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Short Communication

Substance use stigma mechanisms associated with greater depressive symptoms, substance use-related problems, and lower behavioral activation

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ABSTRACT

Objective: Stigma is a well-recognized barrier to substance use (SU) treatment initiation and retention. It is theorized to operate through three distinct mechanisms: internalized, enacted, and anticipated. The unique associations between these specific stigma mechanisms and key psychosocial factors – such as engagement in reinforcing activities (i.e., behavioral activation), depression, and SU-related problems (e.g., social, financial) – remain unexplored, particularly among historically underserved populations. The current study examined how SU stigma in total and each mechanism is associated with these outcomes among individuals in an urban methadone clinic serving a historically underserved community.

Method: This cross-sectional study utilized baseline data from a peer-delivered behavioral intervention trial to examine how SU stigma mechanisms are associated with behavioral activation (BA), depressive symptoms, and SU-related problems among a predominantly low-income sample in methadone treatment ($N = 212$).

Results: Linear regression analyses revealed that overall SU stigma was associated with lower BA, higher depressive symptoms, and greater SU-related problems. In multiple linear regression models controlling for relevant covariates and stigma mechanisms, higher internalized SU stigma remained significantly associated with worse outcomes across all domains. Following multiple-testing correction, associations for anticipated stigma (with lower BA and higher depressive symptoms) and enacted stigma (with greater SU-related problems) were marginally significant.

Conclusions: Findings highlight differential associations of stigma mechanisms in psychosocial functioning, and may point to a need to address internalized stigma in SU interventions. Future longitudinal research is needed to assess causal and mechanistic relationships between stigma, SU and psychosocial outcomes to inform targeted intervention development.

1. Introduction

Substance use (SU) stigma is a well-documented barrier to help-seeking, treatment engagement, and recovery (Brener et al., 2010; Crapanzano et al., 2018; Hammarlund et al., 2018). SU stigma functions across multiple levels and is theorized to operate at the individual level through three mechanisms (Earnshaw et al., 2013; Smith et al., 2016): enacted (i.e., experienced discrimination from others), anticipated (i.e., expected future discrimination from others), and internalized (i.e., self-endorsement of negative beliefs and stereotypes). Research on other stigmas (e.g., HIV, racial) suggests that although each mechanism is associated with poorer mental and physical health, stigma mechanisms may be differentially associated with specific outcomes (Chaudoir et al., 2014). Within SU, internalized stigma has been associated with

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significantly greater odds of nonfatal opioid overdose, with a marginally higher odds ratio than that observed for enacted stigma (Sibley et al., 2024).

Research in the HIV literature has documented a strong association between HIV stigma and depressive symptoms (Earnshaw et al., 2020); depressive symptoms only partially mediated the relationship between stigma and SU. Less is known about the extent to which SU stigma mechanisms are differentially associated with depressive symptoms and related concepts such as behavioral activation (i.e., level of engagement in goal-oriented and enjoyable activities) and non-abstinence-based recovery outcomes identified by patients as markers of success (e.g., interpersonal, intrapersonal, physical health, etc.; Bradley et al., 2025). Additionally, the interplay of stigma mechanisms, depressive symptoms, and SU outcomes remains largely unexamined among individuals from historically minoritized and underserved communities with opioid use disorder (Crapanzano et al., 2018), with much research focusing on traditional markers of success including abstinence and treatment adherence. Furthering our understanding of these relationships can inform future interventions to more effectively engage and retain these communities in care.

The current study examined how SU stigma (in total and each mechanism) is associated with depressive symptoms, problems associated with SU, and behavioral activation among individuals who are receiving treatment with medications for opioid use disorder (MOUD).

2. Methods

2.1. Participants and procedures

Baseline data from an open-label pilot (Magidson et al., 2022) and randomized-control trial (RCT) of a developmental phased award (R61AT010799, R33DA057747; PI: Magidson) examining a peer-delivered behavioral intervention for MOUD adherence and SU were utilized.[1] Adult participants (N = 212) were either newly initiated in methadone treatment (i.e., within the past three months) or had demonstrated methadone treatment adherence challenges (i.e., missed at least one methadone dose in the past three months). See Magidson et al. (2022) and (Magidson et al., 2025) for full inclusion/exclusion criteria and study procedures.

