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ANALYSIS OF THE PREVALENCE OF INSOMNIA IN THE ADULT POPULATION OF SÃO JOSÉ DO RIO PRETO, BRAZIL

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ABSTRACT - *Objective:* To establish the prevalence of insomnia in the adult urban population of São José do Rio Preto, Brazil and correlate it with the demographic data. *Method:* We evaluated 1105 individuals in to guarantee an error margin of 3% and a confidence level of 95% using a structured questionnaire and following the DSM-IV and DSM-III-R criteria, in the period from January 10 to February 28 2001. *Results:* We encountered a prevalence of 32% of insomnia, which was most commonly seen in women, single people, from the lower economical brackets, with a low level of schooling and it was less associated with younger adults (18-31 year-olds). *Conclusion:* Our findings indicate that the prevalence of insomnia in the adult population of São José do Rio Preto is comparable with other countries such as the USA and those of Europe and also with other cities in Brazil.

KEY WORDS: insomnia; epidemiology, prevalence.

Análise da prevalência da insônia na população adulta de São José do Rio Preto, Brasil

RESUMO - *Objetivo:* Estabelecer a prevalência da insônia na população adulta urbana de São José do Rio Preto e correlacioná-la com os dados demográficos. *Método:* Avaliamos 1105 indivíduos em função de um erro de 3% e nível de confiança de 95%, usando um questionário estruturado e seguindo os critérios do DSM-IV e DSM-III-R, no período de 10/01 a 28/02/01. *Resultados:* Encontramos prevalência de 32% de insônia, sendo esta mais associada ao sexo feminino, aos não unidos, classes econômicas D/E, baixo nível de escolaridade e menos associada aos mais jovens (18-31 anos). *Conclusão:* Nossos achados indicam que a prevalência da insônia da população adulta de São José do Rio Preto é comparável a de outros países da América do Norte, Europa e também com outras cidades do Brasil.

PALAVRAS-CHAVE: insônia, epidemiologia, prevalência.

Insomnia is a symptom that can be defined as difficulty in beginning and/or maintaining sleep, the presence of non-restoring sleep, that is, insufficient sleep to maintain a good quality of alertness and physical and mental well-being during the day, with consequent impairment in the performance of daily activities[1]. Among all sleep disorders insomnia is the most common[2]. Whilst cultures vary in their perception and reporting of sleeping problems, the human physiology is presumably similar all around the world. To respect different cultures and to reconcile them with objective findings is one of the challenges that researchers in sleep face, in an attempt to optimize the management of insomnia[3].

We live in a society of excesses, we work more hours, more days and frequently, in more than one job. Not only do we work much, but we also enjoy ourselves much, going to restaurants and nightclubs and with all-night TV and Internet. We sleep 25% less than our ancestors of one century ago and there is nothing that indicates that they required more sleep than we do or that we need less than they did[4].

Insomnia is implicated in an increase in automotive accidents, absenteeism, errors at work and lower achievement at school[3]. Despite of having a high prevalence and although it is a common cause in primary health services, it is rarely the principal complaint in a doctor's appointment[4]. Considering the extent of the problem of insomnia, we surveyed in the adult urban population of São José do Rio Preto with the objective of establishing the

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prevalence of insomnia and correlating this with the demographic data.

METHOD

The research was performed in the city of São José do Rio Preto which is located in the Northwest of São Paulo State, Brazil, with a population of 360000 inhabitants[5]. The city was split in 5 regions according to the map of the administrative regions and streets and houses were randomly chosen (drawn by chance). A structured questionnaire was applied in an interview with any adult who answered the door. The calculated sample size was of 1105 individuals to guarantee an error margin of 3% and a confidence level of 95%[6].The research project was approved by the Research Ethics Committee of the Medical School in São José do Rio Preto and the interviewed individuals gave written post-informed consent.

The application of the questionnaire was made simultaneously in the different regions of the city in the period from January 10 to February 28 2001, by 8 professionals of the Administration and Economy University - D. Pedro II who had already worked with population surveys in this city and who were trained for the application of the research instrument. The average time for application was 25 minutes. Insomnia was defined as the presence of whatever complaint related to difficulty in going to sleep or awakening during the night or excessively early in the morning three or more times per week within the previous month, accompanied by some degree of nuisance either little, moderately or much. These criteria agree with those of the DSM III-R[7] and DSM IV[8].

In relation to the distribution of the demographic variables we studied the gender, age, marital status, education level and economic level simultaneously to applying the questionnaire.

The ages, ranging from 18 to 90 years old, were divided in quartiles resulting in the following age groups: Group 1: 18-30; Group 2: 31-43; Group 3: 44-56 and Group 4: 57-90. The marital state was split in single, married (in church or common law), or previously married (separated, divorced or widowed). Education level was divided in without education, first school certificate, second school certificate and university degree. The economic levels, where the Brazilian Economic Classification Criteria were used, were grouped as A, B1, B2, C, D and E in decreasing order of spending power. This is equivalent to an average monthly income of 1600 dollars for class A, 840 dollars for class B1, 560 dollars for class B2, 290 dollars for class C, 150 dollars for class D and 80 dollars for class E.

