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## Depressive Symptoms following Recent Sexual Assault: The Role of Drug and Alcohol Use, Acute Stress, and Assault Characteristics

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### Abstract

Sexual assault is a common traumatic experience that can have a wide-ranging impact on psychological functioning, including experience of depressive symptoms. While many studies have examined lifetime rates of depression among those with sexual assault history, less is known regarding risk factors for depressive symptoms following recent sexual assault. The study examined whether drug use history is uniquely related to depressive symptoms following recent assault. *Method:*  $N = 65$  individuals (5.4% female; 73.8% white;  $M(SD)$ age = 28.89 (10.29)) who had recently experienced sexual assault (less than 60 days) and completed a SAMFE were interviewed via phone and completed questionnaires regarding depressive and acute/posttraumatic stress symptoms and substance use history. Demographic information as well as information related to the assault was also collected. *Results:* 68.7% of the sample reported clinically significant levels of depressive symptoms (PHQ-9 scores  $\geq 12$ ). In a linear mixed model, drug use was significantly related depressive symptoms ( $\beta = .19, p = .04$ ), even controlling for acute/posttraumatic stress ( $\beta = .72, p < .01$ ) and other variables. Individuals who identified as white reported more severe depressive symptoms ( $\beta = .19, p = .02$ ). Forced sexual assault ( $\beta = -.07$ ), victim-perpetrator relationship ( $\beta = -.01$ ), alcohol misuse ( $\beta = -.06$ ), and days since assault ( $\beta = -.08$ ) were not significantly related to depressive symptoms ( $p$ 's  $> .05$ ). *Conclusion:* Results highlight the potential role of drug use in increasing risk for experiencing clinically significant depressive symptoms following recent assault.

### Keywords

sexual assault; depressive symptoms; drug use

Sexual assault is a common traumatic experience, experienced by 17–25% of U.S. adults (Elliott, Mok, & Briere, 2004), that can have a wide-ranging impact on psychological functioning (Dworkin, Menon, Bystrynski, & Allen, 2017). Though post-trauma depressive symptoms have been associated with a poorer mental health trajectory (O'Donnell, Creamer, & Pattison, 2004), risk factors for depressive symptoms immediately following sexual assault are not well examined. Substance use may be one such risk factor, as it often co-occurs with both sexual assault and depressive symptoms (Grice et al., 1995; Volkow, 2004). Although the risk of substance use following assault is well-studied (Langdon et al., 2017), less research has examined how substance use may influence onset of depressive symptoms following a recent assault. To address this gap, the current study examined whether substance use history is uniquely related to depressive symptoms following recent sexual assault.

## Depression and Sexual Assault

Depressive symptoms are common after sexual assault (e.g., Kilpatrick et al., 2003), likely in part due to concerns related to self-blame, stigmatization and negative self-appraisal, and perceived lack of control (Koss & Figueredo, 2004). However, much of the research on depression among individuals who have experienced sexual assault has focused on lifetime depression, and there is less research examining depressive symptoms more acutely following recent assault (Mgoqi-Mbalo et al., 2017). Although natural recovery for depressive and other trauma-related symptoms can occur within the first three months post-trauma (Frank et al., 1980), many individuals continue to experience long-term symptoms. Further, more severe depressive symptoms early in trauma recovery may be a risk factor for developing other issues, such as posttraumatic stress disorder (PTSD; O'Donnell et al., 2004); thus, additional research on depressive symptoms within the early stages following assault is warranted.

Further, much of the research on depression and sexual assault has focused on the comorbidity of PTSD and depression and there is some debate over whether depression and traumatic stress symptoms are unique and separate constructs (Grant et al., 2008) or both part of a more broad posttraumatic distress pathology (Au et al., 2013). Thus, more research is needed to determine post-assault depressive symptoms while controlling for acute and posttraumatic stress symptoms.

## Alcohol Use, Drug Use, and Depressive Symptoms

Individuals who have experienced sexual assault are at increased risk of alcohol and drug use disorders, likely in part due to experiencing PTSD and depressive symptoms (Kilpatrick et al., 2003). Moreover, there is evidence for a reflexive association between alcohol/drug use and depressive symptoms (e.g., Schuckit, 2006). For example, individuals may “self-medicate” with drugs or alcohol to cope with depressive symptoms or distress following traumatic or negative events (Langdon et al., 2017). Chronic substance use can also lead to neurobiological changes that increase vulnerability for depression (Volkow, 2004). Despite evidence for this reflexive association, sexual assault research has predominantly focused on

alcohol and drug use post-assault or the use of substances as a risk for experiencing sexual assault. Less is known regarding how alcohol and drug use might influence risk of experiencing depressive symptoms, particularly in the early stages following a sexual assault. Importantly, individuals who use alcohol or drugs may continue to use post-assault and potentially exacerbate depressive symptoms and increase risk for a poorer or longer recovery (see Langdon et al., 2017).

