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Primary care provider evaluation and management of insomnia

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Study Objectives: To evaluate the type and extent of information collected from patients with insomnia during their first office encounter for insomnia and the prescribing therapies of primary care providers during this initial encounter.

Methods: This study was a retrospective chart review of randomly selected patients who had a primary care provider office visit at any clinic affiliated with a university medical system between March 1, 2013, and March 1, 2016. Demographic and clinical information was abstracted for analysis.

Results: Our sample (n = 200) was primarily female (63.5%), White (69%), middle-aged (ages 44.6 ± 15.1 years) adults. Most (68.5%) encounter notes did not have significant information related to insomnia risk factors and symptoms (< 50% of the notes). When examining comorbidities, we found that younger patients (<45 years old) were more likely to have anxiety linked to insomnia (P = .025), whereas older patients (≥45) were less likely to have any identified comorbidities associated with insomnia (P = .009). Only 5.0% of patients with insomnia were referred for cognitive-behavioral therapy for insomnia, whereas 51.5% of patients were prescribed sleep medications. The younger cohort was statistically more likely to receive sleep hygiene or cognitive-behavioral therapy for insomnia as a treatment option in comparison to the older cohort (P = .01 and P = .04, respectively).

Conclusions: Progress notes from primary care providers tend to have a paucity of information on insomnia symptoms and related comorbidities. Medications are often prescribed as the first-line treatment for insomnia. Cognitive-behavioral therapy for insomnia remains underutilized despite robust evidence suggesting that cognitive-behavioral therapy for insomnia is a safe and effective treatment for insomnia.

Keywords: insomnia, primary care provider, sleep diary, sleep study, prescribing therapy, cognitive-behavioral therapy, CBT-I

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BRIEF SUMMARY

Current Knowledge/Study Rationale: Insomnia is a prevalent sleep disorder that has negative health and social consequences if left untreated. Our objective was to evaluate the type and extent of information collected from patients with insomnia during their first office encounter for insomnia and the prescribing therapies of primary care providers.

Study Impact: We found clinical practice issues related to how primary care providers identified and treated insomnia: Provider notes contained little information regarding patient symptoms and details relevant to an insomnia diagnosis, providers rarely made a link between comorbidities and insomnia, referrals to sleep medicine providers were minimal, and treatment generally consisted of sleep medication. This work highlights important priorities for public health and provider education strategies around the effective evaluation and management of insomnia.

INTRODUCTION

Insomnia is a sleep disorder defined by difficulty initiating and maintaining sleep or having poor sleep quality.[1] Approximately 30% of the US population is affected by insomnia symptoms; 15%–20% report insomnia symptoms to a provider and approximately 10% meet the diagnostic criteria of insomnia disorder.[2,3] There is a bidirectional relationship with insomnia and comorbid medical conditions. People with insomnia are at an increased risk of developing conditions such as depression, anxiety, and cardiovascular diseases.[4–6] Moreover, insomnia is often precipitated by various medical conditions, including chronic pain, asthma, neurodegenerative disorders, nocturia, and sleep breathing disorders.[1] Consequently, insomnia

impacts productivity and quality of life.[7,8] Recognizing the factors that can commonly lead to insomnia is important in improving rates of identification and subsequent treatment for insomnia.

When appropriately identified and diagnosed, insomnia has traditionally been treated with medications. Several studies have shown long-term risks associated with sleep medications, including mortality, infection, depression, and accidents.[9] However, there are nonpharmacological approaches that can be used to successfully treat insomnia. A substantial body of evidence supports the benefits of cognitive-behavioral therapy for insomnia (CBT-I).[10,11] CBT-I is a viable alternative to sleeping medications, with studies showing its efficacy in various types of patients and researchers supporting it as the

best first-line treatment for insomnia in appropriate settings.[12–14] Not only has CBT-I shown long-term benefits, but the risk-benefit profile is also favorable compared to that of medications.[15] CBT-I has acknowledged limitations, mainly the time and resources required of patients to successfully complete the multiple sessions needed and the paucity of available providers.[16] However, over the past decade, there has been an increase in Internet-based CBT-I to help address some of the scheduling constraints associated with traditional CBT-I. There is empirical support for Internet-based CBT-I programs that have been tested in clinical trials and have been successful in treating patients with insomnia.[4,17–20] However, relatively little is known about their long-term use and effectiveness. Nonetheless, the current literature has shown the positive impact of Internet-based CBT-I on insomnia[21] and other comorbid conditions, such as depression.[22,23] CBT-I should be considered as a viable treatment option especially for patients who experience challenges or difficulties in completing the traditional CBT-I treatment.

