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Seasonal and non-seasonal depression

A comparison of clinical characteristics in Swedish patients

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Abstract This study compares the clinical characteristics of 127 patients with major depression, 99 with a seasonal and 28 with a non-seasonal pattern. Non-seasonal depressives had significantly higher scores in the Comprehensive Psychopathological Rating Scale, and the Hamilton Depression Rating Scale. Increased appetite and carbohydrate craving, were more frequently reported among patients with a seasonal pattern. Compared to previous reports, the Swedish patients with seasonal depression had less atypical vegetative symptomatology. The symptoms sadness, suicidal thoughts, slowness of movement, gastrointestinal symptoms, and weight loss were more frequent in the patients with a non-seasonal pattern. The clinical symptomatology has a low specificity compared to the seasonal pattern in diagnosing seasonal affective disorder according to DSM-III-R for seasonal and non-seasonal patterns.

Key words Seasonal and non-seasonal affective disorder · Major depression · Clinical characteristics

Introduction

Depression is one of the most commonly encountered mental disorders. It occurs in all kind of societies and is a major health problem in both industrialized and developing countries [29]. Depressive symptomatology may be influenced by cultural and geographical factors. Methodology, differences in sample sizes, diagnostic tradition, patient recruitment and selection processes may all be of importance when studying the disorder.

Seasonality for affective illness with increased incidence in autumn-winter, and another in spring-summer, have been known since the time of Hippocrates [34]. In Sweden, seasonality in melancholia is a well-known fact and was already documented in 1762 in a thesis "About winter diseases" written by Carl von Linné.

The etiology of affective disorders is unknown. One of several hypotheses is chronobiological, describing depression as an illness of disorganized internal rhythms [8, 14]. The concept of seasonal affective disorder (SAD) as a syndrome with clinical and therapeutic implications was introduced by Rosenthal and co-workers 10 years ago [24]. Initially they described 29 patients who suffered from depression in autumn and winter and remitted the following spring-summer period. The two main criteria for SAD were

(a) a history of major affective disorder according to the Research Diagnostic Criteria (RDC) of Spitzer et al. [30],

(b) at least two consecutive years in which depression had developed during the autumn and winter and remitted during the following spring-summer.

The following criteria have been described in DSM-III-R [5]:

(a) the diagnosis of major affective disorder, which has been extended to bipolar disorder (including bipolar disorder, not otherwise specified (NOS) or recurrent major depression (including depressive disorder, NOS) and a particular 60-day period of the year

(b) full remissions (or a change from depression to mania or hypomania) within a particular 60-day period of the year and

(c) at least three episodes of mood disturbances in three separate years, at least two of the years were consecutive and

(d) that seasonal episodes of mood disturbance outnumber any non-seasonal episodes of such disturbances that may have occurred by more than three to one and

(e) the absence of other major psychiatric disorders or any organic factor or psychosocial explanation for the seasonal mood changes.

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The first demographic features, clinical, and subjective symptoms described by Rosenthal and coworkers [24] have been confirmed by additional studies [4, 17, 25, 26, 31, 33, 36]. The latitudes of the studies have varied; most of them were conducted between 39° N and 47° N [10]. Some studies have been conducted at more southern [4] or nothern latitudes [11, 13, 15–17]. In three previous studies, seasonal and non-seasonal depressed patients were compared [1, 6, 37]. The prevalence of seasonal depression has been related to both latitude, with increasing prevalence north [16, 22, 23, 28], and to the number of hours of sunshine [28].

To further explore the clinical relationship between patients with seasonal and non-seasonal depression, we have studied a cross section of a clinical sample of Swedish patients with major depression.

Subjects and methods

The present study comprises data from autumn 1988 to spring 1992 at latitude 59°N of 127 patients, 96 females (f) aged 25–74 years and 31 males (m) aged 18–69 years with a major depressive episode, subclassified into seasonal (n = 99; 74 f/25 m) or non-seasonal depression (n = 28; 22 f/6 m), according to the DSM-III-R criteria of seasonal pattern. The study was performed each year from August to May. The patients were referred by physicians or self-referred. One hundred and six came from the Stockholm region and 21 patients were referred from other parts of Sweden. After an initial screening interview, the patients were assigned to a waiting list. They were, after a varying length of waiting time, admitted to a hospital ward where they underwent a second clinical interview based on the DSM-III-R criteria for diagnosis and answered a modified Swedish translation of the seasonal symptom questionnnaire by Rosenthal et al. [24].

