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Research paper

## Self-stigma, stigma coping and functioning in remitted bipolar disorder

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## ABSTRACT

**Objective:** Stigma has a deleterious effect on functioning in individuals with bipolar disorder (BD). However, there has been no research investigating how stigma coping predicts self-stigma and functioning in BD. Furthermore, how different stages of self-stigma might affect functioning is unclear. The following hypotheses were examined: (1) Stigma coping by withdrawal and secrecy was associated with more self-stigma; (2) Stigma coping by withdrawal and secrecy was associated with worse social functioning; and (3) Later stages of self-stigma were associated with worse social functioning.

**Methods:** A random sample of remitted BD in a regional psychiatric clinic was examined using a cross-sectional design ( $n = 115$ ). Self-stigma was measured using the Chinese versions of Self-Stigma of Mental Illness Scale (C-SSMIS). Social functioning was assessed using the Functional Assessment Short Test (FAST). Stigma coping was evaluated using the Stigma Coping Orientation Scale (SCOS).

**Results:** Multiple regression analysis revealed that coping by secrecy was associated with the stereotype agreement subscale of C-SSMIS, while coping by withdrawal was associated with the C-SSMIS self-concurrence and self-esteem decrement subscales. Another regression analysis showed that FAST total score was associated with the self-esteem decrement subscale of C-SSMIS and the severity of depressive and manic symptoms.

**Conclusion:** We showed that self-esteem decrement, the final stage of self-stigma, was the most crucial stage in determining psychosocial functioning. Our findings suggested that stigma-reduction intervention should be arranged during the early stage of BD and targeted at various dysfunctional stigma coping.

## 1. Introduction

Stigma has been defined as stereotypes, prejudice and discrimination [1]. Stereotype is the negative belief about a group, prejudice is the related emotional response and discrimination is the actual behaviour as a reaction to the emotion. Many studies have shown that stigma experience in patients with mental illness is associated with adverse consequences including low self-esteem [2–4], poor treatment adherence [5–9] and increased symptom severity [10]. Self-stigma refers to the internalization of the negative public attitudes toward mental illness and it affects the course of mental illness by reducing the chances of securing employment and job promotion [11,12] and worsening treatment adherence [5,7,9].

Bipolar disorder (BD) is a severe mental illness characterized by episodes of major depression and mania/hypomania. The lifetime prevalence of bipolar I and II disorder has been reported as 2.1% in the United States [13]. With recurrent mood episodes and residual symptoms, BD is associated with significant disability and high healthcare

costs [14]. Early studies on psychiatric stigma mainly focused on people with schizophrenia. With increasing recognition by the general public about BD, studies have shown that stigma is also common in BD, and it has a similar extent and severity to that in schizophrenia [15].

A number of qualitative studies have reported that patients with BD feel stigmatized. A diagnosis of BD can overshadow patients' positive personal qualities and lead to shame, social withdrawal, goal restriction, and a reduced quality of life [16–20]. Regarding the correlates of self-stigma of BD, the presence of depressed mood has been the most consistent finding [21,22]. On the contrary, other correlates of self-stigma are less consistent. A study showed that receiving disability allowance and having a history of suicidal attempt were associated with greater self-stigma [22], but the findings were not replicated in two other studies [21,23]. A study showed that higher level of self-stigma was related to lower educational level and more hospitalization [21], while another study found that greater self-stigma was related to younger age and shorter duration of remission [23]. To have a better prediction of the development of self-stigma, further studies on the

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correlates of self-stigma in patients in remission are needed.

