

OBJECTIVE COSTS AND PREVALENCE OF COMORBIDITIES DURING THE YEAR FOLLOWING DIAGNOSIS FOR PERSONS WITH AND WITHOUT INSOMNIA

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INTRODUCTION

Insomnia affects more than 10% of the adult population and is associated with a number of comorbid conditions, including psychiatric, respiratory, and cardiovascular diseases.¹⁻⁵ Comorbid conditions are a major component of the cost of illness for insomnia and pose a significant financial burden.⁶ However, few studies have looked objectively at the prevalence of comorbid disorders and their associated costs in adults with insomnia.

OBJECTIVE

The goal of the current analysis was to evaluate the prevalence and costs of a comprehensive list of comorbid disorders (using the 261 categories determined by the Agency for Healthcare Research and Quality [AHRQ])⁷ in employees with and without insomnia.

METHODS

- A retrospective analysis was performed on data (2001 to 2006) from the Human Capital Management Services (HCMS) Research Reference Database consisting of approximately 510,000 employees representing the retail, service, manufacturing, and financial industries.
- Employees with insomnia were identified using the *International Classification of Diseases, 9th Revision (ICD-9)* diagnostic codes for insomnia or by a prescription for a hypnotic agent.
 - ICD-9 codes used to identify employees with a primary, secondary, or tertiary diagnosis included: 307.41 (transient disorder of initiating or maintaining sleep), 307.42 (persistent disorder of initiating or maintaining sleep), 307.49 (subjective insomnia), and 780.52 (insomnia).
 - Hypnotic agents included ramelteon, zaleplon, zolpidem, and eszopiclone.
- For each employee with insomnia, 3 employees without insomnia (controls) were matched on propensity scores using logistic regression models based on demographics, job information, and region. Control subjects had no history of an insomnia diagnosis or any prescription for a hypnotic agent.
- The index date in the insomnia group was defined as the date of first diagnosis of insomnia or initial hypnotic prescription.
- The average index date in the insomnia group was used as the index date for the control group.
- Employees included in the analysis were required to be continuously employed and eligible for health benefits for at least 12 months after their index date.
- All cost data were inflated to constant 2006 United States dollars.
- All medical claims were assigned to the 261 specific AHRQ categories based on the primary ICD-9 codes.
- Comorbidity prevalence rates for each group were based on employees with claims for each AHRQ category.

Statistical Analysis

- Means of demographic data were compared using *t* tests for continuous variables and chi-square (χ^2) tests for discrete variables.
- Prevalence comparisons used z-scores of log odds ratios (Woolf method).
- Comorbidity cost comparisons used Satterthwaite *t* tests.
- Differences were considered significant when $P \leq 0.05$.

RESULTS

- Data were available for 12,308 employees with insomnia and 36,924 matched controls (Table 1).
- Out of 261 AHRQ categories for comorbid conditions, 212 were more prevalent in employees with insomnia (81.2%). Only 6 categories were more prevalent in employees without insomnia (2.3%).
 - A comparison of the most common AHRQ categories (greater than 4% prevalence in the insomnia group) between the insomnia and control groups is shown in Figure 1.
 - Less prevalent categories (less than 4% prevalence in the insomnia group) were also significantly different between the insomnia and control groups and are shown in Table 2.
- Costs were significantly higher in 124 AHRQ categories for the insomnia group (47.5%) and 7 for the control group (2.7%).
 - A comparison of costs between the insomnia and control groups is detailed in Table 3.

Table 1. Demographic Profiles of Employees With and Without Insomnia

Category	Insomnia Group		Control Group		Difference ^a
	N	Mean	N	Mean	
Age at Index Date (years) [SE]	12,308	42.59 [0.08]	36,924	42.53 [0.05]	0.06
Annual Salary (\$US) [SE]	12,308	61,317 [549]	36,924	60,160 [315]	1,157
Female Gender (%)	12,308	57.0	36,924	56.9	0.1
Married (%)	11,720	56.2	35,166	56.3	-0.1
Race	10,372		31,116		
White (%)		74.8		75.0	-0.2
Black (%)		7.5		7.5	0.0
Hispanic (%)		8.7		8.7	0.0
Exempt Status (%)	12,308	44.2	36,924	44.1	0.1
Full-time Employee (%)	12,308	94.8	36,924	94.8	0.0

^aNone of the differences between the groups are significant ($P > 0.05$). SE = Standard error

Figure 1. Prevalence of the Most Common Comorbid Conditions for Employees With and Without Insomnia

