

The Relation Between Anger Expression, Depression, and Somatic Symptoms in Depressive Disorders and Somatoform Disorders

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Background: In previous studies, the relationship between either anger suppression and depression or anger suppression and somatic symptoms was examined. However, the relationship between anger expression, depression, and somatic symptoms was not examined in depressive disorders and somatoform disorders.

Method: The DSM-IV–diagnosed subjects included 73 patients with depressive disorders and 47 patients with somatoform disorders. The Anger Expression Scale was used to assess the level of anger expression or suppression. The severity of depression was assessed using the Symptom Checklist-90-Revised (SCL-90-R). The Somatization Rating Scale and the SCL-90-R somatization subscale were used to assess the severity of somatic symptoms. Data were collected from March 2000 to March 2001.

Results: The results of the path analyses showed that in depressive disorder patients, anger expression had a stronger effect on somatic symptoms through depression than did anger suppression, although both anger expression and anger suppression had a significant indirect effect on somatic symptoms. The depressive disorder group also showed a significant but negative direct effect of anger suppression on anger expression in the path from anger suppression to anger expression to depression to somatic symptoms. However, only anger suppression had an indirect effect on somatic symptoms through depression in somatoform disorder patients.

Conclusions: The results suggest that anger expression might play a more predominant role in depression and somatic symptoms of depressive disorder patients than anger suppression, but only anger suppression might be associated with depression and somatic symptoms of somatoform disorder patients. In addition, incomplete anger suppression followed by anger expression is likely to be associated with depression and somatic symptoms in depressive disorders.

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Somatization is known to be not only the expression of emotional distress through a somatic idiom but also one strategy that patients use to cope with depression.¹ Somatoform disorders can be considered a typical mental disorder showing somatization.² In particular, undifferentiated somatic symptoms are often considered a manifestation of depression.³ A consistent association of depression with somatic symptoms has also been reported.^{1,4}

In addition to depression, anger plays a significant role in somatization.^{2,5} Previous studies have reported an association of anger suppression and somatic symptoms. Increased sympathetic nervous system activity induced by anger suppression has been linked to somatization.⁶ In one clinical study, depressed women who appeared to hold their anger were judged to be more prone to somatic symptoms than those who were rarely angry or who expressed their anger.⁷ *Hwa-byung* is known as an anger syndrome specific to Korean culture that is attributed to anger suppression and characterized by a variety of somatic symptoms, such as a feeling of a mass in the epigastrium, hot sensation, palpitation, dyspnea, fatigue, and emotional symptoms such as a fear of impending death and dysphoria.^{2,8–11}

Anger and depression have long been associated and causally linked. It was found that depressive disorder patients were more likely to experience anger than anxiety disorder or somatoform disorder patients.¹² Depressive disorder patients have been reported to have more anger attacks compared with healthy volunteers¹³ and anxiety disorder patients.¹⁴

Anger suppression and anger expression have been described as styles with which people typically manage their

anger.¹⁵ Herein, *anger expression* refers to an overt display of verbally and/or physically aggressive behaviors. Therefore, anger expression is likely to have more negative effects than positive effects as a catharsis.

In addition to biogenic amine imbalance, learned helplessness, loss of self-esteem, and object loss, most theories of depression also acknowledge a causal link between the aggression turned inward (repressed anger) and depression.^{16–18} In one study, people who had recovered from a major depression exceeded those who had never been depressed in the degree to which they reported holding anger in and being afraid to express it. This finding supported the “silencing the self” theory in participants with a history of major depression in which they believe they must hide their feelings to preserve relationships.¹⁹ In another study, it was reported that the suppression of anger appears to be a mediating variable that amplifies the experience of depression among chronic headache patients.²⁰ However, other research has shown that both anger suppression and anger expression had direct influence on depression in chronic posttraumatic headache patients.²¹

Previous research has linked either anger suppression and depression^{22–25} or anger suppression and somatic symptoms.^{2,6,7} The current study extended previous research by examining the relationship between the 2 variables, such as either anger expression and somatic symptoms or anger expression and depression. Therefore, this study examined the role of anger expression and anger suppression in the severity of somatic symptoms and the role of depression in the severity of somatic symptoms in depressive disorders and somatoform disorders. In addition, we examined the role of anger expression and anger suppression in the severity of depression in each of the 2 disorders. Elucidating such interaction was expected to help understand the role of anger expression and anger suppression in somatic symptoms and depression in depressive disorders and somatoform disorders.