Although the relationship between stigma and functioning in people with BD has been explored in several studies [8,21,22,24], how stigma coping interacts with respective factors have not been investigated. For example, two cross-sectional studies found that a higher level of self-stigma was negatively associated with overall functioning [21,22]. Both studies did not address an important correlate of both self-stigma and functioning [25,26], stigma coping. Indeed, a qualitative study on the impact of BD on work functioning showed that stigma and disclosure in the workplace was one of the main themes of patients' concerns [27]. Nearly half of the participants agreed that stigma had resulted in them being dismissed from positions, passed up for promotion, demoted, or had held back their career in other subtler ways. Other participants reported that they had lost their jobs following disclosure. Conceivably, individuals with BD might adopt stigma copings such as secrecy and withdrawal, which can potentiate the deleterious effects of stigma by constricting social networks [26,28] and impeding recovery [29]. How different stigma copings might alter the relationship between self-stigma and functioning, and how they predict the respective factors, are unclear. Since stigma coping might be modifiable, these effects should be investigated.

On the other hand, stigma has been suggested to be comprised of 4 stages [30], namely stereotype awareness, stereotype agreement, self-concurrence and self-esteem decrement. This progressive model describes how public stigma is transformed into self-stigma and then resulting in harm. This model is supported by a longitudinal study showing stereotype agreement and self-concurrence of stereotypes being distinctly associated with hopelessness [31]. The study further demonstrated that later stages of stigma, self-concurrence and self-esteem decrement, were associated with a more detrimental effect on hopelessness. There has been no study on the effect of various stages of stigma on social functioning.

The present study aimed to investigate the role of dysfunctional stigma coping strategies on self-stigma and psychosocial functioning, and the effect of different stages of stigma on social functioning in a remitted sample of individuals with BD. The following hypotheses were examined:

1. Stigma coping by withdrawal and secrecy was associated with greater self-stigma.
2. Stigma coping by withdrawal and secrecy was associated with worse social functioning.
3. Later stages of self-stigma (self-concurrence and self-esteem decrement) are associated with worse social functioning.

## 2. Methods

### 2.1. Study design and participants

The study adopted a cross-sectional design and recruited Chinese patients with BD who were receiving treatment at a regional psychiatric clinic in Hong Kong between 1 August 2015 and 31 March 2016. Random sampling was used to ensure that all patients had an equal chance of being included in the study. The inclusion criteria were: 1) a diagnosis of BD according to the International Classification of Disease 10th edition (ICD-10); and 2) remission phase as defined by Young Mania Rating Scale (YMRS) score  $\leq 7$  [32,33] and Hamilton Rating Scale for Depression (HAM-D) score  $\leq 7$  [34,35]. The exclusion criteria were 1) a comorbid diagnosis of substance abuse or intellectual disability; 2) any organic brain pathology such as cerebral tumor, epilepsy, head trauma, and brain surgery; and 3) difficulty in understanding study questionnaires. The study was approved by the local institutional review board. Written informed consent was obtained from all participants.

### 2.2. Procedure

Patients with a diagnosis of BD were identified by the Clinical Data Analysis and Reporting System, a territory-wide electronic system of public hospitals. Each of the patients was represented by a computer-generated random number. The numbers were then sorted in a descending order, from which patients were approached accordingly. Based on previous studies [21,22], the correlation coefficient ( $\rho$ ) between stigma and functioning in patients with BD varied from 0.26 to 0.34. Using a two-tailed alpha of 5%, power of 80% and  $\rho$  as 0.26, the required number of participants was 114. Assuming a 20% refusal rate, 140 patients were invited to participate in the study.

To confirm a diagnosis of BD, the principal investigator reviewed all clinical information. The diagnosis was further ascertained through a face-to-face interview according to the ICD-10 criteria. Discussion with a senior psychiatrist was arranged when the diagnosis was in doubt. Patients not meeting the inclusion and exclusion criteria were replaced according to the random number list.

### 2.3. Assessments

Sociodemographic characteristics including age, gender, education level, marital status, employment status, living condition, and welfare status were collected. Clinical characteristics such as the age of onset and duration of illness, duration since last remission, number of psychiatric hospitalization, past suicidal attempts and the presence of psychotic symptoms during previous mood episodes were obtained. Symptom severity was assessed with the YMRS [32] and HAM-D [34]. The Chinese version Multidimensional Scale of Perceived Social Support (C-MSPSS) [36] was used to assess the social support from family members, friends, and significant others.

