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

Jinwon Yoon, Haemo Park, Chaeshin Chu, Sung-Yong Choi, Kibum Lee, Sundong Lee

Graduate School of Public Health, Seoul National University, Korea.
Department of Preventive Medicine, College of Korean Medicine, Sangji University, Korea.
Division of Epidemic Intelligence Service, Korea Centers for Disease Control and Prevention, Korea.
Department of Preventive Medicine, College of Medicine, Hanyang University, Korea.

Received: December 29, 2014
Revised: March 17, 2015
Accepted: March 18, 2015

KEYWORDS:
frequent users, Korean medicine, medical utilization, outpatient

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...
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 need 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 the 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
status, income, and health insurance \((p < 0.0001)\). In short, there were significant differences between infrequent visitors and frequent visitors in all the sociodemographic 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.
[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 \( (p = 0.7201) \).

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

| Variables                              | Infrequent | Frequent | Total | \( p \)  |
|----------------------------------------|------------|---------|-------|---------|
| **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 |
| Asthma                                 | 62 (4.5)   | 31 (2.6) | 93 (3.6)  | 0.0102  |
| Fracture                               | 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  |

\(^a\)Diagnosis 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 (%).

Characteristics of visitors to KTM facilities 173
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%), gastrointestinal trouble (180 persons, 7.0%), frozen shoulder (108 persons, 4.2%), sprained ankle (249 persons, 9.6%), muscular wound (357 persons, 13.8%), lumbar sprain (3.5 persons, 11.8%), and afferent from 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 ($p < 0.0001$). 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

| Variables                      | Infrequent | Frequent | Total   | $p$   |
|--------------------------------|------------|----------|---------|-------|
| 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).
| Diseases and treatment | Infrequent | Frequent | Total | $p$  |
|------------------------|------------|----------|-------|-----|
| **Arthritis**          |            |          |       |     |
| Herbal medicine        | 133 (9.6)  | 279 (23.3)| 412 (16.0)| <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**           |            |          |       |     |
| 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 (131)| 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**             |            |          |       |     |
| 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** |          |          |       |     |
| 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**               |            |          |       |     |
| 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**    |            |          |       |     |
| 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)
| Diseases and treatment                | Infrequent | Frequent | Total |  
|---------------------------------------|------------|----------|-------|     |
| 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    |     |
| Total                                 |            |          |       |     |
| Muscular wound                        | 225 (16.3) | 145 (12.1) | 370 (14.3) | 0.0027 |
| Herbal medicine                       | 23 (1.7)   | 35 (2.9) | 58 (2.3) | 0.3010 |
| 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    |     |
| 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    |     |
| Chiropractic treatment                | MR         | MR       | MR    |     |
| Physical therapy                      | 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.
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 5. Treatment effects of outpatients in Korean Traditional Medicine hospitals/clinics. |
|---------------------------------------------------------------|
| Treatment effect | Infrequent | Frequent | Total | $p$ |
|------------------|------------|----------|-------|-----|
| 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      |            |          |       | <0.0001 |
| Very effective   | 421 (44.3) | 529 (55.7) | 950 (39.1) | |
| 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     |            |          |       | 0.0040 |
| Very effective   | 115 (35.9) | 205 (64.1) | 320 (33.9) | |
| 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 |           |          |       | 0.0047 |
| Very effective   | 127 (42.3) | 173 (57.7) | 300 (32.9) | |
| 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 |       |          |       | 0.0241 |
| Very effective   | 31 (33.0)  | 63 (67.0)  | 94 (42.0) | |
| 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 |            |          |       | <0.0001 |
| Very effective   | 203 (40.4) | 300 (59.6) | 503 (31.4) | |
| 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 $n$ (%).
Table 6. Satisfaction level and side effects among outpatients in Korean Traditional Medicine hospitals/clinics.