Primary care providers (PCPs) are uniquely positioned to detect and treat patients presenting with insomnia symptoms, as they are often the first point of contact for patients. Obtaining a detailed history is critical for establishing an effective diagnosis yet can often be challenging in primary care settings. PCPs may lack training regarding the importance of screening and managing insomnia.[24] For instance, PCPs often focus on treating the precipitating or perpetuating factors related to insomnia (eg, depression or anxiety), physical causes (eg, pain or sleep apnea), occupational causes (eg, changes in shift schedule), and social causes rather than the disorder itself. PCPs tend to focus on sleep hygiene and rarely recommend CBT-I therapy, which may be partly because of a lack of knowledge of availability of CBT-I within their facilities[25] or a lack of perceived benefit of CBT-I.[26,27] A more comprehensive analysis into PCP assessments, diagnosis, and treatment of patients with insomnia is warranted.

To address the current knowledge gaps around insomnia identification and treatment by PCPs, we conducted a cross-sectional analysis using a retrospective chart review. This analysis allowed us to assess the information collected by PCPs during a typical first encounter concerning insomnia. Our data abstraction focused on the presence of comorbid conditions and treatment options recommended by the provider. Moreover, we were particularly interested in the frequency of CBT-I and Internet-based CBT-I recommendations as a prescribing therapy for patients with insomnia. These insights regarding patient-provider encounters can help guide future public health initiatives and changes in primary care treatment recommendations for insomnia.

METHODS

We conducted a retrospective chart review of 200 randomly selected patients from a large university health system. The study was reviewed and approved by the university's institutional review board. Encounter notes were located using PennSeek, a tool for abstracting data from the electronic medical record that allows the identification of patient care trends. Each

encounter note contained the same elements: diagnostic readings, past diagnoses (if applicable), current diagnoses, and current medications. However, each encounter note varied in both content and structure (eg, some PCPs wrote long, descriptive passages within the note whereas others focused on relevant test results, diagnoses, or treatment plans). Thus, to collect consistent data across notes, we determined > 70 variables to abstract from each note. Variables included age, medications, comorbidities, and whether or not CBT-I was discussed. Each note was carefully read, and the data were abstracted into the Research Electronic Data Capture platform, a secure web application used for collecting and managing data. Encounter note content was considered related to insomnia if the PCP was explicitly describing the patient's symptoms, background, or treatment plans for insomnia. The insomnia information was often listed immediately after an explicit declaration of insomnia (eg, "patient has insomnia").

Inclusion/exclusion criteria

The following criteria were used to create the patient cohort. First, we determined that the encounter note must include at least 1 of the following *International Classification of Diseases, Ninth Revision*, codes: (1.1) 780.52: insomnia, nonspecific; (1.2) 307.41: transient insomnia; (1.3) 307.42: persistent insomnia; (1.4) 307.40: nonorganic (sleep disorder not due to a substance or known physiological condition, unspecified); (1.5) 307.49: other specific disorders of sleep of nonorganic origin; and (1.6) 327.00: organic insomnia. For this study, we were interested in PCP treatment of primary insomnia that did not have any comorbid or other etiology (ie, not secondary or comorbid insomnia)—we wanted to focus on patients whose main reason for visiting was to treat insomnia. Other *International Classification of Diseases, Ninth Revision*, codes related to insomnia, such as 327.01 (insomnia due to medical condition classified elsewhere), were not included to minimize heterogeneity and the likelihood that insomnia was a secondary complaint for the visit. Second, we established the contact date. The first patient-provider encounter regarding insomnia must have occurred between March 1, 2013 and March 1, 2016; patient encounters before March 1, 2013 were not analyzed because of changes in practice patterns. The third criterion was the patient date of birth: The patient must have been born before 1997 (at least age 18 years). We excluded specialty departments (eg, sleep medicine and pulmonary medicine) to ensure that the provider was a primary care provider. The final criterion was the encounter type, specified as an office visit.

