



Evidence for the indirect effects of perceived public stigma on psychosocial outcomes: The mediating role of self-stigma

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ABSTRACT

This study examined the possible mediating role of self-stigma in the relationship between perceived public stigma and psychosocial outcomes and how this mechanism may be contingent on illness severity in a non-Western (Chinese) sample. A total of 251 participants, namely 151 psychiatric outpatients with psychotic disorders and 100 psychiatric outpatients without psychotic disorders, completed a questionnaire on stigma and psychosocial outcomes that covered topics such as self-esteem, depressive symptoms, and subjective quality of life (QoL). Using a cross-sectional design, ordinary least squares regression and bootstrapping mediation analyses were used to test whether self-stigma mediated the relationship between perceived public stigma and psychosocial outcomes and whether this mediating process was moderated by diagnostic status. The results indicated that self-stigma mediated the effect of perceived public stigma on psychosocial outcomes such as self-esteem, depressive symptoms, and subjective QoL among both patients with psychotic disorders and those without psychotic disorders after controlling for demographic and clinical characteristics. Further, moderated mediation analyses revealed that the indirect effect of perceived public stigma on psychosocial outcomes were not moderated by the status of psychotic diagnoses. Self-stigma might be an essential and tractable target for interventions aimed at breaking the vicious cycle of discrimination and stigmatization toward people with mental illness regardless of their diagnoses.

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1. Introduction

People with mental illness have long experienced prejudice and discrimination (Ritsher et al., 2003; Livingston and Boyd, 2010; Corrigan et al., 2012). Stigmatization of people with mental illness occurs in all cultures and societies, both Western and non-Western (Yang, 2007; Thornicroft et al., 2009). Stigma of mental illness arises in two main forms. Public stigma refers to the endorsement of negative stereotypes of people with mental illness by members of the public (Angermeyer and Dietrich, 2006). Self-stigma occurs when people with mental illnesses agree with and internalize negative stereotypes (Ritsher et al., 2003; Livingston and Boyd, 2010). Self-stigma is typically associated with shame about having a mental illness (Rüsch et al., 2006).

According to the Modified labeling theory (MLT) (Link et al.,

1989), people with mental illness who live in a culture with prevailing stereotypes about mental illness may anticipate and internalize devaluated and discriminated attitudes. This theory provides a paradigm for examining the adverse consequences of stigma and the relationship between perceived public stigma and self-stigma (Link et al., 1989). That is, when people have been officially labeled with severe mental illness, they believe that most people reject and devalue them and may suffer a number of negative outcomes, such as demoralization, lowered self-esteem, impaired social adaptation, unemployment, income loss, reduced psychiatric medication adherence or even directly against the positive effects of ongoing treatment (Rosenfield, 1997; Link et al., 2001; Sirey et al., 2001; Ritsher and Phelan, 2004). Several lines of inquiry have provided empirical support for MLT. First, perceived public stigma has been negatively associated with self-esteem (Link et al., 2001; Ow and Lee, 2012), work and role functioning (Alonso et al., 2009), and quality of life (QoL; Alonso et al., 2009; Ow and Lee, 2012). It has also been associated with greater depressive symptoms (Sirey et al., 2001) and positive symptoms

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(Ertugrul and Uluğ, 2004), reduced medication adherence (Sirey et al., 2001), and more negative attitudes toward help seeking (Vogel et al., 2005, 2007; Pattyn et al., 2014). Second, self-stigma has been linked to numerous poor outcomes including greater emotional distress (Ritsher et al., 2003; Lysaker et al., 2007), decreased hope (Lysaker et al., 2007), reduced self-esteem and self-efficacy (Ritsher et al., 2003; Vauth et al., 2007), avoidance of help seeking (Vogel et al., 2007; Pattyn et al., 2014; Tucker et al., 2013), and a generally poorer QoL (Lysaker et al., 2007). Finally, MLT has also been used to explain the existence of two types of self-stigma, self-stigma of mental illness and the self-stigma of help seeking (Ben-Porath, 2002; Vogel and Wade, 2009; Tucker et al., 2013). Although the associations between mental illness stigma and its effects on psychosocial outcomes have been well established, we found that people with mental illness who are aware of negative labeling but do not apply such labels to themselves suffer considerably less than do those who apply such labels to themselves (Rüsch et al., 2006; Margetic et al., 2010). Therefore, it is essential to investigate that the harm caused by stigma may be not merely a direct result of discrimination by others (Lauber, 2008) but also operating through the internalization of public attitudes and beliefs by stigmatized people. Corrigan and Calabrese (2005) have hypothesized that accepting negative stigmatizing stereotypes as applicable to the self is the primary mediator of the effects of the stigma of mental illness on self-esteem and related indices of psychosocial outcomes. As a result, it seems that self-stigma may mediate the relationship between perceived public stigma and psychosocial outcomes. Despite these theoretical assumptions, only one study has examined the mediating role of self-stigma on the relationship between perceived public stigma and outcome variables like attitudes toward counseling or the willingness to seek counseling (Vogel et al., 2007).