| Satisfaction and side effect | Infrequent | Frequent | Total | p       |
|-----------------------------|------------|----------|-------|---------|
| **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**             |            |          |       |         |
| Stomachache, diarrhea       | 25 (54.4)  | 21 (45.7)| 46 (1.8)  | 0.9106  |
| Rash, itching               | 5 (55.6)   | 4 (44.4)  | 9 (18.4)  | 0.3083  |
| Paralysis                   | 9 (47.4)   | 10 (52.6)| 19 (38.8)|         |
| Jaundice                    | 3 (100.0)  | 0 (0.0)   | 3 (6.1)   |         |
| Edema                       | 0 (0.0)    | 1 (100.0)| 1 (2.0)   |         |
| 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 = 1.13, \( p = 0.0762 \)], 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, \( p = 0.083 \); 10s: OR = 1.26, \( p = 0.3749 \); 20s: OR = 1.69, \( p = 0.0665 \); 30s: OR = 2.93, \( p = 0.0002 \); 40s: OR = 3.29, \( p < 0.0001 \); 50s: OR = 5.45, \( p = 0.0001 \); 60s: OR = 6.44, \( p < 0.0001 \); 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, \( p = 0.1741 \); 5001–>6000 USD: OR = 0.120, \( p = 0.3333 \)) 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, \( p < 0.0001 \)), back-ache (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, \( p = 0.0779 \)), 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) | p       | exp (β) | p       |
| 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)
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 = 1.63, p = 0.0044), lumbar sprain (OR = 1.64, 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 exits [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

### Table 7 (Continued)

| Independent variables | Model 1 | Model 2 |
|------------------------|---------|---------|
|                        | exp (β) | p       | exp (β) | p       |
| Infertility            | 1.08    | 0.9477  | 0.54    | 0.1204  |
| Frozen shoulder        | 1.61    | 0.0294  | 1.07    | 0.8744  |
| Sprained ankle         | 0.65    | 0.0079  | 0.81    | 0.4391  |
| Muscular wound         | 1.10    | 0.4501  | 0.59    | 0.0145  |
| Lumbar sprain          | 1.63    | 0.0004  | 1.49    | 0.0291  |
| Fracture               | 1.25    | 0.2777  | 0.57    | 0.0145  |
| Diet/obesity           | 2.30    | 0.0041  | 0.59    | 0.0145  |
| Skin care              | 2.29    | 0.0344  | 0.56    | 0.0145  |
| Somatoype correction   | 1.94    | 0.2269  | 0.59    | 0.0145  |
| Constitution improvement| 1.24   | 0.4097  | 0.59    | 0.0145  |
| Herbal tonics          | 0.59    | 0.0145  | 0.59    | 0.0145  |
| Height growth          | 4.05    | 0.0833  | 2.89    | <0.0001 |
| Aftereffects from traffic accident | 0.34 | 0.0084 |

Dependent variables: Frequency (infrequent: 0, frequent: 1). Model 1: sociodemographic factors. Model 2: Model 1 + 25 diseases.
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(β). There were no differences in age, marital status, education, and health insurance, but exp(β) of those in their 40s
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 [18], 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.

Acknowledgments

This study is based on the KMOH 2011 Report on Usage of Korean Medicine. The authors thank the Division of Korean Traditional Medicine Policy, KMOH.

References

1. Jin S, Lim HA, Cho MD. Inequality in the medical care utilization and medical expenditure for the patients with chronic illness. Korean J Health Econ Policy 2012 Sep;18(3):79–101 [In Korean].
2. Son KA, Kim YS, Hong MH, Jeong MA. Analysis of the continuity of outpatient among adult patients with hypertension and its influential factors in Korea. J Korea Acad Indusr Coop Soc 2010 Jun;11(6):2161–8 [In Korean].
3. Textbook of Preventive Korean Medicine Compilation Committee. Preventive Korean medicine and public health. Seoul (Korea): Gyechukmunhwasa; 2013 [In Korean].
4. Jung H, Park H, Lee S. Nationwide study on the characteristics of patients visiting and using Korean medical facilities by sex. J Korean Med 2014 Mar;35(1):75–87 [In Korean].
5. Lee E, Lee S, Song A, