Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

A CROSS-SECTIONAL ANALYSIS OF SEDATIVES USAGE AND PRESCRIBING PATTERNS AMONGST THE WORKING POPULATION DIAGNOSED WITH INSOMNIA IN CHINA

WANG SHICONG
Research Scholar, Lincoln University College, Malaysia.

ZHAO NAI RU
Research Scholar, Lincoln University College, Malaysia.

ABED AL-ABED
Associate Professor of Lincoln University College, Department of Community Medicine, Malaysia.

Dr. SANDEEP SHRESTHA
Professor of Lincoln University College Malaysia.

Abstract

The purpose of this research was to investigate recent tendencies regarding the utilization of healthcare services and the consumption of prescribed medications by patients who suffer from sleeplessness. Between January 2010 and December 2016, we analyzed the data from the National Patient Sample that was provided by the Health Insurance Review and Assessment Service in order to establish the healthcare utilization of patients who had been identified with sleeplessness (International Classification of Diseases-10 codes G470, F510). During the course of the research conducted over a period of seven years, there were 87,470 individuals who participated in this study and received medical treatment on at least one occasion. Comorbidities, socioeconomic statistics, and patterns in healthcare utilization were analyzed. Patterns in healthcare utilization included Korean and Western medicine (KM and WM, respectively) treatments utilised. Each year, there was an increase in the number of individuals requesting treatment for sleeplessness at WM or KM. 73% of the patients in the sample were adults older than 45 years old, and the number of female patients outnumbered the male patients. The most frequent treatment for KM was acupuncture, which accounted for 65.29 percent of all cases, while the most common treatment for WM was examination (49.31 percent of all cases). Sedatives and hypnotics were used the most frequently in pharmacological treatment (41.08 percent), followed by antianxiety medications (19.50 percent), and then medicines related to the digestive system and metabolism (7.77 percent). In the WM population, the most prevalent complications were mental health disorders (50.56%), whereas in the KM population, musculoskeletal illnesses (35.67%) were the most common. Code G470 was utilised more frequently than code F510, and the distinction between the two was more noticeable in KM than it was in WM. Both medical practitioners and academic researchers will benefit greatly from the discoveries that were found.

Keywords: Analysis, Sedatives, Prescribing, Patterns

INTRODUCTION

Insomnia is a very prevalent condition, and intermittent short-term insomnia impacts approximately 30–50% of the total population. Insomnia is defined as the persistence of symptoms such as difficulty commencing or maintaining sleep or early-morning awakening at least three times a week for 3 months. Insomnia is defined as the persistence of symptoms such as difficulty initiating or maintaining sleep or early-morning

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

waking at least three times a week for 3 months. A study conducted in the United States (US) and the United Kingdom (UK) found that the prevalence of acute insomnia was 9.5% and 7.9%, respectively, with an annual incidence of 31.2–36.6% A study conducted in Korea found that one in five adults develop insomnia The prevalence of insomnia also increases with age; approximately 50% of older adults have difficulty initiating or maintaining sleep Insomnia can cause severe pain and injury in the body, as well as fatigue, daytime sleepiness, cognitive impairment, and mood disorders. Sleep deprivation can result in a deterioration of the overall quality of life, characterized by depression and poor work performance, and chronic insomnia can increase mortality by activating the body's fight-or-flight response.

Cognitive behavioural therapy for insomnia (CBT-I) is suggested as the first-line treatment for adult chronic insomnia by the American College of Physicians clinical practice guidelines (2016), the European Sleep Research Society clinical practice guidelines (2017), and the American Academy of Sleep Medicine guidelines for the assessment and treatment of adult chronic insomnia. The goal of insomnia treatment is to improve sleep and reduce any resultant suffering or functional impairments. It is recommended that pharmacological treatment should not be continued for longer than four weeks. Appropriate amounts of medications are administered individually in the treatment of adult sleep initiation and sleep maintenance difficulties. In Korea, zolpidem, triazolam, and ramelteon are some of the medications that are used to induce sleep. Other medications, such as eszopiclone, doxepin, trazodone, suvorexant, and zolpidem controlled-release, are used to maintain slumber or rouse people up early in the morning. (CR)

The degree to which a patient is able to ameliorate their symptoms after receiving medication for sleeplessness varies from patient to patient. An insomnia persistence rate of 40–69% over a period of 1–20 years suggests that chronic insomnia can be a substantial financial burden on society. According to a report by the World Health Organization, insomnia is ranked eleventh on the list of mental, neurological, and substance-use disorders with the greatest disease burden worldwide. A study conducted in 2010 in Europe compared the direct and indirect costs of various brain diseases, and insomnia was ranked as the ninth most expensive of those diseases. According to various reports, the direct and secondary costs associated with sleeplessness in the United States are estimated to be between 2 and 16 billion dollars and between 75 and 100 billion dollars, respectively. However, particular projections can differ greatly depending on the methodology used.