In addition, scholars generally agree that stigma toward mental illness is not inherent but rather develops within a sociocultural context (Livingston and Boyd, 2010; Yang et al., 2013). Notably, although prevalent in all cultures, stigma toward mental illness in Chinese societies is particularly pervasive and damaging (Yang, 2007; Yang et al., 2013). In a Chinese sociocultural context, deviant behaviors of mental illness is thought to result from weak character or low moral standard, rather than consequences with known biological causes (Tsang et al., 2007; Lam et al., 2010). Because traditional Chinese values and beliefs are likely to view mental illness as a deserved punishment for moral transgression (Lam et al., 2010; Mohamed et al., 2014), it is shameful to be known as people with mental illness and their family (Lee et al., 2005; Yang, 2007; Rusch et al., 2010; Tang and Wu, 2012). Lee et al. (2005) also suggested that a collective culture, such as the Chinese culture, might not protect its psychiatric patients against public stigma. This culturally specific value helps us to explain why Chinese culture imposes more stigmatizing attitudes toward people with mental illness than Western cultures. However, few studies on the influence of the stigma of mental illness on outcomes related to recovery have been conducted in non-Western countries (Livingston and Boyd, 2010; Corrigan et al., 2012).

Noteworthy, mental disorders are important public health issues in Taiwan (Fu et al., 2013) with more than 5% of its population diagnosed with psychiatric disorders clinically (Chien et al., 2004). Individuals who are mentally ill are often the targets of bias and stigma and thus susceptible to negative attitudes. As a result, the social and psychological consequences are usually serious and pervasive. In some studies, stigma toward mental illness has been linked to poor psychosocial outcomes such as low self-esteem, high rates of depressive symptoms, and poor subjective quality of life (Sirey et al., 2001; Livingston and Boyd, 2010; Ow and Lee, 2012). Although stigma toward mental illness has become a problem to be reckoned with in the worldwide, it is more consequential among

Taiwanese due to socio-cultural contexts. In addition, although previous research has indicated a relationship between distinct types of mental illness stigma and psychosocial outcomes, mediation models incorporating indirect effects that may clarify the complexity of such relationships await empirical validation. The purpose of this study was to examine the role of self-stigma according to the relationship between perceived public stigma and the following psychosocial outcome variables: self-esteem, depressive symptoms, and subjective QoL of psychiatric outpatients with psychotic disorders and those without psychotic disorders. In the current study, it was hypothesized that (i) perceived public stigma is negatively associated with self-esteem and subjective QoL and is positively associated with depressive symptoms; (ii) self-stigma is negatively associated with self-esteem and subjective QoL and is positively associated with depressive symptoms; and (iii) the effects of the stigma of mental illness on psychosocial outcomes are mediated through the internalization of stigma. In other words, among patients with mental illness, perceived public stigma indirectly reinforces the risk of worsening psychosocial outcomes, and greater perceived public stigma is associated with higher levels of self-stigma which, in turn, are related to worsening psychosocial outcomes.

Furthermore, this study examined whether this mechanism is more applicable to patients with more severe psychotic symptoms. Previous research has suggested that the severity of psychotic symptoms is associated with the level of perceived or internalized stigma (Ertugrul and Uluğ, 2004; Livingston and Boyd, 2010). It is also important to recognize that stigma may lead to emotional stress reactions and yield broadly harmful effects on the lives of people with schizophrenia and other mental illnesses (Rusch et al., 2009a, 2009b). Thus, it is logical to hypothesize that (iv) patients with psychotic disorders may perceive and internalize higher levels of stigma, and have a more pernicious effect on their lives than do those who have not been diagnosed with psychotic disorders and, therefore, the indirect effect of perceived public stigma on psychosocial outcomes mediated through self-stigma is greater among patients with psychotic disorders than among those without psychotic disorders.

2. Methods

2.1. Participants

This study was performed in accordance with the latest version of the Declaration of Helsinki. Prior to commencing this study, approval was obtained from the research ethics committee at the Tri-service General Hospital (ID: SS100-05). Following a comprehensive explanation of this study, informed consent was obtained from all of the participants. Participation in the present study was strictly voluntary and anonymous.

A total of 270 Taiwanese outpatients (138 males and 132 females) were recruited consecutively from one psychiatric outpatient department at a general hospital located in Taipei, a city in Northern Taiwan, between 2012 and 2014. Participants who had been diagnosed with a variety of mental disorders according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; (American Psychiatric Association, 2000) were recruited. All patients received ongoing outpatient treatment and were in a fairly stable clinical condition, which was defined as the absence of hospitalization or changes in medication within the preceding 3 months. All outpatients took psychotropic medications at the time of testing. Patients who exhibited evidence of mental retardation or organic brain pathologies including cerebral tumors, epilepsy, systemic disease, a history of cranial trauma, brain surgery, or a history of substance abuse or dependence were excluded from this study. Of the 270 patients initially invited to participate in the study, 19 (11 men, 8 women) did not complete the procedure, leaving a sample of 251 participants available for analysis (93% of the initial sample).

2.2. Measurements

2.2.1. Interview instruments and diagnosis

The clinical procedure used in this study involved administering a structured clinical interview pertaining to the DSM-IV-TR (American Psychiatric Association, 2000), conducting a detailed medical history review, and a physical examination

performed by psychiatrists. The demographic characteristics examined were gender, age, marital status (i.e., single and married), and formal educational attainment. A semistructured interview was conducted to determine the age of illness onset, duration of illness, and recurrence of previous hospitalizations. The age of illness onset was defined as the age at which the patient met the DSM-IV-TR (American Psychiatric Association, 2000) criteria for the first time. The duration of the illness was defined as the time since the first episode of mental illness.

