



ORIGINAL ARTICLE

A Study on the Characteristics of Infrequent and Frequent Outpatients Visiting Korean Traditional Medical Facilities

Jinwon Yoon^a, Haemo Park^b, Chaeshin Chu^c, Sung-Yong Choi^d,
Kibum Lee^b, Sundong Lee^{b,*}

^aGraduate School of Public Health, Seoul National University, Korea.

^bDepartment of Preventive Medicine, College of Korean Medicine, Sangji University, Korea.

^cDivision of Epidemic Intelligence Service, Korea Centers for Disease Control and Prevention, Korea.

^dDepartment of Preventive Medicine, College of Medicine, Hanyang University, Korea.

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Abstract

Objectives: This study was intended to analyze the characteristics of infrequent and frequent outpatients visiting Korean medical facilities, and find the related variables of frequent users.

Methods: The data source was the Report on the Usage and Consumption of Korean Medicine (2011) published by the Ministry of Health and Welfare and Korea Institute for Health and Social Affairs. We analyzed outpatient data using SAS 9.2.

Results: As much as 46.6% of the patients used Korean medical services over 11 times in 3 months. The proportion of frequent users increased depending on age, and their proportion was high in the low-income and low-education group. People with musculoskeletal disease, stroke, hypertension, and obesity were more likely to use Korean medical services. In general, patients were satisfied with their treatment, with frequent outpatients being more satisfied than infrequent outpatients. In logistic regression analysis, age and musculoskeletal disease were significant determinants of frequency of use of Korean medical services.

Conclusion: Age, musculoskeletal disease, and specific diseases were highly associated with frequent Korean medical utilization.

1. Introduction

It is well-known that the major factors that affect the usage of medical facilities are health insurance,

education, private health insurance, disease, treatment rate, and satisfaction [1–6]. In addition to these factors, Korea has a unique situation in which consumers can choose between two competing medical facilities

*Corresponding author.

E-mail: sdlee@sangji.ac.kr (S. Lee).

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available, namely, Korean Traditional Medicine (KTM) and Western medicine. The two facilities are thoroughly divided and undergo differential application of health insurance by disease, treatment methods, and the amount of medical expenditure, so that the consumers can choose either facility with consideration of these factors. Chronic illness is characterized by the need for long-term treatments, and thus, health insurance and medical expenses can be a major factor according to the economic status of the consumer.

KTM involves applying a unique life aspect and medical theories to the treatment and is known to be comprehensive, accessed as the primary facility, and effective for treating chronic and geriatric illness. The use of KTM is known to be characterized by culture, religion, race, sex, region, and diseases [7,8]. Previous studies have shown that women, elderly individuals, low-income, more-educated, married, patients with musculoskeletal diseases (e.g., arthritis, backache, and frozen shoulders), stroke, gastroenteric troubles, and tonic medicine takers are more likely to use KTM [9–11]. The major reasons why they use KTM facilities are subjective expectation of treatment and introduction to KTM facilities by previous visitors [9–11].

This study aims to compare the characteristics of outpatients of the KTM facility by frequency. The authors had interest in understanding the factors of frequent users of this facility. Related data on the outpatients were selected from the Korean Ministry of Health and Welfare's Report (KMOH's Report) on the Usage and Consumption of Korean Medicine in 2011 [10]. The studies on the usage of KTM covered characteristics by sex, age, region, and disease [12–15]. The study patients are elderly individuals [16], patients with chronic illness [17,18], and patients with breast cancer [19]. No previous studies have compared outpatients of KTM by frequency, with specific focus on the frequent users of KTM. Logistic regression analysis was conducted to identify KTM users' sociodemographic characteristics, status of visiting medical facilities, major diseases and treatments, methods and treatment effect by disease, and satisfaction level. It is important to identify the status of KTM users, compare outpatients by frequency, and the factors of frequent users in developing appropriate policy in KTM.

2. Materials and methods

2.1. Study population

This study used data from the KMOH's Report on the Usage and Consumption of Korean Traditional Medicine in 2011 [10]. This report provides the basic statistics for KMOH's policy on KTM by investigating the status of KTM utilization and consumption of herbal medicine in Korea. The study included sociodemographic factors of

inpatients and outpatients of KTM facilities, factors of medical service utilization and user's recognition, and use of KTM facilities for the past 3 months. The study was conducted from August 25 to September 30, 2011. Of the total 12,250 KTM facilities in Korea, 471 KTM facilities (171 KTM hospitals and 300 KTM clinics) were selected by multistage stratified sampling by region and institution type. During the investigation, a total of 5607 inpatients ($n = 1681$) and outpatients ($n = 3926$) were interviewed. We analyzed a total of 2583 outpatients in this study. The remaining outpatients did not provide a response and were thus excluded from the analysis.

2.2. Data analysis

We classified the frequency based on the number of visits to the KTM facility for the 3-month period. Frequency varied from one time to more than 60 times. We divided the study patients into three groups, namely, frequent, infrequent, and middle visitors, or upper 31.07%, lower 35.92%, and others, respectively. Frequent visitors visited KTM facility for more than 11 times and infrequent visitors visited the facility for one to three times. We analyzed the sociodemographic characteristics of the two groups by sex, age, marital status, education, and income. The two groups were also analyzed in terms of the medical institution preferred, disease and treatment method, treatment effect, satisfaction level, and side effect. A Chi-square analysis was conducted to understand the distribution of each variable. For the frequent visitors group, logistic regression models were applied to analyze the factors for using KTM facilities. Model 1 was adjusted for sociodemographic variable and medical institution preferred and Model 2 was adjusted for an additional 25 disease variables with the existing Model 1 variables. SAS 9.2 (SAS Institute Inc., Cary, NC, USA) was used for data analysis and the level of significance is 5% [20].

3. Results

3.1. Sociodemographic characteristics

Table 1 presents the sociodemographic characteristics of total, infrequent, and frequent visitors to KTM. A total of 2583 outpatients visited KTM facilities [766 men (29.7%) and 1817 women (70.3%)]. Most of these visitors were in their 20s to 70s. Frequent visitors were in their 40s to 70s, whereas infrequent visitors were in their 20s to 50s. A majority of the visitors were married (1831 persons, 71.0%) and high-school and college graduates (1699 persons, 66.1%). They had jobs (1205 persons, 47.0%) and had an income of <1000–4000 USD and were covered by residence-based health insurance (2426 persons, 94.2%). There was statistically significant difference between the two groups in age, marital status, education, employment

Table 1. Sociodemographic characteristics of outpatients visiting Korean Traditional Medicine hospitals/clinics.