The trial took place at a community-based opioid treatment program in Baltimore City. All data were collected between October 2020 and April 2025. All study procedures were approved by the University of Maryland, College Park IRB with an Interagency Agreement approved by the University of Maryland, Baltimore. The pilot trial (ClinicalTrials.gov Identifier: NCT04248933) and RCT trial (ClinicalTrials.gov Identifier: NCT05299515) are registered on Clinicaltrials.gov. Participants were compensated $25 for their time following assessment completion.

2.2. Measures

SU stigma was measured using the SU stigma mechanisms scale (SU-SMS; Smith et al., 2016). The SU-SMS is an 18-item measure that measures experiences of three stigma mechanisms (i.e., internalized, anticipated, enacted; 6-items per subscale) within the past three months. Items are averaged to produce scores across all questions and at each subscale; a higher score indicates higher levels of SU stigma, with scores ranging from 0 to 5 (strongly disagree to strongly agree). The SU-SMS has high reliability on each subscale (α = 0.84–0.94; Smith et al., 2016), which was similar in the current sample (α = 0.89–0.91).

Depressive symptoms were measured using the Patient Health Questionnaire (PHQ-8; Kroenke et al., 2009), an 8-point self-reported past-two-week depressive symptom screen. The PHQ-8 demonstrated good internal consistency within the current sample (α = 0.87), similar to other samples with problematic SU (α = 0.90; Vogel et al., 2021). A higher score indicates greater levels of depressive symptoms, with scores ranging from 0 to 24.

Behavioral activation was measured using the Behavioral Activation for Depression Scale – Short Form (BADS-SF; Manos et al., 2011). The BADS-SF includes 9 items to assess past-week levels of behavioral activation and avoidance on a scale of 0 (not at all) to 3 (very much). Lower scores indicate less activation and more avoidance. Internal consistency for the BADS-SF was lower in this sample (α = 0.65) than within a community sample in the initial validation study (α = 0.78; Manos et al., 2011).

Problems related to SU, or non-abstinence based recovery outcomes, were measured using the Short Inventory of Problems – Revised (SIP-R; Kiluk et al., 2013) which includes 17 items. The SIP-R assessed past three-month consequences across five domains: physical, social, intrapersonal, interpersonal, and impulse control. The SIP-R has demonstrated internal reliability within a sample with alcohol and SU disorders (α = 0.95), which was replicated within the current sample (α = 0.92). Items are summed to produce a total score, ranging from 0 to 45; a higher score indicates greater problems related to SU (Kiluk et al., 2013).

Analyses additionally controlled for past three-month substance use severity, defined as the highest risk score achieved across any Tobacco, Alcohol, Prescription Medication, and Other Substance use (TAPS) Tool (Carter et al., 2022) category.

2.3. Analyses

Descriptive statistics were run on all variables. A series of three linear regression models examined how total SU stigma related to depression, behavioral activation, and problems related to SU. Separately, three additional multiple linear regressions were run with each subscale included as an independent predictor to assess if enacted, anticipated, and internalized stigma differentially related to each outcome variable. All models controlled for theoretically relevant covariates related to the variables of interest as previously described in the literature, namely substance use severity (Kulesza et al., 2017), gender (Agterberg et al., 2020; Chen et al., 2013), race (Lynch et al., 2023) age (Choi et al., 2014; Sahker et al., 2015), and education level (Karriker-Jaffe, 2013; Teixidó-Compañó et al., 2018). P-values were adjusted for multiple comparisons using the Benjamini-Hochberg procedure; the pattern of results remained unchanged following the correction (see Table 1). Missing data was handled using listwise deletion.

Analyses were performed to ensure that the assumptions of linear regressions were met (i.e., checks of multicollinearity, linearity, homogeneity of residuals, and normality of residuals). Variance inflation factors (VIF) were examined to assess multicollinearity among predictors. All VIF values were low (range = 1.02–1.61), indicating no evidence of problematic multicollinearity. Bivariate correlations between stigma variables (total and individual mechanisms) and outcomes ranged from r = -0.42 (total stigma and behavioral activation) to r = 0.45 (total stigma and problems associated with SU). All analyses were conducted using R, and alpha was set to 0.05 for all analyses. Independent t-tests and chi-square tests indicated no baseline differences between the pilot and RCT cohorts.