2.2.2. Mental illness stigma

Perceived public stigma was measured using the 25-item Perceived Psychiatric Stigma Scale (PPSS; Han and Chen, 2008). Participants indicated on a 4-point scale the extent to which they believed that most people would devalue or discriminate against people with mental illnesses. The items were summed to provide total scale scores that pertained to perceived public stigma. High scores indicated a substantial awareness of perceived public stigma. Participants completed the PPSS, which had good reliability and validity (Han and Chen, 2008). This culture-specific scale was suitable for assessing perceived public stigma in Chinese societies in both clinical (Han and Chen, 2008) and community (Lien et al., 2015a) research. In the present study, regarding the internal consistency and reliability, the coefficient alpha was 0.88 for the patients with psychotic disorders and 0.90 for the patients without psychotic disorders.

The Internalized Stigma of Mental Illness Scale (ISMIS; Ritsher et al., 2003) was a 29-item self-administered questionnaire designed to measure self-stigma associated with mental illness. The ISMIS contained five subscales: alienation, stereotype endorsement, discrimination experience, social withdrawal, and stigma resistance. The stigma resistance subscale was excluded because it was determined to lack internal consistency and to be poorly correlated with the other ISMIS subscales (Brohan et al., 2010). A modified total ISMIS score was calculated based on the remaining 24 items. Each scale item was rated on a 4-point Likert scale and high scores indicated high levels of self-stigma. According to the procedure described by Ritsher et al. (2003) and Brohan et al. (2010), its scores were calculated by summing item scores and dividing the scores by the total number of answered items. When items were not answered, the total number to be divided was reduced. The resulting score ranged from 1 to 4. Based on the recommended by previous studies (Ritsher et al., 2003; Lysaker et al., 2007; Brohan et al., 2010; Lien et al., 2015b), all the scores were calculated with high scores indicating greater experience of self-stigma. Evidence of acceptable internal consistency, test-retest reliability, and factorial validity was reported by Ritsher et al. (2003) and Lien et al. (2015b). In order to increase the reliability of the measurement to assess the self-stigma, the scores for these four subscales were summed to create a total ISMI score, which is intended to represent a broad measure of self-stigma. The Chinese version of ISMIS had good internal consistency, good test-retest reliability and adequate convergent and construct validity (Lien et al., 2015b). In the present study, the Cronbach's alpha coefficient of self-stigma was 0.87 for the participants with psychotic disorders and 0.94 for the participants without psychotic disorders.

2.2.3. Psychosocial outcomes

The unidimensional self-report Rosenberg Self-esteem Scale (RSES; Rosenberg, 1979) consisted of 10 items that were coded using a 4-point Likert scale identical to that used in the ISMIS. Higher scores on the RSES indicated higher self-esteem levels. In a previous study, the Chinese version of the RSES exhibited high internal consistency, high test-retest reliability, and adequate convergent validity (Cheng and Hamid, 1995). The scale also exhibited high internal consistency in this study (Cronbach's alpha = 0.87 for patients with psychotic disorders and 0.90 for patients without psychotic disorders).

The Beck Depression Inventory (BDI-II) was a 21-item self-report scale (Beck et al., 1996). The items consisted of four statements that are scored on a scale of 0–3; high scores indicate high symptomatic severity. Respondents were instructed to describe their feelings during the previous 2 weeks. The results were scored by summing the responses to each of the items to obtain total depression scores ranging from 0 to 63. The psychometric properties of the Chinese version of the BDI-II were reviewed by Lu et al. (2002). On the basis of this study's data, the total score for internal consistency of the Traditional Chinese version of the BDI-II was high for the participants with psychotic disorders (Cronbach's alpha = 0.88) and for the participants without psychotic disorders (Cronbach's alpha = 0.94).

Subjective QoL was assessed using the Chinese version of the Schizophrenia Quality of Life Scale Revision Four (SQLS-R4; Kuo et al., 2007). The SQLS-R4 (Oxford Outcomes Ltd., 2004) was a self-administered questionnaire that comprises 33 items in two domains: psychosocial and vitality. All but four items were coded on a scale of 0–4 according to the frequency of occurrence during the previous 7 days (0 = always, 4 = never; the exceptional four items were coded: 0 = never, 4 = always). A higher score indicated a better health-related QoL. The SQLS-R4 has been translated into 52 languages by using standard procedures (Oxford Outcomes Ltd., 2004). The Cronbach's alpha values of the Chinese version of the SQLS-R4 were 0.92 for the psychological domain and 0.84 for the vitality domain in a previous study (Kuo et al., 2007). The test-retest reliability was also high; the intraclass correlation coefficients for the psychosocial and vitality domains were 0.84 and 0.84, respectively, for respondents whose psychological conditions remained stable over a 2-week interval (Kuo et al., 2007). In the present study, the Cronbach's alpha

coefficient for subjective QoL was 0.82 for the participants with psychotic disorders and 0.90 for the participants without psychotic disorders.

2.3. Statistical analysis

All statistical tests were performed using the Statistical Package for the Social Sciences (SPSS) Version 15.0 (SPSS Inc., Chicago, IL, USA; Norusis, 2006). Mediation (indirect) and moderated mediation effects were tested using the PROCESS macro for SPSS (Hayes, 2013). We performed multiple test adjustments with Bonferroni correction by the number of potential comparisons to achieve statistical significance at the 5% level; for instance, for 10 compared variables, one would need an individual comparison with p values of $0.05/10 = 0.005$ (Bender and Lange, 2001). All study variables were normally distributed (skewness < 2, kurtosis < 7; Mardia and Foster, 1983).

