Social Support and Depressive Symptoms: Exploring Stigma and Self-Efficacy in a Moderated Mediation Model

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Research Article

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Abstract

Background: Although some psychological processes, such as stigma and self-efficacy, affect the complicated relationship between social support and depressive symptoms, few studies explored a similar psychological mechanism among individuals with substance use disorders. Hence, this research investigates the mediating effects of stigma and the moderating effects of self-efficacy among the psychological mechanism that social support affects depressive symptoms.

Methods: The study included 1040 Chinese participants with substance abuse disorders (SUDs) and completed a series of self-report questionnaires. R software was used to organize and clean up data sets and analyze mediation and moderation effects.

Results: The result showed that stigma had a partial mediating effect on depressive symptoms, while self-efficacy moderated this relationship. More specifically, less social support increased depression symptoms by bringing about higher stigma. Besides, subjects with higher self-efficacy are less susceptible to stigma and therefore have mild depressive symptoms. Furthermore, clinical and theoretical implications are discussed in our study.

Conclusions: Chinese SUDs patients' depressive symptoms were indirectly affected by perceived social support via stigma and less affected by stigma with improved self-efficacy. The theoretical and practical implications of these results are discussed.

1. Introduction

The latest report showed that 2.14 million people have drug use problems in china [1]. According to the world drug report, nearly 271 million people have experienced drug use in 2018, and 35 million individuals suffer from SUDs [2]. Worse, SUDs commonly co-occurs with depressive symptoms [3]. Depressive symptoms among people with SUDs can lead to more severe dysfunction, poor treatment results, higher morbidity, mortality, and more treatment costs [4-9].

Social support, one of the essential factors that can affect depressive symptoms of people with SUDs, is a concept that one feels cared for by others and has a reliable social network, such as family members, friends, and significant others [10]. It is reported that perceived social support positively relates to psychological well-being [11-13], and protects against depressive symptoms and psychological distress [14-16]. For example, family support, such as administering medication, cooking meals, and emotional support, could help patients recover [17]. Conversely, lacking social support or suffering from social isolation will adversely affect mental health [18].

In summary, good social support can help reduce depressive symptoms among patients with SUDs. However, the study on how and when social support affects depressive symptoms in patients with SUDs remains unclear. Therefore, it is necessary to explore the relationship between perceived social support and depressive symptoms.

1.1 The Mediating Role of stigma between perceived social support and depressive symptoms

Stigma is a mark of shame and disapproval resulting in an individual being rejected, discriminated against, and excluded from society [19]. Individuals with SUDs are more likely to be blamed by others [20] and think of themselves as inferior [21]. The public often discriminates against SUDs patients [22], regarding them as violent and dangerous [23]. Even worse, doctors as the primary helpers also held negative attitudes toward SUDs patients. As a consequence, it would negatively affect treatment efficacy [24]. Therefore, they are more likely to experience severe social isolation in personal life or workplace and be treated differently in national policies [22, 25].

Furthermore, the stigmatization of SUDs patients may cause emotional, physical, cognitive stress responses [26]—even mental disorders - depression and anxiety [27-32]. For example, a study about alcohol addiction showed that the feeling of hurt resulted from stigma would easily convert into depressive symptoms, such as unworthiness or embarrassment [33]. A similar conclusion has also been proved in patients with opioid use disorder [34].

Previous studies have indicated that social support and internalized stigma can predict mental illness, such as depression, among HIV patients [35, 36]. For example, a poor social network has been shown to increase internalized stigma in schizophrenia [37]. Conversely, Poor interpersonal relationships may increase stigma [37, 38]. Although studies have shown that perceived social support can mediate stigma and depression [39], the relationship between stigma and perceived social support might also work in the other way, from social support to stigma. For instance, Birtel et al. reported the mediation effect of internalized stigma between the perceived social support and depressive symptoms with a small size of 64 SUDs individuals [40], which indicated that if one with SUDs can feel more supported by others, such as family members or friends, they may lower be internalizing the negative public views to them and then reduce internalized stigma to reduce depressive symptoms.

