

DEPRESSIVE SYMPTOMATOLOGY DIFFERENTIATES SUBGROUPS OF PATIENTS WITH SEASONAL AFFECTIVE DISORDER

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Patients with seasonal affective disorder (SAD) may vary in symptoms of their depressed winter mood state, as we showed previously for nondepressed (manic, hypomanic, hyperthymic, euthymic) springtime states [Goel et al., 1999]. Identification of such differences during depression may be useful in predicting differences in treatment efficacy or analyzing the pathogenesis of the disorder. In a cross-sectional analysis, we determined whether 165 patients with Bipolar Disorder (I, II) or Major Depressive Disorder (MDD), both with seasonal pattern, showed different symptom profiles while depressed. Assessment was by the Structured Interview Guide for the Hamilton Depression Rating Scale—Seasonal Affective Disorder Version (SIGH-SAD), which includes a set of items for atypical symptoms. We identified subgroup differences in SAD based on categories specified for nonseasonal depression, using multivariate analysis of variance and discriminant analysis. Patients with Bipolar Disorder (I and II) were more depressed (had higher SIGH-SAD scores) and showed more psychomotor agitation and social withdrawal than those with MDD. Bipolar I patients had more psychomotor retardation, late insomnia, and social withdrawal than bipolar II patients. Men showed more obsessions/compulsions and suicidality than women, while women showed more weight gain and early insomnia. Whites showed more guilt and fatigability than blacks, while blacks showed more hypochondriasis and social withdrawal. Darker-eyed patients were significantly more depressed and fatigued than blue-eyed patients. Single and divorced or separated patients showed more hypochondriasis and diurnal variation than married patients. Employed patients showed more atypical symptoms than unemployed patients, although most of the subgroup distinctions lay on the Hamilton Scale. These results comprise a set of biological and sociocultural factors—including race, gender, and marital and employment status—which contribute to depressive symptomatology in SAD. Significant mood and sociocultural factors, in contrast to biological factors of gender and eye color, were similar to those reported for nonseasonal depression. Lightly pigmented eyes, in particular, may serve to enhance photic input during winter and allay depressive symptoms in vulnerable populations. Depression and Anxiety 15:34–41, 2002. © 2002 Wiley-Liss, Inc.

Key words: depression; SAD; bipolar disorder; eye color; gender; race; marital status

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INTRODUCTION

Patients with seasonal affective disorder (SAD) show heterogeneous symptom patterns in their nondepressed spring and summer mood states. Recently, we reported that hypomania and mania in bipolar SAD patients, and euthymia and hyperthymia in unipolar patients, could be discriminated by discrete subsets of symptoms within the bipolar spectrum [Goel et al., 1999].

SAD patients also show heterogeneity while depressed in fall and winter. Atypical neurovegetative symptoms are prevalent, although a small group of patients becomes melancholic [Rosenthal et al., 1984; Terman et al., 1996]. Such clinical distinctions may reflect differences in etiology of the syndrome and account for variation in response to treatments.

There have been many studies of nonseasonal depression pointing to symptom differences in subgroups categorized by diagnosis [Cooke et al., 1995; Beigel and Murphy, 1971; Casper et al., 1985], gender [Frank et al., 1988; Angst and Dobler-Mikola, 1984; Young et al., 1990; Ernst and Angst, 1992], age [Casper et al., 1985], menstrual status [Stewart et al., 1992; Harlow et al., 1999], marital status [Bruce and Kim, 1992; Richards et al., 1997; Weissman, 1987; Weissman et al., 1996] and employment status [Dooley et al., 1994; Warr, 1982; Warr and Parry, 1982]. These factors can indeed account for differences in etiology and treatment response. For example, in one longitudinal study, divorced or separated women had substantially increased risk of subsequent depression compared to those who remained married [Coryell et al., 1992]. In another study, men and women showed contrasting sets of depressive symptoms, which might account for the men's more rapid and sustained response to treatment [Frank et al., 1988].

There are few corresponding data for patients with SAD. In one large study, Leibenluft et al. [1995] found that men reported greater severity of depression, while women reported more atypical neurovegetative symptoms of hypersomnia, weight gain, and carbohydrate craving. In comparisons of unipolar and bipolar patients, other studies found no differences in overall severity of depression [Depue et al., 1990] or specific vegetative or mood symptoms [Thompson and Isaacs, 1988]. A psychophysical study of retinal light sensitivity found that blue-eyed patients show a greater decrease in the dark-adapted cone threshold in summer, and greater antidepressant response following bright light treatment in winter than darker-eyed patients [Terman and Terman, 1999]. Whether such ocular factors also differentiate patients with nonseasonal depression is unknown.

Discriminant analysis of symptoms is commonly used to differentiate psychiatric disorders [Feinberg and Carroll, 1982, 1983; Copp et al., 1990; Brockington et al., 1991], identify predictors of subsequent depression in bipolar patients [Lucas et al., 1989], and validate scales that distinguish diagnostic groups [Bauer et al., 1991] or variants of the same disorder

[Goel et al., 1999]. In the present study, we applied discriminant analysis to the clinical profiles of depressed SAD patients categorized by bipolar or unipolar diagnosis, nondepressed mood state, biological factors of gender, race, menstrual status, and eye color, and marital and employment status. Given heterogeneity of the syndromal profile of SAD patients in both depressed and nondepressed mood states [Goel et al., 1999], we predicted that subgroups defined by these clinical, biological, and sociocultural factors would show significant variations in depressive symptomatology, overall severity, or both.

We also sought to ascertain whether the subgroups thus identified have parallels in nonseasonal unipolar and bipolar depression. Nonseasonal depression and SAD share similar symptom profiles, although they differ in clinical course: nonseasonal depression often is chronic, lasting for years, whereas SAD spontaneously remits each spring or summer. Information for SAD may provide insight into the pathophysiology of nonseasonal major depression and help to determine whether these are distinct clinical disorders or mere variants solely distinguished by clinical course.

METHODS

SUBJECTS

Patients were 165 research volunteers enrolled between 1988 and 1996 in protocols using light or negative air ion treatment [Terman et al., 1990, 1998], and included 129 women (78.2%) and 36 men (21.8%), ages 18 to 63 (mean $\pm$ SD, 39.41 ± 10.22 years). One hundred twenty-nine patients (78.2%; 102 women [79.1%]; 27 men [20.9%]) had Major Depressive Disorder, Recurrent (DSM-IV, 296.3; or DSM-III-R equivalent); 30 (18.2%; 21 women [70.0%]; nine men [30%]), Bipolar II Disorder (296.89 [DSM-III-R, 296.7]); and six (3.6%; all women), Bipolar I Disorder (296.5). Depressive episodes all occurred with seasonal pattern (winter-type).

PROCEDURE

Symptom frequency and severity were assessed in the fall or winter using the combined 21-item Hamilton and 8-item atypical scale of the Structured Interview Guide for the Hamilton Depression Rating Scale—Seasonal Affective Disorder Version (SIGH-SAD) [Williams et al., 1994]. Administration of the SIGH-SAD occurred at entrance into clinical trials, prior to treatment. Patients were diagnosed using the Structured Clinical Interview for DSM-III-R Axis I Disorders [Spitzer et al., 1988] or the version for DSM-IV [First et al., 1995], and met National Institute of Mental Health criteria for SAD [Rosenthal et al., 1984]. The “best-ever” interval of retrospective spring or summer mood was also assessed for all 72 patients enrolled between 1994 and 1996 using the Hypomania Interview Guide (Including Hyperthymia), Retrospective Assessment Version (HIGH-R)

[Williams et al., 1999]. Inclusion and exclusion criteria were identical to those used in our other studies [Terman et al., 1998]. Briefly, presence of another Axis I disorder, current use of antidepressants or psychotropic medications, recent suicide attempts, regular awakenings after 9 a.m., or bedtimes later than 1 a.m. were exclusionary. Patients received a complete medical work-up, including physical exam, urinalysis, electrocardiogram, and bloodwork assessing thyroid function and blood cell counts prior to entry.

Information about gender, race, age, eye color, and menstrual, marital, and employment status was obtained from self-reports, clinical interviews, and medical charts. Employed patients held full- or part-time jobs, and included homemakers and students. Single patients had never been legally married.

STATISTICAL ANALYSES

Discriminant analysis. Forward stepwise discriminant analysis [SPSS, 1997], Wilks' lambda method (F to enter, 3.84; F to exit, 2.71) identified depressive symptoms that best discriminated subgroups. Symptoms included the 29 items on the SIGH-SAD. We also included a measure of atypical balance, the score for atypical symptoms divided by the total scale score. The proportion of patients correctly classified by the discriminated symptoms was used as a measure of predictive validity.

