

ORIGINAL ARTICLE

Seasonality in affective disorders using SPAQ

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ABSTRACT

Seasonal affective disorder (SAD) is a subtype of affective disorder, which causes significant distress but has no-definitive treatments available till date. Research on SAD has shown variable prevalence due to different climates and latitudes in which these studies are carried out. The present study was an attempt to study prevalence of SAD, its socio-demographic and clinical characteristics and relationship between seasonality and development of affective disorder in a tertiary care psychiatric centre in North India. 421 consecutive patients of affective disorder were assessed on Socio-demographic profile sheet, Seasonality Pattern Assessment Questionnaire (SPAQ), Dysfunctional Assessment Questionnaire, Hamilton Depression Rating Scale and Mania Rating Scale. Most of patients were male and were living in the present climatic area for a mean duration of 35 years. Severe Depressive Episode with/without Psychotic Symptoms was the commonest diagnosis (ICD-10). Most of the patients did not report any variation in mood or behaviour. 2.85% patients were found to have syndromal / subsyndromal SAD based on Global Severity Score of SPAQ. Comparison of 'Seasonality' and 'Non-Seasonality' groups revealed that both groups were comparable on Socio-clinical variables, family history and severity of illness. Low prevalence of SAD in the present study could be due to the different method of assessment used in the study (assessment lasting for the whole year, direct interview method). It may also be speculated that season of changes are not related to underlying processes or consequent to the development of affective disorders

Key words: Seasonality, Affective Disorders, SPAQ

INTRODUCTION

Seasonal changes in mood and behaviour are well recognised and documented (Magnusson, 2000). The degree to which seasonal changes affect parameters of mood, energy, sleep length, appetite, food preference, or the wish to socialize with other people is called as 'seasonality' (Kasper et al, 1989).

Extent and patterns of seasonality and seasonal affective disorder (SAD) have been identified reasonably consistently over the last 15 years. However, research has shown that there can be variations in the degree to which seasonality exists in the population under study. Normal subjects exhibit seasonality variations, which however, tend

to remain within the bounds of normality (Eastwood et al, 1985; Kasper et al, 1989; Magnusson et al, 1997). Kasper et al (1989) mentioned that on the extreme end of the spectrum of seasonality exists the phenomenon of SAD. To compound issues, an additional concept of subsyndromal SAD (S-SAD) was also introduced (Kasper et al, 1989). Though the distinction between diagnoses of SAD/S-SAD gets blurred (Eastwood et al, 1985; Magnusson et al, 1996), yet assessment procedures have been developed to resolve this issue. Use of seasonal assessment questionnaire — SPAQ of Rosenthal et al, 1984 is one such modality of assessment.

SPAQ has been widely used to identify seasonality and SAD/ S-SAD (Magnusson,

2000). SAD is a sub-type of affective disorder that causes severe distress but has non-definitive treatment modalities (apart from phototherapy) available till date. The classical SAD is of fall (autumn) - winter depression associated with/without manic episodes. Considerable body of research has established beyond doubt the existence of SAD. Also, it is postulated that SAD is due to probable disturbances in the biological rhythms, genetic factors, and neuroendocrinal and neurochemical changes. These changes could be occurring in people who show seasonality-linked fluctuations. SPAQ is useful in that it can pick up the seasonal changes, and can help in identifying and studying people at risk for affective disorder, especially SAD.

However, this research is mainly from western countries, at temperate climates and high latitudes, and in form of general population epidemiological surveys (Magnusson, 2000). In fact, very few studies have been carried out in patient populations (Magnusson, 2000).

The available literature on SAD and seasonality is heavily derived from data in places with a temperate climate (Magnusson, 2000 Avasthi et al, 2001). Very few studies have been carried out in countries like India where the climatic and psychosocial conditions are entirely different. There is some evidence from the Indian sub-continent that the patterns of seasonality and prevalence and type of SAD may be different (Gupta, 1988; Margoob & Dutta, 1988; Jam et al, 1992; Shrivastava and Sharma, 1998). A recent retrospective study from our centre (Avasthi et al, 2001) showed trends for opposite patterns of seasonality and SAD.

This prompted us to attempt a prospective study of patients of affective disorder for seasonality and SAD using a standardized method of assessment i.e. SPAQ.

The following research questions were outlined:

- a) What could be the prevalence of SAD?
- b) What could be the prevalence of seasonality?
- c) What are the socio-clinical characteristics of such patients?

MATERIALS AND METHODS

Sample

The sample of patients for the study was drawn from population of patients attending the outpatient service of the Department of Psychiatry, Postgraduate Institute of Medical Education and Research, Chandigarh in the year 1998 (January to December).