Variables	Infrequent	Frequent	Total (%)	<i>p</i>
Sex				
Men	417 (54.4)	349 (45.6)	766 (29.7)	0.5879
Women	968 (53.3)	849 (46.7)	1817 (70.3)	
Age (y)				
Under 10s	17 (56.7)	13 (43.3)	30 (1.2)	<0.0001
10s	96 (73.9)	34 (26.2)	130 (5.0)	
20s	218 (74.4)	75 (25.6)	293 (11.3)	
30s	295 (69.6)	129 (30.4)	424 (16.4)	
40s	316 (57.1)	237 (42.9)	553 (21.4)	
50s	226 (51.3)	215 (48.8)	441 (17.1)	
60s	133 (33.5)	264 (66.5)	397 (15.4)	
70s	76 (26.8)	208 (73.2)	284 (11.0)	
≥80s	8 (25.8)	23 (74.2)	31 (1.2)	
Marital status				
Single	286 (69.9)	123 (30.1)	409 (15.9)	<0.0001
Married	985 (53.8)	846 (46.2)	1831 (71.0)	
Widowed	87 (30.2)	201 (69.8)	288 (11.2)	
Divorced	15 (48.4)	16 (51.6)	31 (1.2)	
Separated	1 (11.1)	8 (88.9)	9 (0.4)	
Other	9 (90.0)	1 (10.0)	10 (0.4)	
Education				
None	46 (26.6)	127 (73.4)	173 (6.7)	<0.0001
Elementary school	137 (35.3)	251 (64.7)	388 (15.1)	
Middle school	140 (45.6)	167 (54.4)	307 (11.9)	
High school	481 (60.4)	316 (39.7)	797 (31.0)	
College	571 (63.3)	331 (36.7)	902 (35.1)	
Other	3 (75.0)	1 (25.0)	4 (0.2)	
Job				
Yes	781 (64.8)	424 (35.2)	1205 (47.0)	<0.0001
No	593 (43.6)	768 (56.4)	1361 (53.0)	
Income (USD)				
<1000	181 (34.1)	350 (65.9)	531 (20.7)	<0.0001
1001–2000	270 (52.6)	243 (47.4)	513 (20.0)	
2001–3000	314 (58.8)	220 (41.2)	534 (20.8)	
3001–4000	247 (61.4)	155 (38.6)	402 (15.7)	
4001–5000	194 (66.4)	98 (33.6)	292 (11.4)	
>5000	168 (57.7)	123 (42.3)	291 (11.4)	
Health insurance				
Residence based	496 (51.4)	469 (48.6)	965 (37.5)	<0.0001
Workplace based	828 (56.7)	633 (43.3)	1461 (56.7)	
Medicare Class 1	25 (30.1)	58 (69.9)	83 (3.2)	
Medicare Class 2	19 (50.0)	19 (50.0)	38 (1.5)	
Others	15 (51.7)	14 (48.3)	29 (1.1)	
Total (%)	1385 (53.6)	1198 (46.4)	2583 (100.0)	

Data are presented as *n* (%).

status, income, and health insurance ($p < 0.0001$). In short, there were significant differences between infrequent visitors and frequent visitors in all the socio-demographic variables with exception of age.

3.2. Subjective health status, clinics/hospitals, and diseases

In Table 2, the two groups (frequent and infrequent visitors) were compared by subjective health status,

preferred medical institution, preferred KTM facility, and disease. There was a statistical difference ($p < 0.0001$) between the two groups in subjective health status: “Good” (659 persons, 25.5%), “Average” (1078 persons, 41.8%), and “Bad” (687 persons, 26.6%). Most individuals preferred to visit hospitals/clinics (1692 persons, 65.6%) than visiting KTM clinics (563 persons, 21.8%; $p < 0.0001$). However, there was no statistical difference in the preferred KTM facilities (KTM clinics or hospitals) between the two groups

Table 2. Subjective health status, utilized medical institutions, and diseases.

Variables	Infrequent	Frequent	Total	<i>p</i>
Subjective health status				
Very good	56 (70.0)	24 (30.0)	80 (3.1)	<0.0001
Good	429 (65.1)	230 (34.9)	659 (25.5)	
Average	617 (57.2)	461 (42.8)	1078 (41.8)	
Bad	256 (37.3)	431 (62.7)	687 (26.6)	
Very bad	27 (34.6)	51 (65.4)	78 (3.0)	
Medical institutions				
Hospitals/clinics	983 (58.1)	709 (41.9)	1692 (65.6)	<0.0001
Pharmacies	100 (69.4)	144 (30.6)	144 (5.6)	
Korean Traditional Medicine clinics	221 (39.3)	563 (60.8)	563 (21.8)	
Public health centers	4 (44.4)	9 (55.6)	9 (0.4)	
Korean Traditional Medicine hospitals	63 (42.0)	87 (58.0)	150 (5.8)	
Other	12 (60.0)	8 (40.0)	20 (0.8)	
Korean Traditional Medicine institutions				
Korean traditional clinics	911 (52.0)	841 (48.0)	1752 (74.1)	0.2405
Korean traditional hospitals	216 (47.2)	458 (52.8)	458 (19.4)	
Dual clinics ^a	56 (44.4)	126 (55.6)	126 (5.3)	
Korean traditional pharmacies	5 (71.4)	2 (28.6)	7 (0.3)	
Pharmacies	5 (50.0)	5 (50.0)	10 (0.4)	
Acupuncture	6 (60.0)	4 (40.0)	10 (0.4)	
Private institution	1 (100.0)	0 (0.0)	1 (0.04)	
Diseases and symptoms				
Hypertension	29 (2.1)	67 (5.6)	96 (3.7)	<0.0001
Repressed anger and stress	49 (3.5)	49 (4.1)	98 (3.8)	0.4638
Infertility	4 (0.3)	5 (0.4)	9 (0.4)	0.5803
Arthritis	187 (13.5)	361 (30.1)	548 (21.2)	<0.0001
Gastroenteric trouble	161 (11.6)	143 (11.9)	304 (11.8)	0.8061
Sprained ankle	245 (17.7)	182 (15.2)	427 (16.5)	0.0884
Backache	340 (24.6)	444 (37.1)	784 (30.4)	<0.0001
Cold	114 (8.2)	94 (7.9)	208 (8.1)	0.7201
Muscular wound	309 (22.3)	233 (19.5)	542 (21.0)	0.0749
Diabetes	13 (0.9)	30 (2.5)	43 (1.7)	0.0019
Atopy	20 (1.4)	21 (1.8)	41 (1.6)	0.5311
Lumbar sprain	234 (16.9)	247 (20.6)	481 (18.6)	0.0154
Stroke	31 (2.2)	122 (10.2)	153 (5.9)	<0.0001
Cancer	4 (0.3)	8 (0.7)	12 (0.5)	0.1578
Frozen shoulder	76 (5.5)	116 (9.7)	192 (7.4)	<0.0001
Cramps	62 (4.5)	31 (2.6)	93 (3.6)	0.0102
Asthma	11 (0.8)	14 (1.2)	25 (1.0)	0.3324
Fracture	36 (2.6)	56 (6.7)	92 (3.6)	0.0045
Diet/obesity	49 (3.5)	41 (3.4)	90 (3.5)	0.8731
Skin care	25 (1.8)	17 (1.4)	42 (1.6)	0.4392
Somatotype correction	14 (1.0)	12 (1.0)	26 (1.0)	0.9814
Constitution improvement	85 (6.1)	64 (5.3)	149 (5.8)	0.3875
Herbal tonics	318 (23.0)	318 (26.5)	636 (24.6)	0.0350
Height growth	9 (0.7)	8 (0.7)	17 (0.7)	0.9551
Aftereffects from traffic accident	68 (4.9)	88 (7.4)	156 (6.0)	0.0096

^aDiagnosis and treatment conducted by physicians in (Western) hospital/clinics or practicing Korean Traditional Medicine and having obtained certification in both. Data are presented as n (%).

