The Extent and Impact of Insomnia as a Public Health Problem

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Insomnia is common in all age groups. Differences in definitions and assessment methods of insomnia cause difficulties in comparisons between studies. About 20% of middle-aged adults and about one third of the elderly report symptoms of insomnia, which are about 1.5 times more common in women than in men. However, insomnia disorders are not as common as insomnia symptoms. Indications are that prevalence differs greatly between countries. Insomnia is comorbid with many chronic illnesses, and data suggest that insomnia indicates a greater risk for depression. Both self-help methods and prescribed hypnotics are widely used in people with insomnia. Estimates of the economic costs of insomnia vary, illustrating the difficulty in assessing its consequences. With all of its associated health and quality-of-life issues, insomnia is justifiably considered an important public health problem. *(Primary Care Companion J Clin Psychiatry 2002;4[suppl 1]:8–12)*

One essential condition in research is to be able to define exactly the object being investigated. With insomnia, this task is not easy. The definition of insomnia from the International Classification of Sleep Disorders (ICSD),[1] "difficulty in initiating and/or maintaining sleep," has been used in many variations, and these differences, in addition to many other methodological aspects, substantially influence results of insomnia studies. This review, which summarizes data mainly from epidemiologic studies, focuses primarily on studies of subjects with some defined sleep disorder symptoms, rather than patients with specific sleep disorder diagnoses.

PREVALENCE, INCIDENCE, AND DEMOGRAPHICS OF INSOMNIA SYMPTOMS

The prevalence of insomnia symptoms in general is shown in Table 1[2–18] and those of its main manifestations in Table 2.[19–30] Insomnia symptoms are quite common, becoming more prevalent with age. In young people,[3–5] 10% or more report symptoms. In middle-aged adults, the prevalence is around 20%, and in the elderly (over 65 years of age), about one third of subjects report insomnia.[7–17] Linear increase is seen in several studies, but for patients at an old age, the figures may be lower.[18] There is a well-known gender difference in prevalence; insomnia is about 1.5 times more common in women, most notably in menopausal and postmenopausal age groups.[7,12,14,16–18] Trouble falling asleep seems to be the most common manifestation in young people.[19,20] In the middle-aged and the elderly groups, trouble staying asleep and early morning awakening are the most frequent symptoms of insomnia.[21–30] The incidence (new insomnia cases per year) is approximately 5%.[12,18,31,32] Insomnia is known to be a chronic condition in about 10% of the world population. In adults, insomnia is usually persistent, often lasting several years (up to more than 10 years)[11,18,25,28,33] and having a 3-year remission possibility of less than 50%.[31,32]

A few cross-country studies indicate considerable differences in insomnia symptoms. Chevalier et al.[33] found severe insomnia in 4% to 9% of the population in Germany, Sweden, Ireland, and Belgium, but in 22% of the population in Great Britain. Using the newly described expert SleepEval method, Ohayon and coworkers[34] report a prevalence of 36.2% from the United Kingdom and 18.6% from France.[24] In a large World Health Organization (WHO)–coordinated study in the mid-1980s, sleeping habits of subjects aged 11 to 16 years old were studied in 11 European countries.[35] A 2-fold difference in the prevalence of difficulties in falling asleep at least twice weekly was found, with Finland, Belgium, and Wales ranking highest (~20%–30%) in all 3 age groups, and Austria and Spain ranking lowest (~10%–15%). In young adults aged 20 to 45 years old, difficulties in inducing sleep and early

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Table 1. Prevalence of Insomnia Symptoms

Reference	Age (y)	% (all or male/female)[a]
Saarenpää-Heikkilä et al, 1995[2]	7–17	4 + 61/5 + 57
Rimpelä et al, 1983[3]	12–17	1 + 23/2 + 38
Levy et al, 1986[4]	12–18	13
Kirmil-Gray et al, 1984[5]	13–17	11
Price et al, 1978[6]	15–18	13
Lugaresi et al, 1983[7]	3–94	10/17
Smirne et al, 1983[8]	6–92	13
Partinen and Rimpelä, 1982[9]	15–24	5
	25–44	6
	45–64	14
Yeo et al, 1996[10]	15–55	15
Hohagen et al, 1991[11]	18–35	11
	35–50	21
	51–65	27
Ford and Kamerow, 1989[12]	18–65+	8/12
Weissman et al, 1997[13]	18+	12
Dodge et al, 1995[14]	18–44	23/30
	45–64	32/44
	64+	36/48
Simon and VonKorff, 1997[15]	18–65	10
Husby and Lingjaerde, 1990[16]	20–54	30/41
Hyyppä and Kronholm, 1987[17]	29–79	10 + 58/13 + 63
Morgan and Clarke, 1997[18]	65–69	33/44
	70–74	39/44
	75–79	11/44
	80+	18/31