A comprehensive medical and laboratory assessment was carried out to screen for somatic disorders. All patients with abuse of alcohol or drugs, schizophrenia and other severe psychiatric disease, serious somatic disease, and pregnancy were excluded.

The psychiatric symptomatology of the patients were examined by two clinical raters using the Comprehensive Psychopathological Rating Scale (CPRS, 23 items), and Hamilton Depressive Rating Scale (HDRS, 18 items), [3, 9]. The DSM-III-R criteria for major depression with seasonal and non-seasonal pattern, unipolar, manic-depressive (bipolar I, BPI), and hypomanic (bipolar II, BPII) patterns were evaluated by a senior psychiatrist and later, based on a chart review, verified by a second senior psychiatrist.

To control for possible differences due to different pretreatment mood levels between patients with seasonal and non-seasonal pattern a reduced sample was studied. Two individuals matched with respect to pretreatment HDRS score, sex, and age from the seasonal group were randomly assigned to each of the 23 non-seasonal patients which had matching pairs. The matched group thus consisted of 46 seasonal (38 females) and 23 non-seasonal (19 females) patients.

Statistical methods

Variables were tested for normality by means of standardized skewness and kurtosis. Age, height, weight, sum of CPRS scores and sum of HDRS scores appeared to be normally distributed, whereas body mass index (BMI) = weight/(height)^2 had to be log-transformed to meet the normality criteria.

A two-tailed t-test was used for normally distributed differences. When dealing with ordinal data and data that could not be normally distributed by means of transformations (e.g. log-) the non-parametric Wilcoxon signed rank test was used. A one-factor ANOVA was adopted to examine variables for the dependency of categorical data (e.g. uni-/bipolarity, medication). A two-factor MANOVA was used to examine the relationship among continuous dependent variables (ratings), covariates (age, sex, height, weight, and BMI), and factors (seasonality, time of light treatment). Correlations between variables were calculated with the Pearson product-moment or the Spearman rank correlation coefficient when dealing with non-normally distributed data. Normally distributed ordinal group data (e.g. sum of ratings) were also described with mean and standard error of the mean (mean ± SE). A Chi-^{2} test (with Yates correction for 2 × 2 tables when there were few patients in a cell) was used for categorical data analysis. P-values less than 0.05 were considered significant.

Results

Sex

There was no significant difference in the ratio between the number of women and men in seasonal and non-seasonal depressives (74/25 and 28/6, respectively). Women significantly more often carried eye glasses than men and also more often coloured eye glasses ($P < 0.01$). There were no significant sex differences with respect to uni-bipolarity, earlier hospitalization, earlier sick leave, earlier consulted physician, earlier treatment of depression, earlier medication, earlier psychotherapy, change of appetite, carbohydrate craving, smoking, sleep variables, or type of referral.

Age

There were no significant differences in age between females 48.8 ± 1.2 years and males 46.7 ± 2.3 years, or between the diagnostic groups with seasonal pattern 47.5 ± 1.1 years and non-seasonal pattern 51.3 ± 2.5 years. The patients age was significantly higher for those who previously had consulted a physician (48.9 ± 1.1 years; n = 117) as compared to those who had not (41.2 ± 2.2; years; n = 10; $P < 0.05$). Patients with previous treatment for depression were also significantly older (49.3 ± 1.2 years n = 108) than their non-treated counterparts (42.6 ± 1.92; years; n = 18; $P < 0.05$). There were significant age differences in

Table 1 Demographic, diagnostic and clinical features of 127 patients with major depression divided according to seasonal (n = 99) and non-seasonal (n = 28) pattern

Feature	Pattern of depression		P-value
	Seasonal	Non-seasonal	
	N (%)	N (%)	
Sex ratio			ns
Female	74 (74.7)	22 (78.6)	
Male	25 (25.3)	6 (21.4)	
Age, mean ± SE (years)	47.5 ± 1.1	51.3 ± 2.5	ns
Age of onset, mean ± SE (years)	29.9 ± 1.2	27.0 ± 2.3	ns
Age of onset, range in years	10–61	15–57	
Episode length, mean ± SE (months)	4.8 ± 0.2	4.9 ± 0.5	ns
Years of illness, mean ± SE	17.6 ± 1.2	20.0 ± 2.3	ns
CPRS, mean ± SE	19.2 ± 0.7	23.0 ± 1.7	< 0.02
HDRS, mean ± SE	15.1 ± 0.6	18.9 ± 1.3	< 0.01
Diagnosis:			< 0.01
Unipolar	76 (76.8)	19 (67.9)	
Bipolar I	4 (4.0)	6 (21.4)	
Bipolar II	19 (19.2)	3 (10.7)	
Type of referral			< 0.02
Doctors referral	54 (58.1)	23 (85.2)	
Self-referral	39 (41.9)	4 (14.8)	

