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# Sleep Disorders in the adult population of Santiago of Chile and its association with common psychiatric disorders

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**Introduction.** Sleep disorders are a frequent problem and they are a usual reason of primary care consultation, because they are associated to significant deterioration in quality of life. Insomnia is the most common sleep disorder whose estimated total prevalence in adults is 19.1%, 85% of which are chronic insomnia. This, in turn, is closely related to psychiatric disorders and has been described as a depressive episode marker.

**Aims.** To characterize the Santiago adult population suffering from sleep disorders and analyze their statistical association with common mental disorders.

**Methodology.** It corresponds to a secondary analysis of the survey "Common Mental Disorders in Santiago." A cross-sectional survey that used the adult population of Santiago whose ages ranged from 16 to 64 years as a sample was carried out. A structured interview covering sociodemographic factors and the Revised Clinical Interview Schedule (CIS-R) to measure emotional symptoms were applied.

**Results.** 3867 people representative of the adult population were evaluated (52.3% women, 47.7% men). The prevalence of sleep disorders was 26.3%. Statistically significant socio-demographic risk factors were detected, these being female gender, the unemployed seeking employment, the presence of a common mental disorder, alcohol and drugs consumption in the last month, among others.

**Conclusions.** There is a high prevalence of sleep disorders among the population of Santiago. This is closely associated

to female gender, social disadvantages and potentially to the presence of a common mental disorder.

**Key words:**  
Sleep disorders / Insomnia / depression / psychiatric disorders

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## Trastornos del sueño en la población adulta de Santiago de Chile y su asociación con trastornos psiquiátricos comunes

**Introducción.** Los trastornos del sueño son un problema frecuente y constituyen un motivo usual de consulta en la atención primaria, ya que se asocian a un deterioro significativo de la calidad de vida. El insomnio es el trastorno del sueño más frecuente y se ha estimado una prevalencia total en adultos de 19,1%, de los cuales un 85% corresponde a insomnio crónico, el que a su vez se relaciona estrechamente con trastornos psiquiátricos y ha sido descrito como marcador de episodio depresivo.

**Objetivo.** caracterizar a la población adulta santiaguina con trastornos del sueño y estudiar su asociación con cuadros psiquiátricos comunes. Metodología: corresponde a un análisis secundario del estudio "Trastornos mentales comunes en Santiago". Se llevó a cabo un estudio transversal que utilizó como muestra la población entre 16 y 64 años de Santiago. Se elaboró una entrevista estructurada de datos sociodemográficos y aplicó el Revised Clinical Interview Schedule (CIS-R) para medir presencia de síntomas emocionales.

**Resultados.** Se evaluó a 3.867 personas representativas de la población adulta (52,3% mujeres, 47,7% hombres). La prevalencia de trastornos del sueño fue de 26,3%. Se detectaron como factores sociodemográficos de riesgo estadísticamente significativos, al género feme-

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nino, desempleado buscando empleo, trastorno mental común, consumo de alcohol y de drogas en el último mes, entre otros.

**Conclusiones.** Existe una alta prevalencia de trastornos del sueño en la población santiaguina, que se asocian estrechamente al sexo femenino, desventajas sociales y potentemente a la presencia de un trastorno mental común.

**Palabras Claves:**

Trastornos del sueño/Insomnio/depresión/trastornos psiquiátricos

## INTRODUCTION

Insomnia is undoubtedly the most frequent sleep disorder. It consists in having problems to initiate and maintain sleep for at least one month, associated to daytime fatigue, sensation of significant personal malaise and social, work deterioration and deterioration of other important areas of personal activity.<sup>1</sup>

A total prevalence in adults of 19.1% has been estimated in adults, 85% of which correspond to chronic insomnia.<sup>2</sup> It occurs more frequently in women (1.5:1), it being more prevalent in the elderly population, where it appears as a serious problem in 25 to 35% of the population.<sup>3</sup>

Little data can be found for Latin America on the prevalence of sleep disorders. The first effort to perform this type of research was carried out in the year 2000 in the interior of Brazil. The main objectives of that study were to determine the sleep patterns and prevalence of insomnia in the adult population (>18 years) of the city of Bambuí, Minas Gerais (15,000 inhabitants). To do so, 1,221 adults were selected by means of simple random sampling. The prevalence of insomnia was 35.4%, this being higher in the female gender (47%). In addition, 48% of the total complaints of insomnia had a duration greater than one year.<sup>4</sup>