The majority of the secondary expenses were expended as a result of absenteeism, presenteeism (decreased workday productivity), and professional incidents among the workforce. A Health Insurance Review and Assessment Service (HIRA) report showed that the number of patients being treated for insomnia increased from 405,000 in 2015 to 633,000 in 2019, with the total amount of covered health benefits increasing from 38.7 billion KRW in 2012 to 66.7 billion KRW in 2016. A Korean epidemiology study on sleep disorders reported that 22.8% of 5000 adults had insomnia. In addition, the study found that the number of patients being treated for insomnia increased from 405,000 in 2015 to

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

633,000 in 2019. An analysis of the most recent tendencies in the treatment of insomnia is necessary due to the rising incidence of sleeplessness and the associated high direct and indirect medical expenses. As was indicated earlier, the recommendations for therapeutic practice in the West prescribe cognitive behavioural therapy for insomnia (CBT-I) followed by pharmacological treatment for sleeplessness. However, there are limitations in the practical implementation of CBT-I, and prescription concordance is low among patients because of concerns regarding the development of tolerance and dependence, as well as deleterious drug responses with protracted use, such as disturbances in the natural flow of slumber. As a consequence of this, alternative therapies are sometimes utilised in the treatment of sleeplessness. Some of the more common alternative therapies include acupuncture therapy, exercise therapy, and phototherapy. Investigation into these non-mainstream treatments is still going on. In one study that looked at the short-term benefits of acupuncture on sleep quality, the researchers found that acupuncture led to significant improvements in both the quality and quantity of sleep when compared with a placebo treatment.

When compared to psychotherapies, the expense of acupuncture treatment is significantly lower, it does not require a significant amount of time, and it can be modified according to the specific condition being treated. Patients who suffer from sleeplessness and are enrolled in the healthcare system of South Korea, which is a bimodal system, have the choice of receiving reimbursed treatment at institutions that practise Western medicine (WM) or Korean medicine (KM). Acupuncture, moxibustion, suction therapy, botanical medicine, and KM psychoanalysis are all forms of treatment that are utilised in KM. Patients in Korea have the ability to receive treatment for both WM and KM at the same time.

As a result, there may be disparities in the constraints of these treatments as well as their socioeconomic impact in Korea in comparison to other countries. This emphasises the need for studies that take into consideration both WM and KM treatments. Previous research predominantly focused on analysing the changing patterns of treatment for WM, with a particular emphasis on determining the nature of the association between sleeplessness and a specific variable, such as gender, age, or the type of pharmacological treatment received.

Using data from the Health Insurance Review and Assessment (HIRA) from 2010 to 2016, the purpose of this research was to investigate the characteristics of sleeplessness patients, as well as the availability of WM and KM services, the utilisation of these services, medical expenses, and complications, and to analyse the patterns relating to these factors. The data from the HIRA-National Patient Sample (NPS) are statistics that are representative of the entire country and allow for a comparison of the utilisation of WM and KM by patients who have sleeplessness. Our eventual goal was to provide physicians, researchers, and policymakers with dependable foundational data so that they could contribute to the development of successful healthcare policies.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

OBECTIVE OF THE STUDY

1. To do research on insomnia, this is described as the continuation of symptomatology.
2. To conduct research on the current state of healthcare consumption, as well as Korean and Western medicine

RESEARCH METHODOLOGY

We utilised the data that was collected by the HIRA-NPS from January 2010 all the way through December 2016, using data in which the neuropsychological illness identifiers were left unidentified. The data that make up HIRA are insurance claims data, and they are generated each time a healthcare practitioner submits a claim for the purpose of being reimbursed for the expenses of providing healthcare to a patient. Because more than 98% of the population in Korea is covered by national health insurance, these data are nationally representative and, as a result, extremely valuable for healthcare research. These data provide detailed information on a variety of factors, including the following: specifics of care (for example, treatment, and procedure, test, and drug prescriptions), diagnosis, cost covered by the insurer, patient's out-of-pocket cost, patient's demographic information, and information on the healthcare facility.