Table 2 Number and percentage of reported selected symptoms of 127 patients with major depression according to seasonal (n = 99) and non-seasonal (n = 28) pattern

	Seasonal		Non-seasonal		P-value
	N	%	N	%	
Women	74	75	22	79	
Men	25	25	6	21	
Apetite:					
Increased	22/88	25	2/25	8	< 0.05
Decreased	39/88	44	14/25	56	
No change	27/88	32	9/25	36	
Carbohydrate craving:	53/91	58	5/21	24	< 0.01
Weight:					
Increased	33/87	38	6/25	24	
Decreased	23/87	26	13/25	52	
No change	31/87	37	6/25	24	
Affects:					
Sadness	80/88	91	24/24	100	
Anxiety	71/84	85	23/24	96	
Reduced concentration:	86/90	96	22/24	92	
Physical activity:					
Increased	2/89	2	0	0	
Decreased	82/89	92	25/26	96	
No change	5/89	6	1/26	4	
Daytime drowsiness:					
Yes	85/87	98	23/24	96	
No	2/87	2	1/24	4	
Sleep:					
Increased	54/87	62	17/25	68	
Decreased	28/87	32	7/25	28	
No change	5/87	6	1/25	4	
Social withdrawal:	81/99	87	23/28	85	
Job impairment:	91/99	96	26/28	96	
Libido:					
Increased	1/84	1	0	0	
Decreased	63/84	75	18/24	75	
Unchanged	20/84	24	6/24	25	

Table 3 Social features of 127 patients with major depression, seasonal ($n = 99$) and non-seasonal ($n = 28$) pattern

Feature	Seasonal	Non-seasonal	*P*-value
	N (%)	*N* (%)	
Marital status:			ns
Never married	21 (21.4)	4 (14.3)	
Married	46 (46.9)	11 (39.3)	
Cohabiting	9 (9.2)	4 (14.3)	
Divorced	18 (18.4)	7 (25.0)	
Widowed	4 (4.1)	2 (7.1)	
Number of children, mean ± SE (range)	1.6 ± 0.14; (0–6)	1.6 ± 0.23; (0–4)	ns
Education:			ns
Elementary school	19 (20.4)	4 (16.0)	
High school or equivalent	44 (47.3)	10 (40.0)	
University or equivalent	30 (32.3)	11 (44.0)	
Present employment situation:			ns
Employee	85 (88.5)	20 (76.9)	
Self-employed	2 (2.1)	0 (0.0)	
Disability pension and rehabilitation	3 (3.1)	2 (7.7)	
Student	1 (1.0)	0 (0.0)	
Pensioner	5 (5.2)	4 (15.4)	
Information of treatment:			ns
Doctor/therapeut	24 (26.7)	6 (23.1)	
Mass media	58 (64.4)	15 (57.7)	
Else	8 (8.9)	5 (19.2)	
Smoking habits:			ns
Yes	23 (27.1)	6 (28.6)	
No	62 (72.9)	15 (71.4)	

Table 4 Family history in 127 patients with major depression of seasonal ($n = 99$) and non-seasonal ($n = 28$) pattern. Row headings indicate occurrence of disorders in none, first-(1st), and second-(2nd) order of relatives