[KTM clinics (1752 persons, 74.1%) and KTM hospitals (458 persons, 19.4%); *p* = 0.2405].

Major diseases/symptoms were arthritis (548 persons, 21.2%), gastroenteric trouble (304 persons, 11.8%), sprained ankle (427 persons, 16.5%), backache (784 persons, 30.4%), muscular wound (542 persons, 21.0%), and lumbar sprain (481 persons, 18.6%). There was a

statistically significant difference between the two groups in arthritis (*p* < 0.0001), backache (*p* < 0.0001), lumbar sprain (*p* = 0.0154), frozen shoulder (*p* < 0.0001), and herbal tonics (*p* = 0.0035), but no statistically significant difference in gastroenteric trouble (*p* = 0.8061), sprained ankle (*p* = 0.0884), and cold (*p* = 0.7201).

3.3. Treatment methods of KTM

Treatment methods of KTM are summarized in Table 3 and compared between the two groups. The KTM visitors were treated with acupuncture and physical therapy (947 persons, 39.8%), herbal medicine and acupuncture (604 persons, 25.2%), acupuncture and moxa cautery (305 persons, 12.8%), acupuncture and cupping treatment (273 persons, 11.5%), and most took combined treatment. There was a statistically significant difference in these treatment methods between the two groups ($p < 0.0017$).

3.4. Treatment methods of KTM for 12 major diseases and symptoms

The treatment methods of KTM for 12 major diseases and symptoms were summarized and compared between the two groups (Table 4). Acupuncture was the most common treatment for arthritis (15.6%), backache (601 persons, 23.3%), shock (135 persons, 52%), gastroenteric trouble (180 persons, 7.0%), frozen shoulder (108 persons, 4.2%), sprained ankle (249 persons, 9.6%), muscular would (357 persons, 13.8%), lumbar sprain (3.5 persons, 11.8%), and aftereffects from traffic accident (95 persons, 3.7%). Herbal medicine was the most common treatment for cold (73 persons, 2.8%), somatotype correction (71 persons, 2.8%), and herbal tonics (141 persons, 5.5%). These diseases showed

statistically significant difference in treatment methods between the two groups.

3.5. Treatment effect

Treatment effects are summarized and compared between the two groups in Table 5. Herbal medicine showed “very effective” (323 persons, 35.1%) and “slightly effective” (364 persons, 39.5%) treatment effects, and there was a statistical difference between the two groups ($p < 0.0002$). Compounded herbal medicine, acupuncture, and moxa cautery were “slightly effective” (167 persons, 46.7%; 421 persons, 44.6%, respectively), and there was a statistically significant difference between the two groups ($p < 0.0001$ vs. $p = 0.0040$). Cupped treatment was “slightly effective” (420 persons, 46.1%), chiropractic treatment was “very effective” (94 persons, 42.0%), physical therapy was “slightly effective” (771 persons, 48.1%), and showed statistically significant difference ($p = 0.0047$, $p = 0.0241$, $p < 0.0001$). The effect of each treatment method was classified as follows: “slightly effective,” “very effective,” “little effective,” and “not effective.” There were significant differences by treatment method.

3.6. Satisfaction level and side effects

Table 6 summarizes the satisfaction level and side effects and compares the two groups. A total of 559

Table 3. Treatment of Korean Traditional Medicine.

Variables	Infrequent	Frequent	Total	<i>p</i>
Herbal medicine	24 (88.9)	3 (11.1)	27 (1.1)	0.0017
Herbal medicine + compounded herbal medicine	13 (76.5)	4 (23.5)	17 (0.7)	
Herbal medicine + acupuncture	329 (54.7)	272 (45.3)	601 (25.2)	
Herbal medicine + moxa cautery	5 (50.0)	5 (50.0)	10 (0.4)	
Herbal medicine + cupping treatment	5 (55.6)	4 (44.4)	9 (0.4)	
Herbal medicine + chiropractic treatment	3 (50.0)	3 (50.0)	6 (0.3)	
Herbal medicine + physical therapy	17 (63.0)	10 (37.0)	27 (1.1)	
Compounded herbal medicine	1 (100.0)	0 (0.0)	1 (0.04)	
Compounded herbal medicine + acupuncture	29 (54.7)	24 (45.3)	53 (2.2)	
Compounded herbal medicine + moxa cautery	1 (50.0)	1 (50.0)	2 (0.1)	
Compounded herbal medicine + physical therapy	1 (50.0)	1 (50.0)	2 (0.1)	
Acupuncture	20 (60.6)	13 (39.4)	33 (1.4)	
Acupuncture + moxa cautery	129 (42.3)	176 (57.7)	305 (12.8)	
Acupuncture + cupping treatment	145 (53.1)	128 (46.9)	273 (11.5)	
Acupuncture + chiropractic treatment	14 (41.2)	20 (58.8)	34 (1.4)	
Acupuncture + physical therapy	453 (47.8)	494 (52.2)	947 (39.8)	
Acupuncture + other	1 (33.3)	2 (66.7)	3 (0.1)	
Moxa cautery + cupping treatment	1 (33.3)	2 (66.7)	3 (0.1)	
Moxa cautery + physical therapy	6 (60.0)	4 (40.0)	10 (0.4)	
Cupping treatment + chiropractic treatment	1 (100.0)	0 (0.0)	1 (0.04)	
Cupping treatment + physical therapy	4 (57.1)	3 (42.9)	7 (0.3)	
Chiropractic treatment + physical therapy	1 (100.0)	0 (0.0)	1 (0.04)	
Physical therapy	3 (60.0)	2 (40.0)	5 (0.2)	
Physical therapy + other	2 (100.0)	0 (0.0)	2 (0.1)	
Other	2 (100.0)	0 (0.0)	2 (0.1)	

Data are presented as *n* (%). Data contains multiple response (MR).

Table 4. Symptoms/diseases and treatments of outpatients in Korean Traditional Medicine hospitals/clinics.