Stigma was assessed by the Chinese versions of Self-Stigma of Mental Illness Scale (C-SSMIS) [37]. C-SSMIS was developed on the basis of the formalised model of self-stigmatisation [30] and it measures how much patients are aware of the public stigma (stereotype awareness) and the 3 components of self-stigma, including an agreement with stereotypes (stereotype agreement), application of the stereotypes to one's self (self-concurrence), and lowered self-esteem (self-esteem decrement) [37]. Each component has 15 items which are rated using a Likert scale. A higher score indicates a higher level of stigma. Satisfactory psychometric properties have been reported for C-SSMIS, including good internal consistency (Cronbach's  $\alpha$  0.82 to 0.90) and test-retest reliability (intra-class correlation 0.71 to 0.81) [37].

Psychosocial functioning was assessed using the Functional Assessment Short Test (FAST) [38]. The FAST is a brief instrument designed to assess the main functioning problems experienced by psychiatric patients, particularly patients with BD. It comprises 24 items that assess 6 specific areas of functioning: autonomy, occupational functioning, cognitive functioning, financial issues, interpersonal relationships, and leisure time. A higher score corresponds to worse functioning. The validity and reliability of FAST have been shown to be good [38].

Subjects' stigma coping style was measured using the Stigma Coping Orientation Scale (SCOS) [39]. The SCOS has 22 items assessing 4 types of coping, including secrecy, withdrawal, education, and acceptance and each item is rated using a Likert scale. A lower score reflects a higher level of endorsement. The SCOS has been demonstrated to have good construct validity and internal consistency [40].

### 2.4. Statistical analysis

Statistical analyses were performed with the SPSS version 21.0. In view of the non-normal distribution of the continuous variables (Shapiro-Wilk test,  $p < .05$ ), Mann-Whitney  $U$  test and Kruskal-Wallis  $H$  test were used. For categorical variables, Pearson's chi-square test or

**Table 1**  
Sociodemographic and clinical characteristics of the participants ( $n = 115$ ).

Sociodemographic characteristics		
	Mean	SD
Age, years	47.17	11.85
Education level, years	13.09	4.24
	<i>N</i>	%
Gender		
Male	51	37.0
Female	64	63.0
Employment status		
Working	57	51.8
Student/housewife/retired	25	22.7
Unemployed	28	25.5
Marital status		
Single	43	37.4
Married	47	40.9
Divorced	23	20.0
Widowed	7	1.7
Living condition		
Living alone	23	20.0
Living with family	87	75.7
Living with friends	2	1.7
Living at half-way house	3	2.6
Current welfare status		
Receiving disability and/or social security allowance	64	56.1
Not receiving any allowance	50	43.9
Clinical characteristics		
	Mean	SD
Age of onset, years	29.87	9.97
Duration of illness, years	17.59	10.58
Number of psychiatric hospitalization	2.69	3.24
Remission since last episode, months	44.50	60.27
YMRS	0.52	1.12
HAMD	1.28	1.79
C-MSPSS	5.38	1.54
C-SSMIS – stereotype awareness	74.32	25.00
C-SSMIS – stereotype agreement	56.28	22.41
C-SSMIS – self-concurrence	43.63	22.27
C-SSMIS – self-esteem decrement	37.90	24.21
SCOS – secrecy	2.25	0.53
SCOS – education	2.09	0.56
SCOS – withdrawal	2.29	0.64
SCOS – acceptance	2.13	0.38
FAST – autonomy	0.50	1.34
FAST – occupation	5.57	6.39
FAST – cognitive	2.28	2.79
FAST – financial	0.45	0.89
FAST – interpersonal	3.92	3.55
FAST – Leisure	1.63	1.59
FAST – total	14.34	10.37
	<i>N</i>	%
Past psychiatric hospitalization	79	68.7
History of suicidal attempts	31	27.0
Presence of psychotic symptoms during past mood episodes	52	45.2

C-MSPSS, Chinese version of Multidimensional Scale of Perceived Social Support; C-SSMIS, Chinese version of Self-Stigma of Mental Illness Scale; FAST, Functional Assessment Short Test; HAMD, Hamilton Rating Scale for Depression; SCOS, Stigma Coping Orientation Scale; YMRS, Young Mania Rating Scale.

