

## Research papers

# Investigation of insomnia among the elderly in primary care settings in Greece: the efficient collaboration of GPs and psychiatrists

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### ABSTRACT

**Objectives** The aim of this study was to find the prevalence of insomnia among people aged over 65 years, attending primary care settings, in a semi-rural area of Kavala, in northern Greece, to investigate the possible associated factors (demographic, psychological, medical) and to find the possible correlation of insomnia with a general sense of health.

**Methods** Two groups of people attending primary care settings (open centre for the elderly and old people's home) and aged over 65 years were studied, with a total sample size of 201. The presence of insomnia was assessed by the ICD-10 criteria, a medical and psychiatric history was taken and the validated Greek version of the 28-point General Health Questionnaire (GHQ-28) was used. The data were analysed by Pearson's chi-square and Student's *t*-test and multiple regression analysis.

**Results** The prevalence of insomnia was 42.78%. Factors that correlated with insomnia were chronic obstructive pulmonary disease, diabetes, cardiovascular disorders, prostate diseases, arthritis, dementia, and consumption of bronchodilators,

non-steroidal anti-inflammatory drugs and anxiolytics. No demographic factors were associated with insomnia. In the GHQ-28, people with insomnia had a pathological mean score, while those with normal sleep scored below the cut-off point.

**Conclusion** The prevalence of insomnia is significantly higher among the elderly than in the general population. Organic diseases and consumption of certain medications and anxiolytics seemed to be associated with insomnia in the present study. Psychiatric disorders are surprisingly not correlated with the presence of insomnia, while the high GHQ-28 score of those people with insomnia reveals a connection to their poor health status. Moreover, the results imply that benzodiazepine consumption does not alleviate insomnia and a thorough clinical examination of the patients is needed before treatment is decided.

**Keywords:** aged people, general practice, Greece, insomnia, primary healthcare settings, psychiatrists.

## Introduction

Insomnia is the most common sleep disorder, affecting all ages, both sexes and all socio-economic and educational levels.<sup>1-3</sup> It is often reported that the incidence of insomnia increases with age and is

more common in women.<sup>4,5</sup> Various implicating factors such as psychiatric illness, psychosocial stress, medical problems, nocturnal myoclonus, sleep apnoea, restless legs syndrome, medication, bad sleep habits and loneliness, have been identified as possible causes.<sup>6-8</sup> Elderly people frequently use hypnotics, regardless of the aetiology of their

insomnia, and this is a very important issue for primary care settings, where the majority of the people with insomnia are found.<sup>9-14</sup>

Therefore, it was interesting to investigate insomnia among the elderly from different settings in the catchment area of the Chrissoupolis Health Centre and to compare the data obtained with those of other countries across the world.

The aims of this study were to:

- find the prevalence of insomnia among the elderly
- search for differences in prevalence according to demographic factors
- find out whether insomnia is associated with specific diseases and medication
- detect possible correlation between insomnia and general sense of health.

## Methods

### Setting

The study was carried out by a psychiatrist and a general practitioner (GP), in the catchment area of the Health Centre of Chrissoupolis (HCCh), in northern Greece, a semi-rural area of 22 000 inhabitants and 2900 residents over 65 years of age.

### Subjects

Eligible participants were those aged 65 years and over, who were users of two primary care facilities: those who took part in the activities of an open centre for the elderly (OCE), with 800 people registered, and those who were living in an old people's home (OPH) with 70 inhabitants. The OCE is a municipal structured day-centre for care, creative and social activities. People from the community gather in the OCE – they are not referred to it – mainly for entertainment and social reasons and for outpatient care by a physician when this is necessary. People examined were those who attended the activities, during the data collection time. The initial sample size was 192.

The OPH is an inpatient institution for the elderly that require 24-hour health or social support. Elderly people with severe organic and neurological diseases and impairments, and who are socially isolated or unable to live on their own for financial reasons, are referred to the OPH.

These two groups were chosen because they represent a wide range of health statuses of elderly people in the community.

Data collection was carried out between November 2001 and February 2002.

Exclusion criteria were severe dementia, severe psychosis or acute somatic illness (inability to complete the questionnaire) and refusal to participate in the survey. Applying the exclusion criteria, 43 of the 70 inhabitants of the OPH and 158 visitors to the OCE were examined. Thus, the final sample was 201 and the mean age for those suffering from insomnia was 73.51 years (standard deviation (SD) = 6.64) and for the elderly without insomnia 73.29 years (SD = 6.56) (see Table 1).