Diseases and treatment	Infrequent	Frequent	Total	<i>p</i>
Arthritis	133 (9.6)	279 (23.3)	412 (16.0)	<0.0001
Herbal medicine	20 (1.4)	59 (4.9)	79 (3.1)	<0.0001
Compounded herbal medicine	12 (0.9)	28 (2.3)	40 (1.6)	0.0025
Acupuncture	129 (9.3)	275 (23.0)	404 (15.6)	<0.0001
Moxa cautery	48 (3.5)	136 (11.4)	184 (7.1)	<0.0001
Cupping treatment	40 (2.9)	133 (11.1)	173 (6.7)	<0.0001
Chiropractic treatment	3 (0.2)	14 (1.2)	17 (0.7)	0.0028
Physical therapy	88 (6.4)	211 (17.6)	299 (11.6)	<0.0001
Other	0 (0.0)	5 (0.4)	5 (0.2)	0.0161
Backache	267 (19.3)	352 (29.4)	619 (24.0)	<0.0001
Herbal medicine	44 (3.2)	76 (6.3)	120 (4.7)	0.0001
Compounded herbal medicine	24 (1.7)	37 (3.2)	62 (2.4)	0.0172
Acupuncture	257 (18.6)	344 (28.7)	601 (23.3)	<0.0001
Moxa cautery	80 (5.8)	157 (13.1)	237 (9.2)	<0.0001
Cupping treatment	115 (8.3)	187 (15.6)	302 (11.7)	<0.0001
Chiropractic treatment	28 (2.0)	39 (3.3)	67 (2.6)	0.0492
Physical therapy	181 (13.1)	274 (22.9)	455 (17.6)	<0.0001
Other	0 (0.0)	6 (0.5)	6 (0.2)	0.0084
Stroke	23 (1.7)	115 (9.6)	138 (5.3)	<0.0001
Herbal medicine	6 (0.4)	54 (4.5)	60 (2.3)	<0.0001
Compounded herbal medicine	0 (0.0)	13 (1.1)	13 (0.5)	0.0001
Acupuncture	22 (1.6)	113 (9.4)	135 (5.2)	<0.0001
Moxa cautery	5 (0.4)	71 (5.9)	76 (2.9)	<0.0001
Cupping treatment	5 (0.4)	48 (4.0)	53 (2.1)	<0.0001
Chiropractic treatment	1 (0.1)	9 (0.8)	10 (0.4)	0.0056
Physical therapy	13 (0.9)	84 (7.0)	97 (3.8)	<0.0001
Other	1 (0.1)	2 (0.2)	3 (0.1)	0.4808
Gastroenteric trouble	116 (8.4)	97 (8.1)	213 (8.3)	0.7974
Herbal medicine	46 (3.3)	43 (3.6)	89 (3.5)	0.7096
Compounded herbal medicine	36 (2.6)	24 (2.0)	60 (2.3)	0.3160
Acupuncture	96 (6.9)	84 (7.0)	180 (7.0)	0.9363
Moxa cautery	32 (2.3)	41 (3.4)	73 (2.8)	0.0890
Cupping treatment	17 (1.2)	13 (1.1)	30 (1.2)	0.7364
Chiropractic treatment	0 (0.0)	1 (0.1)	1 (0.04)	0.2822
Physical therapy	19 (1.4)	22 (1.8)	41 (1.6)	0.3462
Other	3 (0.2)	3 (0.3)	6 (0.2)	0.8587
Cold	76 (5.5)	47 (3.9)	123 (4.8)	0.0627
Herbal medicine	46 (3.3)	27 (2.3)	73 (2.8)	0.1025
Compounded herbal medicine	27 (2.0)	16 (1.3)	43 (1.7)	0.2240
Acupuncture	32 (2.3)	21 (1.8)	53 (2.1)	0.3189
Moxa cautery	11 (0.4)	6 (0.2)	17 (0.7)	0.3578
Cupping treatment	4 (0.8)	4 (0.5)	8 (0.3)	0.8371
Chiropractic treatment	MR	MR	MR	MR
Physical therapy	7 (0.5)	4 (0.3)	11 (0.4)	0.5044
Other	1 (0.1)	0 (0.0)	1 (0.04)	0.3523
Frozen shoulder	51 (3.7)	62 (5.2)	113 (4.4)	0.0643
Herbal medicine	4 (0.3)	26 (2.2)	30 (1.2)	<0.0001
Compounded herbal medicine	2 (0.1)	9 (0.8)	11 (0.4)	0.0182
Acupuncture	48 (3.5)	60 (5.0)	108 (4.2)	0.0508
Moxa cautery	12 (0.9)	25 (2.1)	37 (1.4)	0.0092
Cupping treatment	18 (1.3)	30 (2.5)	48 (1.9)	0.0238
Chiropractic treatment	1 (0.1)	10 (0.8)	11 (0.4)	0.0030
Physical therapy	30 (2.2)	36 (3.0)	66 (2.6)	0.1778
Other	0 (0.0)	1 (0.1)	1 (0.04)	0.2822

(Continued on next page)

Table 4 (Continued)

Diseases and treatment	Infrequent	Frequent	Total	<i>p</i>
Sprained ankle	178 (12.9)	76 (6.3)	254 (9.8)	<0.0001
Herbal medicine	9 (0.7)	19 (1.6)	28 (1.1)	0.0219
Compounded herbal medicine	9 (0.7)	3 (0.3)	12 (0.5)	0.1366
Acupuncture	175 (12.6)	74 (6.2)	249 (9.6)	<0.0001
Moxa cautery	38 (2.7)	36 (3.0)	74 (2.9)	0.6913
Cupping treatment	44 (3.2)	25 (2.1)	69 (2.7)	0.0866
Chiropractic treatment	3 (0.2)	7 (0.6)	10 (0.4)	0.1334
Physical therapy	103 (7.4)	49 (4.1)	152 (5.9)	0.0003
Other	MR	MR	MR	MR
Muscular wound	225 (16.3)	145 (12.1)	370 (14.3)	0.0027
Herbal medicine	23 (1.7)	35 (2.9)	58 (2.3)	0.0310
Compounded herbal medicine	8 (0.6)	10 (0.8)	18 (0.7)	0.4334
Acupuncture	213 (15.4)	144 (12.0)	357 (13.8)	0.0136
Moxa cautery	52 (3.8)	66 (5.5)	118 (4.6)	0.0332
Cupping treatment	91 (6.5)	74 (6.2)	165 (6.4)	0.6834
Chiropractic treatment	7 (0.5)	15 (1.3)	22 (0.9)	0.0395
Physical therapy	140 (10.1)	100 (8.4)	240 (9.3)	0.1242
Other	2 (0.1)	1 (0.1)	3 (0.1)	0.6503
Lumbar sprain	165 (11.9)	149 (12.4)	314 (12.2)	0.6844
Herbal medicine	12 (0.9)	48 (4.0)	60 (2.3)	<0.0001
Compounded herbal medicine	13 (0.9)	13 (1.1)	26 (1.0)	0.7099
Acupuncture	159 (11.5)	146 (12.2)	305 (11.8)	0.5788
Moxa cautery	39 (2.8)	65 (5.4)	104 (4.0)	0.0008
Cupping treatment	46 (3.3)	66 (5.5)	112 (4.3)	0.0065
Chiropractic treatment	16 (1.2)	28 (2.3)	44 (1.7)	0.0206
Physical therapy	111 (8.0)	110 (9.2)	221 (8.6)	0.2901
Other	0 (0.0)	1 (0.1)	1 (0.04)	0.2822
Somatotype correction	49 (3.5)	36 (3.0)	85 (3.3)	0.4490
Herbal medicine	41 (3.0)	30 (2.5)	71 (2.8)	0.4795
Compounded herbal medicine	1 (0.1)	3 (0.3)	4 (0.2)	0.2507
Acupuncture	14 (1.0)	18 (1.5)	32 (1.2)	0.2599
Moxa cautery	4 (0.3)	6 (0.5)	10 (0.4)	0.3869
Cupping treatment	1 (0.1)	1 (0.1)	2 (0.08)	0.9182
Chiropractic treatment	MR	MR	MR	MR
Physical therapy	2 (0.1)	3 (0.3)	5 (0.2)	0.5410
Other	2 (0.1)	1 (0.1)	3 (0.1)	0.6503
Herbal tonics	96 (6.9)	48 (4.0)	144 (5.6)	0.0012
Herbal medicine	94 (6.8)	47 (3.9)	141 (5.5)	0.0014
Compounded herbal medicine	2 (0.1)	1 (0.1)	3 (0.1)	0.6503
Acupuncture	4 (0.3)	3 (0.3)	7 (0.3)	0.8515
Moxa cautery	1 (0.1)	0 (0.0)	1 (0.04)	0.3523
Cupping treatment	MR	MR	MR	MR
Chiropractic treatment	MR	MR	MR	MR
Physical therapy	MR	MR	MR	MR
Other	1 (0.1)	0 (0.0)	1 (0.04)	0.3523
Aftereffects from traffic accident	42 (3.0)	63 (5.3)	105 (4.1)	0.0043
Herbal medicine	13 (0.9)	39 (3.3)	52 (2.0)	<0.0001
Compounded herbal medicine	4 (0.3)	8 (0.7)	12 (0.5)	0.1578
Acupuncture	34 (2.5)	61 (5.1)	95 (3.7)	0.0004
Moxa cautery	10 (0.7)	29 (2.4)	39 (1.5)	0.0004
Cupping treatment	10 (0.7)	32 (2.7)	42 (1.6)	<0.0001
Chiropractic treatment	2 (0.1)	19 (1.6)	21 (0.8)	<0.0001
Physical therapy	30 (2.2)	51 (4.3)	81 (3.1)	0.0024
Other	0 (0.0)	2 (0.2)	2 (0.08)	0.1282