Fisher's exact test were used. Relationships among self-stigma, functioning, mood symptoms, social support, and stigma coping were explored using Spearman correlation. To avoid the effect from multiple comparisons, type 1 error was controlled by the Benjamini and Hochberg procedure with a false discovery rate set at 5% [41], the corrected level of significance  $p < .01$  was used in this study. The effects of stigma coping on the relationship between self-stigma and functioning were tested using mediation and moderation analysis. Maximum likelihood estimation with STDYX standardization output was used. Multiple linear regression analyses were performed to

examine the factors predicting self-stigma and functioning. Variables that were associated with self-stigma and functioning at  $p < .05$  were included as independent variables. A stepwise method was used to detect the most important variables, which contributed to the variability of the outcome variables. A two-tailed  $p < .05$  was considered significant for multiple regression analyses.

### 3. Results

#### 3.1. Participant characteristics (Table 1)

A total of 544 patients with BD were located; among which a random sample of 140 patients were selected and 115 patients consented to participate. The response rate was 82.1%. Table 1 depicts the sociodemographic and clinical characteristics of the participants. The age and sex of patients were not different from those refused to participate. Nearly half of the sample was older than 50 years old, and the range was from 18 to 71 years. The median age of onset was 28 years, while the median duration of illness was 15 years. The median period of remission was 23 months, and nearly 70% of the participants had previous hospitalizations.

#### 3.2. Associations between sociodemographic and clinical characteristics with self-stigma and functioning

Patients who were unemployed scored significantly higher in stereotype agreement ( $p = .009$ ). A higher educational level was associated with greater stereotype awareness ( $r = 0.277, p = .003$ ). HAMD total score correlated with stereotype agreement ( $r = 0.256, p = .006$ ), self-concurrence ( $r = 0.279, p = .003$ ) and self-esteem decrement ( $r = 0.259, p = .005$ ) subscales of the C-SSMIS. Similarly, C-MSPSS score correlated with stereotype agreement ( $r = -0.259, p = .005$ ), self-concurrence ( $r = -0.325, p = .000$ ), and self-esteem decrement ( $r = -0.274, p = .003$ ) subscales of the C-SSMIS. Age, gender, welfare status, number of years diagnosed with BD, number of psychiatric hospitalization, months since last mood episode, and YMRS score were not associated with the C-SSMIS scores.

FAST total score was significantly associated with the C-MSPSS ( $r = -0.309, p = .001$ ) and HAMD ( $r = 0.372, p = .000$ ) scores. Other sociodemographic or clinical characteristics were not associated with the FAST total score.

#### 3.3. Relationships between self-stigma and stigma coping and functioning (Table 2)

Only stigma coping by secrecy, but not other types of coping, had a trend of association with the FAST total score ( $r = -0.214, p = .022$ ).

Both the secrecy and withdrawal subscales of the SCOS were associated with the self-concurrence component of C-SSMIS ( $r = -0.266, p = .004$  and  $r = -0.322, p = .0001$ , respectively). Only the withdrawal subscale of the SCOS was associated with the self-esteem component of C-SSMIS ( $r = -0.342, p = .0001$ ). FAST total score was associated with the stereotype agreement, self-concurrence and self-esteem decrement subscales of the C-SSMIS ( $r = 0.307, p = .001$ ;  $r = 0.348, p = .0001$ ; and  $r = 0.351, p = .0001$ , respectively). The stereotype awareness component of the C-SSMIS was not associated with stigma coping and functioning.