The HIRA-NPS collects data on claims submitted by patients who were chosen at random from the total population at a rate of 3% (approximately 1,375,842 as of 2011), and the data are then stratified according to gender (two different groups) and age. (16 strata). The dataset is analysed under the presumption that there is a very low probability of duplicating patients because only a small proportion of the patients are included each year. These are secondary data that were selected from the original data after information regarding individuals and legal organisations had been removed; the data comprise yearly claims that make reference to the first day of treatment of the corresponding year.

The International Classification of Diseases, Tenth Revision (ICD-10) codes that are used for the diagnosis of insomnia are F codes (psychiatry) and G codes (neurology). The ICD-10 codes that are most commonly used for diagnosing insomnia are as follows: F510 (nonorganic insomnia), F518 (other nonorganic sleep disorders), F519 (nonorganic sleep disorder, unspecified), F519A (emotional sleep disorder not otherwise specified), G470 ((sleep disorder, unspecified).

Patients were only considered for inclusion in this research if they had received WM or KM treatment at least once between the years 2010 and 2016 and had the diagnostic number F510 (nonorganic insomnia) or G470 (disorders of commencing and maintaining sleep, insomnias) as the primary diagnosis. These parameters were taken from previous research that was conducted in Korea.

Cases with a code for dentistry or public health facility (6167 cases); cases with the type of institution listed as a dental hospital, maternity clinic, or public health facility (225 cases); cases of patients diagnosed with a cancer-related code during the observation

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

period (76,262 cases); or cases with the total cost and number of days in care entered as 0 or missing were found among the claims submitted with Korean Standard Classification of Diseases (KCD) codes F510 or G470. The utilization of general medical services by patients suffering from sleeplessness was analyzed according to the nature of their visits year by year. The patients whose data were selected for the analysis were categorized based on baseline characteristics such as age, sex, insurer type, type of visit, and medical institution, as well as the frequency and proportion of each parameter.

These classifications were used to select the patients whose data were used for the analysis. Age was broken down into eight subcategories based on 10-year increments, ranging from less than 15 years old to more than 75 years old, and recipient type was broken down into health insurance, Medicaid, and other classifications. On the basis of the claim, the sort of contact was categorized as either ambulatory treatment or intensive care, and the medical establishment was broken down into tertiary hospital/general hospital/hospital, clinic, KM hospital, and KM clinic.

The HIRA-NPS database includes a service category that was separated into several subcategories, including examination fee, injection fee, KM treatment fee, psychotherapy fee, hospitalization, radiographic diagnostic, test, treatment/surgery fee, and others. The incidence of each category as well as its overall cost was analyzed. We conducted an investigation into instances of acupuncture (acupoint, special acupoint, zone, and device), a form of treatment in which needles are inserted into acupoints based on the identification of KM patterns; these cases were classified as KM treatments. The patient's out-of-pocket expenditures and those paid by their provider, which are covered by the National Health Insurance Service, were added together to arrive at the total cost of treatment. This was referred to as the "total expense."

In order to conduct an analysis, the service numbers for the management of insomnia-related conditions were separated into WM and KM. Analyses were performed on the number of services offered, total expenditures, number of patients, average yearly cost per service, and average annual cost per patient for psychotherapies in WM, as well as on acupuncture, moxibustion, cupping treatment, and psychotherapies in KM. Psychotherapies in KM were separated into four distinct categories (a. Gyeongja-pyeongji therapy, b. Oji-sangseung therapy, c. Ijeong-byeongi therapy, and d. Jieon-goron therapy). The most distinguishing feature of the psychotherapy in KM is its theoretical basis, more specifically theories in Korean Medicine in understanding emotions and psychological disorders.