Data are presented as *n* (%). MR = multiple response.

Table 5. Treatment effects of outpatients in Korean Traditional Medicine hospitals/clinics.

Treatment effect	Infrequent	Frequent	Total	<i>p</i>
Herbal medicine				
Very effective	133 (41.2)	190 (58.8)	323 (35.1)	0.0002
Slightly effective	166 (45.6)	198 (54.4)	364 (39.5)	
Average	66 (46.5)	76 (53.5)	142 (15.4)	
Rarely effective	8 (47.1)	9 (52.9)	17 (1.9)	
Not effective	1 (33.3)	2 (66.7)	3 (0.3)	
Do not know	52 (73.2)	19 (26.8)	71 (7.7)	
Compounded herbal medicine				
Very effective	41 (48.8)	43 (51.2)	84 (24.9)	0.2503
Slightly effective	83 (49.7)	84 (50.3)	167 (46.7)	
Average	38 (56.7)	29 (43.3)	67 (19.2)	
Rarely effective	4 (50.0)	4 (50.0)	8 (2.3)	
Not effective	—	—	—	
Do not know	13 (76.5)	4 (23.5)	17 (5.0)	
Acupuncture				
Very effective	421 (44.3)	529 (55.7)	950 (39.1)	<0.0001
Slightly effective	537 (51.0)	516 (49.0)	1053 (43.4)	
Average	180 (61.2)	114 (38.8)	294 (12.1)	
Rarely effective	18 (62.1)	11 (37.9)	29 (1.2)	
Not effective	3 (60.0)	2 (40.0)	5 (0.2)	
Do not know	87 (89.7)	10 (10.3)	97 (4.0)	
Moxa cautery				
Very effective	115 (35.9)	205 (64.1)	320 (33.9)	0.0040
Slightly effective	163 (38.7)	258 (61.3)	421 (44.6)	
Average	59 (36.0)	105 (64.0)	164 (17.4)	
Rarely effective	4 (44.4)	5 (55.6)	9 (1.0)	
Not effective	1 (33.3)	2 (66.7)	3 (0.3)	
Do not know	21 (75.0)	7 (25.0)	28 (3.0)	
Cupping treatment				
Very effective	127 (42.3)	173 (57.7)	300 (32.9)	0.0047
Slightly effective	177 (42.1)	243 (57.9)	420 (46.1)	
Average	67 (44.4)	84 (55.6)	151 (16.6)	
Rarely effective	4 (33.3)	8 (66.7)	12 (1.3)	
Not effective	1 (50.0)	1 (50.0)	2 (0.2)	
Do not know	22 (81.5)	5 (18.5)	27 (3.0)	
Chiropractic treatment				
Very effective	31 (33.0)	63 (67.0)	94 (42.0)	0.0241
Slightly effective	32 (36.4)	56 (63.6)	88 (39.3)	
Average	11 (35.5)	20 (64.5)	31 (13.8)	
Rarely effective	1 (50.0)	1 (50.0)	2 (0.9)	
Not effective	—	—	—	
Do not know	8 (88.9)	1 (11.1)	9 (4.0)	
Physical therapy				
Very effective	203 (40.4)	300 (59.6)	503 (31.4)	<0.0001
Slightly effective	360 (46.7)	411 (53.3)	771 (48.1)	
Average	126 (51.0)	121 (49.0)	247 (15.4)	
Rarely effective	9 (45.0)	11 (55.0)	20 (1.3)	
Not effective	2 (40.0)	3 (60.0)	5 (0.3)	
Do not know	49 (87.5)	7 (12.5)	56 (3.5)	

Data are presented as *n* (%).

patients who visited KTM were “very satisfied” with treatment (21.7%); 521 patients reported “satisfied” (59.1%), and 382 reported “average” (15.2%). There was a statistically significant difference between the two groups ($p < 0.0001$). 46 persons (1.8%) experienced

side effects, and there was no difference between the two groups. The major side effect reported was rash/itching (19 persons, 38.8%), followed by stomachache/diarrhea (9 persons, 18.4%) and there was no difference between the two groups.

Table 6. Satisfaction level and side effects among outpatients in Korean Traditional Medicine hospitals/clinics.

Satisfaction and side effect	Infrequent	Frequent	Total	<i>p</i>
Satisfaction level				
Very satisfied	246 (44.0)	313 (56.0)	559 (21.7)	<0.0001
Satisfied	813 (53.5)	708 (46.6)	1521 (59.1)	
Average	235 (60.0)	157 (40.1)	392 (15.2)	
Unsatisfied	14 (51.9)	13 (48.2)	27 (1.1)	
Very unsatisfied	2 (66.7)	1 (33.3)	3 (0.1)	
Do not know	68 (93.2)	5 (6.9)	73 (2.8)	
Side effect	25 (54.4)	21 (45.7)	46 (1.8)	0.9106
Stomachache, diarrhea	5 (55.6)	4 (44.4)	9 (18.4)	0.3083
Rash, itching	9 (47.4)	10 (52.6)	19 (38.8)	
Paralysis	3 (100.0)	0 (0.0)	3 (6.1)	
Jaundice	0 (0.0)	1 (100.0)	1 (2.0)	
Edema	1 (50.0)	1 (50.0)	2 (4.1)	
Other	11 (73.3)	4 (26.7)	15 (30.6)	

Data are presented as *n* (%).

