Relationship between Stress-Coping and Personality in Patients with Bipolar and Depressive Disorders

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Background: Personality might be one of the important factors related to stress-coping in mood disorders. This study aimed to investigate the relationship between personality and stress-coping strategies in patients with bipolar and depressive disorders.

Methods: A total of 195 patients diagnosed with bipolar and depressive disorders according to the criteria mentioned in Diagnostic and Statistical Manual of Mental disorders' 5th edition were included. Pearson's correlation and multiple regression analyses were used to analyze the relationship between personality, measured by Temperament and Character Inventory and NEO-Five Factor Inventory, and coping strategies, measured by Coping Inventory for Stressful Situations.

Results: Self-directedness was reported to be positively associated with task-oriented coping in bipolar disorders, and harm avoidance was negatively associated with task-oriented coping in depressive disorders. Beck Depression Inventory score, neuroticism, and extroversion were found to be positively associated with emotion-oriented coping in bipolar disorders, and neuroticism was positively associated with emotion-oriented coping in depressive disorders. Extroversion was reported to be positively associated with avoidance-oriented coping in bipolar disorders, and extroversion, novelty seeking, and reward dependence were positively associated with avoidance-oriented coping in depressive disorders.

Conclusion: This study concluded that the relationship between personality and stress-coping strategies may vary based on the type of mood disorder that is diagnosed. The interaction between personality and stress-coping might be considered for the modification of coping strategies in mood disorders.

Keywords Bipolar disorder; Coping skills; Depressive disorder; Personality

INTRODUCTION

Stress is one of the clinically important factors having an influence on clinical course in mood disorders. As such, negative events can promote the onset of mood disorders and are also associated with a high risk of relapse due to stress [1]. Stress is not a simple environmental stimulus or a response of an individual, but as a result

of the interaction between the environment and the individual [2]. Stress-coping strategies were related to the ability of individual adaptation to the environment [2]. The level of stress could be different according to the individual's coping strategies of the stressful situations. Stress-coping strategies could be also associated with mental health problems. Previous studies suggest that emotion-oriented coping was strongly associated with

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anxiety, depression, somatization [3,4]. The avoidance-oriented coping was related to negative consequence, such as depressive symptoms, in a maladaptive manner [5]. Depressed patients having avoidance coping styles were more likely to experience the negative emotions in daily life [6]. On the other hand, people mostly using task-oriented coping showed lower levels of depression and anxiety, and less problematic behaviors than those who rarely use task-oriented coping [7]. Therefore, the stress-coping strategies should be considered as the important components in mood disorders.

Several studies reported that patients with mood disorders have the differential patterns of coping strategy compared to healthy control. Patients with depressive disorders were more likely to be emotion-oriented coping strategies and avoidance-oriented coping strategies than healthy control groups [8]. Bipolar patients were also more likely to use emotional coping and avoidant coping styles than general population [9,10]. In a comparison study of coping strategies between bipolar and depressive disorders, patients with bipolar disorders showed more avoidance-oriented and task-oriented coping strategies [11]. Given that previous studies, there might be the similarity and difference of stress-coping strategies between bipolar and depressive disorders.

On the other hand, there have been a bunch of studies on the factors related to stress-coping strategies [12]. Among those, personality traits could be one of the crucial factors. Personality can be referred to the individual pattern responding to stressful situation. Previous studies suggest that specific personality types are related to the different types of stress-coping, perceived stress level, and mental illness [13,14]. The extroversion and frustration tolerance were positively correlated with task-oriented coping strategy in depressive patients [15]. The harm-avoidance was negatively associated with task-oriented coping in depressive patients [16]. In contrast, the neuroticism and isolation tendency and esoteric tendency were positively associated with emotion-oriented coping strategy in patients with major depression. Interestingly, the extroversion was related to the use of the avoidance-oriented strategy with task-oriented coping, as previous noted [15]. The higher harm-avoidance and lower persistence were involved in the use of avoidance-oriented coping in anxious outpatients [17].

However, most of the studies only reported the relationship between stress-coping and personality in patients with depressive disorders. There is lack of evi-

dence on the relationship between the personality types and stress-coping strategies according to diagnostic type in bipolar and depressive disorders. One study with euthymic patients with bipolar and depressive disorders reported the difference of stress-coping and personality that bipolar patients showed higher levels of extroversion, adaptive coping, self-esteem, and lower anxiety [18]. However, this study did not analyze the relationship between stress-coping and personality. The relationship between personality and stress-coping might be different according to diagnostic type in mood disorders. Therefore, the purpose of this study was to examine the similarity and difference of relationship between personality types and stress-coping strategies in patients with bipolar disorders and depressive disorders.