The questionnaire was applied during the daytime, possibly giving rise to a bias of overestimation of women. To estimate the percentage of insomniac individuals of the studied region we utilized: the proportion of women multiplied by the percentage of insomniac women among the women plus the proportion of men multiplied by the percentage of insomniac men among the men. The proportions of men and women were obtained from the tables of IBGE – Brazilian Institute of Geography and Statistics[5].

Statistical analysis - The data were input on a Microsoft Excel spreadsheet. Descriptive statistical analysis (frequency distributions, means and standard deviations) and inferential statistical analysis were performed. Comparison of two means was by student t-test and of more than two by ANOVA or Kruskal-Wallis test when indicated. A comparison of 1 proportion with a fixed value or two proportions of independent samples was made by the normal approximation test. The test for associations between qualitative variables was made by Pearson chi-squared or ANADEP[9] when indicated and for the study of the association structure. A significance level, p-value, of 0.05 was adopted.

RESULTS

Of a total of 1105 individuals of the adult urban population of São José do Rio Preto, 371 (33.57%) individuals were identified as suffering from insomnia within the month preceding the survey according to the criteria of DSM-IV and DSM-III-R. A comparison of the percentage of men and women of the sample with the population as a whole gave an estimated rate of 32% of insomnia in the adult urban population of São José do Rio Preto, Brazil. In Table 1 the distribution of insomnia, including all the subtypes, is shown according to the demographic variables.

DISCUSSION

Studying a representative sample of 1105 individuals in face-to-face interviews using a questionnaire, we evidenced an elevated prevalence of insomnia in São José do Rio Preto: 32% of the adult population complained of insomnia (of one or more subtypes) according to the DSM-III-R and DSM-IV criteria. Other populational investigations also demonstrated high prevalences. Ohayon et al.[10] found 36.3% insomniac individuals in the United Kingdom, utilizing the criteria of DSM-IV in interviews by telephone and in the USA Ancoli-Israel et al.[11] reported 36% of the interviews as with insomnia, also in interviews by telephone but not following the DSM-IV guidelines. Another investigation in Europe[12] uniting France, Germany, United Kingdom, Italy, Spain and Portugal documented a prevalence of 27.2% of insomnia based on the DSM-IV criteria by telephone. Kim et al.[13] encountered a prevalence of 21.4% in the Japanese popula-

Table 1. Distribution of insomnia (in general) in respect to demographic variables.

	Insomniac individuals			Non-insomniac individuals			Total	
	N	DDVI%	DIDV%	N	DDVI%	DIDV%	N	%
Gender								
Female	295	79.51	35.41	538	73.30	64.59	833	100.00
Male	76	20.49	27.94	196	26.70	72.06	272	100.00
Total	371	100.00	33.57	734	100.00	66.43	1,105	100.00
$\chi 2 = 5.134$ GL = 1 p = 0.023 Anadep = p:0.022*								
Age								
18-30 years	67	18.06	23.02	224	30.52	76.98	291	100.00
31-43 years	101	27.22	37.97	165	22.48	62.03	266	100.00
44-56 years	110	29.65	39.57	168	22.89	60.43	278	100.00
57-90 years	93	25.07	34.44	177	24.11	65.56	270	100.00
Total	371	100.00	33.57	734	100.00	66.43	1,105	100.00
$\chi 2 = 21.398$ GL= 3 p= 0.000*								
Marital status								
Single	59	15.90	23.98	187	25.48	76.02	246	100.00
Previously married	73	19.58	42.44	99	13.49	57.56	172	100.00
Married	239	64.42	34.79	448	61.04	65.21	687	100.00
Total	371	100.00	33.57	734	100.00	66.43	1,105	100.00
$\chi 2 = 16.665$ GL = 2 p = 0.000 Anadep = p:0.0002*								
Education								
Without education	35	9.43	38.04	57	7.77	61.96	92	100.00
First school	218	58.76	38.11	354	48.23	61.89	572	100.00
Second school	81	21.83	26.38	226	30.79	73.62	307	100.00
University degree	37	9.97	26.61	97	13.22	72.39	134	100.00
Total	371	100.00	33.57	734	100.00	66.43	1,105	100.00
$\chi 2 = 15.357$ GL = 3 p = 0.002 Anadep = p:0.0001*								
Economic class								
A	18	4.85	29.51	43	5.86	70.49	61	100.00
B1	35	9.43	30.17	81	11.04	69.83	116	100.00
B2	53	14.29	27.32	141	19.21	72.68	194	100.00
C	170	45.82	33.86	332	45.23	66.14	502	100.00
D/E	95	25.61	40.95	137	18.66	59.05	232	100.00
Total	371	100.00	33.57	734	100.00	66.43	1,105	100.00
$\chi 2 = 10.133$ GL = 4 p = 0.038* Anadep = p:0.032*								