3.7. Factors on frequency utilizing traditional Korean medical hospitals/clinics

Table 7 shows two different models based on different confounding factors that estimated $\exp(\beta)$ of frequent and infrequent users, respectively, with reference to each variable.

In Model 1, there was no difference among sexes [women: odds ratio (OR) = 0.84, $p = 0.1293$], marital status (single: OR = 1.18, $p = 0.3787$; widowed: OR = 1.12, $p = 0.5124$; divorced: OR = 1.39, $p = 0.3937$; separated: OR = 5.52, $p = 0.1205$; other: OR = 0.13, $p = 0.0762$), education (elementary school: OR = 0.86, $p = 0.4850$; middle school: OR = 0.78, $p = 0.3180$; high school: OR = 0.67, $p = 0.0977$; college: OR = 0.83, $p = 0.4853$; other: OR = 0.63, $p = 0.7242$), but there was increase in frequency of visits in those over 40 years of age (under 10s: OR = 2.36, $p = 0.083$; 20s: OR = 1.26, $p = 0.3749$; 30s: OR = 1.69, $p = 0.0665$; 40s: OR = 2.93, $p = 0.0002$; 50s: OR = 3.29, $p < 0.0001$; 60s: OR = 5.45, $p = 0.0001$; 70s: OR = 6.64, $p < 0.0001$; 80s and above: OR = 6.18, $p = 0.0006$), and decrease in frequency of visits if the individual is employed (with job: OR = 0.57, $p < 0.0001$). There was no difference in frequency among income (1000–2000 USD: OR = 1.00, $p = 0.9952$; 2001–3000 USD: OR = 0.89, $p = 0.4497$; 3001–4000 USD: OR = 0.88, $p = 0.4678$; 4001–5000 USD: OR = 0.77, $p = 0.1741$; >5000 USD: OR = 1.20, $p = 0.3333$) and health insurance (residence based: OR = 1.05, $p = 0.5687$; Medicare Class 1: OR = 1.61, $p = 0.0862$; Medicare Class 2: OR = 0.95, $p = 0.8789$; Other: OR = 1.12, $p = 0.7853$).

In Model 2, sex was not statistically significant [$\exp(\beta)$ of women = 0.82, $p = 0.0645$] and age was statistically significant in those aged 40 and above [40s, 2.67 ($p = 0.0014$); 50s, 2.79 ($p = 0.0012$); 60s, 4.13 ($p < 0.0001$); 70s, 5.24 ($p < 0.0001$); and 80s, 4.70

($p = 0.0047$)]. Marital status (1.11–0.98), income (0.76–1.31), and health insurance (0.79–1.47) were not significant, but the variable job showed significance (0.56, $p < 0.0001$). Arthritis (2.15, $p < 0.0001$), backache (1.86, $p < 0.0001$), stroke (4.89, $p < 0.0001$), atopy (2.60, $p = 0.0398$), frozen shoulder (1.61, $p = 0.0294$), sprained ankle (0.65, $p = 0.0079$), lumbar sprain (1.63, $p = 0.0004$), diet (2.30, $p = 0.0041$), skin care (2.29, $p = 0.0034$), herbal tonics (0.5, $p = 0.0145$), and traffic accident 2.89 ($p < 0.0001$) were all statistically significant.

In Model 2, there was no statistical difference in frequency between sexes (women: OR = 0.82, $p = 0.0645$). Frequency increased in those aged 40 and above (under 10s: OR = 1.84, $p = 0.2790$; 20s: OR = 1.16, $p = 0.5910$; 30s: OR = 1.47, $p = 0.0665$; 40s: OR = 2.67, $p = 0.0014$; 50s: OR = 2.79, $p = 0.0012$; 60s: OR = 4.13, $p < 0.0001$; 70s: OR = 5.24, $p < 0.0001$; >80s: OR = 4.70, $p = 0.0047$). There was no difference among marital status (single: OR = 1.13, $p = 0.5395$; widowed: OR = 1.11, $p = 0.5599$; divorced: OR = 1.47, $p = 0.3342$; separated: OR = 6.78, $p = 0.0855$; and other: OR = 0.12, $p = 0.0671$), education (elementary school: OR = 0.95, $p = 0.8086$; middle school: OR = 0.93, $p = 0.7758$; high school: OR = 0.77, $p = 0.3018$; college: OR = 0.97, $p = 0.9145$; other: OR = 0.98, $p = 0.9863$). The hired persons tended to decrease in frequency (OR = 0.56, $p < 0.0001$), but there was no difference among income status (1000–2000 USD: OR = 1.03, $p = 0.8483$; 2001–3000 USD: OR = 0.96, $p = 0.8047$; 3001–4000 USD: OR = 0.93, $p = 0.7014$; 4001–5000 USD: OR = 0.76, $p = 0.165$; and >5000 USD: OR = 1.31, $p = 0.1841$) and among health insurance (residence based: OR = 1.07, $p = 0.4817$; Medicare Class 1: OR = 1.47, $p = 0.1709$; Medicare Class 2: OR = 0.79, $p = 0.5461$; and Other: OR = 0.81, $p = 0.6111$).

Table 7. Logistic regression on frequency utilizing Korean Traditional Medicine hospitals/clinics.

Independent variables	Model 1		Model 2	
	exp (β)	<i>p</i>	exp (β)	<i>p</i>
Sex				
Men	Reference		Reference	
Women	0.86	0.1293	0.82	0.0645
Age				
Under 10s	2.36	0.0830	1.84	0.2790
10s	Reference		Reference	
20s	1.26	0.3749	1.16	0.5910
30s	1.69	0.0665	1.47	0.1976
40s	2.93	0.0002	2.67	0.0014
50s	3.29	<0.0001	2.79	0.0012
60s	5.45	<0.0001	4.13	<0.0001
70s	6.64	<0.0001	5.24	<0.0001
80s and above	6.18	0.0006	4.70	0.0047
Marital Status				
Single	1.18	0.3787	1.13	0.5395
Married	Reference		Reference	
Widowed	1.12	0.5124	1.11	0.5599
Divorced	1.39	0.3937	1.47	0.3342
Separated	5.52	0.1205	6.78	0.0855
Others	0.13	0.0762	0.12	0.0671
Education				
None	Reference		Reference	
Elementary school	0.86	0.4850	0.95	0.8086
Middle school	0.78	0.3180	0.93	0.7758
High school	0.67	0.0977	0.77	0.3018
College	0.83	0.4853	0.97	0.9145
Others	0.63	0.7242	0.98	0.9863
Job				
Yes	0.57	<0.0001	0.56	<0.0001
No	Reference		Reference	
Income (USD)				
<1000	Reference		Reference	
1001–2000	1.00	0.9952	1.03	0.8483
2001–3000	0.89	0.4497	0.96	0.8047
3001–4000	0.88	0.4678	0.93	0.7014
4001–5000	0.77	0.1741	0.76	0.1653
>5000	1.20	0.3333	1.31	0.1841
Health Insurance				
Residence based	1.05	0.5687	1.07	0.4817
Workplace based	Reference		Reference	
Medicare Class 1	1.61	0.0862	1.47	0.1709
Medicare Class 2	0.95	0.8789	0.79	0.5461
Others	1.12	0.7853	0.81	0.6111
Diseases and symptoms				
Hypertension			1.40	0.3582
Arthritis			2.15	<0.0001
Backache			1.86	<0.0001
Diabetes			0.81	0.6658
Stroke			4.89	<0.0001
Cramps			1.17	0.620
Asthma			1.14	0.8366
Repressed anger and stress			1.77	0.0877
Gastroenteric trouble			1.34	0.0849
Cold			0.89	0.6191
Atopy			2.60	0.0398
Cancer			1.08	0.9091