MATERIALS AND METHODS

1. Subjects

The patients who were diagnosed as bipolar and depressive disorders and took participation in personality-related and stress-related evaluation at Pusan National University Mood Disorder Clinic from January 2010 to May 2019 were included. The diagnosis of bipolar and depressive disorders was performed by psychiatrists according to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition diagnostic criteria. The exclusion criteria were as follows: firstly, patients having a history of brain damage; secondly, patients having severe medical or neurological disorder that have a difficulty in the evaluation; thirdly, patients having mental retardation or illiteracy.

The total number of subjects in this study was 195, including 109 patients with the bipolar disorders and 86 patients with the depressive disorders. The bipolar disorder group consisted of 36 patients with bipolar I disorder, 29 patients with bipolar II disorder, and 44 patients with other specified bipolar and related disorder. The depressive group consisted of 52 patients with major depressive disorder, 27 patients with other specified depressive disorder, and 7 patients with persistent depressive disorder. This study was approved by the Institutional Review Board of the Pusan National University Hospital (IRB number 1810-007-071). Written informed consent was exempted.

2. Design and assessment

The relationships between personality and coping strategies were examined with cross-sectional design. The variables such as age, sex, education, marital status, and age of onset were also examined using the records of electronic chart. The personality types and stress-coping strategies were measured as follows.

1) Assessment of personality type

(1) Temperament Character Inventory

Temperament Character Inventory (TCI) is a tool developed by Cloninger to measure the personality of individuals in terms of temperament and character [19]. According to Cloninger's theory, temperament refers to the biologic aspect of personality as a person's natural tendency. It responds automatically to the environment or stimulus and shows a consistent pattern over time. Character is the social aspect of personality as contrasted with temperament. It is a tendency to change by environmental or cultural influences, such as self-concepts of goals or values. The temperament consists of four dimensions: novelty seeking (NS), harm avoidance (HA), reward dependence (RD) and persistence (P). The character consists of three dimensions: Self-directedness (SD), cooperativeness (COO), and self-transcendence (ST). In this study, we used the TCI-240 Korean version with good reliability and validity [20].

(2) NEO Five Factor Inventory

NEO-Five Factor Inventory (FFI) is a self-reporting measure developed by Costa and McCrae based on the Big Five theory to measure an individual's personality [21]. NEO-FFI is a 5-point Likert-type scale consisting of 60 items, which is a shortened form of the NEO Personality Inventory. This study used Korean translated version of NEO-FFI [22]. Measuring five factors of personality, each factor is neuroticism, extroversion, openness, agreeableness, and conscientiousness. Neuroticism is the experience of negative emotions such as fear, sadness, anger, guilt, and depression. Extroversion is a social, energetic, and optimistic tendency, and openness is related to pro-social and non-hostile tendencies to accept new ideas or experiences. Agreeableness is a tendency to be good and altruistic with others. Conscientiousness refers to the personality of being careful, efficient, and organized.

2) Assessment of stress-coping strategy

(1) Coping Inventory for Stressful Situations

Coping Inventory for Stressful Situations (CISS) is a tool developed by Endler and Parker to measure the types of stress responses in stress situations [23]. And that the coping behavior of the individual is determined by the personality in the stress situation based on the basic approach to the coping type. This study used the Korean translated version of CISS [24]. The Korean version of CISS was also validated in patients with mood disorders [25]. CISS is a total of 48 items with 5-point Likert scale consisted of three types of subscales: task-oriented, emotional, and avoidance-oriented. Task-oriented coping is the action to manage and adjust the stress situation directly. Emotion-oriented coping constantly raises stress situations and negative emotions by reacting emotionally. Avoidance oriented coping is a way to shift the individual's attention to the stress situation by engaging in social interaction or by focusing on other things rather than solving the stress situation directly.

3) Assessment of depressive symptoms

(1) Beck Depression Inventory

Beck Depression Inventory (BDI) is a test developed by Aron T. Beck to measure depressive symptoms. BDI-II has been developed based on the new criteria for depression [26]. It is total of 21 items with Likert scale of 0-3 points. In this study, Korean version of BDI-II was used, which was validated for patients with mild depression and the general population [27].