This can be broken down into two distinct explanations: the first is that we classified inpatient and outpatient medication prescriptions according to the anatomical therapeutic chemical classification codes, making reference to the classification standards established by the Ministry of Health and Welfare, and then we analysed the incidence and costs associated with each category. Because it is not typically covered by health insurance, prepared natural medication was not included. Comorbidities of sleeplessness were examined in a manner that was distinct from that of WM and KM for each of the major and sub-diagnosis codes, which included F510 and G470. Among the codes for

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

sleeplessness, those corresponding to the ICD codes F510 and G470 were analysed independently for WM and KM in order to determine the total number of claims associated with each of these codes as well as the proportion of claims that were associated with each of these codes.

An Examination of the Statistics

To determine whether or not the yearly pattern in general medical use was statistically significant in each category, we employed a multivariate linear regression model to conduct our analysis. The fundamental characteristics of the patients are broken down into two categories: the total number of patients and the percentage of those patients. The regularity of each service category as well as the costs associated with each prescription category was analysed. Each visit was classified as either inpatient or outpatient treatment, and the various kinds of medical organisations were used to group the facilities.

The number of instances was further broken down into the various subcategories of sleeplessness represented by the illness codes F510 and G470. The various kinds of interventions were classified in order to examine the incidence and overall costs. The comorbidities of each patient were classified according to the first level, and the distribution of comorbidities was displayed in terms of the number of patients as well as the percentages. The ATC numbers were used to classify each and every prescription. The presentation of general medical services included the number of patients, the number of cases, the total expenditures, the yearly expenses, and the number of annual appointments received by each patient on an annual basis.

The investigation focused on determining the typical log change, expressed as a growth rate, for each division. The total cost numbers were then modified using the consumer price index for the healthcare and medical industry of the corresponding year after being transformed to USD based on the average exchange rate from KRW to USD for the year 2020. The results of the analysis were produced using SAS software.

DATA / ANALYSIS

The Cost of Healthcare

From 2010 to 2016, a total of 426,232 claims were filed using the ICD-10 codes F510 or G470 for sleeplessness as the primary diagnostic. These numbers represent a significant increase from the previous decade. In total, 339,492 claims representing 87,470 individuals were chosen from these for the purpose of investigation in this research.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

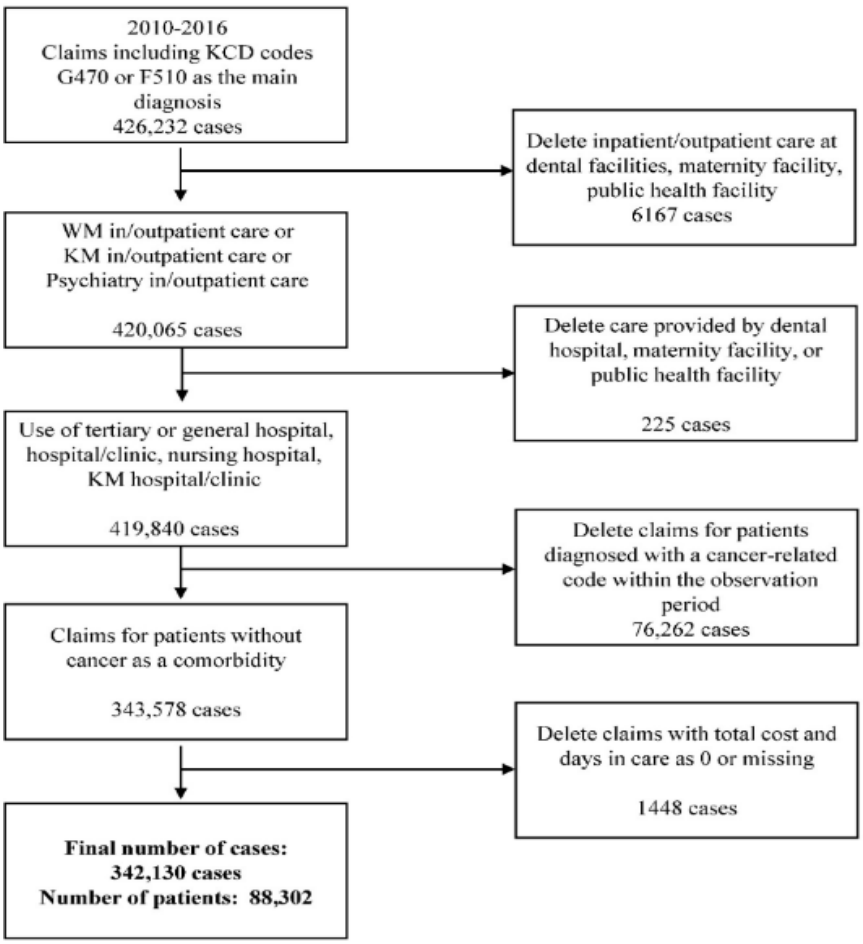

Figure 1: Diagrammatic representation of the study's sample flow. WM stands for western medicine, while KM refers to Korean medicine. KCD stands for the Korean Standard Classification of Diseases