In accordance with the characteristics of insomnia, we can distinguish "primary insomnia" without an identified cause<sup>5</sup> and "secondary insomnia." Within these, the most frequent etiologies are psychiatric conditions (depression and mixed anxiety disorders, mainly), neurological and medical conditions.<sup>5, 6</sup>

"Insomnia related with mental disorders" or "chronic secondary insomnia" together with the primary, already described, are the two most commonly made diagnoses, but their differentiation is a real challenge in the clinical practice.<sup>7</sup>

Although the epidemiologic studies of insomnia in the general population have described high rates of prevalence,

few of these studies have used the diagnostic criteria of the existing classification systems. Ohayon, in 1997, studied insomnia in the general population, especially in reference to mental disorders according to the DSM-IV criteria. The results of this investigation stressed the need to use classifications to determine if the subjects complaining of insomnia have a sleep disorder or if the insomnia is a symptom of a mental disorder, and that these distinctions are of extreme importance in regards to the treatment options.<sup>8</sup>

There the 3 types of questionnaires that evaluate sleep in the adult population and that consider varied aspects of sleep. Among them are the Cuestionario de Calidad de Sueño de Oviedo (COS) (Sleep Quality Questionnaire of Oviedo), Sleeping Timing Questionnaire (SLQ), Sleep Disorders Questionnaire (SDQ), Sleep Evaluation Questionnaire, Sleep Problems Scale.<sup>9</sup> Special attention, due to its extensive use, should be given to the Sleep Quality Questionnaire of Pittsburgh, which Daniel J. Buysse<sup>10</sup> et al. designed in 1988 in order to have an instrument that could analyze the quality of sleep and that could be used in clinical trials. It was widely used and adopted immediately.

As we have already mentioned, insomnia is often related with a psychiatric disease, but little is known about how this relationship behaves in regards to causality and how common it is in subjects with insomnia to have backgrounds of psychiatric disorders. In a multinational study in which 14,915 persons from 15 to 100 years of age participated, it was found that approximately 28% of the subjects with insomnia concomitantly had mental disorder and 25.6% had a psychiatric background. In most of the cases with mood disorders, insomnia appeared earlier than (> 40%) or at the same time as (> 22%) the symptoms of the affective disorder.<sup>2</sup> On the other hand, within the patients with insomnia who also had a psychiatric disorder, 30% of the cases had depression.<sup>11</sup>

It is a known fact that approximately 80% of patients with depression complain of changes in their sleep pattern and that most of them have early waking.<sup>12</sup> On its part, the sleep disorders most frequently associated with the profile of patients with generalized mixed anxiety disorder (GAD) are having trouble falling asleep or initial insomnia and maintenance insomnia.<sup>13</sup>

In 2005, Rocha et al. demonstrated with his study that there was a high proportion of psychiatric disorders among hospitalized patients of general hospitals and low detection of these disorders by the physicians. Furthermore, they found a high prevalence (56.5%) of insomnia in this population and that this could be a marker of the major depressive episode ( $P < 0.001$ ). Thus, they suggested that the doctor should search for the presence of major depressive episode when a patient complains of insomnia.<sup>14</sup> On their

part, Livingston et al., already in 1993, reported that the best predictor of future depression is insomnia, according to a logistic regression analysis that incorporated variables such as gender, mental condition, social circumstances and the use of social services and health services. Sleep disorder was a predictor of depression in the group studied with an Odds Ratio of 3.22 ( $P < 0.001$ ).<sup>15</sup>

The present study has aimed to determine the prevalence of sleep disorders and characterize those persons with this disorder in the adult Santiago population and to measure its association to common psychiatric pictures, for which there are no precedents in Latin America.

## METHODOLOGY

Our study corresponds to a secondary analysis of the study of common mental disorders in Santiago, Chile.<sup>16</sup> A cross-sectional study whose sample framework was the population between 16 and 64 years of age from Gran Santiago ( $n = 3,237,286$ ) was conducted. A stratified and random selection representative of the universe was obtained. A total of 3,867 persons were evaluated.