METHOD

Subjects and Procedures

Outpatients from the Department of Psychiatry at Severance Hospital (Seoul, Korea) with diagnoses of depressive and somatoform disorders were enrolled in this study. One experienced psychiatrist (K.B.K.) made the diagnoses on the basis of DSM-IV²⁶ criteria. The patients were eligible to participate if they were at least 18 years old. However, dually diagnosed subjects, including those with a combination of both depressive and somatoform disorders and physical diseases or other psychiatric disorders, were excluded from this study. The subjects who had past history of other mental disorders, such as somatoform disorders in depressive disorder patients or depressive disorders in somatoform disorder patients, were also excluded. Data were collected from March 2000 to March 2001.

To minimize the effect of medication, we tried to make the proportions of medicated patients and unmedicated patients similar in the depressive disorder (25% vs. 75%) and the somatoform disorder (24% vs. 76%) groups. Most of the medicated patients in each of the 2 disorder groups received antidepressants (selective serotonin reuptake inhibitors [SSRIs]) such as fluoxetine or paroxetine. Those who complained of somatic symptoms and showed anxiety, irritability, and aggression after initiation of the medication were initially excluded and later included in this study only after those symptoms subsided as a result of discontinuation of the medication and change to another antidepressant.

The subjects were consecutively selected and interviewed. The therapist explained the purpose and procedure of the study to all subjects, and written informed consent was obtained from all participants. Only those patients who consented to this study completed the questionnaire, which included items regarding sociodemographic characteristics and the self-rating scales. All but 3 patients who were asked to participate consented and responded to the questionnaire.

The depressive disorder group included 45 patients with major depressive disorder and 28 with dysthymic disorder (32 men and 41 women in total). The somatoform disorder group included 22 patients with undifferentiated somatoform disorder, 9 with somatization disorder, 11 with pain disorder, 3 with hypochondriasis, and 2 with conversion disorder (26 men and 21 women in total). The sociodemographic characteristics of the patients are described in Table 1.

The healthy controls included hospital employees and family members of medical students. They were each sent a letter of informed consent and a questionnaire, along with a written explanation of the study. All but 11 subjects responded to the questionnaire and returned it to the authors. Two hundred fifteen healthy subjects (108 men and 107 women), 18 years of age and older (mean $\pm$ SD = 41.7 $\pm$ 10.4 years), participated in this study. Before they were screened for the presence or absence of any physical and psychiatric disorders via the questionnaire, the hospital employees were contacted directly by the psychiatric residents to ensure that they had no physical or psychiatric disorders. For the family members of medical students, the medical students were asked to check for the presence or absence of physical and psychiatric disorders and to include only those who had no disorders. In addition, from the self-report questionnaire, none of these subjects reported being treated for physical or psychiatric disorders or having symptoms of such disorders.

The psychological measures included the Korean version²⁷ of the Anger Expression Scale,¹⁵ the depression and somatization subscales of the Korean version²⁸ of the Symptom Checklist-90-Revised (SCL-90-R),²⁹ and the

Table 1. Sociodemographic Characteristics of Patients With Depressive Disorder or Somatoform Disorder

Variable	Depressive Disorder (N = 73)	Somatoform Disorder (N = 47)	Statistic	df	p
Sex, N (%)			$\chi^2 = 1.51$	1	.22
Male	32 (43.8)	26 (55.3)			
Female	41 (56.2)	21 (44.7)			
Age, mean $\pm$ SD, y	38.3 $\pm$ 12.3	37.3 $\pm$ 13.1	t = 0.43	118	.67
Education, mean $\pm$ SD, y	13.4 $\pm$ 3.6	12.2 $\pm$ 4.0	t = 1.77	117	.08
Religion, N (%) ^a			$\chi^2 = 0.20$	1	.66
Present	52 (72.2)	28 (68.3)			
Absent	20 (27.8)	13 (31.7)			
Marital status, N (%) ^a			$\chi^2 = 0.16$	1	.69
Married	44 (67.7)	26 (65.0)			
Single	20 (30.8)	14 (35.0)			
Income, mean $\pm$ SD, 1000 dollars/mo	2.23 $\pm$ 0.95	2.01 $\pm$ 0.80	t = 1.41	105	.16
Duration of illness, mean $\pm$ SD, mo	19.4 $\pm$ 29.5	25.6 $\pm$ 32.9	t = 1.09	118	.28

^aNot all subjects answered all items on the questionnaire.