#### 3.4. Mediation and moderation analysis on the relationship between self-stigma and functioning

Mediation and moderation analysis showed that stigma coping by secrecy was not a mediator or moderator of the relation between the C-SSMIS subscale scores (stereotype agreement, self-concurrence, and self-esteem decrement) and FAST total score (all indirect effects with  $p > .05$ ). Since other types of stigma coping were not associated with

**Table 2**  
Associations between self-stigma coping, stigma coping and functioning (n = 115).

Correlation analysis <sup>a</sup>		C-SSMIS								FAST	
		Stereotype awareness		Stereotype agreement		Self-concurrence		Self-esteem decrement		Total	
		r	p-Value	r	p-Value	r	p-Value	r	p-Value	r	p-Value
SCOS	Secrecy	-0.126	.180	-0.217	.020	<b>-0.266</b>	<b>.004</b>	-0.195	.036	-0.214	.022
	Withdrawal	-0.106	.260	-0.223	.017	<b>-0.322</b>	<b>.000</b>	<b>-0.342</b>	<b>.000</b>	-0.162	.084
	Education	0.034	.715	0.171	.068	0.144	.124	0.126	.181	-0.040	.674
	Acceptance	-0.047	.616	0.029	.760	0.006	.951	0.043	.648	-0.042	.653
FAST	Total	0.102	.277	<b>0.307</b>	<b>.001</b>	<b>0.348</b>	<b>.000</b>	<b>0.351</b>	<b>.000</b>	1	-

C-SSMIS, Chinese version of Self-Stigma of Mental Illness Scale; FAST, Functional Assessment Short Test; SCOS, Stigma Coping Orientation Scale. Correlation coefficients that were statistically significant according to the Benjamini and Hochberg procedure (p < .01) are bolded.

<sup>a</sup> Data were presented as spearman correlation coefficient.

**Table 3**  
Stepwise regression analysis predicting self-stigma and social functioning (n = 115).

Stepwise regression analysis predicting self-stigma	C-SSMIS							
	Stereotype awareness		Stereotype agreement		Self-concurrence		Self-esteem decrement	
	β	p-Value	β	p-Value	β	p-Value	β	p-Value
Gender					<b>-0.244</b>	<b>.005</b>		
Education level	<b>0.318</b>	<b>.001</b>						
Currently receiving allowance					0.033	.737	0.004	.969
Unemployment			<b>0.182</b>	<b>.046</b>	0.087	.378		
HAMD			0.148	.129	0.175	.075	0.135	.159
C-MSPSS			-0.091	.356	-0.125	.205	-0.099	.301
SCOS – secrecy			<b>-0.196</b>	<b>.030</b>	-0.152	.121	-0.031	.747
SCOS – withdrawal			-0.055	.578	<b>-0.289</b>	<b>.001</b>	<b>-0.290</b>	<b>.001</b>
FAST – total			<b>0.280</b>	<b>.003</b>	<b>0.325</b>	<b>.000</b>	<b>0.346</b>	<b>.000</b>
Adjusted R <sup>2</sup>		<b>0.093</b>		<b>0.152</b>		<b>0.247</b>		<b>0.213</b>
p-Value of the model		<b>&lt; .001</b>		<b>&lt; .001</b>		<b>&lt; .001</b>		<b>&lt; .001</b>

  

Stepwise regression analysis predicting functioning	FAST	
	β	p-Value
Education level	-0.160	.964
HAMD	<b>0.220</b>	<b>.024</b>
YMRS	<b>0.218</b>	<b>.021</b>
C-MSPSS	-0.158	.867
C-SSMIS stereotype agreement	0.106	.709
C-SSMIS self-concurrence	0.166	.236
C-SSMIS self-esteem decrement	<b>0.306</b>	<b>.001</b>
SCOS secrecy	-0.112	.951
Adjusted R <sup>2</sup>		<b>0.254</b>
p-Value of the model		<b>&lt; .001</b>

C-MSPSS, Chinese version of Multidimensional Scale of Perceived Social Support; C-SSMIS, Chinese version of Self-Stigma of Mental Illness Scale; FAST, Functional Assessment Short Test; HAMD, Hamilton Rating Scale for Depression; SCOS, Stigma Coping Orientation Scale; YMRS, Young Mania Rating Scale. β, standardized beta coefficient.

