divorced/other (*coded 0*) 4% married (*coded 1*)	0	1	.04	.196
Class standing	Freshman (*coded 1*).....Senior (*coded 4*)	1	4	2.83	.885
Employment	33.4% Unemployed (*coded 0*) 66.6% Employed (*coded 1*)	0	1	.67	.473
Dependent Variable					
Substance use	Binary Variable: Yes (*coded 1*) No (*coded 0*)	0	1	.24	.427

Note: This table outlines how the variables are coded and measured. Min stands for the minimum score on the scale. Max stands for the maximum score on the scale. S.D. stands for the Standard Deviation.

RESULTS OF STUDY

To establish the magnitude of substance use problems among college students, Table 2 presents the results of simple frequency analysis, including the mean score and the standard deviation score of the total number of students who self-reported perceived problems they have with substance use. The data in Table 2 show that 23.8% (n=72) of students self-reported having problems with substance use in college (*M* = .24, *SD* = .427), which averages one out of every four students.

Table 3 presents the results from the multivariate logistic regression analyses; regressing the dependent variable on the measures of college stress, depression, and anxiety, while controlling for the effects of demographic variables (e.g., age, gender, marital status, class standing, and employment status). The analyses in this table include three regression models that were created in the hierarchical steps of binary regression. All three models were statistically significant, indicating that one or more of the variables in each model significantly contributing toward predicting self-perceived substance use as a problem among college students. Model 1 and Model 2 include five and seven variables, respectively, that measure college stress, depression, and anxiety. Model 3 includes all of the variables of interest and the control variables. The data in Table 3 show that in this thirteen-variable model, three variables significantly contributed to substance use; namely the time management stress, b=.022, OR = 1.023, p < 05, 95% CI [1.01, 1.05], the social stress, b=.040, OR = 1.041, p < .001, 95% CI [1.03, 1.05], and gender, b=.922, OR = 2.513, p < .01, 95% CI [1.18, 5.38]. Gender recorded the highest odds

ratio (2.513) indicating that male students were 2.5 times more likely to report having substance use problems compared to female students. Both time management stress and social stress were positively associated to substance use among college students. For every unit increase on the time management stress scale, the odds of students reporting having substance use problems increased by 2.3%. For every unit increase on the social stress scale, the odds of students reporting substance use problems increase by 4.1%. Financial stress, academic stress, and family stress did not significantly influence substance use among college students. Surprisingly, depression, b= –.052, OR = .950, p = .268, 95% CI [.867, 1.04], and anxiety (b=.007, OR = 1.007, p = .744, 95% CI [.968, 1.05] did not have a statistically significant effect on the substance use among college students. The results in Table 4 show that most students scored low on the depression and the anxiety scales. These findings lead to the conclusion that depression and anxiety are not good predictors of substance use among college students.

Table 2. Substance Use

Outcome	Frequency	Percent	Cumulative Percent
No substance use	230	76.2	76.2
Yes substance use	72	23.8	100.0
Total Sample	302	100.0	-----
Mean = .24, S.D. = .427	-----	-----	-----

Note: S.D. stands for Standard Deviation

Table 3. Logistic Regression Predicting Substance Use among College Students

	Model 1			Model 2			Model 3		
Independent Variables	B	Sig.	Exp(B)	B	Sig.	Exp(B)	B	Sig.	Exp(B)
Financial stress	-.008	.450	.992	-.007	.512	.993	-.004	.666	.996
Time Management Stress	.011	.283	1.011	.016	.133	1.017	.022	.049	1.023
Social stress	.042	.000	1.042	.043	.000	1.044	.040	.001	1.041
Academic stress	.004	.663	1.004	.005	.544	1.005	.011	.217	1.011
Family stress	.008	.582	1.008	.012	.424	1.012	.009	.560	1.009
Depression	------	------	------	-.040	.469	.961	-.052	.268	.950
Anxiety	------	------	------	-.011	.540	.993	.007	.744	1.007
Control Variables									
Age	------	------	------	------	------	------	-.210	.087	.810
Gender (Male)	------	------	------	------	------	------	.922	.018	2.513
Race (White)	------	------	------	------	------	------	.136	.697	1.145
Marital status	------	------	------	------	------	------	-.395	.725	.674
Class standing	------	------	------	------	------	------	.393	.084	1.482
Employment	------	------	------	------	------	------	-.586	.103	.557