A structured interview was developed. It included questions on sociodemographic data and the Revised Clinical Interview Schedule (CIS-R) to measure the presence of emotional symptoms, among them sleep disorders. ICD-10 diagnoses were established, applying computer algorithms. The CIS-R is a structured interview that has been standardized in order to be administered by lay interviewers. The English and Spanish versions of the CIS-R have been widely used in primary care, occupational studies and community studies with good reliability and validity.<sup>17</sup> Although the CIS-R ascertains about 14 common neurotic symptoms present during the previous week, it includes questions to identify the onset and duration of each episode, so that it makes classification possible in accordance with the ICD-10<sup>1</sup> criteria for the most common disorders. Each one of the 14 symptoms is evaluated with an individual score. The score obtained goes from 0 to 4 (5 for the depressive ideas section) in each section. The symptoms are classified as significant if the score is 2 or more.<sup>18</sup>

The total sum of these 14 results may be used as a good indicator of the severity of a common mental disorder. Persons with a score of 12 or more on the CIS-R are considered to be affected by a common mental disorder.<sup>1</sup> The following ICD-10 diagnoses were included: depressive episodes, phobias, panic attack, generalized mixed anxiety disorder, obsessive-compulsive disorder. All those subjects who were above the threshold of the CIS-R, but did not fulfill the explicit criteria in the ICD-10 for the obtaining of a psychiatric diagnosis were grouped under a category called non-specific neurotic disorders, our equivalent of mixed

anxiety-depressive disorder. The ICD-10 diagnoses were reached with the help of the computer algorithm developed by Meltzer et al, 1995.<sup>19</sup>

## SLEEP DISORDER

This was evaluated through the corresponding section of the CIS-R. This investigates trouble falling asleep, whether sleep initiation, sleep maintenance insomnia or terminal insomnia and hypersomnia during the last week. The subject is asked if he/she knows the cause of these problems and to quantify the frequency of the disorder.<sup>16</sup> The score can range from 0 to 4 points, the higher score representing a greater severity of the sleep problems. The presence of sleep disorder is defined by a score of 2 or greater.

## RESULTS

Of the 4,693 homes selected, 3867 persons representative of the adult population of Gran Santiago (52.3% women, 47.7% men) were interviewed. The sample obtained a prevalence of sleep disorders of 26.3%. Several sociodemographic factors, as gender, schooling, employment of the last month, income per capita, decrease of income, civil status, type of family, type of home, presence of common mental disorder, use of tobacco, alcohol consumption and use of drugs in the last month were associated with the presence of sleep disorder. However, when the mentioned variables were controlled, the principal risk factors that appeared were presence of common mental disorder (OR= 8.19), the unemployed who is not looking for a job (OR= 4.63) and unemployed looking for a job (OR= 2.80). There were also statistically significant factors of drug consumption in the last month (OR= 2.51), having adequate home living condition (OR= 2.05), home in poor condition (OR= 2.04) or large home (OR= 2.02), being a occasional worker (OR= 1.75), alcohol abuse (OR= 1.64), being a housewife (OR= 1.46), normal consumption of alcohol (OR= 1.44) and being female (OR= 1.43). In regards to the age groups, there were no significant differences between them.

On the other hand, the prevalence of common mental disorders in the sample obtained through the CIS-R was 25.4%. The psychiatric diagnoses that showed a statistically significant association with sleep disorders were Severe depression (OR= 7.53), Agoraphobia with panic symptoms (OR= 6.10), Isolated phobia (OR= 5.40), Agoraphobia (OR= 3.99), Social phobia (OR= 3.96), Obsessive-compulsive disorder (OR= 3.31), Moderate depression (OR= 2.75), Generalized mixed anxiety disorder (OR= 2.18) and Mixed anxiety-Depressive Disorder (OR= 1.76). The most frequent ICD-10 diagnoses were depression (7.7%), mixed anxiety-depressive disorder (6.8%) and generalized mixed anxiety disorder (5.1%).