3. Results

Over half of the participants identified as Black or African American (52.8%) and male (59.9%), with a mean age of 48.09 (SD = 11.06). The average total SU stigma score was $M(SD)$ = 2.75(0.86) with anticipated stigma ($M(SD)$ = 2.57(1.04)) enacted stigma ($M(SD)$ = 2.56(1.04)), internalized stigma ($M(SD)$ = 3.13(1.04)), behavioral activation ($M(SD)$ = 26.03(8.57)), depressive symptoms ($M(SD)$ = 10.26(6.56)), and

[1] Fourteen participants completed both the open-label pilot and RCT. In these cases, only data from the open-label pilot (i.e., first baseline instance) were utilized.

Table 1
Behavioral activation, depressive symptoms, and problems related to SU predicted by total SU stigma and each mechanism.

Outcome	Stigma mechanism	Unstandardized coefficient (β)	Standardized coefficient (β)	SE	*p*-value	Corrected *p*-value	Model Adjusted R^2	Model *F*-statistic (df1, df2, *p*-value)
Behavioral activation	**Total**	**−3.28**	**−0.32**	**0.71**	**<0.001**	**<0.001**	**0.21**	**7.85 (8, 194, <0.001)**
		–-			–-	–-	0.21	6.48 (10, 192, <0.001)
	Anticipated	**−1.63**	**−0.20**	**0.77**	**0.036**	**0.058**	–-	–-
	Enacted	−0.18	−0.02	0.81	0.827	0.902	–-	–-
	Internalized	**−1.56**	**−0.19**	**0.58**	**0.008**	**0.016**	–-	–-
Depressive symptoms	**Total**	**2.42**	**0.31**	**0.51**	**<0.001**	**<0.001**	**0.25**	**9.60 (8, 202, <0.001)**
		–-			–-	–-	0.25	8.02 (10, 200, <0.001)
	Anticipated	**1.81**	**0.19**	**0.57**	**0.040**	**0.058**	–-	–-
	Enacted	0.05	0.01	0.60	0.931	0.931	–-	–-
	Internalized	**1.29**	**0.20**	**0.43**	**0.003**	**0.007**	–-	–-
Problems related to SU	**Total**	**6.29**	**0.41**	**1.15**	**<0.001**	**<0.001**	**0.19**	**6.91 (8, 193, <0.001)**
		–-			–-	–-	0.23	6.97 (10, 191, <0.001)
	Anticipated	−0.44	−0.03	1.23	0.723	0.868	–-	–-
	Enacted	**2.59**	**0.20**	**1.28**	**0.044**	**0.058**	–-	–-
	Internalized	**4.74**	**0.36**	**0.92**	**<0.001**	**<0.001**	–-	–-

problems associated with SU (*M(SD)* = 30.66(13.61)). Total SU stigma was significantly associated with lower levels of behavioral activation, greater depressive symptoms, and greater problems associated with SU. See Table 1 for greater detail.

Multiple linear regression models including anticipated, enacted, and internalized SU stigmas simultaneously revealed that higher internalized stigma and anticipated stigma were significantly associated with lower levels of behavioral activation when controlling for other stigma mechanisms. Prior to p-value correction, internalized stigma and anticipated stigma were both significantly related to higher levels of depressive symptoms and internalized and enacted stigmas with greater SU problems, when controlling for other stigma mechanisms. Following Benjamini-Hochberg *p*-value correction, associations between anticipated stigma with depression and behavioral activation as well as enacted stigma with SU problems shifted from significant to marginally significant (adjusted $p = 0.058$). Internalized stigma remained significantly associated with each outcome. See Table 1 and Fig. 1 for more detail.