1.2 The Moderating Role of Self-efficacy between stigma and depressive symptoms

Self-efficacy is a faith that an individual can successfully execute behaviors to achieve desired aims [41]. Self-efficacy could improve the ability to change substance use behaviors, such as drinking behavior [42, 43]. In addition, self-efficacy might contribute to cognitive and behavioral changes [44]. Although some studies have shown a correlation between self-efficacy and stigma in individuals with mental illness [45] and alcohol addiction [32], few studies have explored the relationship between stigma and self-efficacy in SUDs patients.

High self-efficacy is associated with positive outcomes, such as a low depressive symptom and increased well-being [46-48]. In addition, people with solid self-efficacy have the good emotional regulation ability. Hence, they are more likely to perceive satisfaction and experience more positive emotions [49, 50]. In contrast, low self-efficacy is more likely to produce negative emotions, like depression, anxiety [51, 52]. Additionally, many studies have demonstrated that patients with depressive

symptoms reported low self-efficacy [53-55]. Therefore, we speculate that self-efficacy may have a moderating effect on stigma and depression symptoms.

1.3 The purpose of the study

The present study explored how stigma and self-efficacy influence the relationship between social support and depressive symptoms among Chinese SUDs patients by establishing a structural equation model. The hypothetical model is shown in Figure 1, and the following hypothesis is proposed:

Hypothesis 1 (H1): stigma could mediate the relationship between perceived social support and depressive symptoms.

Hypothesis 2 (H2): self-efficacy could moderate the indirect association between stigma and depressive symptoms.

2. Methods

2.1 Participants and procedure

It is a descriptive case-control study conducted at two Compulsory Drug Rehabilitation Centers in Hunan province, China. Patients had to meet the diagnosis of substance use disorders (SUDs) according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). The study was conducted from February 2020 until the end of December 2020. After signing the informed consent, subjects finished the relevant questionnaires. The investigation gained ethical approval from the second Xiang-Ya Hospital of Central South University (Application Number LYF2020109).

2.2 Measures

Social-Demographics Questionnaire

The research team developed the Social-Demographics Questionnaire in light of the literature. It consists of eight questions to collect information about the participants' socio-demographic characteristics, including age, job, gender, salary, marital status, education level, smoking and drinking, and substance use-related characteristics.

The Substance Use Stigma Mechanisms Scale (SU-SMS)

The Substance Use Stigma Mechanisms Scale was used to measure stigma mechanisms among patients with SUDs [56]. This study used the Chinese version of SU-SMS (SUSMS-C) [57], containing five factors and 18 items on a five-point Likert scale. The higher the score on the scale, the more severe the stigma suffered by the individual. The SUSMS-C has good reliability and validity in Chinese patients with substance use disorder, showing the internal consistency reliability is between 0.724 - 0.909, the test-retest reliability is 0.702 [57]. In the present research, Cronbach's alpha was 0.88.

The multidimensional scale of perceived social support (MSPSS)

In this study, we used the Chinese version of the Perceived Social Support Scale (MSPSS) to assess the level of social support [58], which contains a total of 12 items on a seven-point Likert scale. Cronbach's alpha of MSPSS was 0.89 in Chinese adolescents [58]. In the present research, Cronbach's alpha was 0.92.

The Centre for Epidemiologic Studies Depression Scale (CES-D).

We assessed depressive symptoms with CES-D [59]. CES-D contains 20 items on a four-point Likert scale. The higher the total score, the more severe the depression. This Chinese version of the CES-D has satisfactory reliability and internal validity and has been widely used in the Chinese population [60]. In the present research, Cronbach's alpha was 0.87.

The General Self Efficacy Scale (GSES)

We used the General Self Efficacy Scale (GSES) [34], which contains ten items based on four responses, to assess self-efficacy. A lower score indicates a lower level of general self-efficacy. This scale has good reliability and validity in the Chinese population [61]. In the present research, Cronbach's alpha was 0.71.

2.3 Statistical analyses

We used R software (version 3.6.3) to organize and clean the dataset and generate the correlations. We used '*process*' [62] and the '*lavaan*' packages [63], which allows us to analyze mediation and moderation effects at the same time [64]. We tested a moderated mediation model, in which social support served as the independent variable (X), negative affect stigma served as the mediating variable (W), depression served as the dependent variable (outcome, Y). Self-efficacy served as the moderator variable (V). Additionally, we also performed a simple slope computation of the moderation model to test the significance of the moderation slopes. To make the results more robust, we conduct the bootstrapping procedure [65, 66]. In this research, we adopt 1000 Bootstrap samples.