3. Statistical analysis

To investigate the relationship between personality traits and stress coping strategies in each disease group, Pearson correlations were used to analyze the relationship between seven TCI factors, five NEO-FFI factors, and three CISS factors. Based on the significant results of the correlation analysis, multiple regression analysis was performed. The enter method was used as a variable selection procedure in order to consider the total interactions of variables that were already shown as a significant variable in Pearson correlation [28]. Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 22.0 (IBM Co., Armonk, NY, USA), with a statistical significance level of less than 0.05.

RESULTS

1. Sociodemographic characteristics of subjects

As shown in Table 1 the mean age of the bipolar patients was 36.3 ± 11.31 years, and mean age of onset was 24.78 ± 9.90 years. The mean age of the patients with depressive disorder was 38.81 years, and mean age of onset was 28.80 ± 13.84 years. There was no significant difference between the two groups in terms of age, education level, and marital status. However, there was a significant difference of sex and age of onset between two groups (sex, $\chi^2=4.603$, $p=0.043$; age of onset, $t=-2.362$, $p=0.019$).

2. Correlation between personality and coping strategies in mood disorders

As shown in Table 2 in bipolar disorder group, there were negative correlations between novelty seeking, harm avoidance, neuroticism and task-oriented coping (NS, $r=-0.190$, $p=0.048$; HA, $r=-0.482$, $p=0.000$; N, $r=-0.483$, $p=0.000$), and positive correlations between reward dependence, persistence, self-directedness, cooperativeness, self-transcendence, extroversion, openness, agreeableness, conscientiousness and task-oriented coping (RD, $r=0.295$, $p=0.002$; P, $r=0.425$, $p=0.000$; SD, $r=0.564$, $p=0.000$; C, $r=0.330$, $p=0.000$; ST, $r=0.355$,

$p=0.000$; E, $r=0.605$, $p=0.000$; O, $r=0.453$, $p=0.000$; A, $r=0.360$, $p=0.000$; C, $r=0.551$, $p=0.000$). The emotion-oriented coping were negatively correlated with self-directedness, conscientiousness, extroversion (SD, $r=-0.570$, $p=0.000$; C, $r=-0.303$, $p=0.001$; E, $r=-0.302$, $p=0.001$), and positively correlated with harm avoidance, neuroticism (HA, $r=0.458$, $p=0.000$; N, $r=0.617$, $p=0.000$). The avoidance-oriented coping were negatively correlated with harm avoidance and neuroticism (HA, $r=-0.336$, $p=0.000$; N, $r=-0.288$, $p=0.002$), and positively correlated with novelty seeking, reward dependence, self-directedness, self-transcendence, extroversion, openness, agreeableness, conscientiousness (NS, $r=0.237$, $p=0.013$; RD, $r=0.319$, $p=0.001$; SD, $r=0.195$, $p=0.042$; ST, $r=0.267$, $p=0.005$; E, $r=0.530$, $p=0.000$; O, $r=0.234$, $p=0.014$; A, $r=0.291$, $p=0.002$; C, $r=0.217$, $p=0.023$). There were negative correlations between BDI-II score and task-oriented and avoidance-oriented coping (task, $r=-0.523$, $p=0.000$; avoidance, $r=-0.263$, $p=0.006$), but a positive correlation between BDI-II score and emotion-oriented coping (emotion, $r=0.570$, $p=0.000$).

Meanwhile, in depressive disorder group, there were correlation between neuroticism, harm avoidance and task-oriented coping (N, $r=-0.386$, $p=0.000$; HA, $r=-0.486$, $p=0.000$), and positive correlation between reward dependence, persistence, self-directedness, cooperativeness, self-transcendence, extroversion, openness,

Table 1. Sociodemographic and clinical characteristics of the subjects

Variable	Bipolar disorders (n=109)	Depressive disorders (n=86)	p-value
Female	65 (59.6)	38 (44.2)	0.043
Age (y)	36.33 ± 11.31	38.81 ± 13.40	0.162
Education	14.14 ± 2.00	13.54 ± 2.29	0.052
Marriage			
Unmarried	71 (65.1)	51 (59.3)	0.371
Married	26 (23.9)	28 (32.6)	
Divorced and bereaved	12 (11.0)	7 (3.6)	
Diagnosis			
Bipolar I disorder	36 (33.0)		
Bipolar II disorder	29 (26.6)		
Bipolar disorder not otherwise specified	44 (40.4)		
Major depressive disorder		52 (60.5)	
Major depressive disorder not otherwise specified		27 (31.4)	
Dysthymic disorder		7 (8.1)	
Age of onset	24.78 ± 9.90	28.80 ± 13.84	0.019

Values are presented as number (%) or mean $\pm$ standard deviation.

