

Relationship between seasons of the year and anxiety disorders*

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ABSTRACT

Objective: Anxiety disorders represent risk factors for other psychiatric and somatic illnesses and represent the second most prevalent psychiatric disorders and the most frequent during an individual's lifetime. This study was performed to determine if the diagnostic category of anxiety disorders has a seasonal pattern. **Methods:** This was a retrospective (a data-base was studied), cross-sectional (analyzing prevalence), observational (with no intervention), descriptive (did not assess causality) study to determine the prevalence and seasonality of anxiety disorders in a university hospital psychiatric outpatient clinic. Patients were identified between 2005 and 2014 using the diagnostic criteria of DSM IV-TR; the year was divided into four seasons to assign the consultation date to one of these seasons. Anxiety disorder consultations with incomplete registry data or date were eliminated. **Results:** From the universe of consultations given (495,062), 13.7% were anxiety disorders, with these being the second most frequent category. These were distributed 24.91% in spring, 25.29% in summer; 26.56% in autumn; and 23.24% in winter. We also found no statistically significant association between summer and anxiety disorders. **Discussion:** There was no significant difference in the seasonal prevalence of anxiety consultations during the year; therefore, a seasonal pattern was ruled out. (*Anatolian Journal of Psychiatry* 2019; 20(1):54-59)

Keywords: seasonality, anxiety, consultation liaison psychiatry

Anksiyete bozukluklarıyla mevsimler arasındaki ilişki

ÖZ

Amaç: Anksiyete bozuklukları diğer psikiyatrik ve bedensel hastalıklar için risk etkenleridir. İkinci en yaygın psikiyatrik bozukluklardır ve bireyin yaşamı boyunca en sık görülenlerdir. Bu çalışma anksiyete bozuklukları tanı kategorisinin mevsimsel bir paterni olup olmadığını belirlemek için yapıldı. **Yöntem:** Bu çalışma, bir üniversite hastanesinin psikiyatri polikliniğinde anksiyete bozukluklarının yaygınlığını ve mevsimselliğini belirlemek için geriye dönül (bir veri tabanı çalışıldı), kesitsel (yaygınlık analizi), gözlemsel (müdahalesiz), tanımlayıcı (nedensellik değerlendirilmedi) bir çalışmadır. Hastalar 2005-2014 yılları arasında, DSM-IV-TR tanı ölçütleri kullanılarak belirlendi; konsültasyon tarihini bir mevsime atamak için yıl dört mevsime ayrıldı. Bilgileri eksik olan anksiyete bozuklukları konsültasyonları değerlendirmeye alınmadı. **Sonuçlar:** Tüm konsültasyonların (495,062) %13.7'si anksiyete bozuklukları idi. Bunların mevsimlere göre dağılımı şöyleydi: İlkbahar %24.9, yaz %25.3, sonbahar %26.6, kış %23.2. Mevsimler arasında istatistiksel olarak anlamlı bir fark yoktu. **Tartışma:** Yıl boyunca anksiyete konsültasyonlarının mevsimsel dağılımında önemli bir farklılık bulunmadı. Bu nedenle, mevsimsel bir patern oluşturulamadı. (*Anadolu Psikiyatri Derg* 2019; 20(1):54-59)

Anahtar sözcükler: Mevsimsellik, anksiyete, konsültasyon-liyazon psikiyatrisi

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INTRODUCTION

Anxiety disorders evidenced as a psychological and functional discomfort, represent risk factors for other psychiatric (depression and addictions) and somatic illnesses such as cardiovascular disease.¹ The DSM-IV-TR (the version used when patients were included in this study) groups specific pathologies within the category of anxiety disorders. These are generalized anxiety disorder, panic (attack) disorder, excessive compulsive-disorder, posttraumatic stress disorder, acute stress disorder, social anxiety (social phobia) disorder and phobic disorders.