## Characteristics of the Assault, Demographic Characteristics, and Depressive Symptoms

Characteristics of the assault have also been shown to be associated with depressive symptoms. For example, sexual assaults involving physical injury, physical force, or threats of force are associated with particularly heightened risk for experiencing depressive symptoms (Carretta & Burgess, 2013; Zinzow et al., 2010). Further, individuals who have a closer relationship with the perpetrator typically report greater depressive symptoms (Goldsmith et al., 2013; Martin et al., 2013), perhaps due to greater self-blame and risk for ongoing abuse. Individuals with a prior sexual assault history may also be at heightened risk, as revictimization is associated with more severe lifetime depressive symptoms (Najdowski & Ullman, 2011). However, research to date has not yet examined the characteristics of a recent sexual assault as associated with post-assault depressive symptoms.

Individual demographics, such as age and race, are also related to more vulnerability for depressive symptoms. White women (Pegram & Abbey, 2016; Sigurvinsdottier & Ullman, 2015) as well as individuals who experience sexual assault at earlier ages (Dunn et al., 2017) report more severe depressive symptoms. Again, it is unclear what role demographic factors have in depressive symptoms following a recent assault. Research is needed to elucidate risk factors associated with post-assault depressive symptoms to inform secondary prevention efforts during, or immediately following a sexual assault forensic medical examination (SAMFE) in the emergency department.

## Current Study

The current study examined potential risk factors for post-assault depressive symptoms among individuals who received a recent sexual assault forensic medical examination in the emergency department. Based on research examining associations between lifetime sexual assault and depressive symptoms, the current study examined alcohol and drug use (Kilpatrick et al., 2003), acute and posttraumatic stress symptoms (Dworkin et al., 2017), assault characteristics (Carretta & Burgess, 2013; Zinzow et al., 2010), and demographic factors (Dunn et al., 2017; Pegram & Abbey, 2016) as correlates of post-assault depressive symptoms. By examining depressive symptoms after a recent sexual assault, focused prevention efforts can be developed to reduce the likelihood or long-term impact of experiencing post-assault depression.

Specifically, we examined whether alcohol or drug use, acute or posttraumatic stress symptoms, assault characteristics (victim-perpetrator relationship and type of assault), and demographic factors were related to experiencing depressive symptoms. We hypothesized

that individuals alcohol misuse and greater drug use (i.e., use of multiple drugs) would report more depressive symptoms. We also hypothesized that substance use would relate to depressive symptoms, even controlling for other important variables, including characteristics of the assault, prior sexual assault history, and individual demographics, as described above.

## Method

### Participants and Procedure

Participants included individuals who indicated interest in behavioral and medical follow-up after receiving a SAMFE at the local emergency department (ED) within 120 hours of the assault. Only individuals who completed the routine clinical follow-up screen within 60 days of the assault were included in the current study ( $n = 65$ ; 95.4% female; 73.8% white;  $M(SD)$ age = 28.89 (10.29)). Follow-up screening calls were completed by post-baccalaureate-, masters-, and doctoral-level providers and supervised by a licensed clinical psychologist. Individuals were called up to three times with the first attempted call occurring within 10 days of the SAMFE.

### Measures

**Demographic information.**—Participants were asked their racial/ethnic identity. Those who identified as white (=1) were compared to those who were a racial/ethnic minority (=0). Participant age at the time of the assault was calculated using medical records.

**Sexual assault characteristics.**—Participants were asked the date of their assault and the days since assault were calculated. Participants were also asked if they knew the perpetrator (0 = no; 1 = yes) and whether they experienced forced sexual assault (0 = no; 1 = yes). Participants also reported on whether they previously experienced sexual assault (0 = no; 1 = yes).

**Alcohol misuse.**—Individuals completed the Alcohol Use Disorders Identification Test – Consumption Questions (AUDIT-C; Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998) to assess for problematic alcohol use. Three items assess quantity, frequency, and problems, with higher summed scores indicating more severe problem alcohol use ( $\alpha = .80$ ).

**Drug use.**—Participants were asked about lifetime substance use with the following question: “Have you ever used drugs other than those required for medical reasons?” Those who reported lifetime use also reported on type of drug used. Participants were categorized as either non-substance users, single substance users, or polysubstance users. Two dummy variables were created to compare polysubstance use (=1) and single substance use (=1) to non-use.

**Depressive symptoms.**—The Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001) was used to assess depressive symptoms in the past 2 weeks. Participants rated nine items on a scale from 0 (*not at all*) to 3 (*nearly every day*). Total scores range from 0 to 27. Scores of 12 or higher are considered clinically significant ( $\alpha = .86$ ).