Subjects and Diagnostic Criteria

All new, consenting, consecutive cases of Affective Disorder diagnosed according to LCD-10 (F30-F39) were taken up for the study. Diagnosis was made after a detailed work up by a junior resident and discussion with a consultant. Presence of any comorbid psychiatric illness, organic brain disease, and alcohol and drug abuse served as exclusion criteria. All the subjects were cross-sectionally assessed on following instruments:

- a) **Socio-demographic profile sheets** routinely used in the department to assess the patient's age, sex, marital status, occupation, education, income, religion, family type, locality and current place of residence.
- b) **Seasonal Pattern Assessment Questionnaire (SPAQ):** It is a questionnaire developed by Rosenthal et al (1984) to determine patterns of mood and behavior change over different seasons. Besides enquiry into routine demographic data (name, address, place of birth, age, years of education, sex, marital status, occupation and number of years subject has lived in that climate), this questionnaire also determines severity of seasonal changes in several items as sleep, social activity, mood, weight, appetite and energy level. Changes are assessed as '0' i.e. No change to '4' i.e. 'Extremely marked change'. A global seasonality score (GSS) between 0-24 can be obtained. The questionnaire also assesses best and worst change in feelings, gaining losing weight, socialization, eating and sleeping in various months of the year. Effect of weather (cold, hot, humid, sunny days, dry days, grey cloudy days, long days, high pollen count, foggy and smoggy

days and short days) on mood and energy level is rated from '+3' i.e. 'marked improvement in mood or energy level' to '-3' i.e. in very low spirits or markedly slowed down'. The questionnaire also assesses weight fluctuations during the course of year, approximate hours of sleep in 24 hours, change in food preference and person's own feeling if the seasonal changes were problematic for him / her.

If a person has a GSS of 11 or greater, feels that the seasonal changes are a problem at least to a moderate degree, and feels worst in the winter, then that person is classified as probably having, winter SAD as per SPAQ. For classification as S-SAD, [1] a GSS of 10 or above, but no or mild problems with seasonal changes; or [2] GSS of 8 or 9, and having a moderate or worse problem with the seasonal changes.

- c) **Clinical Profile Sheet:** All patients were also assessed on a semi-structured clinical profile sheet to determine LCD-b diagnosis, total duration of illness, month and season of onset of present episode and family history of affective disorder.
- d) **Hamilton Depression Rating Scale (HDRS)** (Hamilton, 1967) for assessing severity of depressive symptoms.
- e) **Bech-Rafaelsen Mania Rating Scale (MRS)** (Bech et al, 1979) for assessing severity of manic symptoms.
- f) **Dysfunction Analysis Questionnaire (DAQ)** (Pershad et al, 1985): Developed at our center, this questionnaire is designed to assess the dysfunction in terms of the current level of functioning in comparison with the level of functioning before any illness. In this 50-item 5-point questionnaire the possible score ranges from 50 to 250. The percentage dysfunction is assessed across five areas - social, vocational, personal, family and cognitive. This questionnaire, widely used in India on different clinical populations, has proven reliability and validity and, norms are available for the Indian population.

Seasons are defined as follows:

In North Indian plains, the latitude varies from 27 degrees to 29 degrees north. The climatic conditions are quite harsh, both in winters as well in the summer months. The demarcation between various seasons is not clear as in temperate zones especially in view of the monsoons, i.e. heavy rains around July/August which are very important for the largely agrarian society in these parts.

Roughly speaking, North India is said to have three seasons viz. Winter, Summer, and Rainy/Monsoon. However, for the sake of this study, the seasons were divided as follows:

Summer: May to July

Autumn/Rainy/Monsoon : August to October
Winter: November to January

Spring : February to April (Avasthi et al, 2001)

Statistical Analysis

Descriptive statistics in the form of frequency, percentage, mean, and standard deviation were used for analysis of the variables. Chi square and student's t- test were used to compare discrete and continuous variables respectively across the groups.

RESULTS

Socio-demographic profile of patients revealed that mean age of patients was 38.59 years (S.D., 13.69). Males formed majority of the patients (54.4%). Majority of patients were married (77.4%), hailed from urban areas (60.6%) and educated upto matriculation (65%). Majority of patients were born in Punjab (40.6%), Haryana (17.8%) and Chandigarh (11.9%). At the time of assessment majority of patients were living in Punjab (33.7%), Chandigarh (32.1%) and Haryana (18.3%). Mean duration (in number of years) in terms of living in the current climate area was 34.54 years (S.D., 15.23). Mean weight of patients at the time of assessment was 60.46 kg (S.D. 9.08).