Regression coefficients that were statistically significant (p < .05) are bolded.

FAST total score, mediation and moderation analysis were not performed.

**3.5. Regression analyses predicting self-stigma components (Table 3)**

Upon multiple stepwise linear regression, education level was the only significant predictor of the stereotype awareness subscale of the C-SSMIS (adjusted R<sup>2</sup> = 0.093, p < .001). The stereotype agreement subscale of the C-SSMIS was predicted by FAST total score, secrecy coping subscale of the SCOS, and unemployment (adjusted R<sup>2</sup> = 0.152, p < .001). While self-concurrence was predicted by FAST total score, withdrawal coping subscale of the SCOS and male gender (adjusted R<sup>2</sup> = 0.247, p < .001), self-esteem decrement component was only predicted by FAST total score and withdrawal coping subscale of the SCOS (adjusted R<sup>2</sup> = 0.213, p < .001).

**3.6. Regression analysis predicting functioning (Table 3)**

YMRS and HAMD total scores and self-esteem decrement subscale of the C-SSMIS were the independent predictors of the FAST total score (adjusted R<sup>2</sup> = 0.254, p < .001).

**4. Discussion**

To the best of our knowledge, this is the first study examining self-stigma, stigma coping, and psychosocial functioning in patients with BD in remission. We found that unemployment, higher depression score, and lower perceived social support were significant correlates of self-stigma. Patients with higher levels of self-stigma were more likely to endorse the use of secrecy and withdrawal in stigma coping. Upon multiple regression analyses, stigma coping by secrecy predicted

stereotype agreement while withdrawal predicted self-concurrence and self-esteem decrement; Depressive and manic symptom severity and self-esteem decrement were the independent predictors of psychosocial functioning. Our findings suggested that 1) stigma copings by withdrawal and secrecy have a distinctly detrimental effect on different stages of self-stigma; 2) the final stage of self-stigma, manifested as self-esteem decrement, was most crucial in determining psychosocial functioning.

Our findings on the correlates of self-stigma partly agreed with former studies. In line with previous researches, we showed that there was an association between unemployment and self-stigma. A qualitative study found that many patients with BD felt that stigma led to job loss or stunted their career growth [27]. A longitudinal study demonstrated that patients with mental illness who were unemployed had a higher level of self-stigma than those receiving supported employment at baseline. After one year, patients' self-stigma decreased among those who were employed and had not experienced any discrimination; for those who experienced work-related discrimination, self-stigma persisted [42]. Therefore, interventions to reduce discrimination at workplace are crucial to enhance the beneficial effects of employment on self-stigma. We could not replicate the association between younger age, lower educational level, history of suicidal attempt, shorter duration of remission, and a greater number of hospitalizations with self-stigma. On the contrary, we found that a higher educational level was associated with greater awareness of public stigma. Although there have been no previous studies showing similar results, more educated patients may be more aware of the social phenomena, including the stigmatized views about mental illness held by the general public. Despite similar findings to previous studies that a greater severity of depression [21,22,24] and a worse social support [21,43] being associated with a higher level of self-stigma, their effects on all components of self-stigma disappeared upon regression analyses. On the contrary, dysfunctional stigma copings and functioning have more significant roles than subsyndromal residual depressive symptoms in predicting self-stigma.