Somatization Rating Scale (SRS).³⁰ The Anger Expression Scale is a 22-item self-rating instrument designed to assess the levels of anger expression (anger-out) and anger suppression (anger-in). Anger-in refers to the inhibition of overt expression of anger, while anger-out refers to an overt display of verbally and/or physically aggressive behaviors. Examples of items of the anger-in subscale are “I pout or sulk,” “I withdraw from people,” and “I am irritated a great deal more than people are aware of.” Examples of items of the anger-out subscale are “I express my anger,” “I lose my temper,” and “I strike out at whatever infuriates me.” In this study, the Anger Expression Scale was rated on a 4-point scale ranging from 0 (almost never) to 3 (almost always). The internal consistency of the Korean version of the Anger Expression Scale was significant for each of the 2 subscales (anger-in: Cronbach’s $\alpha = 0.76$, $p < .001$; anger-out: Cronbach’s $\alpha = 0.83$, $p < .001$). The test-retest reliability of the 2 subscale scores was fairly high (anger-in: $r = 0.82$, $p < .01$; anger-out: $r = 0.87$, $p < .01$). These correlation coefficients were obtained after an interval of 2 weeks. The SCL-90-R is a 90-item self-rating instrument developed to assess psychopathology during the previous week and includes 9 subscales. The depression subscale of the SCL-90-R has 13 items, and the somatization subscale has 12 items. The SRS is a 32-item self-rating instrument that includes 5 subscales.

Data Analysis

Path analysis (SAS version 8.1, proc CALIS [SAS Institute, Cary, N.C.]) was employed to investigate the effect of either anger suppression or anger expression and depression on somatic symptoms in each of the disorder groups. An independent t test was conducted to compare the scores of each of the psychological measures and some of the sociodemographic data (age, income, duration of education, duration of illness) between the 2 groups. Analysis of variance was conducted to compare the scores of the psychological measures, such as the SCL-90-R subscales, among the 3 groups. The Scheffé

test was then employed as a post hoc test. Comparisons of the demographic data such as sex, marital status (married vs. single), and religion (present vs. absent) among the groups were made using a χ^2 test. The Pearson correlation test was used to determine the relationships of the demographic data, such as age, level of education, income, and duration of illness, with the anger measurement scores. Statistical significance was set at $p < .05$.

RESULTS

Sociodemographic Data

The sociodemographic characteristics of the depressive disorder and somatoform disorder groups are shown in Table 1. No significant differences were found in terms of sex, age, duration of education, income, marital status (married vs. single), religion (present vs. absent), or duration of illness between the 2 groups.

Relationship Between Psychiatric Diagnoses and the SCL-90-R Subscales

The relationship between psychiatric diagnoses and the SCL-90-R subscales relevant to the diagnoses was examined to confirm the validity of the diagnoses. As a result, the depressive disorder group was characterized by the highest mean scores on the depression subscale. Depressive disorder patients scored significantly higher on the depression subscale than did somatoform disorder patients and normal controls. The somatoform disorder group was characterized by the highest mean scores on the somatization subscale. Somatoform disorder patients scored significantly higher on the somatization subscale than did normal controls (Table 2). Therefore, each disorder group was consistent with its relevant SCL-90-R subscale, with the highest mean score on the subscales.

Comparison of Anger Expression, Depression, and Somatic Symptoms Between the 2 Disorder Groups

The depressive disorder group scored significantly higher on the anger-out subscale and the SCL-90-R de-

Table 2. SCL-90-R Subscale Scores by Psychiatric Diagnosis in Patients With Depressive Disorder or Somatoform Disorder (mean $\pm$ SD)

SCL-90-R subscale	Depressive Disorder (N = 73)	Somatoform Disorder (N = 47)	Healthy Controls (N = 215)	F	df	p
Depression	63.5 $\pm$ 14.4 ^a	56.1 $\pm$ 14.7 ^b	46.4 $\pm$ 10.2	59.75	2,332	< .001
Somatization	56.5 $\pm$ 14.9 ^c	56.8 $\pm$ 16.5 ^d	47.9 $\pm$ 10.2	19.38	2,332	< .001

^aDepressive disorder > somatoform disorder, healthy controls.^bSomatoform disorder > healthy controls.^cDepressive disorder > healthy controls.^dSomatoform disorder > healthy controls ($p < .05$; Scheffé test).