(Continued on next page)

Table 7 (Continued)

Independent variables	Model 1		Model 2	
	exp (β)	<i>p</i>	exp (β)	<i>p</i>
Infertility			1.08	0.9477
Frozen shoulder			1.61	0.0294
Sprained ankle			0.65	0.0079
Muscular wound			1.10	0.4501
Lumbar sprain			1.63	0.0004
Fracture			1.25	0.5277
Diet/obesity			2.30	0.0041
Skin care			2.29	0.0344
Somatotype correction			1.94	0.2269
Constitution improvement			1.24	0.4097
Herbal tonics			0.59	0.0145
Height growth			4.05	0.0833
Aftereffects from traffic accident			2.89	<0.0001
Total	0.54	0.1204	0.34	0.0084

Dependent variables: Frequency (infrequent: 0, frequent: 1). Model 1: sociodemographic factors. Model 2: Model 1 + 25 diseases.

Persons with arthritis (OR = 2.15, $p < 0.0001$), backache (OR = 1.86, $p < 0.0001$), stroke (OR = 4.89, $p < 0.0001$), atopy (OR = 2.60, $p = 0.0398$), frozen shoulder (OR = 1.61, $p = 0.0294$), lumbar sprain (OR = 1.63, $p = 0.0004$), diet (OR = 2.30, $p = 0.0041$), skin care (OR = 2.29, $p = 0.0344$), and traffic accident (OR = 2.89, $p < 0.0001$) tended to increase in frequency, but those with sprained ankle (OR = 0.65, $p = 0.0079$) and herbal tonics (OR = 0.59, $p = 0.0145$) decreased in frequency.

4. Discussion

The general factors affecting medical utilization are income, education, private health insurance, and age along with the preference for traditional medicine [1–6]. In addition, culture, religion, region, and diseases (muscular wound and breast cancer) are known to be major factors that play a role in deciding the medical institution [7,8]. Especially in Korea, where Western medicine and KTM coexist, comparative advantage of treatment methods by disease exists [21]. Persons visit KTM to treat muscular wounds such as backache, arthritis, frozen shoulder, herbal tonics, gastroenteric trouble, and stroke [9–11]. Further study is necessary whether these diseases/symptoms are more effectively treated in KTM.

This study has utilized data on the KTM facilities from the KMOH's Report on the Usage and Consumption of KTM in 2011 [10]. The reports were prepared to formulate evidence-based KTM policies by KMOH in 2008, 2011, and 2014, respectively. The report contains data on 5607 inpatients and outpatients visiting KTM from August to September 2011. Among them, 3926 outpatients were selected. We analyzed a total of 2583

outpatients in this study. The remaining outpatients did not provide a response and were thus excluded from the analysis.

4.1. Comparison of general characteristics of study patients

Women tended to visit KTM more in both infrequent and frequent outpatients groups. Patients within the age group between 40s and 60s frequently visited KTM facilities, with higher frequencies for those in their 40s. This rate decreases for those aged 50 and above; however, there was no statistical difference between the two groups ($p < 0.0001$). A total of 1831 married persons (71.0%) visited KTM, followed by 409 single persons (15.9%), and there was a statistical difference between the two groups ($p < 0.0001$). When analyzed by education levels, high-school and college graduates constituted more than half of the population (66.1%) with statistical significance ($p < 0.0001$). Job status showed a statistical difference ($p < 0.0001$). When analyzed by monthly income, the "under 4000 USD" formed the majority (77.2%) with a statistical difference ($p < 0.0001$). Individuals with Medicare insurance visited KTM often ($p < 0.0001$, Table 2).

Sociodemographic characteristics showed the following individuals frequently visited the KTM facilities: women, individuals in the age group between 40 and 60 years, married, high-school graduate and above, monthly income of 4000 USD, and those with residence-based and workplace-based insurance. All the variables were significant between infrequent and frequent users of KTM with exception of age. These results corresponded with the previous studies of Lee et al [5], Lee et al [12], and Choi et al [13], and Lee et al [14]. In particular, the subjective health status was significant between the two groups with patients reporting the

following status: “very good” (80 persons, 3.1%), “good” (659 persons, 25.5%), “average” (1078 persons, 41.8%), “bad” (687 persons, 26.6%), “very bad” (78 persons, 3%) ($p < 0.0001$). Most of the individuals (1692 persons, 65.6%) utilized the medical institutions with a significant statistical difference ($p < 0.0001$). KTM facilities were used in KTM clinics (1752 person, 74.1%) and KTM hospitals (458 persons, 19.4%) with no statistical difference.

Major diseases/symptoms treated in KTM were arthritis (548 persons, 21.2%), gastroenteric trouble (304 persons, 11.8%), sprained ankle (427 persons, 16.5%), backache (784 persons, 30.4%), muscular wound (54 persons, 21.0%), lumbar sprain (481 persons, 18.6%), and herbal tonics (636 persons, 24.6%). Arthritis ($p < 0.0001$), backache ($p < 0.0001$), and herbal tonics ($p = 0.0350$) showed statistically significant differences (Table 2). Most KCM visitors (1817 persons, 70.4%) rated themselves as “above average” in subjective health status. The KCM visitors utilize not only disease treatment but also treatment related to skin care, diet/obesity, somatotype correction, herbal tonics, and height growth.

Subjective health status, medical institutions utilized, KTM facilities, major diseases/symptoms corresponded with the results of previous studies [12–14]. However, the difference between the infrequent and frequent outpatients could be compared, which was not covered in the previous studies.

4.2. Treatment methods, effects, and satisfaction level

Treatments methods were herbal medicine, acupuncture and moxa cautery, compounded herbal medicine, physical therapy, chiropractic treatment, and cupping treatment. In real practice, these treatments are combined to treat patients. Most of KCM methods used a combination of herbal medicine with acupuncture, acupuncture with moxa cautery, acupuncture with cupping treatment, and acupuncture with physical therapy, which had a statistically significant difference ($p < 0.0017$) between the two groups (Table 3).

The most frequently utilized treatments in KTM were herbal medicine, compounded herbal medicine, acupuncture, moxa cautery, cupping treatment, chiropractic treatment, and physical therapy. Acupuncture was mainly used for arthritis, backache, and traffic accident. Herbal medicine was used for cold, somatotype correction, and herbal tonics. There was a statistically significant difference by disease (Table 4).

