

Original Research Article

Prevalence of seasonal affective disorder among primary health care attendees in eastern Riyadh-a cross-sectional study

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ABSTRACT

Background: Seasonal affective disorder (SAD), a type of mood disorder, is defined by seasonal depressive symptoms that appear at a particular time of a year. Its burden in Saudi Arabia is poorly understood. In this study, we aimed to estimate the prevalence of and factors associated with seasonal depression among attendees of primary health care centres (PHC) in Eastern Riyadh.

Methods: We conducted a cross-sectional study in the PHC of Eastern Riyadh. We systematically sampled participants attending the PHCs the required sample size was achieved. We measured seasonal depression and beliefs using the validated seasonal pattern assessment questionnaire (SPAQ) and seasonal beliefs questionnaire. We presented the mean and standard deviation (SD) of scores obtained and used Student's t test ANOVA test to compare differences across explanatory variables. We demonstrated internal consistency using Cronbach's alpha.

Results: Among 232 participants, majority were aged 18-35 years (67.2%) and males (60.8%). The mean (SD) score on SPAQ was 1.00 (0.71) and that on the seasonal beliefs was 3.03 (0.69). With a cut-off of 11 on SPAQ, prevalence of SAD was found to be 33.5%. SPAQ score was significantly higher among younger ages, females, single/divorced, Saudis, those with secondary/lower level education and those who earn <50,000 Saudi Riyals ($p < 0.001$). Seasonal beliefs score was significantly higher among younger ages ($p = 0.013$) and Saudis ($p = 0.001$). Both the scales used had high internal consistency (Cronbach's alpha of 0.901 for SPAQ and 0.847 for seasonal beliefs questionnaire).

Conclusions: SAD was a prevalent mental health issue among primary care attendees in Eastern Riyadh. Screening for such conditions at the primary level among high-risk groups should be considered by family physicians.

Keywords: Primary care, Seasonal depression, SPAQ, Seasonal beliefs, Saudi Arabia

INTRODUCTION

Seasonal affective disorder (SAD) is a mood disorder characterized by depressive symptoms that manifest only at a particular season of the year with complete remission. The pathophysiology of this disorder and the cause is unknown. Hypotheses include disturbance of the circadian rhythm, dysregulation of the melanopsin signalling pathway, its effect on serotonin reuptake and hypothalamic-pituitary-adrenal axis dysfunction.¹ It

usually occurs in autumn and winter, but can occur in spring or summer as well. Studies in the United States, Canada, and the United Kingdom show a lifetime prevalence of 0.5% to 2.4% in the general population and 10% to 20% of patients with major depression have a seasonal pattern of symptoms consistent with SAD.^{2,3}

Studies show that summer SAD is more common than winter SAD in countries near the equator. Rising heat and humidity, longer days may be contributing factors.⁴ Day

temperatures in Saudi Arabia can reach up to 50 degrees in summer forcing people to stay indoors and have adverse effects on mood.⁵ SAD affects 4 to 6% of the population in Saudi Arabia. Usually, SAD becomes more prevalent as the days get shorter and colder but for about 10% of people experience it in reverse, with the arrival of summer.⁶ Vacations can disrupt work, sleep, and eating patterns, which can lead to summer depression.⁷

While SAD has been extensively studied in regions with pronounced seasonal variations, such as Northern Europe and North America, there is limited published literature on the burden of SAD in Middle Eastern countries. Middle Eastern countries typically have a desert or arid climate with relatively stable daylight patterns throughout the year. As a result, the prevalence of SAD in these regions may be lower compared to areas with more pronounced seasonal changes. Cultural and societal factors in Middle Eastern countries can influence the perception and expression of mental health issues. Stigmatization of mental health disorders may contribute to underreporting and underdiagnosis of SAD. Rapid urbanization and lifestyle changes in some Middle Eastern countries may influence exposure to artificial light, sleep patterns, and overall well-being. These changes could potentially affect the prevalence of SAD. There is a notable gap in the literature regarding the burden of SAD in Middle Eastern countries. Therefore, we carried out a cross-sectional study to estimate the prevalence of SAD among attendees of PHC of Eastern Riyadh.

METHODS

Study design

We conducted a hospital-based cross-sectional study during 2022-23.

Study setting and population

The study was conducted among adult patients attending the PHC of the Eastern Riyadh province. Participants of both genders aged >18 years who came to the selected PHC were eligible for inclusion. Those who had severe illness or had any other disorder that precluded their ability to answer the interview questions were excluded from the study.

Sampling and sample size

We systematically sampled participants attending the PHCs until the required sample size was achieved. Based on the findings of a previous study done in a similar setting, we calculated the sample size to be 232.