When we implemented the inclusion/exclusion criteria, our searches generated 20,360 patients with 58,167 encounters. "First encounter" was defined as the first instance when the provider diagnosed a patient with insomnia using one of the aforementioned *International Classification of Diseases, Ninth Revision*, codes. Therefore, any patient with a past medical history listing insomnia or that had insomnia listed as an *International Classification of Diseases, Ninth Revision*, code before March 1, 2013 was removed from the cohort. Because we were focused on how the PCP viewed insomnia on the first visit, we simply defined "the initial patient-provider visit for insomnia" as the first visit between a patient and the PCP in which

insomnia was diagnosed within the note. Therefore, patient notes that were chosen for the study could either have been new patient visit encounters that included an insomnia diagnosis or an established patient visit (ie, an ongoing established patient-provider relationship, as is commonly the case for PCPs) during which insomnia was brought up for the first time (ie, a new problem). The majority of the visits were for established patients coming in for an initial evaluation of an insomnia complaint. We wanted a narrow time window for our analysis because there are always changes in practice patterns. To limit data abstraction to patients fulfilling this criterion, 1,000 of the 20,360 patients were randomly chosen through a random sequence generator. We then abstracted the first 200 of the 1,000 patients who met the criteria for "first encounter" because we determined that this was an adequate sample to look at trends and patterns and compare treatment differences by age.

Study methods

Data were abstracted by a primary reviewer from the encounter notes and entered into the Research Electronic Data Capture platform. Areas of focus for the abstraction included demographic information such as age, race, sex, and clinical information such as insomnia symptoms and other health conditions. Evaluation methods used by the provider to identify the cause or characteristics of a patient's insomnia were also abstracted (eg, if a PCP requested a sleep diary or referred a patient to a sleep specialist). The written body (ie, free text) of the encounter note was also evaluated to determine how much of the note focused on insomnia (dichotomized at < 50% or > 50%). This evaluation was done by viewing the overall word count of the note and determining the word count that focused on the symptoms, context, or treatment options for insomnia. A second reviewer abstracted a subset of records to confirm the accuracy of the abstraction process. Discrepancies were discussed, and > 95% agreement was achieved.

Data analysis

All statistical data analysis was conducted using SAS version 9.4 (SAS Institute, Cary, NC). Descriptive statistics were computed for preliminary analyses to examine means, standard deviations, and ranges. Independent t tests and chi-square analyses were conducted with all variables of interest to detect significant differences between the two groups. Hedge's g was applied to estimate effect size. All tests were 2-tailed with a significance value set to $P < .05$.

RESULTS

Demographic information

Our sample (n = 200) was primarily female (63.5%), White (69%), middle-aged (aged 44.6 ± 15.1 years) adults (Table 1). We split patients into 2 different age cohorts based on the mean age of the sample: 1 group aged < 45 years (n = 105; 52.5%) and the other group aged ≥ 45 years (n = 95; 47.5%). There was no significant difference between the 2 age groups regarding sex, race, body mass index (BMI), and nicotine, alcohol, and caffeine usage. The majority (70.5%) of the patients were classified as overweight (BMI of 25 kg/m² or greater), and 39.5% of patients were obese (BMI of 30 kg/m² or greater).

Characteristics of primary care clinics and PCPs

Within our sample, 49 clinics and 137 physicians were represented. The average annual household income for the clinic zip code ranged from $38,352–$196,797. The approximate ages of physicians were 32–81 years. Physicians' age was determined from a review of the health system provider profile, and if not available was estimated based on the undergraduate graduation year or medical school graduation year.

Characteristics of insomnia symptoms

Details of insomnia symptoms, including the amount of insomnia information recorded during encounters, are presented in Table 2. Only 31.5% of the free-text notes devoted > 50% of their content to an insomnia diagnosis and treatment, suggesting that the majority of encounters did not focus on insomnia. Half of the patients in our sample did not have any information recorded regarding the characteristics of their insomnia (ie, difficulty falling asleep, difficulty staying asleep or nocturnal awakenings, and early-morning awakenings). When PCPs noted difficulty staying asleep or nocturnal awakenings, they did not note a specific cause of the awakenings. Additional history elements, such as patterns of caffeine intake, were rarely recorded in the encounter.

Active medical problems and potential links to insomnia

Patients' active medical problems are presented in Table 3. Possible medical causes of insomnia are listed under "Condition." "Diagnosed cause of insomnia" refers to patients for whom the health care provider explicitly linked the diagnosis to insomnia in the encounter note. We found that 62% of the patients in our sample had active medical problems. The most common active medical problems were anxiety (26.5%) and depression (19.5%). However, the provider rarely (only 25% of the time) noted a possible connection between insomnia and the active medical problems. For some patients, the provider noted a potential or direct link to insomnia with a condition that was not already specified on the chart (eg, jet lag or work-related stress), which was categorized as "other." Approximately one-third of patients (38%) did not have any comorbidity listed in the chart. The provider did not make any note of the potential cause of insomnia for 76% of patients.