Clinical profile: Severe depressive episode with / without psychotic symptoms

(46.1%) was the commonest diagnosis as per ICD- 10, followed by Recurrent Depressive Disorder (18.1%), Bipolar Affective Disorder currently Mania with / without Psychotic Symptoms (13.5%), Dysthymia (10.7%). Bipolar Affective Disorder — Others (Recurrent Manic Episode) (3.8%), Mania with /without Psychotic Symptoms (3.1%), Dysthymia with Severe Depressive Episode (2.4%), Bipolar Affective Disorder currently Hypomania (2.1%) and Cyclothymia (0.2%).

In majority of patients, the index episode had onset in first half of year (61.9%). The break up reveled following pattern January (11.4%), February (11.6%), March (10.2%), April (9.7%), May (5.2%), June (13.8), July (5.7%), August (5.3%), September (4.5%), October (5.9%), November (5.0%) and December (7.8%). Pattern of season of onset revealed Summer (31.0%), Spring (25.2%), Winter (22.6%) and Fall (21%). 22.7% of patients had a positive family history of Affective Disorder.

DAQ scores: Mean scores on various domain of DAQ were — Social Area of Dysfunction (SA) 62.39 (S.D., 20.81), Vocational Area of Dysfunction (VA)- 60.63 (S.D., 18.64), Personal Area of Dysfunction (PA) — 62.06 (S.D., 17.75), Family Area of Dysfunction (FA) 58.43 (S.D., 17.68) and Cognitive Area of Dysfunction (CA) — 52.99 (S.D., 13.56). Mean total score was 59.38 (S.D., 16.11).

HDRS scores: HDRS was applied on 326 patients who received a diagnosis of depression; mean score on HDRS was 26.99 (S.D., 12.06).

MRS scores: Mean score on MRS in 95 patients on whom it was applied was 12.05 (S.D., 3.8).

Seasonal Pattern Assessment Questionnaire (SPAQ): Mean SPAQ global severity in patients was 1.39 (S.D, 2.44, range 0-17). Description of response of patients in terms of month in which patients had best or worst response in term of general feelin:4, gaining losing weight, socializing, sleeping and eating in shown in Table I.

As shown, majority of patients did not find any particular month in which they felt best (68.4%), tended to gain most weight

TABLE 1 : Description of months depicting pattern of mood and biological functioning changes (n=421)

Change	None No. (%)	Jan to March No.(%)	April to June No.(%)	July to Sept. No.(%)	Oct. to Dec. No.(%)	Not known No.(%)	Not available No.(%)
Feel best	288(99.4)	53(12.6)	36(8.6)	21(5.0)	21(5.0)	1(0.2)	1(0.2)
Tends to gain most weight	378 (89.8)	22 (5.2)	09 (2.1)	05 (1.2)	07 (1.7)	--	--
Socialise most	369(87.6)	12(2.9)	11(2.6)	19(4.5)	08(1.9)	01(0.2)	01(0.2)
Sleep least	317(84.0)	36(8.6)	10(2.4)	10(2.4)	12(2.6)	--	--
Eat most	353(84.0)	36(8.6)	10(2.4)	10(2.4)	12(2.6)	--	--
Lose most weight	382(0.7)	11(2.6)	03(0.7)	23(5.5)	02(0.5)	--	--
Socialise least	382(90.7)	12(2.9)	04(1.0)	23(5.5)	--	--	--
Feel worst	329(78.1)	16(3.8)	05(1.2)	65(15.4)	05(1.2)	--	--
Eat least	368(87.4)	13(3.1)	03(0.7)	35(8.3)	02(0.5)	--	--
Sleep most	317(75.1)	51(12.1)	02(0.5)	49(11.6)	02(0.5)	--	--

(89.8%), socialize most (87.6%), slept most (75.3%), ate most (84.0%), lost most weight (90.7%), socialized least (90.7%), felt worst (78.1%), ate least (87.4%) and slept most (75%). The commonest months in which these changes were reported were January to March (felt best 12.6% gained most weight 5.2%, ate most 8.6%, socialized least 2.9%, and slept most 12.1%).