Family history	Seasonal	Non-seasonal	*P*-value
	N (%)	*N* (%)	
Seasonal affective disorder (SAD)			ns
1st	20 (20.2)	4 (14.3)	
2nd	6 (6.1)	1 (3.6)	
None	73 (73.7)	23 (82.1)	
Depression-Non-SAD			ns
1st	30 (30.3)	10 (35.7)	
2nd	10 (10.1)	2 (7.1)	
None	59 (59.6)	16 (57.1)	
Alcohol abuse			ns
1st	16 (16.2)	4 (14.3)	
2nd	8 (8.1)	1 (3.6)	
None	75 (75.8)	23 (82.1)	
Suicide			ns
1st	10 (10.1)	3 (10.7)	
2nd	4 (4.0)	1 (3.6)	
None	85 (85.9)	24 (85.7)	
Anxiety			ns
1st	30 (30.3)	4 (14.3)	
2nd	5 (5.1)	2 (7.1)	
None	64 (64.6)	22 (78.6)	
Bipolar; Type 1			ns
1st	2 (2.0)	1 (3.6)	
None	97 (98.0)	27 (96.4)	

some reported sleep variables. Patients who rose later and patients with increased sleep duration were significantly younger, 45.6 ± 1.4 years for later vs 52.8 ± 2.4 years for earlier and 53.3 ± 2.3 years for unchanged rise ($P < 0.01$), and 45.9 ± 1.2 years for increased vs 47.7 ± 6.3 years for unchanged and 52.3 ± 2.0 years for decreased sleep duration, ($P < 0.05$). Patients reporting no change in sleep pattern during depression were significantly older than those who reported alteration in sleep pattern (63.0 ± 4.3 vs 47.5 ± 1.4 years; $P < 0.002$). Age was not significantly related to uni-bipolarity, earlier hospitalization, earlier leave of absence, earlier medication, earlier psychotherapy, change of appetite, carbohydrate craving, or type of referral.

Height, weight, and BMI

Measures of height, weight, and BMI did not demonstrate any significant dependency on age and diagnosis (seasonal and non-seasonal depressives). As expected, women were shorter (height = 166.1 ± 0.7 cm; range 153–190) and lighter (weight = 65.1 ± 1.1 kg; range 47–100) than men (height = 179.2 ± 1.4 cm; range 161–194; weight = 77.2 ± 2.1 kg; range 52–105, $P < 0.0001$), but BMI was not significantly different between sexes.

Diagnosis

The partition into the diagnostic categories unipolar, bipolar I and II (as defined in DSM-III-R), showed statistical

Table 5 Reported medical history in 127 patients with major depression of seasonal ($n = 99$) and non-seasonal ($n = 28$) depression. N = number with positive signs/total number and (%) = percentage

Reported medical history	Seasonal		Non-seasonal		chi-^{2}	df	P
	N	(%)	N	(%)			
Earlier hospitalization for depression	26/90	(28.9)	16/23	(69.9)	11.3	1	< 0.001
Sick leave for depression	67/89	(75.3)	27/28	(96.4)	4.77	1	< 0.05
Drug treatment for depression	78/99	(78.8)	27/27	(100)	5.13	1	< 0.02

difference mainly because bipolar I was more common in non-seasonal depression ($P < 0.01$; Table 1).

Clinical history and symptoms

Non-seasonal patients had, to a significant higher degree, been referred by doctors ($P < 0.02$), but there were no significant differences between seasonal and non-seasonal depressions in age of onset of depression, episode length, number of years with depression (Table 1). Seasonal depressives significantly more often reported symptoms of increased appetite and carbohydrate craving ($P < 0.05$ and < 0.01, respectively; Table 2). The increased appetite was significantly associated with carbohydrate craving (chi^2 = 20.8, $df = 3$, $P < 0.0002$). There were no differences in marital status, number of children (seasonal 1.6 ± 0.14, range 0–6, and non-seasonal 1.6 ± 0.23, range 0–4), eductation, present employment situation, smoking habits and the way the patient received information about treatment possibilities. More than half of the patients in both diagnostic groups were informed through media (seasonal 64.4% and non-seasonal 57.7%) (Table 3). There were no significant differences between patients with seasonal and non-seasonal patterns in family history (SAD, depression other than SAD, alcohol abuse, suicide, anxiety or first order relative with a BP I diagnosis; Table 4). Earlier hospitalization, sick leave for depression and drug treatment for depression were significantly more common in non-seasonal depression ($P < 0.001$, < 0.05, and < 0.02, respectively; Table 5). There were no significant differences in the relative number of patients who consulted a physician for depression, earlier treatment for depression and earlier psychotherapy for depression between the two diagnostic groups.

Medication

The number of patients with antidepressant medication and sleeping pills were larger in the non-seasonal group ($P < 0.05$, respectively). No significant differences between these groups were detected for ongoing medication of other drugs (Table 6).

