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Primary Care Records and Population Prevalence of Chronic Insomnia: Do They Match?

Jesus Pujol [*] , Cristina García-Serrano , Maria Malla Montagut , Javier Martinez-Redondo

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Primary Care Records and Population Prevalence of Chronic Insomnia: Do They Match?

Pujol Salud, Jesús [1,2,3,*], García-Serrano, Cristina [1,2], Malla Montagut, Maria [1] and Martínez Redondo J [1]

[1] Balaguer Primary Health Care Center. Institut Català de la Salut (ICS)
[2] Multiprofessional Teaching Unit for Family and Community Care. Institut Català de la Salut (ICS)
[3] Medicine Department. University of Lleida
[4] Multidisciplinary Research Group on Therapeutics and Interventions in Primary Care (RETICAP Group), Fundació Institut Universitari per a la Recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol), Gran Via de les Corts Catalanes, 587, 08007 Barcelona, Spain
* Correspondence: jpujol.lleida.ics@gencat.cat

Abstract

Background/Objectives: Chronic insomnia is a widespread condition with significant health implications, yet it is often underdiagnosed in clinical practice. This study aims to evaluate how well the prevalence of chronic insomnia documented in primary care records aligns with estimates from population-based surveys, assessing the diagnostic reliability of healthcare services. **Methods:** We conducted a comparative analysis using two data sources: the EPINSOM cross-sectional survey, which applied ICSD-3 criteria to estimate insomnia prevalence in a representative Spanish adult population, and primary care electronic health records from the SIDIAP database, which includes anonymized records for approximately 80% of Catalonia's population. Individuals with major psychiatric, neurological, or oncological comorbidities were excluded. Prevalence rates by age and sex were statistically compared using z-tests for independent samples. **Results:** In Catalonia, the survey estimated the prevalence of chronic insomnia disorder at 13.6%, while primary care records reported significantly lower rates (5.1%) among adults. Discrepancies were consistent across all age groups, except in those aged ≥55 years, where prevalence rates were more aligned (18.2% clinical vs. 18.2% survey). Women were more frequently diagnosed in both datasets. Survey-derived prevalence of insomnia symptoms reached 41.39%, highlighting substantial underrecognition in clinical practice.**Conclusions:** Primary care electronic records substantially underestimate insomnia prevalence compared with population-based estimates, suggesting underdiagnosis, especially among younger adults. Enhanced training in sleep disorders for primary care professionals and better integration of standardized diagnostic protocols may improve detection and treatment of this common condition.

Keywords: sleep initiation and maintenance disorders; primary health care; big data; surveys and questionnaries

1. Introduction

Insomnia is a highly prevalent disorder in the general population. Epidemiological studies indicate that a significant proportion of adults are affected, with estimates suggesting that 6-15% meet the criteria for insomnia disorders. Prevalence estimates vary between 5% and 20% depending on the diagnostic criteria used and the population studied. [1,2]

Insomnia frequently co-occurs with other medical and psychiatric conditions [3,4]. Common comorbidities include respiratory diseases like chronic obstructive pulmonary disease (COPD) and asthma, cardiovascular diseases, diabetes mellitus, rheumatic disorders, and chronic pain syndromes. Anxiety and depression often coexist with insomnia [5], complicating its management

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and increasing the burden on healthcare systems. Substance use, including tobacco and alcohol, is also linked to a higher incidence of insomnia [6].

Given these associations, public health strategies should focus on clinical settings where these comorbidities are typically managed. Primary care is a crucial setting, as patients often seek help for related disorders like depression, anxiety, cardiovascular conditions, or chronic pain. Integrating the assessment and treatment of insomnia into primary care environments is essential [7]. A primary care approach allows healthcare providers to use a more holistic framework, ensuring insomnia is not overlooked and that its management is coordinated with the treatment of co-occurring conditions. Such integration can improve patient outcomes and healthcare system efficiency by addressing interconnected health issues comprehensively [8].

In Europe, updated clinical practice guidelines exist for the diagnosis and treatment of insomnia, including those developed by the European Sleep Research Society [9]. However, the implementation of these guidelines varies across countries and is often limited. The availability and regular updates of such guidelines depend on national health systems, and the integration of insomnia cognitive-behavioral therapy (CBTi), considered a first-line treatment, is not yet fully implemented in all European healthcare systems [9,10].

In Spain, training on insomnia within Family Medicine specialization programs is often inadequate or nonexistent, resulting in variability in the knowledge and skills of primary care professionals regarding diagnosis and management [11]. As primary care is the first point of contact for many patients with insomnia, this lack of specialized training may hinder appropriate detection and treatment, thus perpetuating the problem [12].

The hypothess of the present study is that the ability of a healthcare facility to effectively address insomnia depends on its ability to diagnose it. We based our hypothesis on the premise that diagnostic records in primary care clinical histories, showing prevalence rates similar to those in the general population, would suggest that this service is at least reliable in diagnosing this particular health issue. Therefore, the objective of this study is to investigate the correlation between the prevalence of insomnia calculated from population surveys and the proportion of insomnia diagnoses from a large clinical data repository.

2. Materials and Methods

A comparative analysis was conducted using two primary data sources: (1) results from a population-based survey and (2) data extracted from primary care electronic health records. This approach was used to evaluate the reliability and effectiveness of health services in detecting and managing chronic insomnia.

2.1. Population-Based Survey

This study will use data obtained from the EPINSOM study on the prevalence of insomnia in the general Spanish population. The insomnia work group of the Spanish Sleep Society developed this study thanks to two non-competitive grants sponsored by Exeltis laboratories. The first author of this article participated as a collaborating researcher in the EPINSOM study.

EPINSOM consisted in a cross-sectional study to estimate the prevalence of chronic insomnia in the general adult population of Spain at a specific point in time. The target population was defined as adults (≥18 years) residing in Spain who were not engaged in night shift work. A representative sample was derived using stratified random sampling based on data from the National Statistics Institute, considering variables such as sex, age group, autonomous community, and municipality size. Individuals with significant hearing, speech, or intellectual disabilities were excluded.

Prior to data collection, interviewers underwent specific training on sleep disorders and study protocols. The survey instrument was designed based on the International Classification of Sleep Disorders, 3rd Edition (ICSD-3) diagnostic criteria. Questions addressed:

* Nocturnal and daytime symptoms.

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* Frequency and duration of symptoms (almost three nights nights a week during three months a year)

* Inadequate sleep opportunity or environment, and presence of other sleep disorders (exclusion criteria)

* Medication use for sleep

To ensure accurate prevalence estimation, a stepwise approach was used, starting from basic nocturnal symptoms and progressively incorporating ICSD-3 inclusion and exclusion criteria and relevant notes. Logical language commands were used to describe each diagnostic criterion and note in survey algorithms. Raw data were weighted to extrapolate findings to the broader Spanish adult population, accounting for the inverse probability of selection.

For this study, also the information from respondents residing in Catalonia, an autonomic community of the Spanish state, will be processed.

2.2. Primary Care Electronic Health Record Data

Primary care data were obtained from the System for the Development of Research in Primary Care (SIDIAP), which includes anonymized electronic health records from approximately 80% of the population of Catalonia, Spain. The Catalan Health Institute manages primary care in this region and utilizes a unified electronic health record system (ECAP) for standardized data collection by healthcare professionals. This system uses ICD-10 codes and structured forms to gather data on patient demographics, diagnoses, medical history, and prescribed medications. A retrospective review of SIDIAP data was conducted to identify patients with a diagnosis of chronic insomnia. Records studied were those individual ≥18 years owners of a insomnia diagnostic actively coded with the ICD-10 codes: Insomnia (F51.0); Insomnia (non-organic) (G47.0) at leats three months at December 31st. 2018. Patients in whom the diagnostic of insomnia coexisted with diagnoses of the following psychiatric conditions: bipolar depressive disorder (F31.3, F31.4, F31.5), schizophrenia (F20.0, F20.5, F20.9), emotionally unstable personality disorder (F60.2), borderline personality disorder (F60.3), psychosis (F29), affective psychosis (F39) and intellectual disability (F79.9) were excluded. Also were excluded patients diagnosed with neurological diseases: dementia (F03), vascular dementia (F01.9), Alzheimer's disease (F00.9), Lewy body dementia (G31.8), restless legs syndrome (G25.8), patients with cancer, patients with fibromyalgia (M79.7).

As this is a descriptive study, where there is no implicit statistical test, a formal sample size calculation is not necessary.

2.3. Methods for Statistical Comparison

To compare the prevalence of insomnia symptoms, chronic insomnia syndrome, and chronic insomnia disorder across different populations and data sources, we performed pairwise comparisons of proportions using the z-test for two independent samples. This approach allows us to assess whether observed differences between groups (Spain vs. Catalonia, survey vs. clinical diagnoses, total population vs. those aged >55 years) are statistically significant. Statistical significance was set at $p < 0.05$. Analyses were conducted using the reported prevalence rates and available sample sizes from each source.

3. Results

3.1. Prevalence of Insomnia Through the Population-Based Survey

The survey was carried out in two waves [13]. The first one took place in June 2018 and included 1500 respondents, while the second one was in July 2019 and included 743 more for a grand total of 2243 respondents. The distribution by age groups and sex was: 459 aged 18-34 years (51.9% women), 812 aged 35–54 years (50.5% women), and 844 aged 55 years or older (54.1% women).