Descriptive summary statistics for the entire sample were calculated to identify the psychosocial and clinical characteristics of the groups. When between-group comparisons were executed, care was taken to ensure that the appropriate parametric and nonparametric tests were used. Chi-squared and independent t tests were used to determine whether study variables significantly differed between the groups of participants. Zero-order relations among study variables were examined with Pearson's correlations.

As shown in Fig. 1, total effects (c) refer to relationships between perceived public stigma (independent variable) and psychosocial outcomes such as self-esteem, depressive symptoms, and subjective QoL (dependent variables) without control for self-stigma (mediating variable). Direct effects (c') refer to relationships between perceived public stigma and psychosocial outcomes with control for self-stigma. Indirect effects ($a \times b$ or ab) are relationships in which self-stigma plays a mediating role between perceived public stigma and psychosocial outcome variables.

We used two approaches to explore whether the data supported the mediation model. First, multiple regressions were used to investigate whether the requirement of mediation effects were met in the "causal steps" approach advocated by Baron and Kenny (1986). Second, the model parameters were estimated simultaneously using bootstrapping procedures with the SPSS version of the macro developed by Preacher and Hayes (2004). The bootstrap framework is useful to test the significance of indirect effects in mediation models, particularly with small to moderate sample sizes and when the assumption of non-normality in the sampling distribution may be violated (Shrout and Bolger, 2002). This bootstrap procedure uses randomly resampled with replacement from the original data to create pseudo bootstrap samples (5000 were used in the present study) with point estimates for indirect effects being calculated for each sample. Using these point estimates, the indirect effects and their Bias-corrected and accelerated (BCa) bootstrapped confidence intervals (CIs) are calculated. The CIs are then used to determine if each effect is statistically significant. When the 95% CI does not include zero, the indirect effect significantly differs from zero at $p < 0.05$ (two-tailed), indicating that the effect of the independent variable on the dependent variable is contingent upon the effect of the proposed mediator (Preacher and Hayes, 2004). Age in years, gender, education in year, marital status, ages of illness onset, and illness duration (years) were included as covariates, all of which were entered into path analyses to determine the direct and indirect effects of perceived public stigma and the mediating role of self-stigma among patients with mental illness. The models were

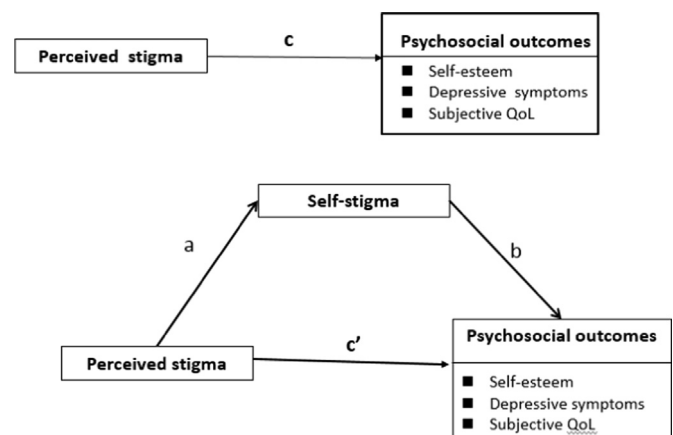


Fig. 1. Illustrations of an indirect (mediation) effect model. c indicates the total effect of perceived stigma on psychosocial outcomes (sum of the direct and indirect effects: $c = c' + (a \times b)$, where c' is the direct effect of perceived stigma on psychosocial outcomes, a is the direct effect of perceived stigma on self-stigma, and b is the direct effect of self-stigma on psychosocial outcomes. The indirect effect path coefficient is computed via the $a \times b$ path coefficient cross-product. QoL, quality of life.

first examined using the entire sample ($n=251$) and then by examining patients with psychotic disorders ($n=151$) and those without ($n=100$) psychotic disorders separately.

To further test whether the indirect effect of perceived public stigma on psychosocial outcome variables through self-stigma was conditioned according to diagnostic status, the moderation and mediation results were combined by estimating the conditional indirect effects of perceived public stigma on psychosocial outcomes through self-stigma as a function of the moderating variable (i.e., diagnostic profile) (Hayes, 2013). In the current study, the significance of moderated mediation (conditional indirect effects) was determined via bootstrapping techniques using the PROCESS macro for SPSS (Hayes, 2013). Continuous variables were centered at their means prior to analysis to facilitate interpretation and reduce multicollinearity; diagnostic status was dummy coded (with psychotic diagnoses=0). For the purposes of this study, the model of moderated mediation (Model 58) was established when both or one of two patterns existed (Hayes, 2013). This study examined whether diagnostic status (i) moderated the relationship between perceived public stigma and self-stigma or (ii) moderated the relationship between self-stigma and each of psychosocial outcome variables (self-esteem, depressive symptoms, and subjective QoL). The final model of moderated mediation in the present study is shown in Fig. 2.

3. Results

Descriptive statistics of the 251 participants (127 men, 124 women) are provided in Table 1 (sociodemographic and clinical characteristics) and Table 2 (measures of mental illness stigma and psychosocial outcomes). All participants ranged in age from 18 to 65 years. The mean age of the participants was 43.2 years ($SD=12.3$). Of the participants with psychotic disorders, 125 (49.8%) were diagnosed with schizophrenia and schizoaffective disorder and 26 (10.36%) were diagnosed with mood disorders with psychotic features. Of the participants without psychotic disorders, 80 (31.5%) were diagnosed with mood disorders without psychotic features and 20 (8.34%) were diagnosed with anxiety disorders. The majority of the participants had attained a high school education (97.0%). Only 73 (29%) participants were married. Over half (72.5%) were disabled and not currently employed.