Younger patients (aged < 45 years) were more likely to have a comorbid condition identified in the note as compared with older patients (aged ≥ 45 years). Although there were no statistically significant differences in anxiety prevalence between the 2 age groups, there was a statistically significant difference between the age groups in terms of whether providers linked anxiety as a potential cause for insomnia. Of the 53 (26.5%) patients with anxiety as an active medical problem (32 and 21 patients for the younger and older age groups, respectively), PCPs linked anxiety to insomnia for 25% of patients in the younger category and only 4.8% of patients in the older group.

Evaluating and treating insomnia symptoms

PCP evaluation for patients with insomnia is presented in Table 4. The majority (73%) of patients did not have any evaluation tests ordered. PCPs only referred 11% of patients

Table 1—Demographics and clinical characteristics.

Patient Characteristics	Total (n = 200)	Ages < 45 Years (n = 105)	Ages ≥ 45 Years (n = 95)	*P* Value
Age, y, mean (SD)	44.62 (15.1)	32.66	57.83	<.001
Sex, n (%)				.28
Male	73 (36.5)	42	31	
Female	127 (63.5)	63	64	
Race, n (%)				.20
White	138 (69.0)	69	69	
Black	43 (21.5)	3	3	
Asian	6 (3.0)	23	20	
Other	13 (6.5)	10	2	
BMI, n (%)				.96
< 18.5 kg/m^2 (underweight)	4 (2.0)	2	2	
18.5 to < 25 kg/m^2 (normal)	55 (27.5)	29	26	
25 to < 30 kg/m^2 (overweight)	62 (31.0)	31	31	
30 to < 40 kg/m^2 (obese)	79 (39.5)	43	36	
Nicotine usage, n (%)				.26
Yes	16 (8.0)	7	9	
No	116 (58.0)	57	59	
Not specified	68 (34.0)	41	27	
Alcohol usage, n (%)				.80
Yes	80 (40.0)	44	36	
No	41 (20.5)	20	21	
Not specified	79 (39.5)	41	38	
Caffeine usage, n (%)				.29
Yes	21 (10.5)	10	11	
No	5 (2.5)	1	4	
Not specified	174 (87.0)	94	80	

Demographic and clinical characteristics of the study population, including age, sex, BMI, nicotine usage, alcohol usage, and caffeine usage. BMI = body mass index, SD = standard deviation.

to a sleep provider for further evaluation and only requested sleep diaries from 1% of patients.

Approximately half (51.5%) of patients were offered a sleeping medication, the most common treatment recommendation (**Table 5**). Although not statistically significant, patients in the older group were more likely to be prescribed a sleeping medication than those in the younger group. Furthermore, 57.5% of patients were only recommended a sleep medication, whereas the rest of the patients were recommended a sleep medication in conjunction with other therapies. PCPs only recommended CBT-I to 5.0% of patients; none of the encounter notes mentioned Internet CBT-I. We noted a statistically significant age disparity for patients being prescribed CBT-I; of the 10 patients who were recommended CBT-I, 9 patients were in the aged < 45 years group and only 1 was in the aged ≥ 45 years group.

The most commonly prescribed medications were antihistamines, Z-sedative hypnotics, benzodiazepines, and melatonin receptor agonists (**Table 6**). Patient notes may have mentioned the name of more than one medication prescribed for sleep. However, some patient notes indicated the use of a sleeping pill without specifying the medication name; in these situations, the medication was not counted into the frequencies. "Other" medication classes included nonsteroidal anti-inflammatory drugs, over-the-counter sleeping pills, and herbal Chinese medication.

Providers recommended good sleep hygiene practices (eg, having a consistent routine; having a bedroom that was quiet, dark, at a comfortable temperature, and free of electronics; avoiding large meals, caffeine, and alcohol before bedtime; being physically active during the day) to 31.5% of patients, 63.5% of whom were in the aged < 45 years group (**Figure 1**). Often, sleep hygiene was a discussion between the PCP and the patient about strategies the patient might use to improve sleep. This discussion was usually summarized as "sleep hygiene" within the note.

DISCUSSION

In this retrospective chart review of adults aged ≥18 years, we evaluated the type and extent of information collected from patients at their first PCP encounter for insomnia and the

Table 2—Characteristics of encounter notes/medical history (n = 200).

Characteristics of Encounter Notes/ Medical History	Total (n = 200), n (%)	Ages < 45 Years (n = 105)	Ages ≥ 45 Years (n = 95)	P Value
Insomnia symptoms				
Trouble falling asleep	58 (29.0)	32	26	.45
Unintentionally wake up early	47 (23.5)	23	24	.48
Nocturnal awakenings	44 (22.0)	25	18	.78
Urinating	2 (1.0)	1	1	.94
Difficulty breathing	6 (3.0)	5	1	.12
Pain	0 (0.0)	0	0	—
Anxiety	2 (1.0)	1	1	.94
Not specified/unknown	100 (50.0)	50	50	.57
Other	5 (2.5)	3	2	.73
Encounter notes/medical history addressed insomnia				.37
0%–50%	137 (68.5)	69	68	—
50%–100%	63 (31.5)	36	27	—
Past usage of medication for insomnia	73 (36.5)	40	33	.82

PCP encounter notes/medical history during patient's first encounter, including insomnia symptoms, percentage of medical history/encounter note that addressed insomnia, and past usage of medication for insomnia. PCP = primary care provider.

Table 3—Comorbid conditions (n = 200).

Condition	Possible Cause of Insomnia, n (%)	Ages < 45 Years (n = 105)	Ages ≥ 45 Years (n = 95)	P Value	Diagnosed Cause of Insomnia, n (%)	Ages < 45 Years (n = 105)	Ages ≥ 45 Years (n = 95)	P Value
Nasal/sinus allergies	21 (10.5)	11	10	.99	0 (0.0)	—	—	—
Gastrointestinal problems	26 (13.0)	12	14	.49	0 (0.0)	—	—	—
Arthritis	7 (3.5)	2	5	.20	0 (0.0)	—	—	—
Asthma	24 (12.0)	16	8	.14	1 (0.5)	0	1	.29
Neurologic conditions	24 (12.0)	17	7	.06	0 (0.0)	—	—	—
Chronic pain	2 (1.0)	1	1	.94	0 (0.0)	—	—	—
Low-back pain	14 (7.0)	6	8	.45	0 (0.0)	—	—	—
Sleep apnea	13 (6.5)	7	6	.92	0 (0.0)	—	—	—
Anxiety	53 (26.5)	32	21	.18	9 (4.5)	8	1	.03
Depression	39 (19.5)	25	14	.11	4 (2.0)	3	1	.36
Nocturia	3 (1.5)	1	2	.50	2 (1.0)	1	1	.94
Other	1 (0.5)	1	0	.34	38 (19.0)	16	22	.15
None of the above	76 (38.0)	31	45	.009	152 (76.0)	81	71	.69

Comorbid conditions of patients with insomnia that were documented as possible medical causes of insomnia (as mentioned in the progress notes) or a diagnosed medical cause of insomnia (as listed in the patient's chart). Comorbid condition was coded by the *International Classification of Diseases, Ninth Revision.*

therapies prescribed during this first encounter. In our sample, we found that the encounter notes generally had a paucity of patient symptom notations and details relevant to the insomnia diagnosis. In addition, we found that many patients had anxiety and depression in their past medical history, yet providers rarely made a link between these comorbidities and insomnia, especially in the older patients. Despite strong associations between insomnia and sleep apnea, patients with a high BMI were rarely screened for sleep apnea, and there was a similar paucity of

referral to sleep medicine providers. PCPs predominantly treated insomnia with medications, and we noted a trend that the older patients more commonly received a medication prescription.

Detailed features of insomnia (difficulty initiating sleep, frequent nocturnal awakenings, early-morning awakenings) were frequently (50%) missing in patient encounter notes. When specific insomnia symptoms were in the encounter notes, the frequency and/or severity of the symptoms were rarely detailed. Although primary care appointments are limited in

Table 4—Evaluation ordered/recommended by the provider (n = 200).

Evaluation Ordered/Recommended by PCP	Total (n = 200), n (%)	Ages < 45 Years (n = 105)	Ages ≥ 45 Years (n = 95)	P Value
Consult sleep provider	22 (11.0)	12	10	.84
Thyroid-stimulating hormone test	27 (13.5)	17	10	.24
Sleep diary	2 (1.0)	1	1	.94
Sleep study	17 (8.5)	11	6	.29
Actigraphy	0 (0.0)	0	0	—
No recommended evaluation	146 (73.0)	73	73	.32

Evaluations that were ordered/recommended by PCPs, including consult/referral to a sleep provider and further assessments (ie, thyroid-stimulating hormone test, sleep diary, sleep study, actigraphy), and no recommended evaluations by PCPs. PCP = primary care provider.

Table 5—Treatment options noted in record vs options recommended to patients (n = 200).

Treatment Options Noted	Total (n = 200), n (%)	Ages < 45 Years (n = 105)	Ages ≥ 45 Years (n = 95)	P Value	One Recommendation (n = 113), n (%)	Ages < 45 (n = 53)	Ages ≥ 45 (n = 60)	P Value
Sleeping pill	103 (51.5)	48	55	.09	65 (57.5)	27	38	.26
CBT-I	10 (5.0)	9	1	.01	0 (0.0)	—	—	—
Internet CBT-I	0 (0.0)	0	0	—	0 (0.0)	—	—	—
Sleep hygiene	63 (31.5)	40	23	.04	18 (15.9)	10	8	.59
Yoga	0 (0.0)	0	0	—	0 (0.0)	—	—	—
Exercise	8 (4.0)	5	3	.56	0 (0.0)	—	—	—
Meditation	5 (2.5)	3	2	.73	1 (0.9)	1	0	.95
Melatonin	30 (15.0)	16	14	.92	10 (8.8)	6	4	.59
Other	44 (7.0)	5	9	.19	19 (16.8)	9	10	.99

Treatment options noted by providers in the patient's record, the number of patients given these treatment options, and the number of patients given only 1 treatment recommendation. CBT-I = cognitive-behavioral therapy for insomnia.

Table 6—Frequencies of medication classes noted in record.

Medication Classes	n (%)
Antidepressant	3 (3.2)
Antihistamine	24 (25.5)
Benzodiazepine	15 (16.0)
Melatonin receptor agonist	13 (13.8)
Z-sedative hypnotic	19 (20.2)
Other	20 (21.3)

A patient record may have mentioned several medications. Patient notes may have indicated the use of a sleeping pill without specifying medication; for these patients, the medication was not counted into the frequencies. "Other" medication classes included nonsteroidal anti-inflammatory drugs, over-the-counter sleeping pills, and herbal Chinese medication.

time, averaging approximately 15 minutes for a face-to-face visit,[28] these details are critical because they impact treatment options. Furthermore, PCPs infrequently documented lifestyle factors known to affect sleep. For example, caffeine intake was rarely addressed during encounters. Caffeine is the most commonly consumed psychoactive substance; an estimated 85% of the U.S. population drinks at least 1 caffeinated beverage per day.[29,30] A recent systematic review of epidemiologic studies and randomized controlled trials found that "caffeine typically prolonged sleep latency, reduced total sleep time and sleep efficiency, and worsened perceived sleep quality."[31]

However, caffeine's effects on sleep may be overlooked by health care providers. Given the importance of good sleep for health and functioning, it may be worthwhile for health care providers to more routinely inquire and counsel patients about lifestyle factors (eg, caffeine intake) that may impact sleep as part of an insomnia evaluation.

To help screen for insomnia symptoms, PCPs should be encouraged to incorporate sleep-related questions into the review of symptoms. Brief screening tools, such as the Insomnia Severity Index, can aid in assessing insomnia symptoms and clinical severity. Sleep diaries are also readily available and can be helpful to have patients complete to longitudinally track sleep patterns. Increased education about insomnia for PCPs is crucial because they are ideally positioned to screen, treat, and refer patients with insomnia.

Anxiety and depression were the 2 most common comorbid conditions present in our sample of patients, yet these were rarely linked to insomnia. Extant literature suggests that 40% of individuals with insomnia have a coexisting mental health disorder.[32] Furthermore, insomnia is reported in 80% of patients with major depression and in 90% of patients with a concurrent anxiety disorder.[3] The relationship between insomnia and such comorbid conditions is important for PCPs to recognize given the potential bidirectional relationship among these disorders, treatment implications, and patient outcomes. For example, anxiety and depression can be a risk factor for insomnia; likewise, insomnia can be a risk factor for anxiety and depression.[33] In fact,