The study was approved by the Scientific and Ethical Committee of the General Hospital of Kavala, Greece.

## Instruments

A structured questionnaire was tailored to include demographic data, medical and psychiatric history, medication and questions about the quality of sleep.

The ICD-10 criteria were also used for validating the presence of insomnia and the psychiatric history was checked by the psychiatrist.<sup>15</sup> Medical data of the sample were crosschecked against the patient's medical booklets. The validated Greek version of the 28-item General Health Questionnaire (GHQ-28) was also applied.<sup>16</sup>

'Organic' insomnia was defined as insomnia caused by known medical symptoms and disorders

**Table 1** Demographic characteristics of elderly people from different settings

Variables	OPH <i>n</i> (%)	OCE <i>n</i> (%)
Sex		
Male	11 (25)	85 (53.8)
Female	33 (75)	73 (46.2)
Family status		
Married	4 (9.3)	118 (74.7)
Widowed	29 (67.4)	36 (22.8)
Divorced	2 (4.6)	2 (1.3)
Unmarried	8 (18.6)	2 (1.3)
Previous profession		
Agricultural	4 (9.1)	48 (30.4)
Merchant	3 (6.8)	17 (10.8)
Worker	10 (22.7)	44 (27.8)
Home	26 (59.1)	45 (28.5)
Public employee	1 (2.3)	3 (1.9)
Private employee	–	1 (0.6)

such as nocturia, pulmonary disease and cardiac failure that provoke dysnoea, gastro-oesophageal reflux, chronic pain, restless legs syndrome, and medication-induced restlessness. On the other hand 'non-organic' insomnia cases were those due to psychiatric disorders and primary insomnia. In mixed cases, the most prominent aetiology was determined and the cases were placed into one of the two previous categories.

## Data analysis

All statistical analyses were carried out using SPSS for Windows (release 10.0). Associations between categorical variables such as different subjects' groups and prevalence of disorders was established by using chi-square tests, or Fisher's test, where appropriate. Comparisons of mean values between groups were made using Student's *t*-test. The possible relationship between organic insomnia and demographics, was controlled with regression analysis, using the stepwise method. The independent influence of all potential factors in identifying the presence of insomnia was studied by means of linear regression analysis.<sup>17,18</sup>

## Results

### Prevalence of insomnia among the elderly

The overall prevalence of insomnia was 86 (42.78%); 38 (18.90%) of the total sample suffered

from organic, and 48 (23.88%) from non-organic insomnia.

Analysis showed no statistically significant differences for insomnia in relation to the demographic characteristics of the two groups.

### Insomnia and medical history

Chronic obstructive pulmonary disease (COPD), seemed to have a statistical significance for the presence of insomnia ( $\chi^2 = 7.859$ ;  $P = 0.005$ ). Cardiovascular disorders (CVS) ( $\chi^2 = 6.759$ ;  $P = 0.009$ ), neuropsychiatric disorders such as dementia, and anxiolytic consumption were significantly correlated with insomnia ( $P = 0.047$  and  $P = 0.042$ , respectively).

#### Psychiatric insomnia

The potential influence of chronic diseases on insomnia due to non-organic (psychiatric) disorders was examined and there was shown to be a significant correlation in patients suffering from dementia ( $P = 0.03$ ), according to Fisher's exact test.

#### Organic insomnia

Table 2 shows the significant correlations demonstrated by regression analysis, between organic insomnia and chronic disorders. In this regression analysis no significant correlations were found concerning the demographic characteristics (age, sex, marital status and previous profession).

Diabetes and other pulmonary diseases such as bronchiectasis and atelectasis, seemed to have no

**Table 2** Association of organic insomnia with chronic diseases and medications

Organic insomnia	B*	Standard error	<i>t</i>	Significance
Constant**	0.161	0.029	5.608	<0.001
COPD	0.315	0.089	3.545	<0.001
Constant	0.034	0.073	0.474	0.636
CVS	0.186	0.079	2.370	0.019
Constant	0.162	0.032	5.123	<0.001
Anxiolytics	0.136	0.066	2.068	0.040
Constant	0.163	0.028	5.759	<0.001
Broncodilators	0.366	0.097	3.764	<0.001

\*B is an unstandardised coefficient of the estimated regression model. \*\*A constant term included in the regression model equations.

statistical significant difference ( $P = 0.076$  and  $P = 0.054$ , respectively).