DDVI, Distribution of the demographic variables with respect to insomnia; DIDV, Distribution of insomnia according to the demographic variables;* statistically significant.

tion using questionnaires sent by mail without using the DSM-IV criteria and in Canada, Sutton et al.[14] found a rate of 24% of insomniac individuals, without taking into account the DSM-IV guidelines. In Brazil populational researches are also being performed. The first was in the city of São Paulo, where Giglio[15] evidenced 50% of insomniac individuals in the population, considering a minimum frequency of one episode per week. In Bambui, Minas Gerais State, Rocha et al.[16] classified 35.4% of the population as sufferers of insomnia and in Campo Grande, Mato Grosso do Sul, Souza et al.[17] found 19.1% of insomniac individuals, both utilizing the DSM III-R and DSM IV criteria in home visits. Other studies demonstrate lower prevalences in their populations. In Norway[18], 11.7% of the studied population reported insomnia, in Germany, Ohayon et al.[19] encountered 6.2% of insomnia, the two surveys followed the DSM IV guidelines in interviews by telephone. In Brazil, Reimão[20,21] studying indigenous populations also found a low prevalence of insomnia. Ethnical and cultural differences in the understanding and appreciation of insomnia, the form of dealing with stress, differences in habits re-

lating to sleep hygiene are probably factors which explain the differing prevalences found in populations.

Different methodologies make the comparison between surveys difficult. These include variations in the definition of insomnia, the duration of the symptoms, the manner of applying the instrument of research (telephone, by mail or face to face interviews). We believe that in our population the method of interviewing is the best, as it did not exclude the illiterate and individuals who do not own a telephone. We faced in this research a rejection rate of 10%, justified by disturbing the domestic chores due to the time required to complete the questionnaire.

Initiating the analysis of the demographic variables, there was a greater prevalence in women (35.41%) than in men (27.94%) p-value = 0.022, a fact that has been widely reported in both national.[15-17] and international[10,12,14,18,22,23] publications. This leads us to speculate about the involvement of hormonal factors. Moline [24] comments that the sleep of women might be significantly affected by normal events such as pregnancy, the postpartum period, the menstrual cycle and menopause. There are no studies evaluating the effect of oral contraceptives on sleep. Nevertheless, cultural factors are also probably involved. We are aware of two studies where there were no differences in the prevalence between the genders; one was performed in Japan[13] and the other in Korea[25].

When we analyzed the age of the population studied we noted that the younger adults (18-30 year-olds) were less prone (p-value = 0.000), probably because they participate in more physical exercise and deal with fewer conflicts. Other authors emphasize the increase in the prevalence with the advance of age[13,14,19,23].

The marital status also demonstrated a significant association with insomnia, with the previously married individuals (separated, divorced and widowed) the most affected (p-value = 0.0002) and the married subjects following close behind the singles in terms of prevalence of insomnia. Yeo[26] researched factors that were related with insomnia in the community in Singapore. He confirmed that stress, and in particular stress originating from the home, is the main determinant of the presence of insomnia. The greatest prevalence of insomnia in the group of previously married individuals was verified in other populational studies[10,12,14,22]. Bixler[27] observed in Los Angeles a strong association between loneliness and insomnia, which is perhaps a common aspect in previously married individuals. Carvalho et al.[28] studied personality traits of a sample of insomniac patients and found insecurity to deal with the day-to-day problems, inability to forget these problems at bedtime, worsening and maintaining the insomnia. Some works did not evidence a significant difference between the marital statuses and insomnia[13,19,23].

The level of education was also analyzed, with the uneducated group and persons with little schooling significantly more associated to insomnia (p-value = 0.001). The individuals with less education in general also correspond to those with a lower spending power and more prone to unemployment and consequently more exposed to anguish. Other investigators also demonstrated this association[14,23,27].

As the last demographic variable, we analyzed the economic class and observed a strong association with the lower social classes, that is, classes D and E (p-value = 0.032), which can be explained by the countless adverse conditions in which these individuals live. Pallesen[18] encountered in Norway this same profile, however he detected that in spite of having a greater prevalence of insomnia in this group, the individuals reported less dissatisfaction with sleep than the other social classes. Kim[13], on the other hand, demonstrated that in Japan there was no significant difference between the economic classes and he justified this by saying that probably in his country the socio-economic differences are less evident compared with other Westernized countries.

In conclusion, approximately one third of the adult urban population of São José do Rio Preto, Brazil presented with insomnia with the most affected being women, over 30-year-olds, previously married individuals, those with less education and a lower social class. Wide-ranging measures need to be introduced, such as training of healthcare professionals who attend public health patients, counseling of the population in relation to the importance of seeking medical assistance, divulging measures to improve the sleep hygiene and increasing specialist treatment. Other research to evaluate precipitating factors and comorbidities will be necessary for a better approach to these patients[29].

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