	Model 1	Model 2	Model 3
Cox & Snell R^2	.124	.136	.174
Nagelkerke R^2	.188	.206	.265
Model Classification	$X^2(5, 288) = 37.99$, p < .000	$X^2(7, 290) = 42.47$, p< .000	$X^2(13, 288) = 54.98$, p< .000
Classification of Cases	76.7% correctly classified	77.8% % correctly classified	78.8% % correctly classified

Note: Dependent Variables = Substance use

When interpreting the results of the depression scale (PHQ-8), it should be noted that a score of less than 9 on a 0 to 24 points scale is considered minimal-to-mild depression. Anything above 10, approaching 20 points is considered a moderate-to-severe depression, and scores above 20 indicate severe depression (Dhingra et al., 2011; Kroenke et al., 2009; Razykov et al., 2012). This, however, does not seem to be the case with college students in the current study. The data in Table 4 show that the average score on the depression scale was only 7.13 points (SD = 5.49), indicating a very low depression, and most of them (68%) scored 8 points or below on a 0 to 24 points scale. Additionally, when interpreting the results of the anxiety scale, it should be noted that scores 0 to 21 indicate low anxiety. Scores 22 to 35 indicate moderate anxiety, and scores that exceed 36 are considered problematic and thus need attention (Back & Steer, 1990). In the current study, the average score on the anxiety scale was only 11.8 points (SD = 11.62), and 68% of them scored 13 points or below on a 0 to 63 points scale (Table 4). This indicates that, overall, students were not suffering from any type of anxiety that needs attention, and as such, anxiety is not considered an influencing or a significant predictor associated the self-perceived substance use problems among college students.

Table 4. Depression and Anxiety Scales

Variables	Minimum	Maximum	68%	95%	Mean	Stand. Dev.
Depression	0	24	8 points	17 points	**7.13**	5.49
Anxiety	0	63	13 points	38 points	**11.89**	11.62

Note: Depression is measured using an 8-item scale with scores ranging from 0 to 3, with a maximum of 24 points. Anxiety scale is measured using a 21-item scale with scores ranging from 0 to 3, with a maximum of 63 points.

DISCUSSION

This study sought to examine the effects of college stress, depression, and anxiety on substance use among college students. From the research perspective, these three predictors are related to one another and can affect one another. For example, research shows that continuous exposure to stress leads to depression (Praag, 2004) and anxiety (Khan & Khan, 2017). When combining all three of them, they become risk factors that affect subsequent behaviors, which can be manifested in the form of substance use (Sinha, 2009; Lewinsohn, Gotlib, & Seeley, 1995; Cox, Norton, Swanson, & Endler, 1990). The current study, however, focused only on the direct effects of these risk factors on substance use, as self-perceived problem by students. From the content validity point of view, college stress is multidimensional. The unique aspects of stress among college students can be rooted in academia, finances, time management, social, and familial as separate categories of stress generators (Avdija, 2018). Thus, college stress has a very broad domain. Nonetheless, the findings of the current study show that stress, overall, remains a risk factor that is associated to substance use among college students, which is consistent with most prior research studies (Broman, 2005; Cunningham-Williams, Jones, Butler-Barnes, et al., 2018; Ste-Marie, Gupta, & Derevensky, 2006). The current study shows that two types of stress categories that significantly contributed to substance use among college students were time management stress and social stress. Increases in the stress level due to the time management constraints and stress as a result of social relations, both were manifested with an increase in the probability of substance use among college students. Financial stress, academic stress, and family stress did not significantly increase the probability of substance use in students. The effect of social stress perhaps comes as a result of peer pressure during the college years. Some students may develop positive attachments to peers who already have substance use problems and then become victims of those associations (Dishion & Tipsord, 2011; Marshal & Molina, 2006). Another possible explanation could be quite the opposite of this, in that they have a hard time making friends at school or face challenges in social activities, thus substance use becomes a coping mechanism for them. This is typical among students who have inadequate social adaptability skills in dealing with new challenges in college life. Further, social stress may predict perceptions of having a substance-use problem because these forms of stress are more directly tied to students' daily lived experiences and coping behaviors. Social stress often involves peer relationships, social expectations, and interpersonal conflict, all of which can increase exposure to environments where substance use is normalized or encouraged.

Time-management stress, on the other hand, similarly predicts perceptions of having a problem because it reflects difficulties balancing academic responsibilities, employment, and social life. Substance use can exacerbate these challenges by interfering with sleep, concentration, and productivity, making its negative consequences more immediately visible. Students who feel chronically overwhelmed or pressed for time may be more likely to interpret substance use as contributing to their inability to manage daily demands, leading them to label it as a "problem." In this way, time-management stress creates a clear feedback loop in which substance use is perceived as undermining functional performance.