After performing multiple comparisons with Bonferroni correction, the two groups (psychotic versus non-psychotic outpatient) exhibited differences in marital status ($\chi^2=10.4$, $p<0.001$), age of illness onset ($t=-4.4$, $p<0.001$), and illness duration ($t=6.89$, $p<0.001$). Participants with psychotic disorders were likely to be single and had an earlier onset and a longer duration of illness than those without psychotic disorders. The results revealed significant differences between the groups regarding perceived public stigma and self-stigma scores (perceived public stigma: $t=-4.80$, $p<0.001$; self-stigma: $t=-6.20$, $p<0.001$). The mean

Table 1

Sociodemographic and clinical characteristics among psychiatric outpatients by psychotic status.

Mean (SD) or N (%)	With psychosis (N=151)	Without psychosis (N=100)	Total sample (n=251)
Gender			
Male	77 (51%)	50 (50%)	127 (50.6%)
Female	74 (49%)	50 (50%)	124 (49.4%)
Age (years)	43.9 (10.4)	42.1 (14.7)	43.2 (12.3)
Education (years)	12.9 (2.63)	13.9 (2.85)	13.3 (2.75)
Marital status			
Single	125 (83%)	53 (53%)	178 (71%)
Married	26 (17%)	47 (47%)	73 (29%)
Illness onset	27.4 (8.2)	33.3 (12.8)	29.9 (10.7)
Illness duration	16.5 (9.4)	8.88 (7.27)	13.5 (9.40)

Table 2

Measures of mental illness stigma and psychosocial outcomes among psychiatric outpatients by psychotic status.

Mean (SD)	With psychosis (N=151)	Without psychosis (N=100)	Total sample (n=251)
PPSS	63.7 (13.8)	55.5 (13.0)	60.5 (14.1)
ISMIS	2.42 (0.44)	2.03 (0.52)	2.26 (0.51)
RSES	25.5 (5.45)	27.3 (5.19)	26.2 (5.41)
BDI-II	17.0 (14.4)	15.2 (12.6)	16.3 (13.7)
SQLS-R4	101.9 (23.8)	109.2 (23.6)	104.8 (24.0)

PPSS, Perceived Psychiatric Stigma Scale; ISMIS, Internalized Stigma of Mental Illness Scale; RSES, Rosenberg Self-esteem Scale; BDI-II, Beck Depression Inventory Two; SQLS-R4, Schizophrenia Quality of Life Scale Revision Four.

perceived public stigma and self-stigma scores were significantly higher in the participants with psychotic disorders than in the patients without psychotic disorders. However, the group with psychotic disorders did not reported higher levels of depressive symptoms, lower self-esteem, and poorer subjective QoL than did the group without psychotic disorders (all p -values > 0.0045 , non-significant for Bonferroni correction).

Bivariate correlations were examined between psychosocial measures and relevant demographic and clinical variables (see Table 3). After Bonferroni correction, perceived public stigma, self-stigma, self-esteem, depressive symptoms, and subjective QoL were significantly associated with each other in the expected directions (all p -values < 0.001).

3.1. Mediation hypotheses

Four criteria are required to reveal a mediator effect (Baron and Kenny, 1986). First, the predictor variable (perceived stigma) must be related to the mediator variable (self-stigma). Second, the predictor variable must be related to the psychosocial outcome variable (self-esteem, depressive symptoms, and subjective QoL). Third, the mediator variable must be related to the psychosocial outcome variable. Fourth, after controlling for the effects of the

Table 3

Correlations among study variables ($n=251$).

	1	2	3	4	5
1. Self-esteem	–	–0.66**	0.67**	–0.61**	–0.51**
2. Depressive symptoms		–	–0.78**	0.50**	0.44**
3. QoL			–	–0.62**	–0.56**
4. Self-stigma				–	0.65**
5. Perceived public stigma					–

QoL, quality of life.

** Significant at corrected statistical level ($p < 0.0025$).

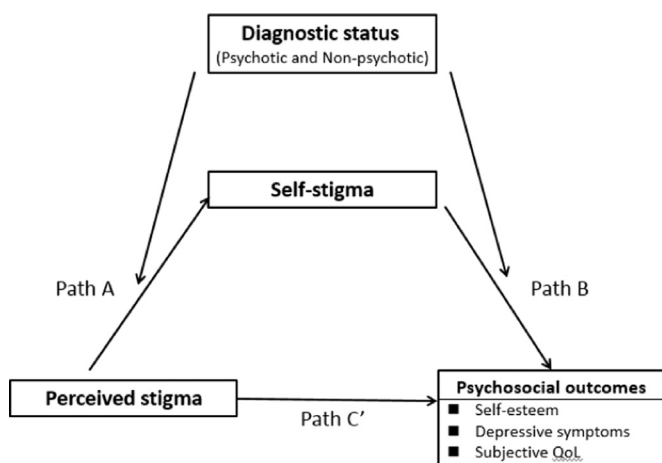


Fig. 2. Conceptual model of moderated mediation. It is hypothesized that self-stigma would mediate the association between perceived stigma and psychosocial outcome variables and that diagnostic status would moderate the mediation effect. QoL, quality of life.