Medina-Mora² found that anxiety disorders were the most frequent during the lifetime of an individual with a prevalence of 14.3% in the general population. In relation to disorders of adult life, anxiety disorders have been reported at earlier ages and are even more frequent than affective disorders and substance abuse. This author in another article reported that anxiety disorders in Mexico City affected 8.3% of the population, with agoraphobia without panic (3.8%) and social phobia (2.2%) being the most common diagnostic category of anxiety disorders.³ These prevalence contrast somewhat with those described in 2011 in a World Health Organization report on mental health system in Mexico. This report mentioned that the main diagnoses were affective disorders with 28%, neurotic (or anxiety) with 25%, and others which included epilepsy, organic mental disorders, mental retardation and psychological disorders of development with 26%.⁴

Despite the great impact that these mental pathologies have, they are sometimes underdiagnosed and not given the importance that they have as causes of alterations in a person's life and as a generator of health services costs. In fact, we know little about the prevalence of anxiety disorders that affect the outpatient population; for this reason, we studied patients from the psychiatric outpatient clinic of the University Hospital in Monterrey, Mexico from a ten-year period, to determine how many of these patients come because of anxiety disorders.

The prevalence of hospitalizations for anxiety disorders reported in studies such as that conducted in Bosnia during 2010 and 2011, revealed that hospitalizations for anxiety disorders are the most prevalent with 29% in 2010 and 32% in 2011.⁵ However, we still do not know the prevalence of anxiety disorders in a psychiatric outpatient clinic since hospitalization occurs

because of greater severity of the illness with greater difficulty in managing the patient outside the structure of a psychiatric hospital.

Meteoropathies are defined as a group of symptoms and reactions that occur when there is a change in one or more meteorological factors.⁶ These changes in climate conditions are recognized throughout the year and may explain the seasonal variation of some pathologies. It is known that the prevalence of anxiety disorders tends to vary depending on the season.^{7,8} An increase is reported in the spring and it is closely related to the seasons.

Numerous psychiatric studies^{9,10} have observed the interaction between psychological conditions and climate changes, reinforcing the theory that climatic variables influence biological functions through neurotransmitters such as serotonin, which is involved in brain modulation and interacts with dopaminergic, GABAergic, and adrenergic systems, and intervenes in human homeostasis. Serotonin increases with exposure to bright light.¹¹

Aims of the study

The objective of this study is to determine if the diagnostic category of anxiety disorders presents a statistically significant seasonal pattern in those patients who attend outpatient consultations in a university hospital from northeast Mexico.

METHODS

We conducted an observational (without the control of the prevalence or date of consultation), cross-sectional (analyzing the consultation's prevalence distribution through the seasons), retrospective (a data-base of consultations was studied) and descriptive (do not assess the causality of the phenomenon) study of consultations from the outpatient clinic during 2005 to 2014 of the Department of Psychiatry of the University Hospital of the Universidad Autonoma de Nuevo Leon following the criteria of the DSM-IV-TR, with the purpose of establishing the prevalence of anxiety disorders in different seasons of the year and to determine if there is a seasonal pattern.