Data collection

We measured seasonal depression and beliefs using the translated versions of the validated SPAQ and seasonal

beliefs questionnaire, respectively.^{8,9} A pre-tested structured questionnaire was used to collect information on socio-demographic characteristics. Participants who attended the PHC were approached and explained the study objectives. After obtained informed consent, a trained interviewer administered the questionnaire to the participants in the local language. The data was collected electronically in a handheld electronic device.

Statistical analysis

We presented the mean and standard deviation (SD) of scores obtained and used Student's t-test or analysis of variance (ANOVA) test to compare mean differences across explanatory variables. Internal consistency of the questionnaire was assessed by the Pearson's correlation coefficient. Statistical significance was defined as $p < 0.05$. All analysis was carried out using SPSS v.20.

Ethical consideration

The study was approved by the institutional review board, ministry of health, Riyadh, Saudi Arabia.

RESULTS

A total of 232 participants were enrolled into the study. A majority of them were aged 18-35 years (67.2%) and were of the male gender (60.8%). Nearly half were married and about 45% were single at the time of interview. Saudis constituted the majority with 82.3%. Most of them had obtained a bachelor's degree and were earning <25,000 Saudi Riyals per month (Table 1).

With regard to the SPAQ, the item on which most participants scored very high (i.e., they said it was extremely difficult) was "feeling tired or having little energy" (22%), followed by "trouble falling or staying asleep, or sleeping too much" (18.1%) and "poor appetite or overeating" (15.1%) whereas the lowest scored items were "Moving or speaking so slowly or the opposite" (9.1%) and "Thoughts that oneself would be better off dead" (5.2%) and "difficulty in taking care of things at home, or getting along with other people" (1.7%) (Table 2). The mean (SD) score on SPAQ was 1.00 (0.71). SPAQ score was significantly higher among younger ages (mean=1.13 with SD=0.71, $p < 0.001$), females (mean=1.23 with SD=0.73, $p < 0.001$), divorced (mean=1.29 with SD=0.61, $p < 0.001$), Saudis (mean=1.08 with SD=0.62, $p < 0.001$) and those with secondary or lower level education (mean=1.24 with SD=0.79, $p < 0.001$). Income was not significantly associated with SPAQ score (Table 3). With a cut-off of 11 on the SPAQ, the prevalence of SAD was found to be 33.5%.

With respect to the seasonal beliefs component, most participants scored the highest (strongly agreed) on items like "I'm always happier when it's colder" (35.3%), "sunny, hot days are depressing" (23.3%), "I'm not a summer person" (26.7%), and "all is well if the winter

seasons” (23.3%) whereas they scored lowest on items like “Spring is no better than any other season” (11.6%), “I am going to have the summer blues every year” (11.6%), “It’s hard to get up in the sun light days” (9.9%) and “I don’t pay much attention to the changing seasons” (6%) (Table 4). The mean (SD) score on the seasonal beliefs questionnaire was 3.03 (0.69). Seasonal beliefs score was significantly higher among younger ages

(mean=3.09 with SD=0.67, $p=0.013$) and Saudis (mean=3.09 with SD=0.68, $p=0.001$). Other socio-demographic variables were not found to be significantly associated with seasonal beliefs (Table 5).

Both the scales used had high internal consistency demonstrated by a Cronbach’s alpha of 0.901 (for SPAQ) and 0.847 (for seasonal beliefs questionnaire).

Table 1: Socio-demographic information of study participants, (n=232).

Socio-demographic factors	N	Percentages (%)
Age group (In years)	18-35	67.2
	36-45	18.1
	46-60	12.5
	61 and above	2.2
Sex	Male	60.8
	Female	39.2
Marital status	Single	45.3
	Married	50.4
	Divorced	4.3
Nationality	Saudi	82.3
	Non-Saudi	17.7
Education	Secondary and less	8.6
	Bachelor	63.8
	Master/ PH. D	27.6
Income	Less than 25000 SAR	54.7
	25000-50000 SAR	12.5
	50000-100000 SAR	11.2
	100000-200000 SAR	14.2
	More than 200000 SAR	7.3

Table 2: Participants’ responses to the seasonal depression questionnaire, (n=232).