mediator on the psychosocial outcome, the relation between the predictor and the psychosocial outcome must be significantly decreased. In order to test mediating effects of self-stigma on the relationships between perceived stigma and psychosocial outcome variables among patients with and without psychotic disorders, we tested these four conditions using simple and multiple regression analyses. First, self-stigma was regressed on perceived stigma ($\beta=0.64$, $p<0.001$). Perceived stigma contributed a significant amount of variance to self-stigma (40.6%). Second, psychosocial outcome variables (self-esteem, depressive symptoms, and subjective QoL) were regressed on perceived stigma (self-esteem $\beta=-0.50$, $p<0.001$; depressive symptoms $\beta=0.45$, $p<0.001$; subjective QoL $\beta=-0.54$, $p<0.001$). Perceived stigma explained a significant amount of variance to psychosocial outcome variables (28.8%, 22.8%, 32.5%, respectively). Third, psychosocial outcomes were regressed on self-stigma ($\beta=-0.60$, 0.51, -0.60 ; all p -values <0.001). Self-stigma explained a significant

amount of variance to psychosocial outcomes (37.9%, 27.1%, 37.8%, respectively). In the fourth equation, psychosocial outcome variables were simultaneously regressed on both self-stigma (-0.46 , 0.36 , -0.42 ; all p -values <0.001) and perceived stigma (-0.22 , 0.23 , -0.29 ; all p -values <0.001). Finally, the regression model contributed a significant amount variance to psychosocial outcome variables (42.0%, 30.0%, 42.0%).

3.2. Indirect effects of perceived public stigma on psychosocial outcome variables: the mediating role of self-stigma

We then formally tested the mediating effect using the bootstrapping methods with a script provided by Hayes (2013). After Bonferroni correction, the results of regression analyses testing mediation effects of self-stigma on the relationships perceived public stigma and self-esteem (or depressive symptoms and subjective QoL) are presented in Table 4. As seen in Table 4, the total

Table 4

Indirect effects of perceived public stigma on psychosocial outcomes through self-stigma among patients.

Psychosocial outcomes	Unstandardized estimates (SE)					Indirect effects		
	a	b	c	c'	ab	Bootstrap	SE	BCa CI ^b
Total sample (n=251)								
Self-esteem	0.02 (0.002)**	-4.77 (0.69)**	-0.19 (0.02)**	-0.09 (0.02)**	-0.10	-0.10 ^a	0.02	[-0.16, -0.06]
(R ² =0.41; F=22.34**)								
Depressive symptoms	0.02 (0.002)**	9.51 (1.91)**	0.44 (0.06)**	0.23 (0.07)**	0.21	0.21 ^a	0.04	[0.10, 0.32]
(R ² =0.30; F=14.37**)								
Subjective QoL	0.02 (0.002)**	-19.46 (3.03)**	-0.92 (0.09)**	-0.50 (0.11)**	-0.42	-0.42 ^a	0.08	[-0.63, -0.24]
(R ² =0.42; F=24.03**)								
Patients with psychotic disorders (n=151)								
Self-esteem	0.48 (0.05)**	-0.26 (0.04)**	-0.18 (0.03)**	-0.06 (0.03)	-0.12	-0.13 ^a	0.02	[-0.19, -0.07]
(R ² =0.36; F=10.58**)								
Depressive symptoms	0.48 (0.05)**	0.63 (0.11)**	0.44 (0.07)**	0.14 (0.09)	0.30	0.31 ^a	0.05	[0.17, 0.46]
(R ² =0.38; F=11.12**)								
Subjective QoL	0.48 (0.05)**	-1.14 (0.17)**	-0.99 (0.11)**	-0.44 (0.13)**	-0.55	-0.56 ^a	0.09	[-0.80, -0.33]
(R ² =0.47; F=15.93**)								
Patients without psychotic disorders (n=100)								
Self-esteem	0.49 (0.08)**	-0.15 (0.04)**	-0.19 (0.03)**	-0.12 (0.04)**	-0.07	-0.08 ^a	0.03	[-0.17, -0.01]
(R ² =0.51; F=13.80**)								
Depressive symptoms	0.49 (0.08)**	0.26 (0.11)**	0.36 (0.09)**	0.23 (0.10)	0.13	0.13 ^a	0.06	[0.01, 0.31]
(R ² =0.36; F=7.85**)								
Subjective QoL	0.49 (0.08)**	-0.67 (0.19)**	-0.72 (0.16)**	-0.39 (0.17)	-0.33	-0.33 ^a	0.14	[-0.79, -0.03]
(R ² =0.45; F=10.98**)								

Note: a, the direct effect of perceived public stigma on self-stigma; b, the direct effect of self-stigma on psychosocial outcomes; c, the total effect of perceived public stigma on psychosocial outcomes; c', the direct effect of perceived public stigma on psychosocial outcomes.

QoL: quality of life; SE: standard error; BCa: bias corrected and accelerated; CI: confidence interval.

R² depicted in the table is the adjusted R-squared value, which measures the proportion of the variation in our dependent variable (y: psychosocial outcome variables) explained by our independent variable (x: perceived stigma) and mediating variable (self-stigma) in this study.

** Significant at the corrected statistical level ($p<0.003$).

^a CI does not contain zero, $p<0.003$.