Table II shows the effect of various weather changes on to the mood or energy level of the patients. As shown, majority of patients did not report any effect on mood or energy level by cold weather (68.0%), hot weather (54.5%), humid weather (56.2%), sunny days (62.6%), dry days (63.3%), grey cloudy days (69.9%), long days (69.2%), high pollen count (77.3%), foggy and smoggy days (90.5%) and short days (70.6%). Mildly lowered energy and low mood was a common influence by hot weather (12.8%), humid weather (27.0%), sunny days (24.2%), dry days (6.4%), grey cloudy days (6.9%) long days (18.0%), high pollen counts (4.7%), foggy days (4.5%) and short days (21.8%). Another common change was slight improvement in mood or energy levels. It was reported by in cold weather (1.7%), hot weather (21.8%), humid weather (11.60%), Sunny days (7.3%), dry days (25.6%), grey cloudy days (19.0%), long

days (8.1%), high pollen counts (15.9%) foggy days (12.4%) and short days (3.3%).

Regarding the number of sleep hours during each season, majority of patients in each season slept 7 or 8 hours a day. Their season wise distribution showed as follows— winter (54.3%), spring (56.4%), summer (50.5%) and fall (60.0%).

Majority of patients (94.3%) did not show any weight fluctuations during the course of year. Majority of patients also did not report any change in food preferences (94.5%) or problem in experiencing changes with season (90.5%).

SAD/S-SAD

Twelve patients (2.85%) were found to have syndromal/subsyndromal SAD. Majority (75%) of these patients were male and married (82.330 a). approximately a half of patients were born in Chandigarh,25% in Uttar Pardesh and 16.700 in Himachal Pardesh and all were living in the same area as that of the birth. Mean age at presentation was 33.16 years (12.55) and patients were living for a mean period of 28 years in the same climate area.

Six patients received diagnosis of Severe

TABLE II : Description of months and energy level w.r.t. different weathers (N=421).

Change	Cold No. (%)	Hot No. (%)	Humid Days No.(%)	Sunny Days No.(%)	Dry Days No.(%)	Grey Cloudy Day No.(%)	Long days No.(%)	High Pollen Count No.(%)	Foggy Days No.(%)	Short days No.(%)
Markedly slow/very low spirits	01 (0.2)	01 (0.2)	4 (0.9)	3 (0.7)	0 (0.0)	1 (0.2)	3 (0.7)	2 (0.5)	1 (0.2)	2 (0.5)
Moderately low/slowed down	07 (1.7)	09 (2.1)	13 (3.1)	12 (2.8)	6 (1.4)	6 (1.4)	5 (1.2)	1 (0.2)	2 (0.5)	11 (2.6)
Mildly low/slowed down	02 (0.5)	54 (12.8)	114 (27.0)	102 (24.2)	27 (6.4)	29 (6.9)	76 (18.0)	20 (4.7)	19 (4.5)	92 (21.8)
No effect	287 (68.0)	230 (54.5)	237 (56.2)	264 (62.6)	267 (63.3)	295 (69.9)	292 (69.2)	326 (77.3)	382 (90.5)	298 (70.6)
Slight improvement in mood/energy level	07 (1.7)	92 (22.0)	49 (11.6)	31 (7.3)	108 (25.6)	80 (19.0)	34 (8.1)	67 (15.9)	10 (2.4)	4 (3.3)
Moderately improved mood and energy level	02 (0.5)	07 (6.4)	02 (0.5)	6 (1.4)	8 (1.9)	4 (0.9)	5 (1.2)	2 (0.5)	02 (0.5)	01 (0.2)
Markedly improved mood and energy level	02 (0.5)	27 (6.4)	02 (0.5)	6 (1.4)	8 (1.9)	4 (0.9)	5 (1.2)	2 (0.5)	02 (0.5)	01 (0.2)
Do not know	51 (12.1)	03 (0.9)	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
N.A.	63 (15.02)	0 (0)	01 (0.2)	02 (0.5)	04 (1.2)	04 (1.2)	02 (0.5)	02 (0.5)	03 (0.9)	02 (0.7)

Depressive Episode, 2 of Recurrent Depressive Disorder and 1 each of BPAD-hypomania, BPAD-mania, Dysthymia and

Double Depression. In 5 each onset of index episode was in winter and spring and 1 each, in summer and fall.