Variables	Not at all/ no difficult		Several days/ somewhat difficult		More than half the days/ very difficult		Nearly every day/ extremely difficult		Mean	SD
	N	%	N	%	N	%	N	%		
Feeling tired or having little energy	43	18.5	93	40.1	45	19.4	51	22	1.44	1.03
Trouble falling or staying asleep/ sleeping too much	69	29.7	91	39.2	30	12.9	42	18.1	1.19	1.05
Poor appetite or overeating	78	33.6	72	31	47	20.3	35	15.1	1.16	1.05
Little interest/pleasure to do things	66	28.4	102	44	30	12.9	34	14.7	1.13	0.99
Feeling down, depressed/ hopeless	73	31.5	93	40.1	33	14.2	33	14.2	1.11	1.00
Trouble concentrating rating on things, such as reading the newspaper or watching television	78	33.6	91	39.2	34	14.7	29	12.5	1.06	0.99
Feeling bad about yourself- or that you are a failure or have let yourself or your family down	95	40.9	67	28.9	38	16.4	32	13.8	1.03	1.06
Moving or speaking so slowly that other people could have noticed. Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual	128	55.2	60	25.9	23	9.9	21	9.1	0.72	0.97
If you checked off any problems, how difficult these problems made it for you to do you work, take care of things at home/get along with other people?	95	40.9%	112	48.3	21	9.1	4	1.7	0.71	0.70
Thoughts that you would be better off dead, or of hurting yourself	169	72.8	35	15.1	16	6.9	12	5.2	0.44	0.83
Seasonal depression									1.00	0.71

Table 3: Differences in the SPAQ scores by socio-demographic characteristics of the study participants.

Variables	N	Mean	SD	F	P value
Age group (In years)					
18-35	156	1.13	0.71	6.682	<0.001
36-45	42	0.81	0.65		
46-60	29	0.64	0.59		
61 and above	5	0.48	0.49		
Sex					
Male	141	0.85	0.65	-4.009	<0.001
Female	91	1.23	0.73		
Marital status					
Single	105	1.26	0.74	17.476	<0.001
Married	117	0.74	0.58		
Divorced	10	1.29	0.61		
Nationality					
Saudi	191	1.08	0.71	4.487	<0.001
Non-Saudi	41	0.62	0.55		
Education					
Secondary and less	20	1.24	0.79	8.461	<0.001
Bachelor	148	1.09	0.71		
Master/ PH. D	64	0.70	0.58		
Income					
Less than 25000 SAR	127	1.08	0.75	2.082	0.084
25000-50000 SAR	29	1.11	0.70		
50000-100000 SAR	26	0.88	0.62		
100000-200000 SAR	33	0.73	0.55		
More than 200000 SAR	17	0.91	0.66		

Table 4: Participants' responses to the seasonal beliefs questionnaire, (n=232).

Variables	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	SD
	N	%	N	%	N	%	N	%	N	%		
I'm always happier when it's colder	16	6.9	24	10.3	56	24.1	54	23.3	82	35.3	3.70	1.24
Sunny, hot days are depressing	16	6.9	43	18.5	57	24.6	62	26.7	54	23.3	3.41	1.22
All is well if the winter seasons	21	9.1	55	23.7	49	21.1	53	22.8	54	23.3	3.28	1.30
I'm not a summer person	25	10.8	55	23.7	49	21.1	41	17.7	62	26.7	3.26	1.36
It's difficult to feel good on sunny days	17	7.3	62	26.7	70	30.2	46	19.8	36	15.5	3.10	1.18
I cannot productive on dark, dreary days	14	6.0	71	30.6	59	25.4	55	23.7	33	14.2	3.09	1.16
The weather has nothing to do with how I feel	26	11.2	60	25.9	66	28.4	36	15.5	44	19.0	3.05	1.27
Spring is no better than any other season	19	8.2	59	25.4	84	36.2	42	18.1	27	11.6	3.00	1.11
I'm stuck in rut in summer	21	9.1	72	31	58	25	47	20.3	34	14.7	3.00	1.21
Sunlight doesn't affect my mood	30	12.9	69	29.7	57	24.6	44	19	32	13.8	2.91	1.25
I'm ineffective in summer	23	9.9	77	33.2	68	29.3	33	14.2	30	12.9	2.87	1.18
I don't pay much attention to the changing seasons	27	11.6	86	37.1	61	26.3	44	19	14	6.0	2.71	1.09
Summer is the best season of the year	38	16.4	84	36.2	50	21.6	28	12.1	32	13.8	2.71	1.27
I am going to have the summer blues every year	33	14.2	86	37.1	59	25.4	27	11.6	27	11.6	2.69	1.20
It's hard to get up in the sun light days	34	14.7	90	38.8	50	21.6	35	15.1	23	9.9	2.67	1.19
Seasonal beliefs											3.03	0.69

Table 5: Differences in seasonal beliefs scores by socio-demographic characteristics of study participants.