As demonstrated by the fact that there was a total of 9881 patients who sought medical attention for insomnia in the year 2010, with 1303 patients visiting a KM facility and 8578 patients visiting a WM facility; in comparison, there were a total of 15,362 patients who sought medical attention for insomnia in the year 2016, with 1826 patients visiting a KM facility and 13,536 patients visiting a WM facility. According to this finding, the number of patients requesting medical treatment for sleeplessness increased annually over the course of the study's seven-year duration (p-value 0.0001), which demonstrates that the prevalence of insomnia is increasing. While the overall number of patients seeking treatment for WM has shown a trend towards growth over the years, the number of patients seeking treatment for KM has not significantly increased. The overall cost of treatment in WM continued to climb at a steady pace year after year, while in KM it rose by a more modest amount each year. The typical cost of providing medical treatment to a patient in KM remained the same over the course of the seven-year timeframe, whereas in WM it rose each year, with the exception of 2011. However, the yearly changes for KM

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

were not consistent, and the average cost of care in KM was greater than the average cost of care in WM. While the average expenditure per case has typically increased continuously over the years for WM, the annual changes for KM were inconsistent. The number of patients who visited healthcare facilities remained relatively constant throughout the course of the research, with the number of patients who visited KM facilities being approximately twice as high as those who visited WM facilities.

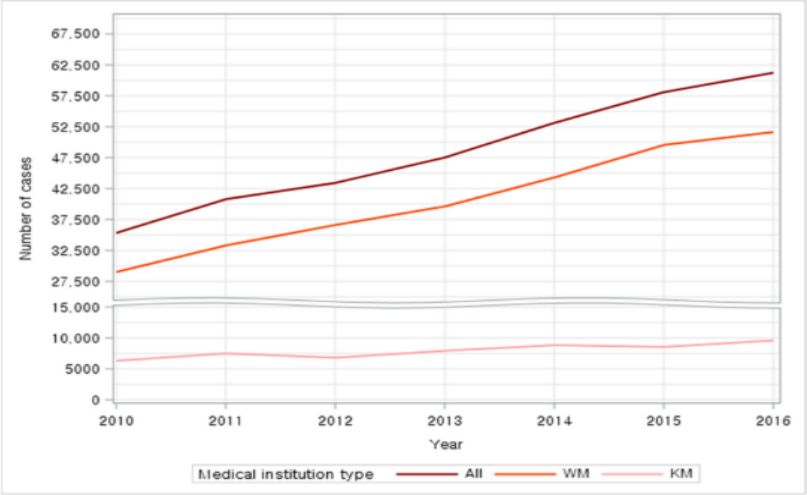

Figure 2: Utilization of general medical services for the treatment of insomnia: the number of instances; WM stands for Western medicine, whereas KM refers to Korean medicine