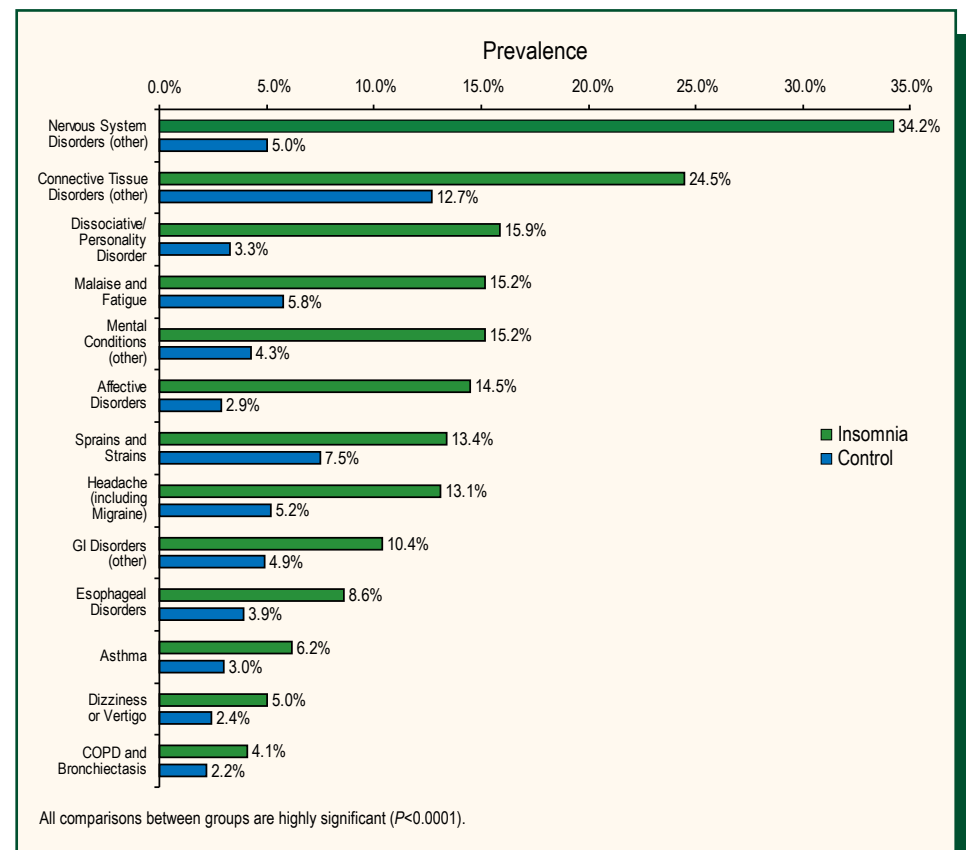


Table 2. Prevalence of Less Common (<4% of Employees) Comorbid Conditions for Employees With and Without Insomnia

Comorbid Condition (AHRQ Category)	Employees With Insomnia (%)	Employees Without Insomnia (%)
Substance-Related Mental Disorders	2.0%	0.8%
Fracture (Lower Limb)	1.6%	1.0%
Syncope	1.6%	0.7%
Fracture (Upper Limb)	1.3%	0.7%
Rheumatoid Arthritis	1.3%	0.5%
Breast Cancer	1.2%	0.7%
Hereditary/Degenerative Nervous System Disorders	1.1%	0.2%
Alcohol-Related Mental Disorders	0.9%	0.2%
Senility/Organic Mental Disorders	0.8%	0.1%
Chronic Renal Failure	0.5%	0.1%
Psychoses (other)	0.2%	0.1%

All comparisons between groups are statistically significant ($P < 0.05$).

Table 3. Incremental Cost Differences for Comorbid Conditions Between Employees With and Without Insomnia

Comorbid Condition (AHRQ Category)	Cost for Employees With Insomnia (\$US)	Cost for Employees Without Insomnia (\$US)	Difference Between Groups ^{a,b}
Nervous System Disorders (other)	\$168	\$40	\$128
Affective Disorders	\$125	\$17	\$108
Breast Cancer	\$112	\$26	\$86
Connective Tissue Disorders (other)	\$111	\$44	\$67
Chronic Renal Failure	\$74	\$7	\$67
Sprains and Strains	\$69	\$31	\$38
Headache (including Migraine)	\$54	\$16	\$37
Mental Conditions (other)	\$44	\$11	\$33
Dissociative/Personality Disorders	\$34	\$6	\$28
GI Disorders (other)	\$42	\$19	\$23
Esophageal Disorder	\$30	\$12	\$19
Fracture (Lower Limb)	\$26	\$8	\$18
Alcohol-Related Mental Disorders	\$18	\$3	\$14
Senility/Organic Mental Disorders	\$14	\$1	\$13
Asthma	\$20	\$8	\$12
Rheumatoid Arthritis	\$19	\$7	\$12
Syncope	\$14	\$5	\$9
Malaise and Fatigue	\$14	\$5	\$8
Dizziness or Vertigo	\$16	\$8	\$8
Fracture (Upper Limb)	\$15	\$7	\$8
Substance-Related Mental Disorders	\$7	\$1	\$6
COPD and Bronchiectasis	\$10	\$5	\$5
Hereditary/Degenerative Nervous System Conditions	\$5	\$1	\$5
Psychoses (other)	\$2	\$0	\$2

^aAll comparisons between groups are statistically significant ($P < 0.05$).

^bNumbers have been rounded; differences are based on unrounded numbers.

CONCLUSIONS

- Comorbid conditions are more prevalent and are associated with higher costs in employees with insomnia compared with those without insomnia.
- The focus of this study was limited to employed adults and does not reflect the prevalence and costs of comorbid conditions in all insomnia populations.

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