Variables	N	Mean	SD	F	P value
Age group (In years)					
18-35	156	3.09	0.67	3.668	0.013
36-45	42	3.06	0.66		
46-60	29	2.65	0.70		
61 and above	5	2.82	0.79		
Sex					
Male	141	3.05	0.72	0.662	0.509
Female	91	2.99	0.63		
Marital status					
Single	105	3.05	0.67	0.215	0.807
Married	117	3.00	0.71		
Divorced	10	2.94	0.66		
Nationality					
Saudi	191	3.09	0.68	3.304	0.001
Non-Saudi	41	2.71	0.65		
Education					
Secondary and less	20	3.16	0.64	2.192	0.114
Bachelor	148	3.07	0.63		
Master/ PH. D	64	2.87	0.81		
Income					
Less than 25000 SAR	127	3.09	0.60	1.478	0.21
25000-50000 SAR	29	2.95	0.59		
50000-100000 SAR	26	3.06	0.90		
100000-200000 SAR	33	2.78	0.89		
More than 200000 SAR	17	3.04	0.60		

DISCUSSION

Summary of the findings

We found that 1 in 3 participants experience SAD. In terms of seasonal beliefs, participants strongly agreed with statements like preferring colder weather and finding sunny, hot days depressing. Younger age groups, female gender, divorcees, Saudis, and those with lower education levels were at high risk of developing SAD.

Comparison with previous literature

Prevalence of SAD reported in previous studies range between 2 to 9% and increases with latitudes further away from the equator.¹⁰ The influence of latitude on SAD prevalence is however less according to Mersch et al and is impacted by a number of factors. SAD was highly prevalent in the population, even in central Europe, as demonstrated by Steinhausen et al. Based on the SPAQ, Steinhausen et al demonstrated that the prevalence of SAD was 7.84%.¹¹ According to Pjrek et al 1.9% of participants had SAD when ICD-10 criteria were utilized.¹² The participants with SAD scored considerably higher on the Sheehan Disability Scale and had significantly higher rates of sick leave and lower productivity days than healthy subjects. There is sparse literature on SAD in the middle east. Few cross-cultural studies have reported absence of the seasonal mood

disturbances among the working class in Saudi Arabia as compared to those living in the northern countries owing to longer photoperiods.^{13,14} However, the present study showed SAD prevalence of 33.5% among indicating the contribution of other factors to SAD.

Our study showed significant associations between females and higher SPAQ and seasonal beliefs scores. Also, significant associations were observed between younger age groups and higher SPAQ scores. While contradictory findings have been reported in a few, majority of the studies showed high risk of SAD among females and younger age groups.^{12,15,16-20} SAD sex ratios as reported in epidemiological studies range from 2.7:1 upto 9:1.¹⁷ The results from a community health survey in Alaska by Booker et al showed a higher proportion of women in the SAD and Subsyndromal SAD group as compared to the No-SAD group. Likewise, significantly higher proportion of participants less than 40 years of age belonged to the SAD group. Gender and age were significant predictors of SAD in the study by Magnusson et al and Drew et al wherein women and younger aged individuals were more likely to experience SAD as compared to men and older age groups.

Our study also showed significant associations between SAD and other sociodemographic factors i.e., marital status, education levels and cultures/nationality. Civil status and level of education were unrelated to SAD in

the Netherlands according to the study conducted by Mersch et al.²¹ However, cultural associations with SADs have been reported in previous studies. Kasof et al showed significant correlations of SAD with culture irrespective of seasonal differences.²²

Strengths and limitations

Our study has several strengths. Primary care set-up is very closely representative of the population at large and we were able to capitalize on this study population to draw inferences about the general population. Next, we used validated and translated locally relevant tools for capturing mental health symptoms which are otherwise very difficult to obtain in a valid and reliable way. Lastly, we obtained reasonably high internal consistency on our tools, reinforcing the reliability of the data collected. However, there are some limitations that have to be mentioned. We conducted the study only in a few selected PHC. In order to get a wider picture of the region, more provinces need to be studied in the future. The differing levels of literacy among the study participants could have influenced the way in which they understood the questions and responded. Saudi society is very conservative and holds strong beliefs about mental health issues. Therefore, we cannot rule out the possibility of social desirability bias preventing people from accepting that they have certain mental health related difficulties.

CONCLUSION

Our study highlights the extent of SAD within the primary care attendees of Eastern Riyadh, shedding light on the pressing need for proactive measures to address this significant mental health concern. The findings of our research underscore the critical role that primary care physicians play in the early detection and management of mental health disorders, especially among high-risk groups.

It is imperative that primary care physicians in Eastern Riyadh and similar regions become well-equipped with the necessary knowledge and screening tools to identify SAD and other mood disorders. Early detection not only allows for timely intervention but also reduces the burden on specialized mental health services, which are often overwhelmed by the growing demand for psychiatric care in developed countries. Such strategies should include targeted screening programs aimed at high-risk populations, such as individuals living in regions with extreme seasonal variations in daylight. These programs could involve routine mental health assessments during primary care visits, particularly during the seasons when SAD symptoms are most prevalent.

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