Categorical variables were analyzed by chi-square, and continuous variables by independent t-test.

Table 2. Correlation analysis between personality and stress-coping strategies in bipolar and depressive disorders

Coping strategy	Task	Emotion	Avoidance	BDI-II	NS	HA	RD	P	SD	CO	ST	N	E	O	A	C
Bipolar disorders																
Task	1.000	-0.141	0.506**	-0.523**	-0.190*	-0.482**	0.295**	0.425**	0.564**	0.330**	0.355**	-0.483**	0.605**	0.453**	0.360**	0.551**
Emotion	-0.141	1.000	0.035	0.570**	0.040	0.458**	-0.002	0.036	-0.570**	-0.303**	0.070	0.617**	-0.302**	0.041	-0.188	-0.173
Avoidance	0.506**	0.035	1.000	-0.263**	0.237*	-0.336**	0.319**	0.102	0.195*	0.105	0.267**	-0.288**	0.530**	0.234*	0.291**	0.217*
Depressive disorders																
Task	1.000	-0.018	0.411**	-0.322**	-0.026	0.279**	0.241*	0.241*	0.424**	0.422**	0.313**	-0.386**	0.303**	0.287**	0.246*	0.367**
Emotion	-0.018	1.000	0.168	0.558**	0.030	0.448**	-0.071	-0.009	-0.428**	-0.156	-0.024	0.641**	-0.351**	-0.189	-0.298**	-0.252*
Avoidance	0.411**	0.168	1.000	-0.146	0.354**	-0.236*	0.384**	0.012	0.014	0.216*	0.157	-0.074	0.435**	0.224*	0.115	-0.044

BDI-II, beck depression inventory II; NS, novelty seeking; HA, harm avoidance; RD, reward dependence; P, persistence; SD, self-directedness; CO, cooperativeness; ST, self-transcendence; N, neuroticism; E, extraversion; O, openness; A, agreeableness; C, conscientiousness.
* $p < 0.05$, ** $p < 0.01$.

agreeableness, conscientiousness, and task-oriented coping (RD, $r = 0.279$, $p = 0.009$; P, $r = 0.241$, $p = 0.026$; SD, $r = 0.424$, $p = 0.000$; C, $r = 0.422$, $p = 0.000$; ST, $r = 0.313$, $p = 0.003$; E, $r = 0.303$, $p = 0.005$; O, $r = 0.287$, $p = 0.007$; A, $r = 0.246$, $p = 0.022$; C, $r = 0.367$, $p = 0.001$). The emotion-oriented coping were negatively correlated with self-directedness, extroversion, agreeableness, conscientiousness (SD, $r = -0.428$, $p = 0.001$; E, $r = -0.351$, $p = 0.001$; A, $r = -0.298$, $p = 0.005$; C, $r = -0.252$, $p = 0.019$), and positively correlated with neuroticism and harm avoidance (N, $r = 0.641$, $p = 0.000$; HA, $r = 0.448$, $p = 0.000$). The avoidance-oriented coping were negatively correlated with harm avoidance (HA, $r = -0.236$, $p = 0.028$), and positively correlated with novelty seeking, reward dependence, cooperativeness, extroversion, openness (NS, $r = 0.354$, $p = 0.001$; RD, $r = 0.384$, $p = 0.000$; C, $r = 0.216$, $p = 0.046$; E, $r = 0.435$, $p = 0.000$; O, $r = 0.224$, $p = 0.038$). Regarding the relationship between BDI-II score and coping strategies, there was a negative correlation between BDI-II score and task-oriented (task, $r = -0.322$, $p = 0.002$), but a positive correlation between BDI-II score and emotion-oriented coping (emotion, $r = 0.558$, $p = 0.000$).