3. Results

3.1 Demography

One thousand and forty SUDs (204 females, 836 males) aged 16 and 65 years (Mean = 35.38, SD = 8.49) took part in this research. In this study, 785 participants (75.48%) mainly used methamphetamine, following heroin users were 171 (16.44%), and ketamine users were 62 patients (5.96%). (Table 1)

Table 1
Descriptive statistics of socio-demographic. (N = 1040)

		Total N (%)
Gender		
	male	836(80.4%)
	female	204(19.6%)
Occupation		
	Unemployment	143(13.75%)
	Employment	897(86.25%)
Marry		
	unmarried	630(60.58%)
	married	410(39.42%)
Income (CNY/Month)		
	< 2000	153(14.7%)
	2000 ~ 5000	365(35.1%)
	5000 ~ 10000	336(32.3%)
	> 10000	186(17.9%)
Smoking		
	Y	987(94.9%)
	N	53(5.1%)
Drinking		
	Y	536(51.5%)
	N	504(48.5%)
Drug kind		
	Methamphetamine	785(75.48%)
	Heroin	171(16.44%)
	ketamine	62(5.96%)
	Others	22(2.12%)

3.2 Correlations and Regressions

The score of CES-D positively linked with that of SU-SMS (Pearson correlation = 0.49, $P < 0.01$), while negatively correlated with that of GSES (Pearson correlation = -0.33, $p < 0.01$), and MSPSS (Pearson correlation = -0.33, $P < 0.01$). Further analysis of the data revealed that there was a significant negative correlation between SU-SMS and GSES (Pearson correlation = -0.16, $p < 0.001$), as well as MSPSS (Pearson correlation = -0.27, $P < 0.01$). Additionally, MSPSS positively correlated with GSES (Pearson correlation = 0.29, $P < 0.01$) (Table 2).

Table 2
Means, standard deviations and correlations for the variables.

	Means (SD)	GSES	CES-D	SU-SMS	MSPSS
GSES	24.02(6.73)	1			
CES-D	20.92(9.22)	-0.33**	1		
SU-SMS	45.18(11.38)	-0.16**	0.49**	1	
MSPSS	58.75(12.72)	.029**	-0.33**	-0.27**	1
Note: SD = standard deviation; SU-SMS: Substance Use Stigma Mechanisms Scale; MSPSS: the multidimensional scale of perceived social support; CES-D: Centre for Epidemiologic Studies Depression Scale; GSES: General Self Efficacy Scale. * $p < 0.01$, ** $p < 0.001$.					

The result of linear regression analysis with depression as the dependent variable and clinical data (MSPSS, SU-SMS, GSES, GSES: MSPSS) as independent variables showed that MSPSS-C ($\beta = -0.16$, $p < 0.01$), SU-SMS ($\beta = 0.84$, $p < 0.01$), the interaction of GSES and MSPSS-C ($\beta = -0.60$, $p = 0.01$) were independent variables to predict CES-D, and the total explanatory quantity of the three variables was 35% (Table 3).

Table 3
Moderated mediation testing results.

Outcome	Predictors	Path	b	SE	z-value	P(> z)	LLCI	ULCI
SU-SMS								
	MSPSS	(a)	-0.24	0.032	-7.56	< 0.01	-0.24	-0.27
CES-D								
	MSPSS	(c)	-0.11	0.02	-5.32	< 0.01	-0.12	-0.11
	SU-SMS	(b1)	0.68	0.07	9.36	< 0.01	0.68	0.61
	GSES	(b2)	0.36	0.13	2.84	< 0.01	0.36	0.19
	SU-SMS : GSES	(b3)	-0.02	0.01	-5.12	< 0.01	-0.02	-0.44
Note: SU-SMS: Substance Use Stigma Mechanisms Scale; MSPSS: the multidimensional scale of perceived social support; CES-D: Centre for Epidemiologic Studies Depression Scale; GSES: General Self Efficacy Scale.								

3.3 The Moderated Mediation Model

To confirm whether stigma plays a mediating role in the relationship between perceived social support and depressive symptoms and whether this mediation was moderated by self-efficacy, a moderated mediation model was constructed.

The unstandardized regression coefficients of each path of the model were shown in Fig. 2.