Category	Type of Visit	Year							*p*-Value *
		2010	2011	2012	2013	2014	2015	2016	
No. of patients	Total	9881	11,303	11,649	12,471	13,618	14,897	15,362	<0.0001
	WM	8578	9858	10,303	11,020	11,997	13,199	13,536	<0.0001
	KM	1303	1445	1346	1451	1621	1698	1826	0.0016
No. of cases	Total	35,328	40,778	43,413	47,523	53,124	58,091	61,235	<0.0001
	WM	29,002	33,292	36,608	39,611	44,287	49,546	51,642	<0.0001
	KM	6326	7486	6805	7912	8837	8545	9593	0.0022
Total expense	Total	$529,941	$699,089	$728,091	$890,754	$1,032,866	$1,129,685	$1,143,220	<0.0001
	WM	$442,862	$586,277	$626,568	$761,495	$873,214	$979,806	$978,872	<0.0001
	KM	$87,079	$112,812	$101,523	$129,259	$159,652	$149,879	$164,348	0.0019
Per-patient	Total	$53.63	$61.85	$62.50	$71.43	$75.85	$75.83	$74.42	0.0030
	WM	$51.63	$59.47	$60.81	$69.10	$72.79	$74.23	$72.32	0.0021
	KM	$66.83	$78.07	$75.43	$89.08	$98.49	$88.27	$90.00	0.0269
Per-case expense	Total	$15.00	$17.14	$16.77	$18.74	$19.44	$19.45	$18.67	0.0140
	WM	$15.27	$17.61	$17.12	$19.22	$19.72	$19.78	$18.95	0.0190
	KM	$13.77	$15.07	$14.92	$16.34	$18.07	$17.54	$17.13	0.0076
Total care	Total	141,791	188,944	210,626	230,259	267,531	297,266	286,923	0.0002
	WM	134,732	180,738	202,962	221,534	257,775	287,662	276,514	0.0003
	KM	7059	8206	7664	8725	9756	9604	10,409	0.0010
	Total	24.15	29.38	29.09	29.73	32.78	33.51	30.13	0.0478

Table 1: General medical service use for patients with insomnia

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

Characteristics at the Starting Point and Healthcare Utilization

According to the findings in, more female patients (62.38%) sought medical treatment for sleeplessness than male patients (37.62%) did. The majority of patients were either middle aged or elderly, with the greatest proportion of patients being between the ages of 55 and 64 (19.60%), followed by those between the ages of 45 and 54 (19.40%), 65 to 74 (18.74%), and over 75 (15.25%). The vast majority of patients (n = 76,780, 88%) only sought treatment through WM, whereas only 8979 patients utilised KM and 1711 patients utilised both WM and KM. Patients who only utilised KM had a similar age distribution to those who only utilised WM (55–64 years, 21.97%; 45–54 years, 20.84%; 65–74 years, 18.90%). Patients who only utilised WM had a similar age distribution to those who only utilized WM (45–54 years, 19.19%; 65–74 years, 18.59%). The primary age distribution of patients who utilized both KM and WM looked like this: 55–64 years old (25.07%), 65–74 years old (24.49%), and 45–54 years old (21.57%). The percentages of male and female patients seeking only WM treatment were 38.96% and 61.04%, respectively, while the percentages of male and female patients seeking only KM treatment were 27.36% and 72.64%, respectively. This suggests that a greater proportion of female patients requested KM treatment than WM treatment. The percentage of male patients requesting both KM and WM treatment was 31.39%, while the percentage of female patients seeking care was 68.61%. This demonstrates that a greater proportion of women requested care than males did. Health insurance was the most common form of recipient, accounting for 92.95% of all payments, followed by Medicaid, which accounted for 6.93%. Demonstrates the regularity as well as the proportion of the utilization of outpatient/inpatient treatment as well as the degree of the healthcare institution for KM and WM.

		Total		Western Medicine		Korean Medicine		Both Medicines	
		No. of Patients	%	No. of Patients	%	No. of Patients	%	No. of Patients	%
Age	<15 years	359	0.41	85	0.11	273	3.04	1	0.06
	15–24	3108	3.55	2614	3.40	468	5.21	26	1.52
	25–34	8566	9.79	7647	9.96	825	9.19	94	5.49
	35–44	11,596	13.26	10,301	13.42	1140	12.70	155	9.06
	45–54	16,971	19.40	14,731	19.19	1871	20.84	369	21.57
	55–64	17,142	19.60	14,740	19.20	1973	21.97	429	25.07
	65–74	16,392	18.74	14,276	18.59	1697	18.90	419	24.49
	≥75 years	13,336	15.25	12,386	16.13	732	8.15	218	12.74
Sex	Male	32,909	37.62	29,915	38.96	2457	27.36	537	31.39
	Female	54,561	62.38	46,865	61.04	6522	72.64	1174	68.61
Payer type *	NHI	81,302	92.95	71,080	92.58	8605	95.83	1617	94.51
	Medicaid	6064	6.93	5597	7.29	374	4.17	93	5.44
	Others	104	0.12	103	0.13	-	-	1	0.06

Table 2: Basic Characteristics of Patients

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

Cases treated and dollars spent on medical care broken down by category

Examination was the most frequently practised category, accounting for 45.33 percent of all services (531,353 total), followed by pharmaceutical administration (287,899 total services), KM treatment (147,832 total services), and psychoanalysis (82,426 total services), respectively. Examination was the category that was performed the most frequently in WM (466,399 services, 49.31%), followed by the administration of prescription (276,114 services, 29.19%) and psychoanalysis (82,426 services, 8.72%). The category that was practised the most frequently in KM was treatment, which accounted for 147,832 services (65.29%), followed by examination, which accounted for 64,954 services (28.69%).