Effect size. The magnitude of between-group differences in symptom scale scores was expressed as effect size, d , the standardized difference between means ($d = 0.3$, small; 0.5 , medium; 0.8 , large); or proportions, h ($h = 0.2$, small; 0.5 , medium; 0.8 , large) [Cohen, 1988].

Other statistics. Multivariate analysis of variance (MANOVA), with age as a covariate, assessed subgroup differences in total SIGH-SAD score, with gender and diagnosis as the primary ("core") comparisons. Factors of race, eye color, employment status, and marital status were added individually to the core, thus maximizing available sample sizes.

RESULTS

MOOD FACTORS

Diagnostic groups. The total SIGH-SAD score was significantly higher in the bipolar (I and II) than in the unipolar group (mean $\pm$ SD, 30.86 ± 6.37 vs. 27.75 ± 5.40 ; $F_{1,162} = 8.41$, $P < .005$; $d = 1.05$). Bipolar patients were differentiated from unipolar patients by more psychomotor agitation, with a classification accuracy of 63.0% (Table 1). Bipolar I patients were differentiated from unipolar patients by more social withdrawal, with a classification accuracy of 71.9%. A set of three symptoms—late insomnia, social withdrawal, and psychomotor retardation—differentiated bipolar I from bipolar II patients, with a classification accuracy of 86.1%. All three symptoms were greater in bipolar I patients.

Nondepressed mood states. In 72 patients, we categorized groups within the nondepressed mood continuum using total HIGH-R scores [Goel et al., 1999]. These groups included euthymia ("calm," "normal" mood), hyperthymia (hypomanic-like periods without associated impairment), and high-hyperthymia (elevated mood with scores overlapping those of hypomania) in unipolar patients; hypomania (excessive energy, elevated mood, subjective speediness, decreased need for sleep) in bipolar II patients; and mania (severe impairment) in bipolar I patients.

The total SIGH-SAD score did not differ significantly between nondepressed subgroups, although specific symptoms varied. Euthymies showed more depressed mood, while hyperthymes showed more appetite loss; these symptoms yielded a classification accuracy of 73.3% (Table 2). High-hyperthymes showed more late insomnia, a symptom that differentiated them from euthymies with a classification accuracy of 77.8% (Table 2). Decreased work and activities (greater in high-hyperthymes) and paranoia (greater in bipolar II patients) differentiated these groups, with a classification accuracy of 92.9% (Table 2).

TABLE 1. Discriminators of unipolar Major Depressive Disorder (MDD) vs. Bipolar Disorder

Group comparisons (n, % classified)	Total classification accuracy (n, %)	Symptom (SIGH-SAD) ^a	Effect size (d)
Bipolar I and II (19/36, 52.8) Unipolar (85/129, 65.9)	104/165, 63.0	Psychomotor agitation	0.53
Bipolar II (18/30, 60.0) Unipolar (85/129, 65.9)	103/159, 64.8	Psychomotor agitation	0.71
Bipolar I (4/6, 66.7) Unipolar (93/129, 72.1)	97/135, 71.9	Social withdrawal ^b	1.23
Bipolar I (4/6, 66.7) Bipolar II (27/30, 90.0)	31/36, 86.1	Late insomnia Social withdrawal ^b Psychomotor retardation	2.80 1.60 1.38

^aSIGH-SAD, Structured Interview Guide for the Hamilton Depression Rating Scale—Seasonal Affective Disorder Version.

^bFrom the atypical symptom scale.

TABLE 2. Discriminators of nondepressed mood subgroups

Group comparisons (n, % classified)	Total classification accuracy (n, %)	Symptom (SIGH-SAD) ^a	Effect size (<i>d</i>) ^b
Euthymes (16/22, 72.7)	33/45, 73.3	Depressed mood	0.72
Hyperthymes (17/23, 73.9)		Loss of appetite	-1.02
Euthymes (31/35, 88.6)	35/45, 77.8	Late insomnia	-1.22
High-hyperthymes (4/10, 40.0)			
High-hyperthymes (10/10, 100.0)	13/14, 92.9	Decreased activity	1.15
Bipolar II (3/4, 75.0)		Paranoia	-1.62

^aFor abbreviation, see Table 1.^bNegative sign indicates predominance of the symptom in the second comparison group.