SPAQ description of these 12 patients revealed that 6 (50%) out of 12 felt best in January-March. 8 (75%) reported no particular month in which they tended to gain most weight. In 3 (25%) each, July-September and October-December were reported best to socialize. 6 (50%) reported no particular month in which they slept least or ate most. In 7 no particular month was reported in which they lost weight. In 8 (75%) no particular month was reported in which they socialized least/felt worst. Four each reported January-March, July-September and October-December as months in which they ate least

Effect of different weathers in these 12 patients revealed that Cold, Hot, Humid, Grey cloudy, Foggy and Sunny weather had effects on most of these patients in terms of improvement or worsening of mood or

energy levels. Dry days, Long days, High pollen count and Short days had no effect on most. Most patients slept between 6-8 hours in different weathers. All of these patients reported problems with change of season. This change was of moderate level in all patients

Depending upon the global severity of seasonality score on SPAQ, patients were divided into two groups Seasonality pattern Negative (score 0) (N=255) and Seasonality pattern Positive (score >1) (N=166) and patients in two groups were compared on socio-demographic and clinical variables. As shown in Table II and III (a), patients did not differ in terms of sex, marital status, locality, education status, place of birth, current place of residence, age and number of years in present climatic area. Mean weight (in Kg) of 'Seasonality pattern Positive' group (61.63, S.D; 8.2) was significantly higher than 'Seasonality pattern Negative' group (59.70, S.D. 9.51) ($p < 0.05$). As shown in Table IV and IV (a), both group were comparable in terms of life time diagnosis, month of onset, season of onset,

family history, total score and domains score of DAQ, HDRS and MRS.

DISCUSSION

a) Profile of patients with affective disorder (N=421)

The socio-demographic profile of patients attending the psychiatric outpatient clinic in this prospective study is comparable to that reported earlier over a 5-year period (Avasthi et al, 2001). Nearly 70% of the patients had their birthplace in the latitude region from 27°N-29°N; nearly 84% of the cohort was staying in this latitude range very nearly from birth onwards. This suggests that the cohort under study had acclimatized to the effects of latitude, climate and weather.

The clinical profile, in terms of ICD-10 diagnosis, is again comparable to that listed in a previous report from the same centre (Avasthi et al, 2001). Unipolar single episode (non-recurrent) depression comprised nearly

TABLE III : Comparison of Seasonality Group and Non Seasonality Group on various socio-demographic variables

S.No. Variables	Non-seasonality Group (N=255) No. (%)	Seasonality Group (N=166) No. (%)	Chi-square/t-test value (df); p value
1. Sex			
a) Males	136 (53.3)	93 (56.02)	0.902 (df=2);
b) Females	118 (46.7)	73 (43.98)	(N.S.)
2. Marital Status			
a) Single	41 (16.07)	30 (18.07)	1.75 (df=3)
b) Married	199 (78.03)	127 (76.5)	(N.S.)
c) Widowed	05 (1.9)	01 (0.06)	
d) Divorced	10 (3.9)	08 (4.8)	
3. Locality			
a) Urban	150 (58.82)	105 (63.25)	1.395 (df=2)
b) Rural	105 (41.18)	61 (4.8)	(N.S.)
4. Education Status			
a) Upto primary	81 (31.75)	48 (28.91)	7.97 (df=7);
b) Pri-middle	36 (14.11)	15 (9.0)	(N.S.)
c) Middle-mature	61 (23.92)	39 (23.49)	
d) Matric - Inter	23 (9.01)	22 (13.25)	
e) Inte-Graduate	39 (15.29)	29 (17.46)	
f) Graduate - Prof	15 (5.88)	13 (7.8)	
g) NK	1	0	
5. Place of Birth			
a) Chandigarh	31 (12.15)	19 (11.44)	14.372 (df=14)
b) Punjab	107 (41.96)	64 (38.55)	(N.S.)
c) Haryana	48 (18.82)	27 (16.26)	
d) Delhi	01 (0.04)	02 (1.2)	
e) H.P.	27 (10.58)	20 (12.04)	
f) U.P.	21 (8.2)	21 (12.60)	
g) Bihar	02 (0.07)	01 (0.06)	
h) J&K	08 (0.31)	01 (0.06)	
i) Kerala	00	01 (0.06)	
j) Leh	00	01 (0.06)	
k) Rajasthan	00	01 (0.06)	
l) M.P.	01 (0.04)	01 (0.06)	
m) Pakistan	04 (1.5)	07 (4.2)	
n) Nepal	03 (1.1)	01 (0.06)	
o) Ethiopia	01 (0.4)	00	
6. Place of Residence			
a) Chandigarh	75 (33.3)	60 (36.14)	06.92 (df=8)
b) Punjab	88 (39.11)	54 (32.33)	N.S.
c) Haryana	51 (22.66)	26 (15.66)	
d) H.P.	21 (9.3)	12 (7.2)	
e) U.P.	11 (6.6)	10 (6.02)	
f) J&K	06 (3.6)	02 (1.2)	
g) Rajasthan	02 (1.2)	00	
h) N.P.	01 (0.06)	00	
i) Nepal	02 (1.2)	00	
7. Age (in years)	38.55 (14.08)	38.61 (13.81)	-0.019 (df=419) N.S.
8. Weight (in kg.)	59.70 (9.51)	61.63 (8.2)	-2.121 (df=419)
9. Number of years in present climatic area	34.92 (15.14)	33.96 (15.33)	0.626 (df=418) (N.S.)