1) Multiple regression analysis between personality and coping strategies in mood disorders

In the bipolar disorder group, self-directedness and self-transcendence were positively associated with task-oriented coping (SD, $\beta = 0.250$, $p = 0.48$; ST, $\beta = 0.173$, $p = 0.029$) (Table 3). All factors related to the task-oriented coping strategy accounted for 51.4% of the total variance. The BDI-II, neuroticism, and extroversion were positively associated with emotion-oriented coping in bipolar disorders (BDI-II, $\beta = 0.310$, $p = 0.004$; N, $\beta = 0.466$, $p = 0.002$; E, $\beta = 0.324$, $p = 0.004$) (Table 4). All factors related to the emotion-oriented coping accounted for 45.3% of the total variance. Extroversion was positively associated with avoidance-oriented coping in bipolar disorders (E, $\beta = 0.584$, $p = 0.001$) (Table 5). All factors related to the avoidance-oriented coping accounted for 28.8% of the total variance.

In the depressive disorder group, harm avoidance was negatively associated with task-oriented coping (HA, $\beta = -0.325$, $p = 0.036$) (Table 3). All factors related to the task-oriented coping strategy accounted for 30.6% of the total variance. Neuroticism was positively associated with the emotion-oriented coping (N, $\beta = 0.455$, $p = 0.005$) (Table 4). All factors related to the emotion-oriented

Table 3. Multiple regression analysis for predicting personality related to task-oriented coping in bipolar and depressive disorders

Variable	Bipolar disorders					Depressive disorders				
	B	β	t	p-value	R ²	Adjusted R ²	F	p-value	R ²	Adjusted R ²
Constant	-0.953		-0.059	0.953					41.173	
BDI-II	-0.154	-0.160	-1.604	0.112					-0.162	-0.223
Sex	3.387	0.119	1.636	0.105					1.896	0.097
NS	-0.372	-0.165	-1.785	0.078						
HA	-0.043	-0.025	-0.180	0.858					-0.491	-0.325
RD	0.126	0.033	0.349	0.728					-0.208	-0.048
P	0.393	0.056	0.554	0.581					0.445	0.224
SD	0.366	0.250	2.006	0.048*	0.577	0.514	9.154	0.000**	0.071	0.055
CO	-0.216	-0.111	-1.221	0.225					0.260	0.240
ST	0.356	0.173	2.219	0.029*					0.354	0.209
N	0.155	0.109	0.716	0.476					0.103	0.078
E	0.416	0.258	1.887	0.062					-0.306	-0.258
O	0.393	0.187	1.945	0.055					0.156	0.106
A	0.058	0.022	0.234	0.816					-0.413	-0.253
C	0.106	0.061	0.560	0.577					0.291	0.225

BDI-II, beck depression inventory II; NS, novelty seeking; HA, harm avoidance; RD, reward dependence; P, persistence; SD, self-directedness; CO, cooperativeness; ST, self-transcendence; N, neuroticism; E, extraversion; O, openness; A, agreeableness; C, conscientiousness.

Multivariate linear regression was performed with enter method.

*p<0.05, **p<0.01.

Table 4. Multiple regression analysis for predicting personality related to emotion-oriented coping in bipolar and depressive disorders

Variable	Bipolar disorders						Depressive disorders					
	B	β	t	p-value	R ²	Adjusted R ²	F	p-value	R ²	Adjusted R ²	F	p-value
Constant	4.980		0.404	0.687					14.473		0.994	0.324
BDI-II	0.267	0.310	2.989	0.004**					0.175	0.220	1.737	0.086
Sex	-2.114	-0.083	-1.140	0.257					-1.630	-0.076	-0.846	0.400
HA	0.012	0.007	0.059	0.953					-0.005	-0.003	-0.024	0.981
SD	-0.173	-0.133	-1.093	0.277					-0.099	-0.072	-0.546	0.587
CO	-0.158	-0.091	-1.068	0.288	0.489	0.453	13.787	0.000**		0.446	0.389	7.751
N	0.595	0.466	3.210	0.002**					0.658	0.455	2.906	0.005**
E	0.468	0.324	2.936	0.004**					0.043	0.033	0.266	0.791
A									-0.083	-0.046	-0.448	0.655
C									0.052	0.036	0.326	0.745

BDI-II, beck depression inventory II; HA, harm avoidance; SD, self-directedness; CO, cooperativeness; N, neuroticism; E, extraversion; A, agreeableness; C, conscientiousness.