Clinical ratings

The correlation coefficient between the total sum of scores on CPRS and HDRS was 0.83, and the range of the sum of scores were similar in seasonal and non-seasonal depressives (Fig. 1). The interrater reliability for CPRS and HDRS expressed as correlation coefficient were 0.95 and 0.96, respectively. Non-seasonal depressives had significantly higher mean ratings in both CPRS (23.0 ± 1.7 vs 19.2 ± 0.7, $P < 0.02$) and HDRS (18.9 ± 1.3 vs 15.1 ± 0.6, $P < 0.01$; Table 1). In the MANOVAS, the sum of scores both for CPRS and HDRS did not show any dependency on the covariates age and sex (factor equal diagnosis). Concerning the various items of CPRS, there was a significant dependence on age for items 5 (inablity to feel, $P < 0.05$), 19 (hyposomnia, $P < 0.0001$), and 20 (hypersomnia, $P < 0.0001$). The covariate coefficients were rather small (–0.011; –0.017; –0.015 per year, respectively) and without clinical significance.

The only sex differences were detected for aches and pains (item 24), where women had a mean score that was +0.41 higher ($P < 0.05$). Non-seasonal patients had significantly higher ratings in items 1 (sadness; $P < 0.02$), 7 (suicidal thoughts; $P < 0.01$), 41 (apparent sadness; $P < 0.02$), 60 (slowness of movement; $P < 0.05$), and 66 (global rating of illness; $P < 0.02$) (Table 7).

For the different items of HDRS, there were significant dependence on age for item 6 (insomnia, delayed; $P < 0.002$) item 16 (loss of weight; $P < 0.02$) and item 17 (loss of insight; $P < 0.05$), but the covariate coefficients were small (0.003 and 0.004 per year, respectively) and of no clinical importance. Sex did not influence any of the HDRS items. Item 1 (depressed mood; $P < 0.01$), item 3 (suicide; $P < 0.01$), and item 12 (somatic symptoms, gastrointestinal; $P < 0.01$) and item 17 (loss of weight; $P <$

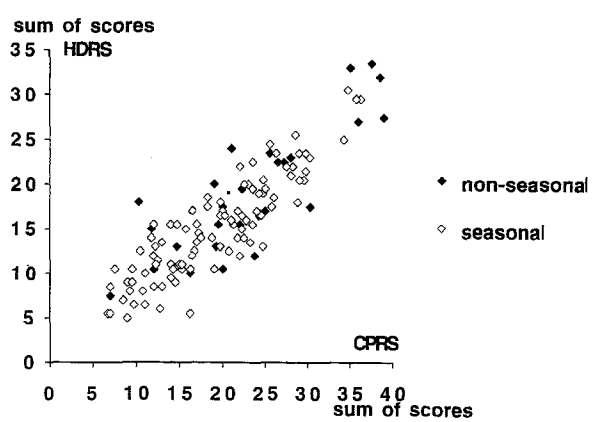

Fig. 1 Correlation between the ratings according to the Comprehensive Psychopathological Rating Scale (CPRS) and the Hamilton Depression Rating Scale (HDRS) of patients with major depression of seasonal *(open squares)* and non-seasonal *(hatched squares)* pattern

Table 6 Patients with prescribed medication on admission, divided in seasonal and non-seasonal pattern of depression

Feature	Seasonal	Non-seasonal	*P*-value
	N (%)	*N* (%)	
Antidepressants	19 (19.2)	12 (42.9)	< 0.05
Sleeping pills	11 (11.1)	8 (28.6)	< 0.05

0.02) were all higher in depressed patient with non-seasonal pattern (Table 8). There were no differences in degree of depression in patients referred by doctors compared with those who made direct contact or among patients with unipolar, bipolar-I, or bipolar-II diagnosis.

Sample matched for age, sex and pretreatment mood level

Patients reporting sleep changes when depressed were significantly younger than those who reported no changes (changes, 48.9 ± 1.4; no changes, 64.3 ± 5.5, $P < 0.01$). Younger patients reported significantly earlier sleep onset and later sleep rise (sleep onset: earlier 45.7 ± 2.01, unchanged 57.1 ± 3.3, later 51.2 ± 2.3; sleep rise: earlier 56.4 ± 3.7, unchanged 54.4 ± 1.7, later 46.4 ± 1.7; $P < 0.02$ respectively). Females were significantly shorter, and lighter than men ($P < 0.0001$ and 0.01, respectively). There were no differences in BMI between sexes, and no differences between seasonal and non-seasonal patients with respect to height, weight, and BMI. As a result of the matching strategy, there were no significant differences between the two diagnostic groups in total rating scores of HDRS and CPRS (seasonal, HDRS: 15.9 ± 1.0; CPRS: 19.6 ± 1.3; non-seasonal, HDRS: 15.9 ± 1.4; CPRS: 20.0 ± 1.8). There were no significant differences between patients with a seasonal pattern compared to patients with a non-seasonal pattern with respect to uni-/bipolarity, social features, heredity, sick leave for depression, drug treatment for depression in the reported medical history, changes in appetite, in reported selected symptomes or prescribed medication on admission. For comparison with the total material see Tables 1–8.