The results agreed with *hypothesis 1* that dysfunctional stigma copings are associated with higher self-stigma. This is in line with previous studies on patients with schizophrenia [44,45] and severe mental illness [29]. The relationship is likely bidirectional. While individuals may consider their illness a disgrace, they tend to conceal their history of mental illness and withdraw from social interactions due to worries about discrimination and rejection [46], the adoption of these dysfunctional coping strategies exacerbate self-stigma because of a failure in recruiting support [47,48]. Intriguingly, copings by secrecy and withdrawal exerted selective effects on different subscales of self-stigma. Secrecy coping predicts earlier self-stigma process (stereotype agreement), whereas withdrawal coping affects the later stages (self-concurrence and self-esteem decrement). This might explain the lack of effect on reduction of self-stigma in a stigma reduction program which only targeted secrecy coping by disclosing one's mental condition [49]. Since self-stigma has been suggested to be a progressive process [31], the effect of early intervention on self-stigma reduction by engaging patients in social interaction using a cognitive approach should be investigated.

*Hypothesis 2* was not supported by our results. Only secrecy coping had a trend of association with worse social functioning ( $p = .022$ ). Also, it does not appear to have any roles in mediation or moderation with regard to the relationship between self-stigma and functioning. This suggests that although stigma coping has a significant effect on self-stigma, the change of coping strategy might not salvage functioning. Caution must be taken when interpreting this apparently pessimistic finding because our subjects have a long duration of illness and the results therefore only reflect the effect of coping strategy on functioning in the chronic stage. Hence, a future study in new-onset BD is

warranted.

*Hypothesis 3* was partly corroborated by our results. Only the final stage of self-stigma manifested as self-esteem decrement, was crucial in determining psychosocial functioning. This is in line with a longitudinal study which found lower self-esteem in patients with BD being associated with worse overall functioning, particularly in aspects related to interpersonal relationships, even after illness remission [50]. It can be postulated that if advancement of self-stigma can be prevented, the loss in social functioning might be reduced. Therefore, although stigma coping does not appear to alter functioning in individuals with chronic BD, the effects of early stigma coping modification on halting the progression of self-stigma and recovering functioning are still valuable to be examined. Conversely, social functioning was the most important predictor of all components of self-stigma. It is conceivable that individuals who have more functional impairment would internalize the stereotypes and have a lower self-esteem. Hence, an improvement in social functioning might reduce self-stigma and improve self-esteem.

**Strengths and limitations:** The merits of the present study include a low selection bias by employing a random sampling procedure and a high response rate of over 80%. However, a longitudinal design is required to delineate the causal relationships between self-stigma, stigma coping and functioning. Furthermore, the generalizability could be affected because about half of the subjects were older than 50 years old and had a long illness duration. Compared to studies in other countries [21,22,24], our sample had a higher educational level (mean level = 13 years) and lower unemployment rate (25%). We believed that our sample was truly representative of our clinic population in view of our random selection procedure and that subject characteristics being comparable to a local study on BD in remission [51]. Another limitation was that our sample only comprised of BD patients with mild impairment in social functioning (mean FAST total score = 14.34). Since those with poor functioning might have residual depressive symptoms, recruiting only remitted BD might therefore eliminated those with more impaired functioning. Hence, our results might be better applied to remitted BD with good functioning.

Our findings suggest that stigma hinders the psychosocial functioning of patients with BD. Therefore, it is important to address the issue of stigma in the treatment of BD. Various modalities have been designed to reduce self-stigma [52]. Psychoeducation and cognitive restructuring serve as the backbone of a number of stigma reduction programs [53–55]. For instance, a randomized controlled trial of a self-stigma reduction program, with components of psychoeducation, cognitive behavioral therapy, and social skills training, was able to improve self-esteem and enhance psychosocial treatment adherence among individuals with schizophrenia [56]. An incorporation of coping strategy modification (both secrecy and withdrawal) into these programs might improve the outcome. These stigma reduction programs should be developed for patients with BD in order to improve their psychological well-being and functioning.

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#### Conflicts of interest

None.

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