Table 1		Sociodemographic description of the population of Gran Santiago and prevalence (95% CI) and its association with sleep disorder			
	N of the sample	Prevalence %	Odds Ratio (95% CI) crude	Odds ratio (95% CI) adjusted*	
<b>Gender</b>					
Male	1535	47.7	1.00	1.00	
Female	2332	52.3	1.93 (1.57-2.36)	1.43 (1.14-1.80)	
<b>Age (years)</b>					
15-25	980	31.3	1.00		
26-39	1317	29.9	1.07 (0.85-1.36)		
40-50	818	20.1	0.93 (0.70-1.25)		
51-64	752	18.7	1.01 (0.74-1.39)		
<b>Schooling</b>					
Upper	1313	22.3	1.00	1.00	
Middle	1880	54.0	1.53 (1.19-1.98)	1.21 (0.90-1.62)	
Basic	643	23.1	2.04 (1.48-2.81)	1.27 (0.85- 1.90)	
None	25	0.6	3.34 (1.17-9.50)	2.58 (0.80-8.37)	
<b>Employment in last month</b>					
Employed	1819	46.8	1.00	1.00	
Occasional worker	286	8.6	2.18 (1.39-3.41)	1.75 (1.11-2.77)	
Housewife	920	22.1	2.20 (1.70-2.85)	1.46 (1.09-1.95)	
Student	597	16.1	1.22 (0.90-1.65)	1.12 (0.74-1.71)	
Unemployed due to health	25	0.7	3.78 (1.27-11.21)	1.43 (0.42-4.85)	
Pensioner	72	1.5	2.23 (0.97-5.12)	1.90 (0.88-4.11)	
Unemployed looking for a job	76	2.2	2.88 (1.47-5.61)	2.80 (1.32-5.93)	
Unemployed not looking for a job	20	0.6	4.28 (1.32-13.88)	4.63 (1.71-12.51)	
Permanently unemployed for physical reasons	11	0.7	8.09 (1.16-56.59)	3.18 (0.50-20.23)	
Permanently unemployed for mental problems	2	0.1	0.60 (0.04-9.74)	1.41 (0.07-26.40)	
Others	38	0.7	1.70 (0.65-4.49)	2.01 (0.67-6.05)	
<b>Quartile of per capita income</b>					
High	1,432	25.01	1.00	1.00	
Middle high	795	24.02	1.46 (1.08-1.97)	1.00 (0.71-1.40)	
Middle low	728	25.47	1.39 (1.02-1.90)	0.71 (0.49-1.03)	
Low	847	25.51	2.06 (1.57-2.71)	0.92 (0.66-1.30)	
<b>Decrease of income</b>					
No	2808	69.1	1.00	1.00	
Yes	1059	30.9	1.89 (1.54-2.32)	1.20 (0.93-1.55)	
<b>Civil Status</b>					
Married	2057	54.4	1.00	1.00	
Living with someone	130	3.6	1.67 (1.04-2.69)	1.18 (0.68-2.07)	
Widow(er)	143	2.8	2.14 (1.25- 3.67)	2.28 (0.95-5.47)	
Separated	289	5.4	1.58 (1.06-2.37)	1.61 (0.84-3.07)	
Single	1248	33.8	1.06 (0.82-1.38)	1.51 (0.79-2.88)	
<b>Type of Family</b>					
Couple with children	1618	47.2	1.00	1.00	
Couple without children	515	10.0	1.02 (0.73-1.43)	0.90 (0.63-1.28)	
Single parents	430	9.4	1.59 (1.18-2.15)	0.62 (0.33-1.15)	
Alone	1304	33.4	1.00 (0.77-1.31)	0.75 (0.40-1.41)	

Table 1	Continuation			
	N of the sample	Prevalence %	Odds Ratio (95% CI) crude	Odds ratio (95% CI) adjusted*
Type of lodgings				
Luxury	244	3.3	1.00	1.00
Spacious but not luxurious	1274	24.2	2.44 (1.41-4.22)	2.02 (1.26-3.26)
Only adequate	1729	52.3	3.27 (1.89-5.65)	2.05 (1.21-3.47)
In poor condition	420	13.7	4.07 (2.28-7.27)	2.24 (1.24-4.03)
Shack	134	4.6	2.94 (1.34-6.42)	1.18 (0.52-2.66)
One piece	36	1.3	4.67 (1.61-13.53)	2.18 (0.83-5.67)
Others	28	0.7	1.49 (0.47-4.76)	1.24 (0.43-3.60)
Presence of common mental disorder				
Negative	2971	74.6	1.00	1.00
Positive	896	25.4	9.12 (7.05-11.79)	8.19 (6.25-10.73)
Use of tobacco				
No	2475	61.9	1.00	1.00
Yes	1392	38.1	1.29 (1.03-1.61)	1.00 (0.77-1.29)
Consumption of alcohol				
Does not drink	1234	33.1	1.00	1.00
Normal drinking	1699	42.2	1.29 (1.02-1.64)	1.44 (1.11-1.86)
Abuse	730	18.0	1.17 (0.83-1.64)	1.64 (1.06-2.52)
Dependence	203	6.7	1.30 (0.81-2.09)	1.44 (0.87-2.36)
Consumption of drugs in last month				
No	3745	96.7	1.00	1.00
Yes	122	3.3	2.18 (1.27-3.75)	2.51 (1.26-5.00)

\*Sample weighted and adjusted by gender, schooling, employment and last month, income per capita, decrease of income, civil status, type of family, type of lodging, presence of common mental disorder, use of tobacco, consumption of alcohol and consumption of drugs in the last month.