Except for chiropractic treatment, the other KCM treatments were rated in the following order: “slightly effective,” “very effective,” “average,” “little effective,” and “not effective.” All the treatments for infrequent KTM users showed significant differences in compounded herbal medicine, with the exception of compounded medicine (Table 5). This suggested that the

KTM patients regarded KTM treatment as effective, but not very effective, and there were no differences between the two groups, which could not be compared due to lack of similar studies.

More than of half of the patients (80.8%) were reported satisfaction with the treatment they received. The satisfactory levels were rated in the following order (Table 6): “satisfied” (1521 persons, 59.1%), “very satisfied” (559 persons, 21.7%), “average” (392 persons, 15.2%), “unsatisfied” (27 persons, 1.1%), and “very unsatisfied” (3 persons, 0.1%); however, the intensity of satisfaction was low, which coincided with the treatment effect (i.e., not very effective reported in Table 5). There was a statistically significant difference between the two groups ($p < 0.0001$). Infrequent users rated their satisfactory levels as follows: “satisfied” (53.5%), followed by “very satisfied” (44.0%); by contrast, frequent users were “very satisfied” (56.0%), followed by “satisfied” (46.6%). Frequent users were more satisfied compared with the infrequent users, which suggested that the more satisfied individuals more frequently utilized the KCM.

A total of 46 individuals (1.8%) experienced side effects, which had no difference between the two groups. Rash/itching (19 persons, 38.8%) and stomachache/diarrhea (9 persons, 18.4%) were the major symptoms and there was no difference between the two groups. These side effects could be observed when taking the herbal medicine; however, most studies reported no side effects [22,23] or 0.1% side effects only [24]. The side effect rate of 1.8% (46/2583) in this study was thus higher than other related studies. Most of these were dermatologic and gastroenteric side effects. There was only one person among 48 persons who experienced malfunction of liver, which was associated with hepatotoxicity.

4.3. Factors affecting the frequency of usage

Most studies on medical utilization were based on the Western medicine and interested study groups, whereas no study on KTM is conducted, and therefore, related data to be applied in various policy and strategy development are rare. The study on the utilization of medical service is essential to identify factors to draw individuals’ attention on what kind of services were utilized as well as to establish public health policies and plans [25].

This study adjusted confounding factors and prepared Model 1 and Model 2 with the regard to men, individuals in their 10s, married, no education, nonhired, income under 1000 USD, workplace-based health insurance, infrequent outpatients, and with no diseases, and analyzed the factors of frequent visitors to KTM facilities. Model 1 contained sex, age, marital status, education, job, income, and health insurance and conducted logistic regression and calculated $\exp(\beta)$. There were no differences in age, marital status, education, and health insurance, but $\exp(\beta)$ of those in their 40s

compared with those 10s was 2.93 ($p = 0.0002$), $\exp(\beta)$ of those in 50s was 3.29 ($p < 0.0001$), $\exp(\beta)$ of those in 60s was 5.45 ($p < 0.0001$), $\exp(\beta)$ of those in 70s was 6.64 ($p < 0.0001$), and $\exp(\beta)$ of those in 80s was 6.18 ($p = 0.0006$). Nonhired persons' $\exp(\beta)$ showed a significant difference of 0.57 ($p < 0.0001$), compared with the hired (Table 7). Our results show that the frequent users of KTM facilities in their 40s to 80s utilized the facilities 2.93 to 6.65 times more, compared with those under 10 years of age. Nonhired persons used KTM less by 0.57 times than the hired.

Model 2 included 25 more diseases as variables in addition to the variables in Model 1. However, the results obtained were similar to those in Model 1. There was no significant difference in sex, marital status, education, income, and health insurance. There was no difference in age, marital status, education, and health insurance, but the $\exp(\beta)$ of those in their 40s compared with those under 10s was 2.93 ($p = 0.0002$), and the $\exp(\beta)$ of those in their 50s (3.29, $p < 0.0001$), 60s (5.45, $p < 0.0001$), 70s (6.64, $p < 0.0001$), and 80s (6.18, $p = 0.0006$) showed difference. Nonhired persons' $\exp(\beta)$ showed a significant difference of 0.56 ($p < 0.0001$) compared with the hired (Table 7). Our results show that the frequent users of KTM facilities in their 40s to 80s utilized the facilities 2.93 to 6.65 times more, compared with those under 10 years of age. Nonhired persons used KTM less by 0.57 times than the hired. Compared with those under the age of 10, the $\exp(\beta)$ of those in their 40s (2.67, $p = 0.0014$), 50s (2.79, $p = 0.0012$), 60s (4.13, $p < 0.0001$), 70s (5.24, $p < 0.0001$), and 80s (4.70, $p = 0.0047$) showed difference.

The following diseases/symptoms showed significant difference [$\exp(\beta)$ values]: arthritis, 2.15 ($p < 0.0001$); backache, 1.86 ($p < 0.0001$); stroke, 4.89 ($p < 0.0001$); atopy, 2.60 ($p = 0.0398$); frozen shoulder, 1.61 ($p = 0.00294$); sprained ankle, 0.65 ($p = 0.0079$); lumbar sprain, 1.53 ($p = 0.0004$); diet, 2.30 ($p = 0.0041$); skin care, 2.29 ($p = 0.0344$); herbal tonics, 0.59 ($p = 0.0145$); and traffic accident, 2.89 ($p < 0.0001$; Table 7).

This indicates that the frequent users of KTM facilities in their 40s to 80s utilized the facilities 2.67 to 5.24 times more, compared with those under 10 years of age. Nonhired persons used KTM less by 0.56 times than the hired. Persons with arthritis, backache, stroke, atopy, frozen shoulder, lumbar sprain, diet, skin care, and traffic accident used KTM facilities by 1.61–4.89 times, whereas persons with sprained ankle and herbal tonics used less by 0.59–0.65 times.

The KTM facilities were more utilized by aged, persons with arthritis, backache, and stroke, whereas the hired persons, patients with sprained ankle and herbal tonics used significantly utilized less KCM facilities. This corresponded to the results reported by Oh et al [17] and Lee et al [18], however, a direct comparison

was limited. For this study, we analyzed the data by specific disease, whereas the two previous studies included a comprehensive chronic disease.

Previous studies on KTM service utilization included elderly individuals [16], public health center visitors of a region [17], National Health and Nutrition Survey data [18], and breast cancer patients [19]. Furthermore, the dependent variable of these studies was chronic disease, not specific diseases as is the case in this study. Further study should be followed with the results of this study to compare frequency by disease, so as to implement proper disease treatment strategies and improve efforts to treat chronic diseases in the context of Korea where the Western medicine and KTM coexist.

A comparative study detailing the advantages of treating chronic diseases with either Western medicine or KTM is important for maximization of medical resources, and minimization of medical expenses [21]. In addition, KTM needs to improve its service and facilities with a grasp of frequent visitors to their facilities [26].

Conflicts of interest

All contributing authors declare no conflicts of interest.

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