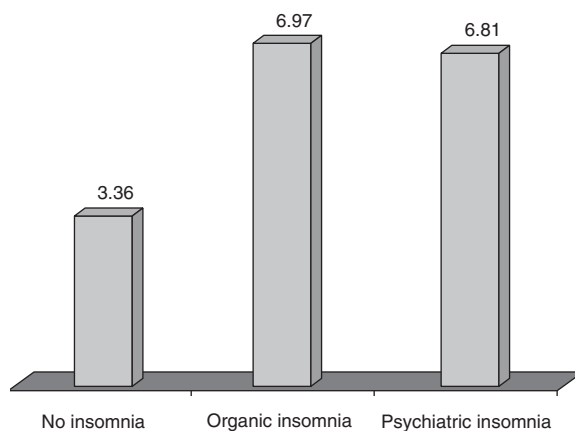
### Insomnia and the GHQ

The mean score on the GHQ in the total sample was 4.86 (SD = 3.84); 94 (46.77%) of the sample scored above and 107 (53.23%) below the cut-off point (5 or more and 4 or less, respectively). Comparison of the ages of the two groups showed that those with a pathological GHQ score were significantly older (mean age 74.46 years; SD = 6.972 versus 72.45 years; SD = 6.092;  $t = 2.180$ ,  $P = 0.03$ ).

The mean GHQ total score of the elderly people without insomnia was 3.36, while for those with organic insomnia it was 6.97 ( $P < 0.001$ ) and those with non-organic insomnia it was 6.81 ( $P < 0.001$ ; see Figure 1).

### Regression analysis

Somatic disorders causing polyuria such as diabetes and prostate diseases had an independent but



**Figure 1** Mean GHQ-28 scores of people with and without insomnia

significant influence as predicting factors for the appearance of insomnia ( $P = 0.000$  and  $P = 0.018$  correspondingly). Moreover, non-steroidal anti-inflammatory drug (NSAID) use, and chronic pain were significant independent factors predicting insomnia ( $P = 0.007$ ). Arthritis seemed to have a marked but not statistically significant influence on the presence of insomnia ( $P = 0.012$ )

The results of the regression analysis are illustrated in Table 3.

### Discussion

Several methodological considerations should be discussed before any interpretation of the study results. Our sample seems to be quite representative; the present study is based on people who live in a community setting and this reflects the current picture of the real situation in which GPs and psychiatrists are invited to work in Greece.

### Study limitations

The data collected was based on the medical histories given by each participant, but they were also crosschecked by participants' health booklets, their psychiatric history relating to the presence of insomnia, certified by application of the ICD-10 criteria, and followed by an examination by the psychiatrist.

The GHQ-28 is intended to be a tool for general use, whose optimal cut-off point varies and is influenced by ethnic-specific factors, and factors associated with sex, age and chronic pain.<sup>19,20</sup> The GHQ also fails to register the true burden of chronic diseases because it concentrates on recent deterioration. Moreover it focuses mainly on suicidal ideation, which is not the main feature of

**Table 3** Linear regression analysis of variables predicting insomnia

Dependent variable	Independent variables	B	Standard error	Significance
Insomnia	Const	0.980	0.006	<0.001
	Diabetes	0.100	0.21	<0.001
	NSAID users, chronic pain	0.037	0.014	0.007
	Arthritis	-0.071	0.028	0.012
	Prostate diseases	0.034	0.014	0.018

mild depression. However it is a useful, complementary, instrument for detecting health status and mild psychopathology and can be used by GPs.<sup>21,22</sup>

Insomnia, a highly prevalent disorder with direct and indirect economic consequences, affects daytime functioning, behaviour, and quality of life.<sup>23,24</sup> Previous studies estimated the prevalence of insomnia in aged people and presented a wide range of results, depending on the criteria of insomnia used and the characteristics of the population studied. Some of them showed that by taking into account only subjective complaints about sleep, the percentage prevalence for older people can rise to 80%.<sup>25</sup>