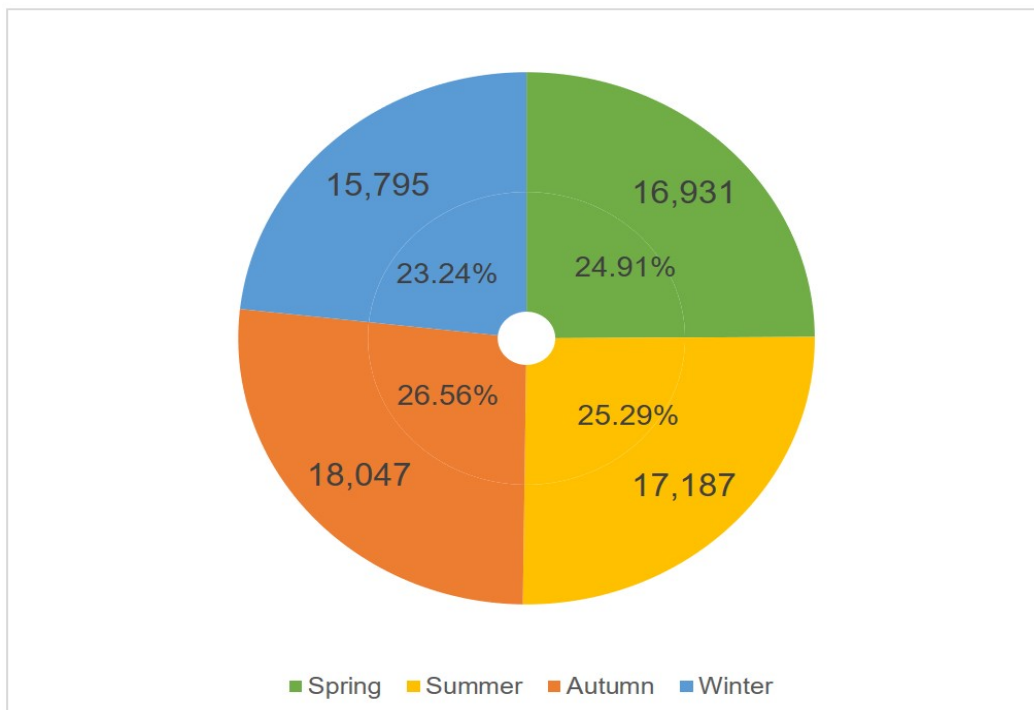
This study took place in Monterrey, Nuevo Leon, Mexico which is located at latitude: 25.6732, longitude: -100.3092, N25 40'24", E -100 18'33". The world map of the Köpen-Geiger climate classification¹² is a widely used method in research as a basis for climatic regionalization and

is useful to facilitate global comparisons. Monterrey has a hot semi-arid climate classified as BSh on the Köpen-Geiger classification map. This means that the weather in this city is classified as a steppe type with hot to extremely hot summers as well as warm to cool winters.

A total of 495,062 psychiatric consultations took place in the ten-year period in the Psychiatric Clinic of the University Hospital in Northeastern Mexico, which is a specialized center that attends population that suffers from psychiatric diseases. Of these consultations, 67,690 met criteria for anxiety disorders. The psychiatric evaluations were made by conscientious anamnesis by a multidisciplinary team including psychology and psychiatry senior postgraduate students supervised by psychology and psychiatry professors. The patients received therapy if medication was needed. Patients with incomplete registry data were subsequently elimi-

nated, and those who did not have a diagnosis in the anxiety disorder category or who did not have an appointment date registered were excluded. The final analysis was performed with a population of 67,690 patients with anxiety disorders who attended the outpatient clinic between 2005 and 2014. The season of the year that corresponded was determined based on the date on which the consultation took place, segmenting the year into spring (from March 21 to June 20), summer (from June 21 to September 20), autumn (from September 21 to December 20), and winter (from December 21 to March 20). Data were captured in a database and subsequently analyzed. Traditional descriptors were determined establishing the presence or absence of an association and correlation using Chi-square and Spearman's correlation at a level of reliability of 95%.

Graph 1. Prevalence and percentage of anxiety disorders by season 2005-2014.



N = 67,690 psychiatric consultations; the internal ring presents the percentages and the outer ring the absolute frequency.

Table 1. Statistically significant associations of the seasons of the year and anxiety disorders.

Test	Spring	Summer	Fall	Winter
Pearson Chi ²	55.571	0.949	20.784	4.132
Fisher exact test (p)	<0.0001	0.332*	<0.0001	0.042

**A $p > 0.05$ was found, therefore, no statistically significant association exists.*

RESULTS

Of all the consultations that took place during the period 2005-2014, 13.7% represented anxiety disorders; of these 93.04% were subsequent consultations and 6.96% were first-time visits. Regarding gender, women represented 55.4% and men 44.6%, showing a slight tendency to affect women more than men. In relation to the age of the patients, the mean age was 32 years with a standard deviation of 13 years. The patients in this category were grouped according to

the season in which their consultation took place, resulting in 24.9% for anxiety disorders in the spring, 25.3% in the summer, 26.6% in autumn, and 23.2% in winter.