The direct effect between perceived social support and depressive symptoms was significant (path c': $\beta = -0.11$, $p < 0.01$, 95%CI [0.08, 0.16]). In the mediation analysis, perceived social support negatively predicted stigma (path a': $\beta = -0.24$, $p < 0.01$, 95%CI [-0.27, -0.24]), and stigma positively predicted depressive symptoms (path b1': $\beta = 0.68$, $p < 0.01$, 95%CI [0.61, 0.68]). Hypothesis 1 was supported. (Table 3)

The interaction effect between stigma and self-efficacy on depressive symptoms was significant (path b3: $\beta = -0.02$, $p = 0.01$, 95% CI [-0.02, -0.44]). Through the moderating effect of self-efficacy on stigma, the analysis results of the indirect influence of social support on depressive symptoms are as follows: the indirect effect was significant for both low self-efficacy ($\beta = -0.10$, SE = 0.02 95% CI -0.13, -0.07), and high self-efficacy ($\beta = -0.05$ SE = 0.01, 95% CI -0.07, -0.03) (Table 4). Figure 3 shows the moderation effect of self-efficacy on the relationship between stigma and depressive symptoms.

Table 4
Conditional indirect effect of perceived social support on depressive symptoms through stigma by self-efficacy.

Self-efficacy	Effect	BootSE	BootLLCI	BootULCI
Low self-efficacy	-0.10	0.02	-0.13	-0.07
Moderate self-efficacy	-0.08	0.01	-0.11	-0.06
High self-efficacy	-0.05	0.01	-0.07	-0.03

4. Discussion

The present study explored the mediator role of stigma between social support and depressive symptoms among SUDs patients by a moderated mediation model, which showed that stigma partially (38.51%) mediated the relationship between perceived social support and depressive symptoms. More specifically, less social support increased depressive symptoms by bringing about higher stigma. We also found that self-efficacy significantly alleviated the effect of stigma on depressive symptoms, suggesting that SUDs patients with high self-efficacy are less affected by stigma.

An exciting finding indicated that the SUDs-related stigma mediates the relationship between perceived social support and depressive symptoms, which confirmed our H1(H1)—in line with previous studies, suggesting that a poor social network could induce severe internalized stigma in schizophrenics [37, 38]. It has been widely reported that social support can be used as a predictor of depressive symptoms and

stigma [14, 15, 35, 67, 68]. A study in a population of women infected with Acquired immunodeficiency syndrome (AIDS) found that stigma could mediate the relationship between social support and depressive symptoms [69]. Similar results were also found in substance abuse patients [40]. Therefore, given that the above results indicate that a supportive environment, including equal acceptance of SUDs patients and providing necessary help and care, can help patients build self-esteem and alleviate depression.

On the contrary, a hostile environment can cause SUDs patients to believe that they are primarily responsible for the disease, therefore exacerbating the stigma. This finding highlights the importance of social support for SUDs patients. SUDs patients with reliable social support are accompanied by lower stigma, which can help reduce the mental stress associated with SUDs, such as depression symptoms. Our finding emphasized the necessity to provide more social support for SUDs patients and reduce their stigma. We also found that self-efficacy moderated the relationship between stigma and depressive symptoms, which supported former studies showing that stigma can lower self-efficacy among individuals with alcohol addiction [32]. However, the study results about internet addiction did not prove that self-efficacy could influence stigma [70]. This is inconsistent with our results. The discrepancy could come down to the different samples. We speculate that people with internet addiction would perceive less stigma from their family members and peers than patients with SUDs.

Individuals with a high sense of self-efficacy have strong beliefs to accomplish the goals. Therefore, they are rarely interfering with ed by the negative evaluation of others, such as stigma. The labeling theory proposed by Link et al. could help us further explain this result, suggesting that stigma affects mental health by destroying the evaluation dimension of self-, concept which is mainly related to self-efficacy [71]. Decreased self-efficacy has been shown to weaken personal empowerment, and reduced power can lead to a higher level of depression [72].

Additionally, Bandura. et al. put forward that self-efficacy relieves depressive symptoms in SUDs patients because depression may stem, in part, from conditions that induce a belief that they cannot overcome the difficulties [73]. Hence, Curran. et al. also explain why self-efficacy can be a strong predictor of abstinence [74]. Earlier studies have shown that self-efficacy can reduce the recurrence rate of substance use patients [75, 76]. We speculate that this may be achieved by reducing depressive symptoms.