4. Discussion

Results revealed significant relationships amongst total SU stigma scores with less behavioral activation, worsened depressive symptoms, and greater problems related to SU. Different mechanisms of SU stigma were differentially associated with these outcomes: internalized stigma was significantly associated with higher depressive symptoms, lower

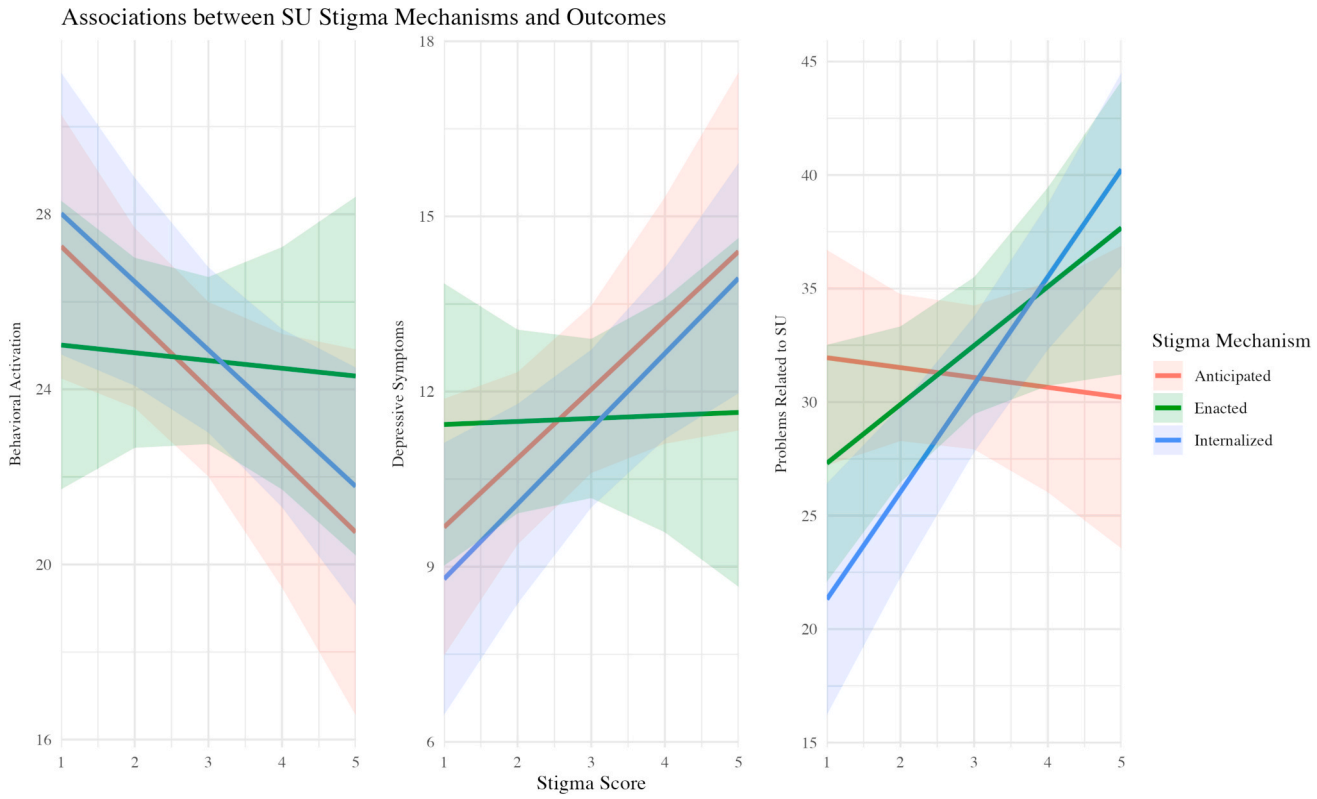

Fig. 1. *Note*. Behavioral activation was measured utilizing the BADS-SF, depressive symptoms using the PHQ8, problems related to SU utilizing the SIP-R, and stigma using the SU-SMS.

behavioral activation, and greater SU problems. Anticipated stigma was marginally associated with lower levels of behavioral activation and higher levels of depressive symptoms, and enacted stigma was marginally associated with greater SU problems.