^b Bonferroni corrected CI.

effect (c) when perceived public stigma was regressed alone on self-esteem (or depressive symptoms and subjective QoL) was -0.18 ($0.44, -0.99$) among patients with psychotic disorder and the total effect was -0.19 ($0.36, -0.72$) among those without psychotic disorders. The unstandardized estimates dropped from c ($-0.18, 0.44, -0.99$) to c' ($-0.06, 0.14, -0.44$) among patients with psychotic disorders and those dropped from c ($-0.19, 0.36, -0.72$) to c' ($-0.12, 0.23, -0.39$) among those without psychotic disorders when self-stigma added into the equation. These results indicated that full mediation obtained when the predictor variable (perceived public stigma) has no significant effect on the psychosocial outcome variables (self-esteem and depressive symptoms) among patients with psychotic disorders and on the psychosocial outcome variables (depressive symptoms and subjective QoL) among those without psychotic disorder. Moreover, as shown in Table 4, the indirect effect ($a \times b$) of perceived public stigma on each psychosocial outcome variables mediated by self-stigma was significant among the participants with psychotic disorders and those without psychotic disorders; this effect was independent of participants' sex, age, education, marital status, age of illness onset, and illness duration. The Bonferroni corrected BCa CI for the indirect effect of perceived public stigma on psychosocial outcomes through self-stigma did not include zero indicating that self-stigma explained a significant portion of the effect of perceived public stigma on self-esteem, depressive symptoms and subjective QoL. Mediation effects appeared to differ in extent between the group with psychotic disorders and the group without psychotic disorders for psychosocial outcome variables. The indirect effect ($a \times b$) of perceived public stigma on psychosocial outcomes mediated through self-stigma yielded greater values for the participants with psychotic disorders than for the participants without psychotic disorders.

3.3. Moderation of the indirect effects of perceived public stigma on psychosocial outcomes by psychotic status

Moderated mediation was tested using a bootstrapping procedure according to Hayes (2013) Model 58, which can be used to evaluate the moderation of the path between a predictor and a mediator (i.e., path a) or the path between a mediator and an outcome (i.e., path b). Accordingly, diagnostic status was tested as a moderator of the path from perceived public stigma to self-stigma and the path from self-stigma to psychosocial outcome variables. The results revealed that the mediation of the association between perceived public stigma and psychosocial outcomes via self-stigma were not moderated by diagnostic status.

4. Discussion

According to our thorough review of relevant research, this is the first investigation of the mediating influence of self-stigma on the relationship between perceived public stigma and psychosocial outcomes in Chinese patients according to psychotic status. This study revealed perceived public stigma and anticipated self-stigma as two different stigma dimensions and provided evidence for their effects on psychosocial outcomes in patients with mental illness. Our findings support the conceptualization of mental illness stigma as a multilevel process that is associated with poor psychosocial outcomes. For many people with mental illness, self-stigma along with psychiatric symptoms might be a severe problem because it impedes their recovery.

Our results support the hypothesis that psychosocial outcomes, such as self-esteem, depressive symptoms, and subjective QoL, are associated with the degree to which public stigma and self-stigma are experienced. These results seem consistent with other findings

regarding the negative influence of perceived public stigma (Alonso et al., 2009; Ow and Lee, 2012; Sirey et al., 2001) or self-stigma (Livingston and Boyd, 2010) on psychosocial outcomes, including lower self-esteem, higher levels of depressive symptoms, and poorer QoL. These results also in accord with the MLT which casts social and psychological consequences as outcomes of stigma in patients diagnosed with mental illnesses (Link et al., 1989; Vogel et al., 2007, 2013). In the present study, we observed that anticipated self-stigma and perceived public stigma exerted different impacts on psychosocial outcomes; self-stigma is a critical predictor of psychosocial outcomes. Furthermore, the results of this study supplement the mental illness stigma literature by providing empirical evidence that the effect of perceived public stigma on psychosocial outcomes is mediated by internalization of the public stigma of mental illness. When the role of self-stigma was accounted for, evidence of the indirect effects of perceived public stigma on psychosocial outcome variables through self-stigma remained. In other words, public stigma may exert harmful effects through the internal perceptions, beliefs, and emotions of the stigmatized person, transcending the effects of direct discrimination by others (Ritsher and Phelan, 2004).

Our study found that our participants with psychotic disorders exhibited greater levels of perceived public stigma and self-stigma than did those without psychotic disorders, which was consistent with previous studies (Ertugrul and Uluğ, 2004; Livingston and Boyd, 2010; Brohan et al., 2010, 2011). Patients with psychotic diagnoses are often exposed to public prejudice or labels and may consequently internalize negative attitudes about their mental illnesses, frequently leading to stigma internalization. This finding also draws attention to the fact that patients with various disorders may differ in regard to variables that are relevant to the process of self-stigmatization. Accordingly, our results further clarified how stigma affects psychosocial outcomes in psychiatric patients with varying severity symptoms. However, our results might not support the moderated indirect effects of perceived public stigma via self-stigma on psychosocial outcomes in subsequent moderated mediation analyses. It may be the case that all participants deeply influenced by Chinese culture and this culture more strongly stigmatizes mental illness than other cultures (Lauber and Rossler, 2007; Yang, 2007; Yang et al., 2013). In fact, previous research suggested that subjective experiences of stigma are shaped by a country's social and cultural environment (Lv et al., 2013). Thus, it is plausible that people living in a more stigmatizing culture not only directly causes their perception of mental illness stigma as stressful but also render them more vulnerable to stigma stress and its harmful effects regardless of severity of mental illness.