Discussion

The aim of this work was to present and compare demographic and social data, previous medical history and clinical symptoms of patients with major depression of seasonal and non-seasonal pattern admitted for examination and evaluation for special antidepressant treatment, e.g. light therapy, in an academic research hospital setting.

The female overrepresentation among both seasonal and non-seasonal depressives corresponds well with the findings in three other studies that compared seasonal and non-seasonal depressives [1, 6, 37]. There were no significant differences in the sex ratios between seasonal and non-seasonal patients in our study. In general, the higher number of females in most reports reflects the increased risk for major depression in women, which has been documented in Sweden [7], Germany [12] and in USA [35]. In some studies of patients with seasonal patterns, both higher and lower female/male ratios have been reported. In a British sample [33], a sex ratio of 9:1 (f/m) and in a Japanese sample [31] 1.4:1 (f/m) was reported. These discrepancies have been suggested to be dependent on factors such as recruitment processes or genetic and other differences. In general practice, an excess rate for depression among women of 3:1 or 4:1 has been reported [21].

The higher age in patients with some specific depressive symptoms and previous history (consulted physician earlier, treated for depression earlier, reported sleep changes and shorter sleep duration) have also been previously reported [1, 6, 37].

There were no significant difference in age between seasonal and non-seasonal depressives, as was also found by Yerevanian et al. [37] (47 and 36 years, respectively), although our samples have a higher mean age (seasonal 48 years and non-seasonal 51 years). Other studies of seasonal depressives in different countries have reported a mean age between 36 and 44 years [4, 17, 26, 27, 31–33, 36]. Most patients, 58% of the SAD and 85% of the non-SAD patients, were referred by their doctors ($P < 0.02$; Table 1), while most patients in the seasonal studies mentioned above were recruited through advertisment. Attitudes in age groups, cultural and geographical factors may be of importance for these differences. We did not find any differences in age of onset between seasonal and non-seasonal depressives (Table 1), and our findings correspond well with other findings of age of onset for major

Table 7 Clinical ratings using the Comprehensive Psychopathological Rating Scale (CPRS, mean ± SE) of 127 patients with major depression in relation to seasonal and non-seasonal pattern. Only symptoms with significant differences included

	Seasonal	Non-seasonal	*P*-value
Reported symptoms			
1. Sadness	1.16 ± 0.05	1.49 ± 0.15	< 0.02
7. Suicidal thoughts	0.66 ± 0.07	1.08 ± 0.16	< 0.01
Observed symptoms			
41. Apparent sadness	1.03 ± 0.06	1.38 ± 0.14	< 0.02
60. Slowness of movement	0.42 ± 0.05	0.67 ± 0.13	< 0.05
66. Global rating of illness	1.89 ± 0.06	2.20 ± 0.12	< 0.02

Table 8 Clinical ratings using the Hamilton Depression Rating Scale (HDRS, mean ± SE) of 127 patients with major depression in relation to seasonal and non-seasonal pattern

Only symptoms with significant differences in the whole patient sample included

	Seasonal	Non-seasonal	*P*-value
Reported symptoms			
1. Depressed mood	1.58 ± 0.08	2.07 ± 0.18	< 0.01
3. Suicide	0.55 ± 0.09	1.13 ± 0.21	< 0.01
12. Somatic symptoms, gastrointestinal	0.32 ± 0.05	0.63 ± 0.11	< 0.01
16. Loss of weight	0.26 ± 0.06	0.63 ± 0.17	< 0.02

depression [21]. Also, the episode length in our study is in agreement with others [4, 26, 31–33, 36].