The second objective of the current study was to examine the effects of depression and anxiety on substance use among college students. Considering the age factor, depression and anxiety are not very common factors present among college students. Depression among students is most likely not as serious as it would be when dealing with biological depression because, at this age, it is mostly stress-induced depression – a form of acute depression resulting from poor coping mechanisms and stress mismanagement (see Praag, 2004; Yang, Zhao, Wang, et al., 2015 Mahmoud, et al., 2012 for more information on different types of depressions). Furthermore, research shows that depression, overall, is much lower among young people at an early age than older people (Mirowsky & Ross, 1992). The current study concurs with prior studies in terms of age and its low correlation with depression. The findings of the current study show that students scored very low on both depression and anxiety scales. In terms of the direction of the influence that depression and anxiety have on substance use among college students, prior research shows that these two are positively correlated. Miller, Miller, Verhegge, et al. (2002) study, for example, shows that students with a higher level of depression had a higher rate of alcohol abuse compared to those who had low depression. Stewart, Karp, et al. (1997) also found a similar correlation between anxiety and substance use in their study (see also Newbury-Birch, Lowry, & Kamali, 2002). The current study, however, does not support these findings. Within the context of the current study's findings, depression, and anxiety do not appear to be significant predictors of self-perceived substance use problem among college students. The average score on the depression scale was only 7.13 points (on the scale of 0 to 24), indicating a very low depression. Likewise, the average score on the anxiety scale was only 11.8 points (on the scale of 0 to 63). This indicates that, overall, most students were not suffering from any type of serious-to-moderate depression or anxiety, and as such, both variables are not influential or significant predictors of the substance use among college students.

A secondary in nature, but an important finding that emerged from this study was the effect of gender on substance use. This study shows that male students were 2.5 times more likely to report heaving substance use problems compared to female students, which is consistent with prior studies regarding gender differences in substance use cases (McCabe, Morales, Cranford, et al., 2007; Cotto, Davis, et al., 2010; Kloos, et al., 2009; Brady & Randall, 1999).

In conclusion, these findings have important implications for practice, particularly in emphasizing the value of early screening for students' perceived substance-use problems. Even when the actual use levels are low, students' recognition of a problem may indicate underlying stress, coping difficulties, or vulnerability to future risk. Campus counseling, health and wellness services could incorporate brief, self-report assessment tools to identify students who perceive their substance use as problematic, enabling timely and targeted support. Early identification could facilitate preventive interventions, stress-management programs, and referrals to personalized counseling before substance use escalates or leads to more serious consequences, ultimately supporting student well-being and academic success.

Limitations

While there are several limitations that we acknowledge, they do not diminish the overall contribution of this study. First, although the dependent variable is measured using a subjective self-report item that captures students' perceptions of having a substance-use problem rather than objective levels of use, this measure aligns well with the study's focus on self-recognition and perceived impact. Perceptions of having a "problem" are meaningful in their own right, as they may be more closely linked to stress experiences, help-seeking behaviors, and readiness for intervention than behavioral frequency alone. Nonetheless, the single-item, dichotomous measure limits reliability and does not allow for distinctions across types, frequency, or severity of substance use. In addition, the distinction between perceived substance-use "problems" and the actual substance use behaviors, to some degree, limits the interpretation of the findings. Students may engage in substance use without identifying it as problematic, while others may label relatively low levels of use as a problem based on personal, social, or cultural factors. This subjective framing introduces variability that cannot be easily disentangled and may obscure differences in behavioral risk. However, this limitation also highlights an important direction for future research to examine how stress influences both substance use patterns and the process by which students come to define their use as problematic. Second, while the use of convenience sampling from one university restricts broad generalizability, it allows for an in-depth examination of stress and substance-related perceptions within a specific university context. This focused approach provides valuable exploratory insights and establishes a foundation for future research to test these relationships across more diverse, multi-institutions samples using more comprehensive measures.

DECLARATION

Ethic approval and consent to participate

The Institutional Review Board (IRB) has reviewed and approved this study. Participation of subjects in this study was voluntary, and in accordance with the IRB protocol, they all received and signed the consent form before participating in this study.

Consent for publication: N/A

Availability of data and material (ADM)

The data and materials for this study are not available online. However, they can be obtained from the corresponding author upon request.

Conflicts of interest Statement

The authors do not have any financial interests to disclose.

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Authors' contributions

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ADDITIONAL INFORMATION

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