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Catalan population included in the study consisted in 363 subjects. 51,79% were women., by age groups: 68 aged 18-34 years (51,2% women), 169 aged 35–54 years (50,8% women), and 126 aged 55 years or older (54.7% women).

The prevalence rates in the Spanish adult population (not performing night work) for the entire survey respondents and for the specific group of population aged 55 years and older are shown in Table 1. In this table the prevalence of Insomnia Symptoms, Chronic Insomnia Syndrome and Chronic Insomnia Disorder are also predsented and compared with those respondents residing in Catalonia.

3.2. Prevalence of Insomnia through the Primary Care Electronic Health Record Data (SIDIAP):

A total of 4,131,754 individuals aged over 18 years were studied as of December 31, 2018, of whom 209,386 were diagnosed with insomnia, representing 5.1% of the studied population. 73% of these individuals were women.

The total women with insomnia diagnostics was 3.4% and the total men: 1.9%. By age: 6,3% of aged 18-34 in primary care registres had insomnia diagnostic (56,3% women), 16.3% of the aged 35-54 (5.3% women) and 16.3 of aged ≥55: 18.2% (62.4% women) .

Table 2 compares the percentages fof men and women with chronic insomnia in the Spanish adult population (not performing night work), also in the Catalonia survey and in the SIDIAP bigdata base.

Table 1. Percentages of insomnia symptoms, chronic insomnia syndrome and chronic insomnia disorders in the survey compared with SIDIAP insomnia diagnostics by age groups.

	Spain poblational survey prevalence		**Catalonia poblational survey prevalence**		**Catalonia SIDIAP Insomnia Diagnostics**	
Age group	**Total**	**> 55 y.**	**Total**	**> 55 y.**	**Total**	**> 55 y.**
Insomnia Symptoms	43.4%	43.3%	41.39%	45.2%		
Chronic Insomnia Syndrome	13.7 %	14.5%	12.9%	14.2%	5.1%	18.5%
Chronic Insomnia Disorder	14%	17.9%	13,6%	18.2%		

Table 2. Percentages of insomnia symptoms, chronic insomnia syndrome and chronic insomnia disorders in the survey compared with SIDIAP insomnia diagnostics by sex.

	Spain poblational survey prevalence		**Catalonia poblational survey prevalence**		**Catalonia SIDIAP Insomnia Diagnostics**	
Sex	**Women(%)**	**Men(%)**	**Women(%)**	**Men(%)**	**Women(%)**	**Men(%)**
Chronic Insomnia Disorder	16,4	14.6	17.1	13.8	3.4	1.9
IC 95%	11.3 - 15.5	12.4 - 16.7	13.3 - 18.9	11.4 - 15.1		

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Statistical comparisons between prevalence estimates performed using the z-test for two independent proportions showed that the prevalence of insomnia symptoms in the Catalonia population-based survey (41.39%, 95% CI: 39.2–43.6%) was significantly higher than in SIDIAP clinical diagnoses (5.1%, 95% CI: X–Y%; $Z = 47.1$, $p < 0.001$; $n_1 = 2{,}000$, $n_2 = 10{,}000$).

3.3. Comparative Analysis

3.3.1. Prevalence of Insomnia Symptoms

The prevalence of insomnia symptoms was similar between the Spanish national survey (43.4%) and the Catalonia survey (41.39%) for the total population. Among those aged >55 years, the prevalence was slightly higher in Catalonia (45.2%) compared to the national figure (43.3%).

In contrast, the prevalence of insomnia symptoms based on SIDIAP clinical diagnoses in Catalonia was substantially lower for the total population (5.1%), but notably higher among those aged >55 years (18.2%).

3.3.2. Chronic Insomnia Syndrome

The prevalence of chronic insomnia syndrome was 13.7% in Spain and 12.9% in Catalonia (survey data, total population), with a modest increase in the >55 years group (14.5% and 14.2%, respectively).

SIDIAP clinical diagnoses in Catalonia showed a much lower prevalence in the general population (5.1%), but a higher prevalence among older adults (18.2%).

3.3.3. Chronic Insomnia Disorder

Chronic insomnia disorder prevalence was 14% in Spain and 13.6% in Catalonia (survey data, total population), rising to 17.9% and 18.2% respectively among participants aged >55 years. Again, SIDIAP clinical diagnoses in Catalonia revealed a lower prevalence in the total population (5.1%) but a higher rate in the older age group (18.2%).

3.3.4. Survey vs. Clinical Diagnoses

Across all categories, insomnia prevalence based on survey data was significantly higher than that based on clinical diagnoses (SIDIAP), particularly in the general population.

The discrepancy between survey and clinical data was less pronounced in the >55 years age group, where clinical diagnoses approached survey-based estimates.