No difference was found between prevalence by seasons ($p > 0.05$). Anxiety disorders showed a statistically significant association with spring (Rho=55.57, $p < 0.001$), autumn (Rho=20.78, $p < 0.001$) and winter (Rho=4.13, $p = 0.042$). No statistically significant association was found between anxiety disorders and the summer

season ($Rho=0.95$, $p=0.332$).

DISCUSSION

In the analyzed population, anxiety disorders accounted for more than one in ten of the total psychiatric consultations, with this being an important part of the population. A slightly higher tendency to present anxiety disorders in women was found; this tells us that nowadays both genders suffer similarly from stressors that sometimes manifest as anxiety disorders. In relation to the seasonal pattern, there was no marked difference in the prevalence of psychiatric consultations in the population studied, since similar numbers were found both in terms of frequency and percentage in the four seasons of the year.

What is noteworthy is that there was an absence of a statistically significant association between anxiety disorders and summer ($Rho=0.95$, $p=0.332$); however, a lower frequency of consultations determined by a difference in magnitude was not found. The present study collected the frequency of consultations over 10 years yielding reliable results with a total of 67,690 psychiatric consultations that were similarly distributed in the four seasons of the year, discarding the existence of a seasonal pattern for the diagnostic category anxiety disorders in our population.

Comparing our findings with other seasonal prevalence studies, we found the same increase in frequency during fall and summer respectively with these being the seasons with higher absolute prevalence of anxiety consultations than Singh et al.¹³ Nevertheless, the seasonal variation was not big enough to set a trend; the difference between the highest and lowest prevalence ratio was 3.3%, which is very similar to the findings reported by Oyane et al.¹⁴ who did not find a considerable variation during the seasons of the year.

Taking into consideration the seasonal variation of meteorological factors that could influence the prevalence pattern of some pathologies, an Australian study was able to correlate the increase in environmental temperature (above 26.7°C) with an increase in psychiatric hospitalizations in several diagnostic categories including anxiety disorders. An increase of 7.3% in hospitalizations was observed during heat waves compared to periods without heat waves.¹⁵ Therefore, although an influence of temperature and sunlight is accepted in some psychiatric pathologies, a multifactorial characteristic capable of triggering certain psychiatric

pathologies in meteor-sensitive population, is notable.¹⁶ San Gil et al. argue that for a variable to be recognized as seasonal, it must be present at different times of the year and vary statistically; in other words, it should not have a uniform pattern.¹⁷

Our findings agree with those reported by De Graaf et al., a scarce seasonal variation in mental disorders that was attributed to mild variation in the climate in this region and to the population.¹⁸

We observed a similarity with the results of Medina-Mora² with a prevalence of 14.3% of anxiety disorders throughout life in the general population. In comparison, data from the WHO Report⁴ showed a prevalence of neurotic (or anxiety) disorders of 25% in the general population. The 13.7% that was registered in the Department of Psychiatry of the UANL shows that there is a different prevalence or that a large part of the population does not seek medical attention for their anxiety disorders.

The fact of not having determined a seasonal pattern for the prevalence of anxiety disorders means that these have similar prevalence throughout the year. A finding of note was that there was an absence of a statistically significant association between anxiety disorders and summer. This does not mean that they do not occur or that they do to a lesser extent, only that both variables do not have a causal relationship.

There is still the question of why, in different regions, a seasonal pattern for anxiety disorders that was reported in other articles is not observed in this study. Could it be that the different weather conditions of the region present throughout the year or sociocultural or environmental variables not analyzed on this occasion influence these disorders? It is well known that psychiatric disorders are due to the combination or presence of multiple factors; therefore, a cause-effect relationship could not be given to the season or to the climatic conditions of the region.

Limitations

This retrospective, cross-sectional study does not assess for causality but describes the pattern of consultation seen through the seasons of the year. The diagnoses were made by senior post-graduate psychiatry and psychology students supervised by psychiatry and psychology professors and grouped in diagnostic categories for purposes of this study.

Regarding the weather conditions that may influence the pattern of consultation, our region does not have a clearly defined seasonal vari-

ation of climate conditions; this is why we theorize that we did not appreciate a clear trend in any season.

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