Both Rosenthal et al. [24] and Thompson et al. [33] noted an overrepresentation of BPII in their material. In the study of Garvey et al. [6], the majority of the patients with seasonal affective disorders were bipolar. The proportion was, however, not significantly greater than in the patients with non-seasonal affective disorder. Yerevanian et al. [37] and Allen et al. [1] noticed a greater proportion of unipolars in both seasonal and non-seasonal depressives. In later studies of only seasonal patients, the percentage of unipolar patients has been found to be higher and fewer patients having BP II and BP I disorder [20, 27, 32]. Different results in different studies may be related to methodology [2, 19] and factors such as difference in latitude [37] and processes in recruitment. The different factors have been discussed by Kasper and Kamo [12] who found that 11% of a sample of 105 of major depressed patients in Germany showed an autumn-winter pattern although they did not fulfill the criteria for SAD.

Like Allen et al. [1], we found significantly more patients with antidepressant medication and sleeping pills among non-seasonal patients. This differences between the samples may indicate that the non-seasonal sample was a generally more impaired sample than the seasonal group; difference in the symptom profile, and different attitudes to medication among patients and doctors.

The significantly higher frequencies among non-seasonal patients in doctor's referral (Table 1), earlier hospitalization, sick leave for depression and drug treatment for depression (Table 5) indicate that these patients represent a more severely ill group. There are, however, no differences between seasonal and non-seasonal patients in consulted physician for depression, earlier treatment for depression and psychotherapy or in age of onset, episode lenght or years of illness.

The reported findings are clear indications that seasonal and non-seasonal patients at our latitudes cannot be identified either by social features or by reported symptoms. The finding of a significantly higher proportion of patients with increased appetite among seasonal depressives in reported symptoms are in agreement with the findings of Allen et a. [1] but not with Yerevanian et al. or Garvey et al. [6, 37]. In contrast to previous findings [1, 6], we found no differences between seasonal and non-seasonal patients in hypersomnia. The reported high frequency of hypersomnia in earlier depressive states, in non-SAD patients, does not correspond to the CPRS rating which is based on the sleep pattern for the past nights. The higher frequency of carbohydrate craving among our seasonal depressives was also found by Garvey et al. [6].

Allen et al. [1] found a significant higher amount of alcoholism in the family history of patients with seasonal affective disorder than Garvey et al. [6] and in our study. This difference may have a methodological background, as their data were determined through the family history method [2, 19], while our data rest on reports in a seasonal questionnaire. When only seasonal studies are compared, the first-degree relatives for SAD varied between 8% and 41% [20], similar to our 20%. Our finding of 30% with a first-degree relative with affective disorder among seasonal patients are somewhat lower than that reported by Hellekson et al. [10], who found affective disorder in more than half of the patients with SAD in a combined study from four centers.

The significant differences in both mean scores and the same two single items in both scales (sadness and suicidality) is a further indication that non-seasonal patients are more severely ill, which is in agreement with the findings of Yerevanian et al. [37]. The HDRS mean values in our seasonal and non-seasonal samples agree with other studies, indicating that the severity of illness is comparable [11, 24, 25, 31, 36]. There are few differences between seasonal and non-seasonal depressives in the two rating scales when they are compared item by item, and especially between some so-called vegetative symptoms, where the only significantly higher ratings were found in non-seasonal patients in the items slowness of movement (CPRS 60), somatic symptoms (gastrointestinal; HDRS 12) and loss of weight (HDRS 16). These differences might, however, indicate etiological differences and/or differences in severity between the two samples.

The significantly higher frequency of two reported atypical vegetative symptoms, increased appetite and carbohydrate craving, in seasonal depression compared to higher frequency of antidepressant drugs, earlier hospitalization for depression, sick leave for depression and higher rating scores in both CPRS and HDRS among non-seasonal depressives are further indications that non-seasonal patients as a group are more severely ill than seasonal depressives.

Matching the sample of seasonal and non-seasonal patients with respect to pretreatment mood level, sex, and age caused a combined effect of exclusion of subjects, accounting for extreme characteristics and loss of statistical power due to reduction of sample size, a so-called statistical type-II error. The matched procedure reduced or abolished some significant differences found among all 127 patients, but conserved most of the initial results.

In conclusion, the Swedish patients with seasonal depression had somewhat less atypical vegetative symptomatology compared to other samples. This finding may relate to a recent Icelandic report that the relationship between seasonal affective disorder and geographic latitude may also be influenced by genetic adaptation [18]. Further studies are needed to test this hypothesis.

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