**Acute and posttraumatic stress symptoms.**—The Posttraumatic Stress Disorder Checklist (PCL-5; Weathers et al., 2013) was used to assess both acute (within 30 days of the assault) and posttraumatic stress (after 30 days of the assault). Participants indicated how much they were bothered by 20 symptoms on a scale from 0 (*not at all*) to 4 (*extremely*), with total scores ranging from 0 to 80. Clinical cut off scores for PTSD are 33 (Bovin et al., 2015;  $\alpha = .94$ ).

### Statistical Analyses

We conducted a linear mixed model using maximum likelihood (ML) estimation in SPSS 24.0 to predict depressive symptoms (PHQ-9). The following dichotomous variables were included: race, whether physical force was used, previous sexual assault history, victim-perpetrator relationship, single substance use, and polysubstance use. Age, days since assault, and alcohol use were entered as continuous variables. Only individuals with complete data on study variables were included in analyses ( $N = 65$ ;  $n = 14$  excluded due to missing data).

## Results

### Preliminary Results

Across the sample, 69.7% ( $n = 53$ ) reported clinically significant levels of depressive symptoms (i.e., PHQ-9 total score  $\geq 12$ ). Only 2 individuals who completed the questionnaires more than 30 days after the assault reported non-clinical levels of depression, suggesting the majority of individuals did not experience natural recovery following the assault. There was also high comorbidity among depression and acute/posttraumatic stress: 55.1% ( $n = 43$ ) of individuals had significant depressive and acute/posttraumatic stress symptoms (see Table 1).

### Linear Mixed Model with Depressive Symptoms

Drug use was significantly related depressive symptoms ( $\beta = .19, p = .04$ ), even controlling for acute/posttraumatic stress ( $\beta = .72, p < .01$ ) and other variables. Individuals who identified as white also reported more severe depressive symptoms ( $\beta = .19, p = .02$ ). Forced sexual assault ( $\beta = -.07$ ), victim-perpetrator relationship ( $\beta = -.01$ ), alcohol misuse ( $\beta = -.06$ ), and days since assault ( $\beta = -.08$ ) were not significantly related to depressive symptoms (see Table 2).

## Discussion

The current study examined whether drug use was related to experiencing post-assault depressive symptoms, as well as potential associations between acute or posttraumatic stress symptoms, alcohol misuse, sexual assault and demographic characteristics, and prior sexual assault history with post-assault depressive symptoms. Drug use was associated with depressive symptoms, such that those who reported using more than one drug (i.e., multiple drugs) reported more severe depressive symptoms following recent sexual assault. Acute/posttraumatic stress symptoms were also related to depressive symptoms. Further, individuals who identified as white were also more likely to report depressive symptoms

compared to racial/ethnic minorities. Neither age, days since assault, forced sexual assault, current problem alcohol use, nor victim-perpetrator relationship, were uniquely associated with depressive symptoms.

Individuals with drug use and particularly use of multiple drugs reported more severe depression symptoms. While most studies examine risk for substance use following assault or risk of experiencing assault based on substance use, the current findings suggest that drug use may increase risk of experiencing significant depressive symptoms, even in the early recovery period following assault. Although the mechanisms for this are unclear, there are a few potential explanations. For one, chronic drug use can cause neurobiological changes that may leave one more vulnerable to experiencing depressive symptoms (Volkow, 2004). Drug abuse may also be a sign of preexisting depressive symptoms, given their high comorbidity (Schuckit, 2006). There is also evidence for underlying traits related to both drug use and depressive disorders that may explain the association. In particular, poorer coping skills, lower distress tolerance, and higher stress sensitivity among drug users may leave one more vulnerable to experiencing more severe depressive symptoms following an assault (e.g., Buckner et al., 2007). Regardless of the mechanism, these findings suggest the importance of screening for drug use among sexual assault victims following an assault, as findings suggest that drug use may be a marker for vulnerability to more severe distress pathology following an assault. More importantly, those with drug use, and particularly drug use disorders, may continue to use drugs to cope with symptoms, which can exacerbate symptoms (Schuckit, 2006).

Surprisingly, alcohol misuse was not related to depressive symptoms, which is inconsistent with extensive evidence for alcohol misuse following sexual assault (Langdon et al., 2017). One potential explanation may be because the average alcohol misuse score was a 3, which is the clinical cutoff for women suggesting alcohol misuse. Therefore, alcohol misuse may not represent a unique factor associated with depression due to alcohol misuse being so common in this population. This may explain the discrepant findings between the current study and previous work examining potentially less severe samples. Therefore, in the current sample, drug use, compared to alcohol misuse, was more reflective of depression severity.