Service Category	Total				Western Medicine				Korean Medicine			
	No. of Services	%	Expenses	%	No. of Services	%	Expenses	%	No. of Services	%	Expenses	%
Examination	531,353	45.33	$3,508,362	52.84	466,399	49.31	$3,082,432	54.61	64,954	28.69	$425,930	42.79
Medication administration	287,899	24.56	$702,345	10.58	276,114	29.19	$684,515	12.13	11,785	5.20	$17,830	1.79
KM treatment	147,832	12.61	$523,799	7.89	-	-	-	-	147,832	65.29	$523,799	52.62
Psychotherapy	82,426	7.03	$1,216,909	18.33	82,426	8.72	$1,216,909	21.56	-	-	-	-
Test	59,587	5.08	$248,335	3.74	59,587	6.30	$248,335	4.40	-	-	-	-
Injection	39,101	3.34	$52,208	0.79	39,101	4.13	$52,208	0.93	-	-	-	-
Treatment/surgery	15,959	1.36	$48,490	0.73	15,959	1.69	$48,490	0.86	-	-	-	-
Diagnostic radiology	3965	0.34	$39,915	0.60	2715	0.29	$34,137	0.60	1250	0.55	$5778	0.58
Hospitalization	2874	0.25	$280,292	4.22	2638	0.28	$259,955	4.61	236	0.10	$20,337	2.04
Other *	1205	0.10	$18,662	0.28	843	0.09	$16,987	0.30	362	0.16	$1675	0.17

Table 3: Number of medical services and medical expenses per category

Examining the patient resulted in the highest overall cost during the seven-year timeframe (3,508,362 USD, 52.84%), followed by psychoanalysis (1,216,909 USD, 18.33%) and pharmaceutical administration (702,345 USD, 10.58%) respectively. In WM, the categories that contributed the most to the overall costs were examination (3,082,432 USD, 54.61%), psychotherapy (1,216,909 USD, 21.56%), and medication administration (684,515 USD, 12.13%). In KM, the categories that contributed the most to the overall costs were KM treatment (523,799 USD, 52.62%) and examination (425,930 USD, 42.79%).

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

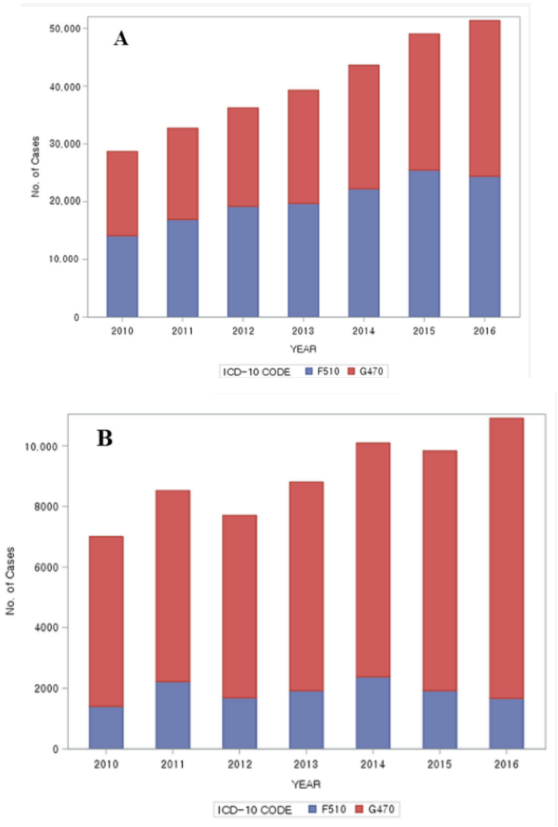

Figure 3: Number of cases per ICD-10 code F510, G470; (A): Western medicine; (B): Korean medicine. ICD-10 = International Classification of Diseases, Tenth Revision