Figure 1—Number of recommendations for CBT-I, sleep hygiene, and sleeping pills for patients, and number of patients (*x* axis) who received recommendations for CBT-I, sleep hygiene, and sleeping pills.
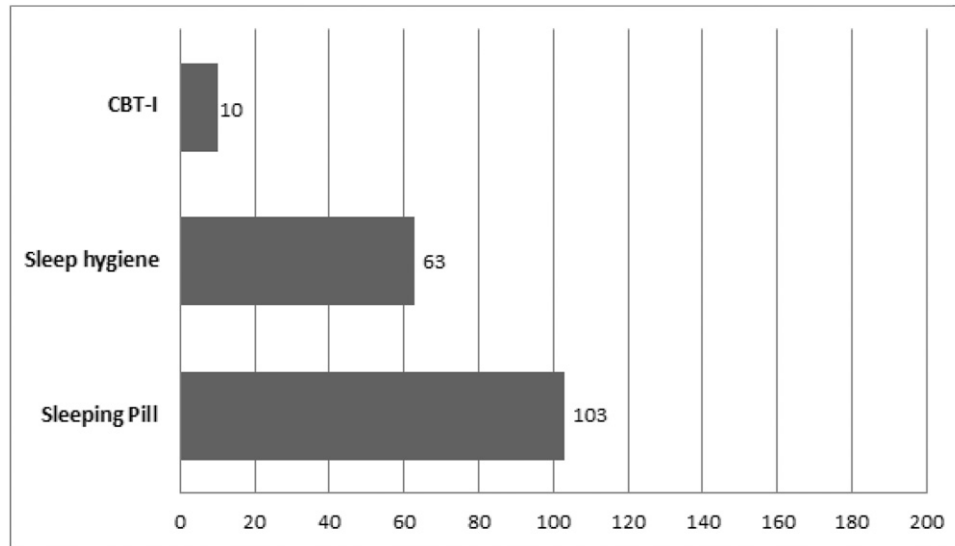
CBT-I = cognitive-behavioral therapy for insomnia.

insomnia increases the risk of developing depression by 2-fold.[34] This risk has crucial treatment implications because treatment should focus on both the insomnia and the comorbid condition for optimal outcomes.[14]

Patients with sleep apnea risk factors such as a high BMI were not screened for sleep apnea, despite its associations with insomnia. The majority (70.5%) of the patients in our sample were categorized as overweight or obese, yet sleep apnea was rarely considered as a possible diagnosis (6.5%). There is a known and complex relationship between obesity, sleep apnea, and insomnia. Given that obesity increases both the risk and severity of sleep apnea[35] and that sleep apnea is highly associated with insomnia (the prevalence of comorbid sleep-disordered breathing and insomnia is estimated to be as high as 54.9%),[15] we would expect the sleep apnea prevalence to be fairly high in our sample. Unfortunately, sleep apnea is often undiagnosed or missed; statistics suggest that 80% of patients with sleep apnea are undiagnosed.[36] Based on the prevalence of an elevated BMI in our sample, we would thus have expected a high rate of sleep study orders; however, < 10% of patients were recommended for a sleep study evaluation. Patients with sleep apnea frequently complain of insomnia symptoms; a sleep apnea diagnosis may be missed if the provider focuses on just the insomnia symptoms without pursuing further screening for sleep apnea.

Taken together, these results highlight the need for PCPs to consider obtaining a sleep study in patients with complaints of insomnia and in the event that sleep apnea is suspected as comorbid with insomnia (ie, the patient exhibits sleep apnea symptoms such as snoring, daytime sleepiness, and morning headaches), especially those who are at higher risk (eg, overweight or obese). Failing to detect underlying sleep apnea and focusing solely on insomnia treatment may be detrimental for a variety of reasons. First, hypnotic medications such as benzodiazepines can worsen sleep apnea and associated hypoxemia and contribute to respiratory depression.[37] In 1 study of > 900 adults who failed pharmacotherapy treatment for

insomnia, 78% were found to have undiagnosed sleep apnea.[38] In addition, untreated sleep apnea has a host of known negative consequences.[39] When sleep apnea and insomnia coexist, treatment should focus on both conditions, particularly combination therapy including CBT-I and sleep apnea treatment.[40]

As mentioned above, PCPs only recommended a consultation by a sleep specialist in 11% (22) of encounter notes, and 73% of encounter notes included no further evaluation of sleep, suggesting that the majority of insomnia care is managed by PCPs. Patients often present to their PCP with multiple chronic conditions, so in a time-constrained visit, insomnia may not be prioritized. Assessing insomnia symptoms and the related consequences requires substantial time, and PCPs are limited by competing demands. In addition, PCPs may not have a clear sense of when to refer patients to sleep specialists, or there may be a limited number of sleep specialists available.[41–45] Because insomnia treatments are usually initiated at a primary care visit, PCPs' attention to and knowledge of insomnia evaluation and treatment and the availability of sleep providers are critical. Underdiagnosis and failure to treat insomnia could perpetuate insomnia and negatively impact a patient's health and overall quality of life.

Interestingly, sleep characteristics or specific insomnia symptoms were not specified in approximately one-quarter (6/22) of the encounter notes that included sleep consultation. This finding could indicate that PCPs may not record details of a patient's sleep in an encounter note even though they realize that the symptoms are severe enough to warrant sleep specialist evaluation. This lack of documentation may result from time constraints in the office encounter, limiting the ability to transcribe the information or obtain the history.

PCPs preferentially prescribed sleep medication as the first treatment option for insomnia. Only in 5% of encounters did providers recommend CBT-I as a prescribing therapy for the patient; Internet CBT-I was never mentioned as a prescribing therapy.

Furthermore, 51.5% (103) of patients were prescribed a sleeping medication; of these patients, 57.5% (63) were given only a sleeping medication and no other treatment options. The American College of Physicians clinical practice guideline recommends prioritizing nonpharmacologic treatment methods[46]; CBT-I is recommended as the first-line treatment for chronic insomnia by the American Academy of Sleep Medicine,[14] and the American College of Physicians.[46] CBT-I has been shown to be a more effective treatment for insomnia when compared with hypnotic medications.[13] Moreover, in contrast to hypnotic medications, the benefits of CBT-I seem to last several months after treatment completion.[12] Furthermore, CBT-I has been shown to be effective in improving insomnia symptoms in patients with comorbid medical and psychiatric conditions, even having a positive impact on comorbid conditions.[47] Unlike CBT-I, hypnotic medications for insomnia can be associated with several disadvantages, including adverse effects, drug-drug interactions, habituation, and dependency.[48] Therefore, PCPs should consider CBT-I as the first-line treatment for both primary and comorbid insomnia. With the rise of Internet CBT-I programs and results showing improvements in insomnia symptoms,[49] PCPs should also consider Internet CBT-I as a treatment option for insomnia to meet population needs.

Younger patients in our study were more likely to be prescribed CBT-I and sleep hygiene, whereas older patients were more likely to be prescribed sleeping medication. However, there are often adverse effects associated with the most commonly prescribed sleep medications, despite evidence suggesting a reduction in sleep onset latency. Antihistamines such as diphenhydramine can result in anticholinergic effects like blurred vision, dizziness, difficulty urinating, dry mouth, and constipation.[48] Benzodiazepines and Z-sedative hypnotics can result in rebound insomnia, residual daytime sedation, motor incoordination, cognitive impairment, and increased risk of falls in older adults, and prolonged use can lead to tolerance and dependence.[48] Potential adverse effects of melatonin receptor agonists include gastrointestinal disturbances and headache, somnolence, and fatigue.[48] It is also unclear whether there are generational preferences related to medications and counseling; this issue may be a topic for future research.[50] Given that CBT-I typically requires frequent outpatient visits, it is possible that these visits may be difficult for older adults to attend because of mobility limitations.

Limitations

We acknowledge that an encounter note is not a transcription of PCP visits; thus, more information could have been discussed with the patient than was documented in the record. The amount of information recorded in each encounter note could be a reflection of individual PCP preferences for documentation. Nonetheless, these weaknesses highlight a problem with standardizing encounter notes, suggesting a larger, more general issue with encounter notes. Furthermore, although we abstracted PCP demographic information and data were drawn from 49 clinic sites serving diverse socioeconomic levels, these sites were affiliated with 1 large university medical center based in a northeastern region of the United States and in a predominantly urban environment, so the findings may not be generalizable to more rural settings, other types of health systems (such as the Veterans Affairs system), or other countries. In addition,

we acknowledge that we looked only at the first encounter, to examine initial insomnia assessment and management strategies. Future research is necessary in a larger sample to examine later encounters to see whether rates of referrals to sleep clinics and CBT-I are increased.

CONCLUSIONS

PCPs are the first providers who evaluate, diagnose, and treat insomnia in most patients. In our review of initial insomnia encounter progress notes, the majority of patients did not complete sleep diaries to guide the diagnosis and management of insomnia, were not screened for sleep apnea, and were not referred to sleep specialists. The majority of PCPs prescribed sleeping medication and sleep hygiene for insomnia. CBT-I was rarely recommended, and Internet CBT-I was never mentioned. Moreover, despite literature showing the association between comorbid conditions and insomnia, very few of the encounter notes documented a possible link between the comorbid conditions with insomnia. Overall, these findings help reveal important priorities for public health and provider education strategies around the effective evaluation and management of insomnia.

ABBREVIATIONS

BMI, body mass index
CBT-I, cognitive-behavioral therapy for insomnia
PCP, primary care provider

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DISCLOSURE STATEMENT

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