These findings emphasize that both stigma and social support should be considered when treating SUDs patients with depression. A prior clinical trial applied acceptance and commitment therapy to reduce the stigma on SUDs patients, and the results showed that decreasing the stigma could improve emotions, cognitions, and behaviors [77]. Psychotherapy research found a relatively enduring and robust effect of stigma on well-being, indicating that if therapists wish to maximize the well-being of the people they treat, they must pay more attention to addressing stigma [78]. The social support network is an essential factor that should be considered in reducing SUDs related stigma [37, 38], which can be subdivided into multiple dimensions according to the source (e.g., peers, family) and type (e.g., general support or specific support for abstinence [79]. For example, peers in mutual aid groups are the primary support source outside of the

conventional treatment of alcohol addiction [80]. A clinical study explored the efficacy of 12-step group therapy in 121 patients diagnosed with SUDs and mental disorders showing that self-help groups help reduce mental health and the severity of drug abuse symptoms [81]. Another source of social support is family [82]. Family members, such as parents, play a crucial role in helping patients meet basic demands. Good family support could help patients reduce the impact of stigma [37, 38]. However, if the patient brings a high level of stress and tension, which overwhelming the family's ability to cope, it may lead to reduced family support [83]. Therefore, psychiatrists should pay more attention to increase social support and reduce the stigma of SUDs.

In addition to conventional interventions, doctors should also improve patients' self-efficacy, thereby reducing the adverse effects of stigma on patients and improving mental health. For example, some research has indicated that applying Zen or Tao can resist the urge to drink or take drugs by enhancing self-efficacy [84]. In addition, psychotherapy research, cognitive-behavioral stress management (CBSM) on self-efficacy and relapses into a form of SUDs, shows that CBSM training contributes positively to increasing self-efficacy and lowering the risks of relapse into once again showing SUDs symptoms [85]. A system review that contained 37 interventions on self-efficacy showed that physical activity interventions might be an excellent choice to enhance self-efficacy [86]. Therefore, when treating SUDs patients with high levels of stigma, clinicians can consider encouraging patients to do more regular physical exercises to improve self-efficacy, reducing the negative emotions of drug patients being affected by stigma.

We should not ignore some limitations in the present research. First of all, the study is a cross-sectional study that contains some weaknesses, such as the inability to measure the incidence, difficulty making causal inferences, and making a causal inference [87]. In addition, this study did not control the influence of other confounding variables, for example, whether participants are accompanied by other mental illnesses (e.g., schizophrenia, bipolar disorder, depression, etc.). Moreover, while the model fits patients with drug use disorder, it is unknown whether the result could be expended to other populations, such as alcohol addiction.

Despite these limitations, this study contains some strengths. First of all, this is the first study to explore social support mechanisms affecting depression in a large sample of SUDs patients in China. We also consider the moderating effect of self-efficacy in the mediation model, which was ignored in previous studies [40, 69]. Second, our research established a mediation model and chose a more reliable statistic-1000 bootstrapping, to get robust results. Third, this study also provides some advice for clinical psychiatrists to improve treatment effects.

5. Conclusion

The present study reported the partial mediating role of stigma in the relationship between perceived social support and depressive symptoms and moderated by self-efficacy among Chinese SUDs patients. The results indicated the critical role of stigma and self-efficacy in treating SUDs patients with depressive symptoms.

Abbreviations

Substance Use Stigma Mechanisms Scale (SU-SMS); the multidimensional scale of perceived social support (MSPSS); Centre for Epidemiologic Studies Depression Scale (CES-D); General Self Efficacy Scale (GSES); Substance abuse disorders (SUDs); cognitive-behavioral stress management (CBSM)

Declarations

Ethics approval and consent to participate: The investigation gained ethical approval from the second Xiang-Ya Hospital of Central South University (Application Number LYF2020109). All subjects signed an informed consent to participate in this study, which was carried out in accordance with the Helsinki Declaration.

Consent for publication: This study has obtained consent to publish from the participants to report individual patient data.

Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable requests.

Competing interests: No conflict of interest was disclosed for each author.

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Figures

Figure 1

Conceptual framework of the current study.

Figure 2

Unstandardized regression coefficient for the moderated mediation model.

Figure 3

Moderation of the effect of Stigma on depressive symptoms by self-efficacy.