The significant relationship between internalized SU stigma and lower BA, higher depressive symptoms, and greater problems related to SU supports qualitative findings that internalized stigma has a severe, negative impact on mental health and SU recovery goals beyond abstinence (Anvari et al., 2022, 2025). As low BA is both a symptom and maintaining factor of depression (Ferster, 1973; Lejuez et al., 2011), future research may longitudinally assess if BA levels mediate the relationship between internalized stigma and depressive symptoms. Future research may also investigate whether behavioral withdrawal mediates the relationships between internalized stigma and problems related to SU, particularly regarding physical, social and interpersonal problems. Others have theorized that changes in social status may mediate the relationship between stigma and interpersonal outcomes (Ertl et al., 2021).

The findings from this study may point to a need for innovative solutions in addressing internalized SU stigma. Peer recovery specialists with lived experience may uniquely address internalized stigma and recovery barriers by modeling success, instilling hope, and teaching coping strategies (Anvari et al., 2022). Moreover, recent research indicates that peer recovery specialists (PRSs) can also implement strategies to increase behavioral activation (Anvari et al., 2023; Magidson et al., 2020, 2022). Future work should consider how interventions specifically targeting internalized stigma as a transdiagnostic factor, such as acceptance and commitment therapy (Luoma, 2014), may be suitable for PRS delivery.

Enacted SU stigma demonstrated a trend-level association with problems related to SU. This may reflect the interpersonal and social problems measured by the SIP-R, where higher enacted stigma scores suggest experiences of discrimination from others. This may warrant future investigation utilizing the SIP-R subscales, particularly among marginalized individuals, such as those in our study. Further, given the cross-sectional nature of this study, future longitudinal research may disentangle the directionality and causality of these relationships. Given the likely intersectional stigmas and discrimination experienced by racially and ethnically minoritized individuals (Earnshaw et al., 2015; Williams & Fredrick, 2015), it is also important to consider how the stigmatization of multiple identities may play a role in these relationships.

These findings should be interpreted in the context of key study limitations. Given the cross-sectional nature of this study, speculation on directionally, causality, and temporality cannot be made. Regarding study measures, it is important to note that each measure assessed distinct timeframes over the past three months, which is needed to consider for guiding interpretation of these cross-sectional findings. Further, the BADS-SF demonstrated modest internal reliability in this sample. This is one of the first studies to evaluate the BADS-SF in this population; future work may be needed to consider how to adapt the measure for patients receiving methadone treatment. This study did not assess the potential influence of pre-existing psychiatric diagnoses on these relationships, which should be investigated in future research.

In summary, total stigma and internalized stigma were cross-sectionally associated with greater problems related to SU and depressive symptoms and lower behavioral activation levels. Although most of the measures utilized (i.e., SU-SMS, BADS-SF and SIP-R) do not have established clinical cutoffs, the associations observed in the current study suggest that higher stigma, particularly internalized, is meaningfully related to psychosocial functioning in this population. These findings underscore the clinical significance of addressing internalized stigma in intervention efforts to support OUD and related recovery outcomes. Future longitudinal and mechanisms research is needed to further understand how these variables relate over time, determine clinically meaningful changes within these relationships, further inform intervention development.

CRediT authorship contribution statement

Morgan S. Anvari: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Caroline A. Sacko:** Writing – review & editing, Writing – original draft, Conceptualization. **Noah S. Triplett:** Writing – review & editing, Visualization, Supervision, Methodology, Formal analysis. **Valerie D. Bradley:** Writing – review & editing, Validation, Project administration, Investigation, Data curation. **Mary B. Kleinman:** Writing – review & editing, Validation, Project administration, Investigation, Data curation. **Abigail C. Hines:** Writing – review & editing, Validation, Investigation, Data curation. **Rithika Baskar:** Writing – review & editing, Validation, Investigation, Data curation. **Jessica S. Anane:** Writing – review & editing, Validation, Investigation. **Valerie A. Earnshaw:** Writing – review & editing, Supervision. **Annabelle M. Belcher:** Writing – review & editing, Supervision. **Jessica F. Magidson:** Writing – review & editing, Supervision, Methodology, Funding acquisition.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Jessica F. Magidson reports financial support was provided by National Institute on Drug Abuse. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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