BIOLOGICAL FACTORS

Age. Age, a covariate in all ANOVA analyses, did not differ significantly between any subgroup comparisons.

Gender. The total SIGH-SAD score did not differ significantly between men and women. Men, however, showed more obsessions/compulsions and suicidality, while women showed more early insomnia and weight gain. These four items differentiated men from women by correctly classifying 63.0% of cases (Table 3).

Menstrual status. The total SIGH-SAD score did not differ significantly between menstrual and postmenopausal women. Guilt was greater in menstrual women, while diurnal variation (distinct variation in symptoms between morning and evening) was greater in postmenopausal women. These two symptoms differentiated postmenopausal women from menstrual women, with a classification accuracy of 66.4% (Table 3).

Race. The total SIGH-SAD score did not differ significantly between whites and blacks. However, whites showed more guilt and fatigability, while blacks showed more hypochondriasis and social withdrawal.

These four symptoms differentiated whites from blacks, correctly classifying 81.4% of cases (Table 3).

Eye color. The difference in the total SIGH-SAD score was significantly higher in darker-eyed (29.03 ± 5.75) than blue-eyed (26.87 ± 5.52) patients ($F_{1,154} = 4.29$, $P < .05$; $d = 0.45$). Fatigability—greater in darker-eyed patients—differentiated them from blue-eyed patients, with a classification accuracy of 64.4% ($h = 0.70$; Table 3).

SOCIOCULTURAL FACTORS

Marital status. The total SIGH-SAD score did not differ significantly among single, married, and divorced or separated patients. Hypochondriasis, suicidality, and diurnal variation—all greater in single patients—differentiated them from married patients, with a classification accuracy of 61.8% (Table 4). Similarly, hypochondriasis, psychomotor agitation, and diurnal variation were greater in divorced or separated patients, differentiating them from married patients with a classification accuracy of 67.0%.

TABLE 3. Discriminators of biological subgroups

Group comparisons (n, % classified)	Total classification accuracy (n, %)	Symptom (SIGH-SAD) ^a	Effect size (<i>d</i>) ^b
Men (25/36, 69.4)	104/165, 63.0	Suicidality	0.54
Women (79/129, 61.2)		Obsessions/compulsions	0.49
		Weight gain ^c	−0.28
		Early insomnia	−0.51
Menstrual (66/99, 66.7)	83/125, 66.4	Guilt	1.03
Postmenopausal (17/26, 65.4)		Diurnal variation ^d	−2.00
White ^e (119/145, 82.1)	127/156, 81.4	Guilt	2.88
Black (8/11, 72.7)		Fatigability ^c	1.44
		Social withdrawal ^c	−1.47
		Hypochondriasis	−2.18
Blue eyes (19/47, 40.4)	105/163, 64.4	Fatigability ^c	−0.54
Darker eyes (86/116, 74.1)			

^aFor abbreviation, see Table 1.^bNegative sign indicates predominance of the symptom in the second comparison group.^cFrom the atypical symptom scale.^dDistinct variation in symptoms between morning and evening.^eNot of Hispanic origin.

TABLE 4. Discriminators of sociocultural subgroups

Group comparisons (n, % classified)	Total classification accuracy (n, %)	Symptom (SIGH-SAD) ^a	Effect size (<i>d</i>) ^b
Single (42/77, 54.5)	81/31, 61.8	Hypochondriasis	1.17
Married (39/54, 72.2)		Suicidality	0.76
		Diurnal variation ^c	0.48
Married (39/54, 72.2)	59/88, 67.0	Psychomotor agitation	−0.50
Divorced or separated (20/34, 58.8)		Diurnal variation ^c	−0.52
		Hypochondriasis	−1.01
Employed (100/138, 72.5)	110/165, 72.1	Atypical balance	2.55
Unemployed (19/27, 70.4)		Hypochondriasis	0.86
		Carbohydrate craving ^a	0.48

^aFor abbreviation, see Table 1.

^bNegative sign indicates predominance of the symptom in the second comparison group.

^cDistinct variation in symptoms between morning and evening.

^dFrom the atypical symptom scale.