[a]In some studies, prevalence is given as "always or often + sometimes."

morning awakenings were studied in Iceland, Belgium, and Sweden.[36] The total prevalences were quite similar, but differences were about 2-fold between the countries in the percentage of the most frequent occurrence. These results indicate that although true differences may exist between countries, the reasons are less clear and should be targeted for future research.

PREVALENCE OF INSOMNIA DISORDER DIAGNOSES

Only 2 population-based sleep-focused studies also give diagnoses on sleep and psychiatric disorders. They have used telephone interviews and the SleepEval system, which formulates questions and gives diagnoses according to the classification of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), International Classification of Diseases (ICD), and the ICSD. In the French study,[24] symptoms of insomnia were reported by nearly 20% of the population. A little less than half received a psychiatric diagnosis, and a little less than one third were diagnosed with an insomnia disorder according to the DSM. In both main groups, the most common diagnosis was related to anxiety disorders.

In the study performed in the United Kingdom,[34] 36.2% of the population had symptoms of insomnia (almost twice that reported by the French). The most common DSM diagnosis was primary insomnia (3.6%), and the most common ICSD diagnoses were mood disorder with sleep disturbance (4.4%) and psychophysiologic insomnia (2.2%). These studies by Ohayon et al.[24,34] indicate that many sleep disturbances are a constellation of symptoms but do not fulfill the criteria of a disorder.

MORBIDITY AND MORTALITY ASSOCIATED WITH INSOMNIA

Insomnia affects patients' subjective assessment of well-being and performance in many ways while they are awake, as shown in the 1991 National Sleep Foundation Survey in the United States.[37] Good or excellent quality of life was reported by 96% of those without insomnia, 81% of patients with occasional insomnia, and only 70% of patients with chronic insomnia.[37] Insomnia is also comorbid with a wide range of chronic illnesses. In the study by Katz and McHorney,[38] patients had mild (34%) and severe (16%) insomnia at baseline. The strongest insomnia comorbidity associations were seen in affective disorders, cardiopulmonary disease, painful musculoskeletal conditions, and prostate problems. In a 2-year follow-up of approximately 1800 patients, most associations persisted. However, no firm data exist on the possible causal relationship between insomnia and medical disorders.

Several studies suggest that insomnia indicates a greater risk for depression and possibly anxiety disorders.[12,39,40] However, as pointed out by Gillin,[41] sleep disturbances are common manifestations of major depressive and anxiety disorders, and preceding insomnia may represent prodromes of full-blown clinical episodes.

A complicated association exists between sleep length, insomnia, use of hypnotics, and mortality. Results from different studies are conflicting,[29,42–47] and firm conclusions are difficult to draw. The authors' opinion is that, so far, there is no convincing and especially no causal link between mortality and sleep length, insomnia, or the use of modern hypnotics. However, indications are that increased mortality is associated with the use of nonhypnotic medication to improve sleep.[46,48] These complex relationships need more rigorous research.

TREATMENT METHODS USED BY PEOPLE WITH INSOMNIA

How do people try to improve their symptoms of insomnia? The 1991 National Sleep Foundation Survey[49] found that only 46% of patients with chronic insomnia and 25% of those with occasional insomnia had ever discussed their sleep disturbances with a physician, and only 5% of all patients with insomnia had visited their physician specifically for insomnia. The survey found that to promote sleep, 23% of people with insomnia had used over-the-counter medications; 28%, alcohol; and 21%, prescribed medication. Self-help methods used to improve sleep included physical exercise (25% of those with

Table 2. Prevalence of Insomnia Symptoms: Main Manifestations[a]

Reference	Age (y)	Trouble Falling Asleep (%) (all or m/f)	Trouble Staying Asleep (%) (all or m/f)	Early Morning Awakening (%) (all or m/f)
Blader et al, 1997[19]	5–12	24	13	…
Morrison et al, 1992[20]	15	9/10	2/3	3/4
Lack, 1986[21]	16–50	18	9	13
Janson et al, 1996[22]	20–45	7	…	6
Ohayon, 1996[23]	15+	…	33/45	…
Ohayon, 1997[24]	15+	11/15	16/25	14/18
Bixler et al, 1979[25]	18+	14	23	14
Karacan et al, 1983[26]	18–65+	6/11	13/17	6/8
Kronholm and	30–40	5	…	24
Hyyppä, 1985[27]	50–60	10	…	43
	71	15	…	36
Ganguli et al, 1996[28]	66–97	27/44	19/36	14/23
Foley et al, 1995[29]	65+	19	30	19
Henderson et al, 1995[30]	70+	5	…	3

[a]Abbreviation: m/f = male/female. Symbol: … = not available.