It is also surprising that prior sexual assault and assault characteristics were not associated with depressive symptoms. It may be that within this sample, given that the assault was sufficiently severe for the individual to go to the ED to receive a SAMFE, prior assault and assault characteristics may not impact post-assault depressive symptoms as they would when looking at a general sample of individuals with a history of lifetime sexual assault.

These results are particularly important given the recency of sexual assault in the sample, as fewer studies have examined depressive symptoms before individuals can seek services or potential for recovery (Mgoqi-Mbalo et al., 2017). The study is cross-sectional, and thus, we do not know the long-term trajectory of symptoms; however, findings suggest the potential for early detection of potentially chronic psychological distress following assault. Future research should examine the trajectory of depressive symptoms over time following assault.

This study is not without limitations. The small sample size limited power, and thus, could contribute to lack of significant associations between assault characteristics and depression. Drug use was assessed using an open-ended question as part of clinical care, and did not assess for onset of drug use as well as extent of drug use issues. Future studies should include more comprehensive assessments of drug use disorders.

## Conclusion

Findings highlight the importance of assessing depressive symptoms post- sexual assault as well as the potentially important role of drug use in increasing risk for depressive symptoms following assault. These preliminary results support the need for future research to better understand early depressive symptoms following sexual assault.

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**Table 1**

## Sample Demographics and Study Variable Descriptive Statistics

	No Depression ( <i>n</i> = 18)	Depression ( <i>n</i> = 47)	Total ( <i>N</i> = 65)
Age (18–58)	25.28 (8.57)	30.14 (10.32)	28.75 (9.90) ( <i>t</i> = 1.98 <sup>*</sup> )
Race (% white)	16 (69.6%)	41 (78.8%)	57 (76%) ( $\chi^2 = 0.75$ )
Days since SAMFE	17 (16.28)	10.13 (11.57)	12.06 (13.10) ( <i>t</i> = 1.91)
Know Perpetrator	11 (55%)	32 (60.4%)	43 (58.9%) ( $\chi^2 = 0.17$ )
Forcible sexual assault	14 (60.9%)	34 (70.8%)	48 (67.6%) ( $\chi^2 = 0.71$ )
Prior sexual assault	8 (36.4%)	21 (40.4%)	29 (39.2%) ( $\chi^2 = 0.11$ )
Alcohol Misuse (AUDIT-C)	3.24 (3.15)	3.29 (3.12)	3.20 (3.10) ( <i>t</i> = .09)
Drug use			
No use	11 (61.1%)	13 (27.7%)	24 (36.9%) ( $\chi^2 = 5.79$ <sup>*</sup> )
Single use	7 (30.4%)	21 (39.6%)	28 (33.7%) ( $\chi^2 = 0.58$ )
Poly-drug use	-	13 (24.5%)	13 (15.7%) (Fisher's <i>p</i> < .01)
Acute/Posttraumatic stress symptoms (PCL-5)	27.96 (14.81)	53.85 (14.16)	45.57 (18.62) ( $\chi^2 = 9.97$ <sup>**</sup> )
Depressive symptoms (PHQ-9)	7.09 (3.18)	18.53 (4.18)	15.07 (6.56) ( <i>t</i> = 11.72 <sup>**</sup> )

Note. *N* = 65. Values are M(SD) or n(%).

\* *p* < .05.

\*\* *p* < .01.

Participants with complete data are shown. Depressed individuals are those with a PHQ-9 ≥ 12.

**Table 2**

## Hierarchical Linear Regression Predicting Depressive Symptoms

	<b>B</b>	<b>SE</b>
Step 1		
Acute/posttraumatic stress symptoms (PCL-5)	.78**	.03
Step 2		
Acute/posttraumatic stress symptoms (PCL-5)	.77**	.03
White (0=no, 1=yes)	.20*	1.18
Age	.11	.05
Prior sexual assault (0=no, 1=yes)	-.04	1.07
Perpetrator (0=stranger, 1=acquaintance)	-.01	1.02
Forcible sexual assault (0=no, 1=yes)	-.07	1.07
Days since assault	-.08	.04
Step 3		
Acute/posttraumatic stress symptoms (PCL-5)	.72**	.03
White (0=no, 1=yes)	.19*	1.19
Age	.10	.05
Previous sexual assault (0=no, 1=yes)	-.09	1.10
Perpetrator (0=stranger, 1=acquaintance)	.02	1.01
Forcible sexual assault (0=no, 1=yes)	-.07	1.07
Days since assault	-.04	.04
Alcohol misuse	-.06	.18
Single drug use	.09	1.24
Poly-drug use	.22*	1.61

Note. N = 65.

\*  $p < .05$ .

\*\*  $p < .01$ .