Employment status. The total SIGH-SAD score did not differ significantly between employed and unemployed patients. Atypical balance, hypochondriasis, and carbohydrate craving—all greater in employed patients, differentiated them from unemployed patients—with a classification accuracy of 72.1% (Table 4).

DISCUSSION

In comparison with total scale scores, the frequency and severity of specific symptoms best differentiates subgroups of patients with SAD. Subgroups categorized by biological variables, such as gender, race, or eye color, or by sociocultural variables, such as marital or employment status, show significant differences in symptomatology. In most cases, distinguishing items fell on the Hamilton Depression Rating Scale rather than the atypical scale of the SIGH-SAD. When sociocultural or mood factors were used as subgroup discriminators, our findings corroborated those reported for nonseasonal depression in other studies; however, when biological factors were used as subgroup discriminators, results were less consistent between seasonal and nonseasonal depression.

Winter depression was more severe in bipolar patients than in unipolar patients. By contrast, Depue et al. [1990] found no difference in the total SIGH-SAD score between bipolar II and unipolar patients with SAD. That study, however, likely lacked sufficient power, given relatively small sample sizes (bipolar [*n* = 14] and unipolar [*n* = 10]). It is unclear whether severity varies with diagnosis in nonseasonal depression. One study found that unipolar patients were more depressed than bipolar patients [Feinberg and Carroll, 1984], although most studies have found no significant differences [Deltito et al., 1991; Dunner et al., 1976; Benazzi, 1997; Popescu et al., 1991].

Among our depressed bipolar patients, late insomnia, psychomotor retardation, and social withdrawal were strong indicators for mania, as was psychomotor

agitation for hypomania. By contrast, Thompson and Isaacs [1988] found no differences in vegetative or mood symptoms among bipolar I, bipolar II, or unipolar patients with SAD. Their study, however, had a smaller sample size in the bipolar II (*n* = 19) and unipolar (*n* = 23) groups, and was based on self-ratings. Each of the discriminating depressive symptoms—psychomotor agitation, social withdrawal, late insomnia and psychomotor retardation—or their opposites (e.g., increased energy and social activity) are also symptoms of elevated mood states. Thus, across their depressed and remitted periods, bipolar SAD patients show larger seasonal changes than unipolar SAD patients, both in overall mood and specific characteristic symptoms. Similarly, patients who become euthymic or hyperthymic in the summer also show significant symptom differences while depressed in the winter.

Depressive symptoms also have been shown to differentiate bipolar from unipolar patients with nonseasonal depression. Unipolar patients reported more sleep disturbance and appetite and weight loss [Casper et al., 1985], while bipolar patients reported more diurnal variation [Casper et al., 1985] and psychomotor retardation [Cooke et al., 1995]. Another study found that bipolar patients showed less activity and more social withdrawal, while unipolar patients showed more somatic complaints, anger, and activity [Beigel and Murphy, 1971]. Thus, although increased social withdrawal in our bipolar SAD patients corroborates nonseasonal data [Beigel and Murphy, 1971], increased psychomotor agitation provides a contrast [Beigel and Murphy, 1971; Cooke et al., 1995].

Men and women with SAD did not differ in the overall severity of depression [this study; Leibenluft et al., 1995]. Although the finding of weight gain in women is remarkably consistent across studies regardless of seasonal pattern [this study; Leibenluft et al., 1995; Frank et al., 1988; Angst and Dobler-Mikola, 1984; Young et al., 1990; Ernst and Angst, 1992], we found no gender differences in the concomitant symp-

toms of appetite increase or food cravings. By contrast, change in sleep in women is less consistent: one study found more hypersomnia [Leibenluft et al., 1995], while two found more initial insomnia [this study; Angst and Dobler-Mikola, 1984]. The high prevalence of diurnal variation in our postmenopausal patients may result from changes in estrogen levels that affect sleep: postmenopausal women have more difficulty initiating and maintaining sleep [reviewed in Leibenluft, 1993], and may feel worse in the morning because of interrupted sleep.