Table 3. Use of Hypnotics[a]

Reference	Country	Pattern	Age (y)	Users (%) (all or m/f)
Kirmil-Gray et al, 1984[5]	United States	Ever	13–17	15
Lack, 1986[21]	Australia	Occasionally or more often	16–50	5
Janson et al, 1996[22]	Northern Europe	Weekly	20–45	1.3
Ohayon, 1996[23]	France	Currently	15+	7/13
Simen et al, 1996[50]	Germany	Weekly	14–65	1
			65+	10
Johnson et al, 1998[51]	United States	Within the past year	18–45	18
Karacan et al, 1983[26]	United States	Sometimes or more often	18–65+	7/11
Partinen et al, 1983[52]	Finland	> 2 months	18–39	1/1
		During the preceding year	40–59	3/3
			60–69	4/8
Hyyppä and Kronholm, 1987[17]	Finland	Sometimes	29–79	11/15
		Often		2/3
		Almost every evening		2/4
Mellinger et al, 1985[53]	United States	Regularly, > 1 year	18–79	0.3
Morgan et al, 1988[54]	Great Britain	Sometimes	65+	3
		Often		1
		All the time		12
Henderson et al, 1995[30]	Australia	Previous 2 weeks	70+	15 (community)
		Nearly every night		40 (institutions)

[a]Abbreviation: m/f = male/female.

chronic insomnia and 14% of those with occasional insomnia), relaxation techniques (17% and 9%, respectively), and reading (11% and 6%, respectively). For the health care system, the big challenge is to better inform the public and intensify efforts to identify and treat people with insomnia.

Data on the use of hypnotics are given in Table 3.[5,17,21–23,26,30,50–54] Once again, the studies are methodologically very different, but some trends can be seen. In the United States, the use of sleeping pills in the young is not uncommon; 15% of the total population has tried them at some time. In the middle-aged group, ~5% to 10% use hypnotics more or less regularly; in the elderly, the percentage is higher (10%–15%), and in institutionalized individuals, the percentage is even higher.

COSTS OF INSOMNIA

The fact that only a few studies assess the financial consequences of insomnia underlines the difficulty in estimating the costs of this disorder. The direct costs—caused by medical care and self-treatment—are in themselves not easy to define exactly, and defining the indirect costs, such as work loss, accidents, and increased morbidity and mortality, is even more difficult. Examples from the United States are described below.

Walsh and Engelhardt[55] assessed the direct costs of insomnia in 1995. About one quarter of the total $14 million in costs are used to pay for sleep-promoting substances and outpatient visits for investigations and treatment. The other three quarters are allocated to costs of nursing home care.

However, the real reason for institutionalization is probably a more universal deterioration in patient capabilities for independent living than pure insomnia, reflecting the problem in defining calculations of this nature.

In the early 1990s, Stoller[56] calculated the economic effects of insomnia, including some of the indirect costs. The calculations are based on a 33% insomnia prevalence rate. The loss of productivity is based on an estimation of 4% performance decrement. Estimates of increased accident risk for people with insomnia are increased 2- to 3-fold for traffic, home, and public accidents combined, and 1.5-fold for work-related accidents. The rate of alcoholism in people with insomnia is estimated to be doubled. Thus, the total annual cost is $100 billion.

Walsh and Engelhardt,[55] among others have criticized these calculations and used more conservative estimates, e.g., 10% prevalence rate rather than 33%. They have estimated annual direct and indirect costs to be $30 to $35 billion. It is evident that more research is needed in this area.

CONCLUSION

Epidemiologic studies show that insomnia is common, affecting quality of life, performance, risk of accidents, and morbidity. Considering all of its associations with other health aspects and consequences, regarding insomnia as a public health problem is justified. As underlined in the WHO report on insomnia,[57] better methods are needed in the health care system to identify patients with insomnia, and more studies using standardized methodologies are needed, especially prospective and cross-cultural studies and studies on consequences and costs of insomnia.

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