Abbreviation: SCL-90-R = Symptom Checklist-90-Revised.

Table 3. Scores on the Anger Expression Scale, the SCL-90-R Depression and Somatization Subscales, and the Somatization Rating Scale in Patients With Depressive Disorder or Somatoform Disorder (mean $\pm$ SD)

Scale	Depressive Disorder (N = 73)	Somatoform Disorder (N = 47)	t	df	p
Anger Expression Scale					
Anger-in	12.0 $\pm$ 7.0	11.4 $\pm$ 6.9	0.46	117	.64
Anger-out	10.2 $\pm$ 8.3	5.8 $\pm$ 4.6	3.71	116	< .001
SCL-90-R subscales					
Depression	63.5 $\pm$ 14.4	56.1 $\pm$ 14.7	2.73	118	.007
Somatization	56.5 $\pm$ 14.9	56.8 $\pm$ 16.5	-0.11	118	.91
Somatization Rating Scale total	43.4 $\pm$ 25.1	39.6 $\pm$ 25.0	0.82	118	.41

Abbreviation: SCL-90-R = Symptom Checklist-90-Revised.

Table 4. The Relationship Between Anger-In and Anger-Out With Somatization in Patients With Depressive Disorder or Somatoform Disorder

Scale	Depressive Disorder (N = 73)		Somatoform Disorder (N = 47)	
	AI ^a	AO ^a	AI ^a	AO ^a
Somatization Rating Scale total	.27 ^b	.47 ^c	.29 ^b	-.05
SCL-90-R somatization subscale	.24 ^b	.45 ^c	.31 ^b	-.09

^aPearson correlation coefficients.^b $p < .05$.^c $p < .001$.

Abbreviations: AI = anger-in subscale of Anger Expression Scale, AO = anger-out subscale of Anger Expression Scale, SCL-90-R = Symptom Checklist-90-Revised.

pression subscale than did the somatoform disorder group (Table 3). However, no significant differences were found between the 2 disorders on the anger-in subscale or in the level of somatic symptoms, as measured by the total SRS scores and SCL-90-R somatization subscale scores.

The Relationship Between Anger Expression and the Severity of Somatic Symptoms

The depressive disorder group showed positive correlations between the anger measurements, including the anger-out and anger-in subscales and the level of somatic symptoms, such as the total SRS scores and SCL-90-R somatization subscale scores. However, the anger-out subscale scores had a much stronger correlation with the

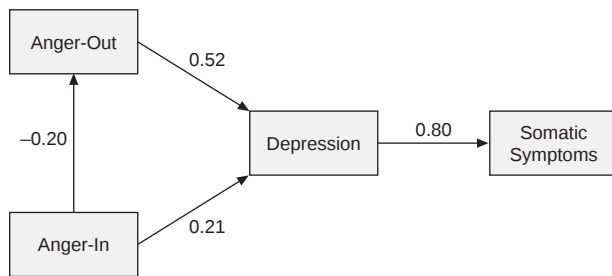
level of somatic symptoms than did the anger-in subscale scores (Table 4).

In the somatoform disorders group, the anger-in subscale scores had a significant positive correlation with the level of somatic symptoms, as measured by the total SRS scores and SCL-90-R somatization subscale scores. However, the anger-out subscale scores were not significantly correlated with the level of somatic symptoms (Table 4).

The Relationship Between Anger Expression, Depression, and Somatic Symptoms in Depressive Disorders

The path model shown in Figure 1 was found to have the best fit (Bentler's Comparative Fit Index: 0.91) with a significant path in depressive disorder patients. The only direct significant path on the somatic symptoms (total SRS scores) was from depression (SCL-90-R depression subscale scores). Here, the path coefficient of 0.80 indicates a strong positive effect of depression on somatic symptoms. The R^2 was 0.64, which accounted for 64% of the variation in the dependent variable. A test of the paths on the depression variable revealed 2 significant direct paths from anger-out to depression and from anger-in to depression. However, the path coefficient of 0.52 in the former was greater than that of 0.21 in the latter. Therefore, the indirect effect of anger-out on somatic symptoms through depression was greater than the effect of anger-in on somatic symptoms through depression in depressive disorders. A test of the path on the anger-out variable revealed a significant but negative direct path from anger-in

Figure 1. The Relation Between Anger Expression, Depression, and Somatic Symptoms in Depressive Disorders^{a,b,c}



^aBentler's Comparative Fit Index: 0.91.