Blue-eyed patients with SAD were significantly less depressed and fatigued than darker-eyed patients. Since it is a truism that blue-eyed individuals are more sensitive to light, Terman [1997] hypothesized that the lack of ocular pigmentation serves to reduce patients' vulnerability to the diminished natural light of winter. Indeed, blue-eyed patients showed larger increases in cone sensitivity in summer than darker-eyed patients, and stronger response to light treatment [Terman and Terman, 1999]. Only 33% of Caucasian patients in the present study had blue eyes compared with higher frequencies of 50–60% in two other studies [Mitchell et al., 1998; Lock-Andersen et al., 1998]. Additionally, the percentage of blue-eyed men and women was proportional to the overall gender distribution. This finding is consistent with the study of Mitchell et al. [1998], but contrasts with a report of a higher prevalence of blue eyes in men [Lock-Andersen et al., 1998]. Thus, the symptom differences in blue- vs. darker-eyed patients may reflect a significant physiological factor of vulnerability to SAD and optimum treatment dose; darker-eyed patients may require longer or brighter light exposure.

Single and divorced or separated patients with SAD showed more symptoms of anxiety and depression than married patients, as has been shown for nonseasonal depression. For example, divorce or separation is a risk factor for major depression [Weissman, 1987], whereby divorced or separated patients are more affected than married patients [Weissman et al., 1996]. Furthermore, divorced or separated individuals score higher on anxiety and depression scales than married individuals who never were divorced [Richards et al., 1997]. Marriage may provide social support and a partial buffer for depression in SAD.

Unemployed patients with SAD showed more melancholic symptoms, while employed patients showed more symptoms of atypical depression. In other populations, the rate of, and risk factors for clinical depression are greater in unemployed than employed patients [Weissman et al., 1991; Dooley et al., 1994]. Furthermore, unemployment is associated with psychological distress and deterioration in well-being [Warr, 1982; Warr and Perry, 1982].

Subgroup discriminations were mainly for items on the Hamilton scale, not the atypical scale. This finding was unexpected, since items on the atypical scale typify SAD and are the best predictors of response to light

therapy [Terman et al., 1996]. Discriminative symptoms on the atypical scale included only weight gain, carbohydrate craving, fatigability, and social withdrawal. We have previously questioned whether the latter two symptoms should be considered atypical, since they are ubiquitous in SAD and therefore fail to predict treatment response [Terman et al., 1996].

Our study, however, does not address the issue of causality with respect to sociocultural group membership (e.g., employment, marital status) and depressive symptoms. It remains unclear whether patients are more depressed because of membership in a particular group or whether such symptoms determine group placement.

The range of classification accuracy between subgroups was wide (61.8–92.9%) and generally lower than for patients when classified according to nondepressed, springtime symptoms [Goel et al., 1999]. Such contrasts may be due either to the relative sensitivity of the instruments used to detect differences (SIGH-SAD vs. HIGH-R) or the magnitude of symptom differences between subgroups.

Bipolar and unipolar patients show contrasting symptom profiles in both summer and winter, and thus may represent different subtypes of SAD. Symptom variation related to biological and sociocultural factors highlight their significant influence on the phenomenology of winter depression. Although the role of sociocultural factors may have obvious links to depression, thus far they have received little attention in SAD. Future research should investigate whether gender, race, and marital and employment status relate to treatment response. If such differences are found, adjunctive or alternate treatments may benefit subgroups of nonresponders to light therapy. For example, counseling may prove a useful adjunct for divorced or unemployed patients.

Differences in symptomatology and group membership may predict response to treatment. For example, we previously reported that 72.9% of unipolar patients responded to bright light therapy, compared with 50.0% of bipolar patients [Terman et al., 1996]. Single patients show more suicidality than married patients, and suicidality has been shown to predict nonresponse to light therapy in SAD [Terman et al., 1996]; thus, single patients may be more likely to be nonresponders. Similarly, employed patients show higher atypical balance than unemployed patients, and atypical balance is known to be higher in responders than nonresponders to light therapy [Terman et al., 1996]; thus, employed patients may be more likely to be responders.

In this study, we constructed a set of diagnostic features that retrospectively defined our patient subgroups. Such cross-sectional analysis is limited by the strict exclusion criteria used to define "pure," relatively severe cases, and may not apply to SAD with comorbid disorders, winter exacerbation of chronic depression, or subsyndromal SAD, which occurs with

far higher frequency than seasonal MDD. Additionally, longitudinal studies are needed to separate consequence from cause for the biological and sociocultural aspects of SAD. Apart from treatment, such information could be used for prevention in the community, providing buffers for those who may be at greater risk for developing this disorder.

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