57% of the sample, followed by recurrent depression in 20.5% subjects, bipolar affective disorder in 19.6% subjects, and single episode mania in 3.1% subjects. Hence, it can be said that the overall socio-clinical profile of the cohort was representative of the population with affective disorders attending our services on a regular basis.

However, the pattern of onset of the affective episodes was not in keeping with our previous report. Avasthi et al (2001) had reported the onset of episodes of affective disorders in a particular descending order of frequency viz. Winter, Summer, Autumn/Fall / Monsoon, and Spring. The present study shows a different pattern viz. Summer, Spring, Winter, and Autumn/Fall/Monsoon in that order. Although this difference in frequency could be a reflection of different populations and methodology used, yet the importance of assessment and determination of seasonality needs to be highlighted. The previous reports, being retrospective chart review, required extraction of information from case records. Whereas in the present study, determination of seasonality was done by direct clinical interview supplemented with information from SPAQ.

Around 20% patients had a family history of affective disorder suggesting a role of genetic factors operating in the development of the illness in the probands. The cohort, as a whole, was suffering from a reasonably severe degree of affective illness at time of presentation as evinced from their mean psychopathology scores on both HDRS and MRS, as well as DAQ scores (which indicates moderate degree of dysfunction). The global seasonality score (GSS) of 1.39 ± 2.44 was quite low as compared to data from temperate climates and higher latitudes (Kasper et al, 1989; Rosen et al, 1990; Kasper & Kamo, 1990; Hegde & Woodson, 1996; Raheja et al, 1996). This could be simply interpreted as (and extrapolated from the evidence in literature) that with higher northern latitudes, there is a small yet definite increase in SAD (Magnusson, 2000). However, a closer look at the study from similar latitude in USA (Hegde & Woodson, 1996) shows a higher GSS of 7.43. Higher GSS from USA could be possibly related to the difference in climate w.r.t. that in North India. This low GSS is based on a

TABLE IV(a) : Comparison of Seasonality Group and Non Seasonality Group on various clinical characteristics

S.No. Variables	Non-seasonality Group (N=255) No. (%)	Seasonality Group (N=166) No. (%)	Chi-square/ t-test
1. Life time diagnosis			
a) Severe Depressive Episode	123 (48.23)	71 (42.77)	6.35 (df=8)
b) Recurrent Dep. disorder	43 (16.80)	33 (19.87)	N.S.
c) BPAD-Hypomania	05 (1.9)	04 (2.4)	
d) BPAD - Mania	30 (11.76)	27 (16.26)	
e) BPAD-recurrent mania	12 (4.7)	04 (2.4)	
f) Manic episode	06 (2.3)	07 (4.2)	
g) Dysthymia	28 (10.9)	17 (10.24)	
h) Double depression	07 (2.7)	03 (1.7)	
i) Cyclothymia	01 (0.04)	00	
2) Month of onset			
a) January	25 (9.8)	23 (13.85)	12.49 (df=12)
b) February	26 (10.1)	23 (13.85)	N.S.
c) March	33 (12.94)	10 (6.0)	
d) April	28 (10.9)	13 (7.8)	
e) May	12 (4.7)	10 (6.0)	
f) June	37 (14.5)	21 (12.58)	
g) July	15 (5.8)	09 (3.5)	
h) August	22 (8.6)	17 (10.24)	
i) September	14 (5.4)	05 (3.01)	
j) October	14 (5.4)	11 (6.6)	
k) November	11 (4.3)	10 (6.0)	
l) December	17 (6.6)	15 (9.0)	
3. Season of onset			
a) Winter	52 (20.39)	43 (25.96)	4.76 (df=4)
b) Summer	87 (34.11)	43 (25.96)	N.S.
c) Spring	64 (25.09)	42 (25.30)	
d) Fall	50 (19.60)	38 (22.89)	
e) NA	02 (0.07)	00	
4. Family History			
a) Absent	157 (59.02)	95 (39.15)	0.837
b) Present	44 (21.56)	40 (24.09)	(df=2)
c) Not known	44 (17.25)	30 (18.07)	N.S.

TABLE IV (b) : Comparison of Seasonality Group and Non-Seasonality Group on various clinical characteristics.