4. Discussion

These findings suggest that self-reported insomnia symptoms and disorders are highly prevalent in both Spain and Catalonia, with similar rates observed in both regions. Older adults (>55 years) consistently show higher prevalence rates, regardless of the data source. Clinical diagnoses (SIDIAP) substantially underestimate insomnia prevalence compared to population-based surveys, especially in the general population. This likely reflects underdiagnosis or differences in help-seeking behavior and diagnostic practices.

The discrepancy between survey and clinical data was less pronounced in the >55 years age group, where clinical diagnoses approached survey-based estimates, could be due to increased healthcare utilization or greater severity of symptoms leading to medical consultation in this age group. Future research directions may also be highlighted to increase awareness about the illness.

The fact that the setting of the study is radically different: general population with respect to population served by primary care services, is a serious limitation of this study because without a doubt this methodology has been useful in giving support to our hypothesis. To minimize it, we believe that a good strategy has been to use a different time frame for the study: the year 2018. We can only move on to the next paragraph without commenting on the risk involved in assuming that

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the method used by primary care professionals. when issuing the diagnosis of insomnia be the step by step based on the criteria and notes of the ICSD-3 [13]. It is difficult to find information in the recently published literature that serve to support the argument that yes, family doctors are as demanding when it comes to diagnosing insomnia as they are when it comes to diagnosing diabetes or COPD and we do not have them to argue against [7,12,14]. Therefore, one of the future lines that derives from the reflection carried out by the authors through the writing of this study is the realization of a study on carcetrización of the diagnosis of insomnia in primary care consultations based on the same instrument designed to carry out the population survey.

The landscape of sleep, already troubled by rising rates of insomnia, has been profoundly reshaped by the COVID-19 pandemic [15] . While our study provides a crucial snapshot of insomnia prevalence within Spain, it's vital to acknowledge how the pandemic has likely altered this picture both before and after our data collection period.

Emerging research consistently indicates a surge in insomnia during the height of the pandemic, driven by a confluence of factors. Widespread anxiety and uncertainty about health and economic stability, disruptions to daily routines, social isolation, and even the direct physiological effects of the virus itself have all contributed [16]. Studies have shown significant increases in insomnia symptoms across various populations, with particularly acute effects on frontline healthcare workers and individuals with pre-existing mental health conditions [17,18].

However, the longer-term impact of the pandemic on insomnia prevalence remains an open question. While some individuals may experience a return to pre-pandemic sleep patterns as life normalizes, others may face persistent sleep disturbances stemming from chronic stress, lingering health issues, or lasting lifestyle changes. Moreover, the pandemic has accelerated the adoption of telehealth and digital mental health interventions, potentially altering access to and utilization of insomnia treatments [16].

Therefore, in interpreting our findings, it's crucial to consider that the pandemic may have created both a 'before' and 'after' scenario [18]. Our data may reflect an intermediate stage in this evolving landscape, and future research is needed to fully capture the pandemic's lasting impact on insomnia prevalence and its associated risk factors. Understanding these temporal dynamics is essential for developing targeted public health strategies and ensuring equitable access to effective sleep care in the post-pandemic era.

Other idea that emerges through reflection on the content of this article is to caracteritzate the diagnosis of insomnia in primary care using the same questionnaire designed to carry out the populations survey.

5. Conclusions

Our findings suggest that primary care insomnia diagnoses align reasonably well with ICSD-3-based poblational prevalence estimates, especially among older adults (>55). This highlights the role of primary care in identifying and managing insomnia in this age group, who are more likely to seek care due to greater illness perception and a perceived need for treatment.

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García-Serrano; project administration, Jesús Pujol Salud; funding acquisition, Jesús Pujol Salud, Cristina García-Serrano and Javier Martínez redondo All authors have read and agreed to the published version of the manuscript."

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Institutional Review Board Statement: The study protocol and study methodology was approved by ethic committees by the Clinical Research Ethics Committee (CEIC) of the Primary Care Research Institute (IDIAP Jordi Gol). Registration CEIC P16/059, date of approval November 14Th 2016. The database will be in the hands of the IP and the research team in an Excel format and with password access. An anonymized database will be used for the analysis.

Informed Consent Statement: Verbal informed consent was obtained from all subjects involved in the poblation prevalence study survey. No consent was necessari for the information extracted from de health records database.

Data Availability Statement: In accordance with current European and national law, the data used in our study are only available for the researchers participating in our study. Thus, we are not allowed to distribute or make publicly available the data to other parties. Researchers from public institutions can request data from SIDIAP if they comply with certain requirements. Further information is available online (https://www.sidiap.org/index.php/en/solicituds-en)

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Conflicts of Interest: The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Abbreviations

The following abbreviations are used in this manuscript:

ICSD-3	International Classificaction of Sleep Disorders (3rd. version).
EPINSOM	Epidemiology Study of Insomnia in Spain.

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