Multivariate linear regression was performed with enter method.

*p<0.05, **p<0.01.

Table 5. Multiple regression analysis for predicting personality related to avoidance-oriented coping in mood disorders

Variable	Bipolar disorders						Depressive disorders					
	B	β	t	p-value	R ²	Adjusted R ²	F	p-value	R ²	Adjusted R ²	F	p-value
Constant	0.650		0.042	0.966					14.964		2.093	0.038
BDI-II	-0.018	-0.023	-0.193	0.847					0.022	0.029	0.374	0.709
Sex	0.220	0.010	0.109	0.914					-0.290	-0.014	-0.222	0.825
NS	0.359	0.197	1.869	0.065					0.293	0.176	2.666	0.008**
HA	0.127	0.090	0.580	0.563					-0.057	-0.040	-0.430	0.668
RD	0.060	0.020	0.177	0.860					0.421	0.173	1.996	0.047*
SD	-0.103	-0.087	-0.579	0.564	0.367	0.288	4.638	0.000**				
ST	0.282	0.170	1.803	0.075							0.401	0.339
N	0.010	0.009	0.505	0.960								
E	0.762	0.584	3.552	0.001**					0.535	0.429	3.975	0.000**
O	-0.202	-0.120	-1.124	0.264					0.005	0.003	0.048	0.962
A	0.298	0.143	1.259	0.211								
C	-0.072	-0.051	-0.403	0.688								
CO									-0.187	-0.142	-1.696	0.092

BDI-II, beck depression inventory II; NS, novelty seeking; HA, harm avoidance; RD, reward dependence; SD, self-directedness; CO, cooperativeness; ST, self-transcendence; N, neuroticism; E, extraversion; O, openness; A, agreeableness; C, conscientiousness.

Multivariate linear regression was performed with enter method.

*p<0.05, **p<0.01.

coping accounted for 38.9% of the total variance. Novelty seeking, reward dependence, and extroversion were positively associated with the avoidance-oriented coping (NS, $\beta=0.176$, $p=0.008$; RD, $\beta=0.173$, $p=0.047$; E, $\beta=0.429$, $p=0.000$) (Table 5). All factors related to the avoidance-oriented coping accounted for 33.9% of the total variance.

DISCUSSION

The results of this study suggest that personality types might be differentially related to stress-coping strategies in patients with bipolar and depressive disorders, respectively. Firstly, based on the results of correlation analysis between personality profiles and stress-coping strategies, many personality types were related to stress-coping strategies as we hypothesized previously. Also, each stress-coping way had the great relevance of specific personality types. These results were mostly consistent with previous studies on the relationship between personality profiles and stress-coping [13-17]. It might be assumed that an individual personality profile plays an important role in finally determining the patient's own stress-coping.

On the other hand, more important personality profiles that might have an influence on the selection of coping strategies might be exist according to diagnostic subtype in mood disorders. Regarding task-oriented coping, the self-transcendence and self-directedness were positively associated with the task-oriented coping in bipolar disorders after adjustment of interactions among personality types. Given that self-directedness is defined as the ability to adapt to the situation for achieving personal goal and values [19], it is inevitable that self-directedness was importantly related to the selection of task-oriented coping. Several studies on patients with mood disorders also support these results [29]. Meanwhile, self-transcendence was associated with task-oriented coping. Self-transcendence is a kind of personality that involves the expansion of personal boundary, including spiritual experience [30]. Interestingly, in patients having severe medical illness or intractable diseases, self-transcendence was related to emotional well-being and higher quality of life [31]. The self-transcendence might help patients to understand the meaning of life in the situation suffering from the illness. Likewise, self-transcendence might give the patient the reason of life for solving

the stressful situation in patients already suffering from bipolar disorder. However, there were no association between these two factors, such as self-directedness and self-transcendence, and task-oriented coping in depressive disorders, even though correlation analysis showed a significance to these factors. This might reflect the possibility that these factors play a more important role in bipolar disorder, which have relatively greater stigma than depressive disorder. Depressive patients with low level of harm-avoidance were likely to use task-oriented coping. Previous studies reported that harm-avoidance could hinder the patients from using the task-oriented coping through heightening the level of anxiety and reducing the executive function [32]. In patients with depressive disorders, harm-avoidance might be more related to task-oriented coping.