^b $R^2 = 0.64$.

^cAll values are path coefficients.

to anger-out in the path from anger-in to anger-out to depression to somatic symptoms. The path model that used the SCL-90-R somatization subscale also revealed the same pattern as that which used the total SRS score.

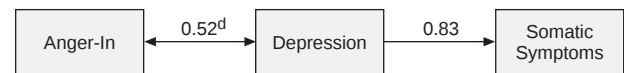
The Relationship Between Anger Expression, Depression, and Somatic Symptoms in Somatoform Disorders

The path model shown in Figure 2 was found to have the best fit (Bentler's Comparative Fit Index: 0.98) with a significant path in somatoform disorder patients. The only direct significant path on somatic symptoms was from depression. Here, the path coefficient was 0.83, which indicates that there is a strong positive effect of depression on somatic symptoms. The R^2 was 0.62, which accounted for 62% of the variation in the dependent variable. A test of the paths on the depression variable revealed only one significant correlation between anger-in and depression ($r = 0.52$). However, there was no effect of anger-out on depression in the somatoform disorder group. Therefore, it is suggested that somatoform disorder patients have only the indirect effect of anger-in on somatic symptoms through depression. The path model that used the SCL-90-R somatization subscale also revealed the same pattern as that which used the total SRS score.

The Relationship Between the Sociodemographic Variables and Somatic Symptoms in Each of the Disorder Groups

In the depressive disorder and somatoform disorder groups, there were no significant differences in total mean $\pm$ SD SRS scores between men and women (depressive disorder: 42.5 ± 26.5 vs. 44.2 ± 24.3 , $t = -0.28$, $df = 71$, $p = .78$ and somatoform disorder: 36.0 ± 24.2 vs. 44.0 ± 25.9 , $t = -0.10$, $df = 45$, $p = .28$) and between married and single patients (depressive disorder: 41.1 ± 24.0 vs. 45.3 ± 24.0 , $t = -0.65$, $df = 62$, $p = .52$ and somatoform disorder: 40.6 ± 21.9 vs. 37.1 ± 28.9 , $t = 0.44$, $df =$

Figure 2. The Relation Between Anger Expression, Depression, and Somatic Symptoms in Somatoform Disorders^{a,b,c}



^aBentler's Comparative Fit Index: 0.98.

^b $R^2 = 0.62$.

^cAll values are path coefficients unless otherwise specified.

^dCoefficient of Pearson correlation.

38, $p = .67$). Age, level of education, income, and duration of illness also had no significant correlations with the total SRS scores (depressive disorder: $r = -0.11$, $p = .35$; $r = -0.12$, $p = .30$; $r = -0.14$, $p = .22$; $r = 0.03$, $p = .82$, respectively, and somatoform disorder: $r = -0.05$, $p = .76$; $r = 0.03$, $p = .83$; $r = 0.05$, $p = .75$; $r = 0.14$, $p = .34$, respectively).

DISCUSSION

The model tested hypothesized a path from either anger suppression or anger expression to depression to somatic symptoms in depressive disorders and somatoform disorders. In this study, path analysis was used to examine the degree of the effect of anger suppression, anger expression, and depression on somatic symptoms, because this statistical method enables one to measure the effect that one variable has on another.³¹

The results of the path analyses showed the following findings. First, anger expression had an indirect effect on somatic symptoms through its relationship with depression in depressive disorders. Anger suppression also had an indirect effect on somatic symptoms through its relationship with depression in somatoform disorders. However, a direct link between anger expression or anger suppression and somatic symptoms was not found. Therefore, depression was shown to have a direct effect on somatic symptoms, but anger expression or anger suppression had an indirect effect on somatic symptoms through depression. This finding suggests a trend for the association of anger with somatic symptoms to be weaker than that of depression with somatic symptoms. This finding is in accord with previous findings in that there is a consistent association of somatic symptoms with depression,^{1,4} and hostility may not be a main or specific factor in the formation of functional somatic symptoms.³²

An association of inhibited anger and somatic symptoms has been reported in previous studies.⁶ In this study, it is suggested that only anger suppression had an indirect effect on somatic symptoms in the somatoform disorder patients. However, in depressive disorder patients, both anger expression and anger suppression had a significant indirect effect on somatic symptoms. Herein, the path

coefficient in the path from anger-out to depression was greater than that in the path from anger-in to depression. Therefore, the indirect effect of anger-out on somatic symptoms through depression was also greater than the effect of anger-in on somatic symptoms through depression in depressive disorders. These findings suggest that anger expression may be predominantly involved in the somatic symptoms of depressive disorders, but only anger suppression might be involved in the somatic symptoms of somatoform disorders.