Variables	Seasonality Negative (N=255) Mean (S.D.)	Seasonality Positive (N=166) Mean (S.D.)	t-value
Social Area of Dysfunction (SA)	62.66 (20.44)	61.86 (23.41)	0.339 (df=418)NS
Vocational Area of Dysfunction (VA)	60.52 (18.89)	60.80 (18.31)	-0.150 (df=418)NS
Personal Area of Dysfunction (PA)	62.77 (18.0)	60.96 (17.32)	1.022 (df=418)NS
Family Area of Dysfunction (FA)	59.94 (17.58)	56.57 (17.31)	1.745 (df=418) (0.082)
Cognitive Area of Dysfunction (CA)	53.58 (13.96)	52.09 (12.92)	1.101 (df=418) (0.272)
Total DAQ Score	59.96 (15.98)	58.52 (16.31)	0.880 (df=418) (0.380)
HDRS Score (N=325)	27.38 (11.66)	26.41 (12.66)	0.222 (df=416) (0.424)
MRS (N=96)	13.96(10.12)	15.02(11.75)	-0.982(0.326)

clinic - based study of affective disorder patients, unlike the study population in other studies listed above. In keeping with the very low GSS, majority of the patients reported no variation in their mood and adaptive functions related to seasonal changes (Table 1). However, more than two third of the cohort reported changes in mood and adaptive functions without mentioning any particular month or seasons. Hence, it appears that changes occurred throughout the year in the subjects; unlike the pattern reported by Kasper et al (1989). Kasper et al (1989) found peaks in January / February (Winter) and substantially lower peaks in July/ August (Summer). A possible reason for these discordant results could be that the study by Kasper et al (1989) was carried out at higher latitude (39°N) in a temperate climate where there is a good demarcation of seasons. The climatic conditions in North India are very harsh for brief periods with less well demarcation of four seasons (Avasthi et al, 2001). Due to a long period of residence in this area, the cohort could have possibly acclimatized to the prevailing climate/ weather. Conversely, climatic variation, apart from temperature variation, could be an important stimulus for producing chronobiological alterations (Mersch et al, 1999). This hypothesis is supplemented by the results that varied types of weather/ seasons (Table 2) did not produce any effect or change on the mood in majority of the patients. Even if changes in mood were reported (w.r.t. varying weather/climate), they were of a mild intensity; unlike that in the study by Kasper et al (1989).

b) Seasonal Affective Disorder (SAD)

Before proceeding with the discussion on SAD, it shall be pertinent to mention here that the cases of SAD and S-SAD, due to small numbers, were clubbed together for purpose of analysis. This was done on the basis of previous literature, where it is mentioned that SAD and S-SAD identified on the basis of SPAQ criteria do not have a very clear demarcation and both should be seen on a continuum requiring treatment (Kasper et al, 1989; Rosen et al, 1990).

i) **Prevalence:** The prevalence of SAD and S-SAD was 2.85% (12/421) as

per the SPAQ criteria of Kasper et al (1989). This prevalence rate is higher than in the study by Sakamoto et al (1993) from Japan, 26°N-44°N but significantly low than other studies on depressed outpatients from USA (Thase, 1986; Garvey et al, 1988), Germany (Kasper & Kamo, 1990), Canada (Williams & Schmidt, 1993), Italy (Faedda et al, 1993); UK (Eagles et al, 1999) and Turkey (Elbi et al, 2002); latitude ranging 37°N-60°N. This finding appears to be in keeping with the hypothesis of greater prevalence of SAD at higher northern latitudes (Kasper et al, 1989; Magnusson, 2000).

- ii) **Socio-demographic profile:** The socio-demographic profile of these patients was on similar lines as the whole cohort outlined previously. Due to the marked inequality in numbers of the SAD group (N=12) and the non-SAD group (N=409), statistical analysis was not attempted for comparing them.

Previous studies have generally reported a female predominance in patients with SAD (Kasper et al, 1989; Takahashi et al, 1991; Sakamoto et al, 1993; Faedda et al, 1993; Hegde & Woodson, 1996; Magnusson, 1996), contrary to the male predominance in our study. A similar finding was reported from the same centre previously too (Avasthi et al, 2001) and in other studies (Shrivastava & Sharma, 1998). As all these are clinic-based studies, it could be possible that gender differences could be related to the type of setting under study in SAD.

Younger age has been consistently reported with higher rates of SAD in the general population studies (Kasper et al, 1989; Rosen et al, 1990; Hegde & Woodson, 1996). Patients with SAD in our study were also in their early thirties at the time of presentation.