In terms of emotion-oriented coping, neuroticism was positively associated with emotion-oriented coping in both bipolar and depressive disorders. Neuroticism that is conceptually similar to emotion-oriented coping has known to be principal risk factor in mood disorders [33]. Previous studies have consistently reported that neuroticism could be highly related to emotion-oriented coping [34]. Interestingly, bipolar patients with extroversion highly tend to use emotion-oriented coping in stressful situations, differently from depressive disorders. Contrary to our result, extroversion has been proposed as a positive trait for effectively adapting to stressful events in general population [35]. This discrepancy might be caused by the baseline emotional status that extroversion works. The extroversion itself refers to the direction of the energy for responding to external stimuli [36]. The extroversion with the negative emotion might causes the negative emotion to be expressed, and the extroversion with positive emotion makes the positive emotion appear. In contrast, it is interesting that there was no association between extroversion and emotional coping in depressive disorders. That is because depressive patients might have mostly experienced the negative life events in their childhood [37]. Additionally, depressive symptoms patients might be considered as more important factors related to emotion-oriented coping in bipolar disorder. Compared to unipolar depression, bipolar depression might have been represented as mostly fluctuated course and atypical features, such as mood reactivity and interpersonal sensitivity, that is similar to emotional coping [38]. Given that these characteristics of bipolar depression, bipolar depression might be more related to

emotion-coping strategy than unipolar depression.

Regarding avoidance-oriented coping, there were significantly positive associations between extroversion and avoidance-oriented coping in both bipolar disorders and depressive disorders. As previously described, extroversion might be interpreted as the direction of energy to be able to pursue. Avoidance-oriented coping refers to the selection of other ways to cope the stressful situation, instead of directly solving the stressful situation by itself [23]. Most of the avoidance-oriented strategies need the energy to perform avoidance activity. Thus, people with extroversion are likely to easily use avoidance-oriented coping. Meanwhile, novelty-seeking and reward dependence were positively associated with avoidance-oriented coping in depressive disorders. Novelty-seeking that tend to focus on the new stimuli could be related to attentional shifting [39]. Patients with novelty-seeking might use avoidance-oriented coping to distract their own discomfort caused by stressful situations, instead of directly solving the problem. Meanwhile, reward dependence refers to the sensitivity to social reward [40]. Those having social reward can easily use avoidance-oriented coping strategy related to social and recreational activity in the face of the stressful situation.

This study has some limitations as follows. Firstly, this study is a cross-sectional study with a small number of subjects. Large scale prospective longitudinal study or meta-analysis on this topic are needed to confirm these results. Secondly, stress-coping and personality assessments in this study were only evaluated by self-report questionnaire. Thirdly, this study did not control the mood phase and the severity of each mood disorder. The depressive phase could have an influence on the response to self-report questionnaire. The stress-coping assessment in the euthymic phase can be necessary to examine the genuine coping strategies of patients independent of depressive symptoms, but strict sampling like this might not reflect the natural clinical states. Because the depressive phase in mood disorders takes a large portion of the clinical course, the sampling including depressive patients would be better in order to represent the interactions between personality types and coping strategies for a natural course in mood disorders. Thus, in this study, we statistically adjust the effect of depressive symptoms as a covariate when analyzing the relationship between stress-coping and personality. Fourthly, this study also did not control the status of medications. This confounding factor also can have an

influence on the relationship between stress-coping and personality in patients with bipolar or depressive disorders. In future studies, the status of medications should be considered. Fifthly, we did not diagnose personality disorders, but only measured the personality traits using self-report scales. In future studies, it is necessary to consider the relationship between the diagnosis of personality disorders and personality traits.

Despite several limitations, this study suggests that several personalities might have a significant association with coping strategies. Also, there might be the differential relevance of these two characteristics according to diagnostic types. Given that the coping strategies can have an influence on clinical outcome, maladaptive coping strategies were needed to change in the treatment of mood disorders. It is necessary to understand the relevant personality traits to change the coping strategy. In addition, personality traits that affect coping strategies may differ depending on the subtype of mood disorders. This study showed the similarities and differences in personality traits affecting stress-coping strategies in bipolar or depressive disorders. The understanding of the relationship between personality and stress-coping strategies might be crucial for the intervention on coping strategy modification in mood disorders. Also, it should be considered when modulating coping strategies, as the personality traits that need to be addressed to change stress-coping strategies may vary depending on the subtype of mood disorders.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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