Table 2	Prevalence of common psychiatric disorders in the population of Gran Santiago and their association with sleep disorders			
	N of the sample	Prevalence %	Odds Ratio (95% CI) crude	Odds ratio (95% CI) adjusted*
Diagnosis				
Panic disorder	53	1.3	3.67 (1.63-8.24)	2.02 (0.79-5.17)
Generalized mixed anxiety disorder	202	5.1	4.38 (2.98-6.44)	2.18 (1.23-3.87)
Mixed anxiety-depressive disorder	237	6.8	4.25 (3.00-6.02)	1.76 (1.11-2.81)
Social phobia	36	1.1	5.73 (2.44-13.45)	3.96 (1.46-10.74)
Isolated phobia	68	1.9	9.78 (5.43-17.59)	5.40 (3.03-9.63)
Agoraphobia	33	1.0	5.82 (2.13-15.91)	3.99 (1.42-11.19)
Agoraphobia with panic symptoms	19	0.3	11.18 (2.96-42.17)	6.10 (1.60-23.21)
Obsessive-compulsive disorder	35	1.3	7.72 (3.49-17.06)	3.31 (1.39-7.89)
Mild depression	68	2.0	2.05 (0.95-4.43)	1.10 (0.47-2.55)
Moderate depression	111	3.5	14.87 (7.48-29.54)	2.75 (1.03-7.33)
Severe depression	63	2.2	32.17 (9.83-105.24)	7.53 (1.39-40.89)

\*Sample weighted and adjusted by psychiatric diagnosis.

## DISCUSSION

This descriptive study provides an estimation of the Santiago de Chile population affected by sleep disorders, common psychiatric disorders and the association existing between them. Thus, more than one-fourth of the adult population of Santiago could be considered to be suffering a sleep disorder, which fully exceeds the amounts published in developed countries, where they are about 20%. However, it is much less than the prevalence of sleep disorders described in Brazil (35.4%). One-fourth of the Santiago population met the ICD-10 diagnostic criteria for some common mental disorder, the most frequent ones being depression, mixed anxious-depressive disorder and generalized mixed anxiety disorder.

A structured psychiatric survey was used and was administered to a representative sample of adults living in their own home in Santiago, capital of Chile. The interviewers received intensive training and were tested to allocate their reliability and were supervised in the work field. In spite of these strengths, this was a cross-sectional study conducted exclusively in one city. Therefore, it is not possible to extrapolate the results to the rest of the country. However, our work provides interesting data as it found that those persons suffering common mental disorders had approximately 8 times more risk of having a sleep disorder than those who did not. This was, among the factors studied, the one that had the greatest association. Therefore, it is essential for the clinician who treats patients with psychiatric disorders to have good knowledge and tools for the adequate management of sleep disorders.

In regards to the available evidence, most of the investigations published up to date have found that women and the elderly have a much greater prevalence of sleep disorders. This study, on the contrary, although it replicated the same findings regarding the female gender, did not find a statistically significant difference in regards to age. This could be explained because the sample did not consider patients over 64 years of age in whom this is an important problem.

Given the prevalence and association between sleep disorders and common mental disorders, when a sleep disorder is present, the presence of a common mental disorder, especially depression, should be ruled out. In this way, sleep disorders could be a good marker of the major depressive episode in our adult population, as suggested by Rocha<sup>12</sup> for the population of hospitalized patients.

To be able to determine if sleep disorders are also a risk factor for developing a major depressive episode in the future, it is necessary to design studies with follow up of

patients in the middle and long-term in order to determine the role that the preexistence of sleep disorders has.

Finally, it would be worthwhile to point out that it is of vital importance in an emerging economy as ours, to know that depression, mixed anxiety-depressive disorder and generalized mixed anxiety disorder are the most prevalent common psychiatric disorders, so that we could use the resources that are aimed at mental health as efficiently as possible in benefit of all.

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