Previous research has linked anger suppression with depression.²²⁻²⁵ However, in this study, the depressive disorder group had significantly higher scores on the anger-out subscale than did the somatoform disorder group. In addition, the scores of the anger-out subscale were more strongly associated with the level of depression in the depressive disorder group than the scores of the anger-in subscale. This finding suggested that the severity of depression in depressive disorder patients may be related more to anger expression than to anger suppression. Other studies have also shown that depression is related to the overt expression of hostility.³³⁻³⁵ However, only the scores of the anger-in subscale were associated with the level of depression in the somatoform disorder group. Therefore, only anger suppression is likely to be related to the severity of depression in somatoform disorder patients, unlike depressive disorder patients.

It is an interesting finding that the depressive disorder group had a significant but negative direct effect of anger-in on anger-out in the path from anger-in to anger-out to depression to somatic symptoms. Therefore, incomplete (or inadequate) anger suppression followed by anger expression is likely to be associated with depression and somatic symptoms in depressive disorders. In contrast, complete (or adequate) anger suppression is likely to be associated with depression and somatic symptoms in somatoform disorders.

Why anger expression and/or anger suppression are differently related to the severity of depression and somatic symptoms in the depressive disorder and somatoform disorder groups could be explained biopsychosocially on the basis of the results of the previous studies. It was reported that serotonin activity was decreased in patients with impulsive aggression,³⁶⁻³⁸ and that reduced serotonin activity was proposed as a possible cause of depression.^{18,39} Therefore, anger expression is likely to decrease the level of serotonin, which is followed by depression and somatic symptoms in depressive disorders. Psychodynamically, guilt preceded by incomplete anger suppression and anger expression is likely to cause depression in this group. In contrast, anger suppression is likely to be associated with increased sympathetic nervous system activity followed by somatic symptoms⁶ in somatoform disorders. In addition, the "anger-turned-in" hypothesis proposed as a psychodynamic theory of

depression²²⁻²⁵ could support the relation between anger suppression and depression in somatoform disorders.

It is worth discussing whether transcultural factor was involved in somatic symptoms in this study. In the past, somatization was known to be more prevalent in non-Western cultures than in Western cultures.⁴⁰⁻⁴³ However, epidemiologic data have not shown cross-national differences in the somatization of depression.^{44,45} Somatization is now considered a universal psychopathology.^{46,47} Therefore, the influence of transcultural factor on the prevalence of somatic symptoms in the study seems small enough to be ignored.

However, there are a few limitations in this study. First, the subjects consisted of heterogeneous subgroups, especially in somatoform disorders. Therefore, future study requires including only a homogeneous subgroup. Second, the effect of the SSRI antidepressant on anger, depression, and somatic symptoms needs to be considered in interpreting the results, although this study tried to minimize the effect of the medication. The medicated patients were likely to show reduced levels of anger, depression, and somatic symptoms compared with the unmedicated patients, because those patients who had side effects from the medication were excluded from this study. In addition, path analysis was used, but the direction of causality cannot be stated with certainty, because this study was cross-sectionally designed.

In conclusion, the results suggest that anger expression might play a more predominant role in depression and somatic symptoms of depressive disorder patients than anger suppression, but only anger suppression might be associated with depression and somatic symptoms of somatoform disorder patients. In addition, incomplete anger suppression followed by anger expression is likely to be associated with depression and somatic symptoms in depressive disorders. Therefore, management for depression and somatic symptoms needs to be more focused on anger expression than anger suppression in depressive disorders, whereas it needs to be focused on anger suppression in somatoform disorders. Further studies require adding anxiety to the variables of anger suppression, anger expression, and depression and somatic symptoms to examine the effect of anxiety on somatic symptoms in depressive disorder and somatoform disorder patients, because anxiety is also considered an important variable affecting somatization.

Drug names: fluoxetine (Prozac and others), paroxetine (Paxil and others).

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