Consistent with findings from Yen et al. (2009), this study found that a high level of mental illness stigma associated with a poor psychosocial outcome in subjects with depressive disorders, which indicated that the compromising effects of stigma on psychosocial outcomes are seen not only in patients with schizophrenia but also in those with depressive disorders. The results of this study further support the importance of reducing stigma and discrimination against people with depressive disorders.

In this study, we found that our sample with psychotic disorders reported higher mean scores of self-stigma than other studies in Western (Lysaker et al., 2007; Brohan et al., 2010; Sibitz et al., 2011; Sorsdahl et al., 2012) and Chinese (Lv et al., 2013) societies. Using four categories developed by Lysaker et al. (2007), 51% of our participants with psychotic disorders showed evidence of currently moderate or high levels of self-stigma which was higher than that in Brohan et al. (2010) findings, which almost half (42%) subjects across 14 European countries with a diagnosis of schizophrenia or other psychotic disorder reported moderate or high levels of self-stigma. Furthermore, employing a cutoff score of

2.5, our study showed higher levels of self-stigma (50%), a percentage twice as high as in [Lv et al. \(2013\)](#) study (20%) in Hong Kong and which was also higher than previous reported ([Boyd et al., 2014](#)). On the other hand, we reported higher mean scores of self-stigma among our sample without psychotic disorders (2.26) than that of previous research (1.79) conducted from fourteen European countries with a diagnosis of bipolar or depressive disorders ([Brohan et al., 2011](#)). Overall, the self-stigma reported in our study was higher than that reported in other studies.

Several methodological limitations should be considered when interpreting these findings. First, convenience sampling was used to select the participants in the study. Accordingly, these participants were not representative of all patients with mental illness. Second, cross-sectional analyses limit conclusions with regard to causality. [Maxwell and Cole \(2007\)](#) found that cross-sectional approaches to mediation typically generate substantially biased estimates of longitudinal parameters even under the ideal conditions when mediation is complete. Larger samples adequate for structural equation modeling and longitudinal studies are necessary to more effectively parse such causal relationships. Third, the Bonferroni correction was employed to reduce the chance of type I errors and considered to be conservative, might have increased the risk of rejection of true correlations (Type II errors; [Shi et al., 2012](#); [Armstrong, 2014](#)). Fourth, the subjective QoL measure is limiting. The Chinese version of the SQLS-R4 was designed to assess subjective QoL among patients with schizophrenia but was not designed for assessing subjective QoL among patients without psychotic disorders. However, the SQLS-R4 exhibited favorable internal consistency (0.9) for the participants without psychotic disorders. Finally, none of the outpatients with psychotic disorders who participated in our study were antipsychotic naïve. Most of them took atypical antipsychotics and none were drug free at the time of assessment. A study reported that treatment with antipsychotic medications may contribute to stigma experienced by patients with severe mental illnesses such as schizophrenia, schizoaffective disorder, and bipolar disorder ([Sajatovic and Jenkins, 2007](#)). Further research in this area would benefit from investigation of the influence of medication effects on self-stigma formation in psychosis.

This study provides crucial implications for psychological rehabilitation and emerging views on recovery from mental illness. In addition, the results of this study support the notion that perceived stigma engenders numerous negative consequences for patients who carry the associated stigmatized label ([Link et al., 1989](#)) and is a substantial obstacle to seeking psychological help ([Vogel et al., 2007](#)). Furthermore, the results of this study provide further corroborating evidence that self-stigma is a critical predictor of patients' psychosocial outcomes and a more proximal indicator than perceived public stigma in the context of psychological problems.

The recent emphasis on reclaiming a positive sense of self as a key feature of recovery indicates the importance of subjective experiences and the influence of such experiences on the course and outcome of mental illness ([Ritsher and Phelan, 2004](#); [Bellack, 2006](#); [Davis et al., 2012](#); [Drapalski et al., 2013](#)). Research on mental illness stigma has addressed the effects of various programs which were intended to erase public stigma of mental illness and its related stress ([Corrigan et al., 2012](#); [Clark et al., 2013](#); [Clement et al., 2013](#)). However, a recent meta-analysis of outcome studies about the effects of antistigma intervention programs conducted by [Corrigan et al. \(2012\)](#) highlighted that interventions aimed to reduce the negative impact of public stigma on stigmatizing individuals produced only small effects. As a result, it seems that

development of interventions to decrease self-stigma on persons with mental illness is imperative ([Mittal et al., 2012](#); [Lannin et al., 2015](#)). This study supports the need for widespread access to cognitive interventions that target the modification of self-stigmatizing beliefs that are linked with poor outcomes and are prevalent among this population. When self-stigma develops from public stigma, interventions should be developed to interrupt this process at the individual level and reduce or eliminate self-stigma despite perceptions of public stigma ([Corrigan and Calabrese, 2005](#); [Vogel et al., 2013](#)), as our findings support. Specifically, we believe that integrating promising new cognitive-behavioral therapy ([Corrigan and Calabrese, 2005](#); [Yanos et al., 2008, 2010](#)), narrative enhancement ([Yanos et al., 2008, 2010, 2011](#)), and individually approaches focused on addressing attitudes related to illness identity may help individuals with severe mental illness to address self-stigma, change their cognitive distortions or dysfunctional attitudes through the process of cognitive restructuring ([Corrigan and Calabrese, 2005](#); [Yanos et al., 2008, 2010](#)) and accept themselves as sufficiently privileged to construct a meaningful story of one's self and illness ([Lysaker et al., 2003](#); [Yanos et al., 2010, 2011](#)).

Competing interests

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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