- iii) **Clinical profile:** Only 16% (2/12) of the patients with SAD had a diagnosis of bipolar affective disorder (BPAD). This finding is in contrast to other clinic based studies reporting rates of 50% - 65% (Garvey et al, 1988; Faedda et al, 1993; Avasthi et al 2001). The severity of illness, on HDRS, MRS and DAQ, was similar

to that of the total cohort.

- iv) **Seasonality profile:** In relation to the question on "months when you felt best", most patients gave a positive response for autumn and winter months. As regards other parameters (socialization, eating, sleep, weight), majority of the patients reported no negative influence of winter season or short periods of daylight. This pattern is in direct contrast to findings reported from the west at higher latitudes where winter season or short periods of daylight are associated with "feeling worst/not feeling good" (Kasper et al, 1989; Rosen et al, 1990; Elbi et al, 2002). Previous reports from the Indian subcontinent have also reported consistently reverse patterns of SAD and seasonality of episodes (Gupta, 1988; Shrivastava & Sharma, 1998; Avasthi et al, 2001). Finally, as expected, all the 12 patients reported moderate degree of problem with change in seasons

c) Seasonality and Non-Seasonality : Its relationship with affective disorders

Research on SAD has shown that seasonal variations in mood and behaviour is a continuous, dimensional variable ranging from no change to full-blown SAD (Terman, 1988; Hegde & Woodson, 1996). It has been additionally demonstrated that manifestation of an affective disorder (i.e. major depression) is not necessarily associated with high seasonality change (Kasper & Kamo, 1990). In fact, it is mentioned that identification of patients with major depression with seasonality pattern is helpful as they are likely to respond better to light therapy than non-seasonal pattern of major depression (Kasper et al, 1989; Kasper & Kamo, 1990). Based on this, we attempted to evaluate the cohort of affective disorders (n=421) for seasonality changes; comparing the "seasonality" group with non seasonality" group.

On the basis of the 055 of SPAQ, two groups were generated "Seasonality" group (GSS=1) and "Non-Seasonality" group (GSS=0). "Seasonality" group (SG) comprised 166 cases(39.4%) whereas "Non-

Seasonality" group (NSG) comprised 255 cases (60.6%). Both groups were then compared on socio-clinical and select SPAQ variables. This comparison was carried out on the following paradigm viz, certain antecedents (sociodemographic, family history and seasonality variables) are interacting and manifesting as an affective disorder (of any type) with certain related consequences (clinical and psychopathological variables). Whether the presence or absence of seasonality has any relevance was the question to be addressed.

As evident from Tables III & IV, both groups were comparable on all sociodemographic, clinical, family history, severity and all seasonality variables (except for weight being more in the SG group). These findings can be interpreted that variables relevant to the concept of seasonality and SAD (as reported in the literature) viz, age, sex, place of birth, migration, family history do not appear to be related to seasonality change (experienced and reported over the life time of these patients), or lack of it. Hence, it could be hypothesised that other factors (i.e. social, psychological, biological) may be playing a role in determining the development of affective disorder; including SAD. Additionally, even after development of affective disorder, the related parameters viz, type of disorder, season of onset, dysfunction and severity are comparable showing that seasonality change does not appear to greatly influence the manifestation of affective disorders. Conversely, it needs to be emphasised here that the 'SG' group contains all those patients who experienced seasonal fluctuations on a continuum of 'very low' to full blown 'SAD' due to which such results may have been obtained.

CONCLUSION

Hence, overall it can be concluded that in patients attending a tertiary care outpatient clinic with a diagnosis of affective disorder are characterised by:

- varying pattern of seasonality of episodes; commonest onset being in summer and least being in monsoon/fall.
- The "GSS" was quite low with majority

of the cohort reporting only mild changes throughout the year

- c) Low (2.85%) prevalence of SAD.
- d) SAD patients being mostly young males, unipolar with reverse patterns of seasonality.
- e) Majority (60%) of the cohort reporting no seasonal changes; seasonal changes not being related to processes underlying or consequent to the development of affective disorder.

Certain possible reasons can be put forth for the variation in findings (especially for prevalence of SAD) w.r.t. previous literature. Firstly, patients were evaluated over the whole year and not specifically during the winter or summer months. If such had been done, probably the rate of SAD might have been higher (Sakamoto, 1993). Secondly, it has been seen that SAD/seasonality gets overestimated due to mail/telephone surveys as individuals get biased/sensitized (Kasper et al, 1989; Sakamoto et al, 1993). Thirdly, the cohort comprised patients with all types of affective disorders; not solely being restricted to major depression.

Nevertheless, the findings obtained do tend to generate more speculation than clearing doubts regarding seasonality and SAD in India. This study should serve to generate more research; with collaboration at national and international level.

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