The overall prevalence of insomnia found in the present survey (42.78%) is certainly higher than that of the general population observed in other countries, which varies from 9% to 16.8% but, it is in accordance with the results from other studies performed in elderly people, which vary from 13% to 57% depending on the definition of insomnia, the type of criteria used and the sex of participants.<sup>25-34</sup> It seems that the application of unanimously agreed criteria is needed before comparisons can be made, although all authors agree that incidence of insomnia raises with age.<sup>28,35</sup>

The lack of significant differences in the incidence of insomnia among the elderly in relation to the setting (OCE versus OPH) is in contrast to what was expected. Previous investigations showed that low levels of physical activity, dissatisfaction with social life, and physical disabilities, issues frequently found among the inhabitants of an institution, have a serious impact on insomnia.<sup>25,32,36</sup> In our sample, the inhabitants of the OPH did not differ significantly from the people living in the community, and this could be due to their receiving better care.

The greater risk of female subjects suffering from insomnia in comparison with males has been reported in other studies, but in the present study there was only a relatively higher prevalence in women.<sup>30,31,37-39</sup> The reason why this difference exists needs further investigation. Respiratory and cardiovascular diseases, which produce symptoms of dyspnoea, were recognised in this study as specific risk factors for insomnia, a finding that is in accordance with other reports.<sup>25,39,40</sup>

The association between medication and insomnia has been reported previously.<sup>41,43</sup> Some drugs interfere directly with the sleep process, while others act indirectly by causing depression. Distinguishing between disease and medication as the causative factors of insomnia is very difficult in some cases. In our study, drugs related to insomnia were mainly anxiolytics and bronchodilators. It has been reported that benzodiazepine consumption

is related to insomnia.<sup>44-46</sup> This can be explained by the fact that benzodiazepines are considered to be a solution for short-term treatment of insomnia, disregarding the complications of chronic use of these medications.<sup>37-39</sup> In our study, 47 (23.4%) of the total sample were found to be consuming anxiolytics and there was a range of diagnostic reasons why people were taking them (anxiety disorders, depression, history of psychosis and organic diseases). The role of psychiatric diagnosis will be discussed further.

Bronchodilators are known for their stimulating and agitating action, which prevents sleep, but the lack of a control group in our survey does not allow firm conclusions about their role in insomnia. This is because participants under bronchodilator treatment were also suffering from COPD, which was also strongly correlated to insomnia.<sup>47-49</sup>

Mild dementia seems to be implicated in the presence of insomnia in our study, although the cases were few, and this finding has also been interpreted conversely by considering insomnia as a predictive factor for later cognitive decline in men.<sup>50,51</sup> In the present study it is not clear whether insomnia was an early symptom or an aetiological factor of cognitive decline.

Diabetes was revealed to be more frequent in those people suffering from both types of insomnia in comparison with those who did not suffer. The same goes for prostate hypertrophy. It is assumed that these diseases, causing nocturia and therefore frequent awakenings, can evoke considerable insomnia.<sup>52</sup>

Arthritis and other diseases connected with chronic pain have been shown to be strongly correlated with sleep disorders, even in the absence of concomitant depression.<sup>46,53-55</sup> This is in accordance with our findings and it seems that insomnia due to chronic pain is remarkably persistent and leads to excessive use of hypnotic agents.<sup>56</sup>

The presence of a history of depression was not a predominant indicator of insomnia in our study, contrary to other findings and this could be due to the fact that almost all of the people suffering from depression in our sample were under medication, and therefore sufficiently treated not to suffer from insomnia.<sup>25,31,36</sup> The same issue arises for the anxiety disorders which were not significantly correlated with insomnia, as expected.<sup>33,57-59</sup> The GHQ-28 score reflects the subjective feeling of poor health and is related to the presence of insomnia of both types.<sup>25,36,39,60-62</sup> This finding supports what has been suggested by previous studies, that ageing *per se* is not responsible for the increase of insomnia in the elderly, and healthy older people have a prevalence of insomnia similar to that observed in younger people.<sup>32,36</sup> Carefully designed studies using



the GHQ-28 and comparing different age groups for insomnia are needed to certify this hypothesis.

In conclusion, the correlation between organic diseases and insomnia highlights the importance of co-operation between GPs and psychiatrists in detecting insomnia in different community settings.

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## CONFLICTS OF INTEREST

None.

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