CONCLUSION

By analyzing the data from the HIRA-NPS, we were able to demonstrate in this research the overall patterns in the management of sleeplessness in Korea. These trends included the different kinds of medications, the expense of care, and the complications. The fact that the yearly number of patients who sought treatment at a primary care institution for sleeplessness increased at the same rate as the expense of care is indicative of the growing significance of accurately identifying insomnia in the clinical setting. In addition, a comprehensive analysis of the utilization of pharmacological and non-pharmacological interventions across the board is conducted to represent current practices in Korea. Despite the fact that psychoanalysis is recommended for the treatment of sleeplessness ahead of the prescription of medications like hypnotics and sedatives, there are a number of obstacles, such as the expense and the practical implementation. As a result, we wish to bring attention to the necessity of supplementing psychotherapies with an emphasis on therapeutic utilization, of formulating criteria to prevent the protracted use of medications, and of formulating measures to ameliorate deleterious responses. In addition, the use of KM for the treatment of sleeplessness is analysed and addressed,

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 56 Issue: 05:2023
DOI10.17605/OSF.IO/KNCEH

which calls for additional research regarding the therapeutic efficacy of this treatment. The conclusions of this study will be helpful as a cornerstone for further research into the conventional medications for sleeplessness as well as the expenses of care.

References

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*; American Psychiatric Pub: Washington DC, USA, 2013.
2. Ellis, J.G.; Perlis, M.L.; Neale, L.F.; Espie, C.A.; Bastien, C.H. The natural history of insomnia: Focus on prevalence and incidence of acute insomnia. *J. Psychiatr. Res.* **2012**, *46*, 1278–1285.
3. Cho, Y.W.; Shin, W.C.; Yun, C.H.; Hong, S.B.; Kim, J.; Earley, C.J. Epidemiology of insomnia in Korean adults: Prevalence and associated factors. *J. Clin. Neurol.* **2009**, *5*, 20–23.
4. Crowley, K. Sleep and sleep disorders in older adults. *Neuropsychol. Rev.* **2011**, *21*, 41–53.
5. Kim, K.W.; Kang, S.-H.; Yoon, I.-Y.; Lee, S.D.; Ju, G.; Han, J.W.; Kim, T.H.; Lee, C.S.; Kim, T. Prevalence and clinical characteristics of insomnia and its subtypes in the Korean elderly. *Arch. Gerontol. Geriatr.* **2017**, *68*, 68–75.
6. Levenson, J.C.; Kay, D.B.; Buysse, D.J. The pathophysiology of insomnia. *Chest* **2015**, *147*, 1179–1192
7. Patel, D.; Steinberg, J.; Patel, P. Insomnia in the elderly: A review. *J. Clin. Sleep Med.* **2018**, *14*, 1017–1024.
8. Bhaskar, S.; Hemavathy, D.; Prasad, S. Prevalence of chronic insomnia in adult patients and its correlation with medical comorbidities. *J. Fam. Med. Prim. Care* **2016**, *5*, 780.
9. Parthasarathy, S.; Vasquez, M.M.; Halonen, M.; Bootzin, R.; Quan, S.F.; Martinez, F.D.; Guerra, S. Persistent insomnia is associated with mortality risk. *Am. J. Med.* **2015**, *128*, 268–275.e2.
10. Qaseem, A.; Kansagara, D.; Forciea, M.A.; Cooke, M.; Denberg, T.D. Management of chronic insomnia disorder in adults: A clinical practice guideline from the American College of Physicians. *Ann. Intern. Med.* **2016**, *165*, 125–133. [
11. Riemann, D.; Baglioni, C.; Bassetti, C.; Bjorvatn, B.; DolencGroselj, L.; Ellis, J.G.; Espie, C.A.; Garcia-Borreguero, D.; Gjerstad, M.; Gonçalves, M. European guideline for the diagnosis and treatment of insomnia. *J. Sleep Res.* **2017**, *26*, 675–700.
12. Schutte-Rodin, S.; Broch, L.; Buysse, D.; Dorsey, C.; Sateia, M. Clinical guideline for the evaluation and management of chronic insomnia in adults. *J. Clin. Sleep Med.* **2008**, *4*, 487–504.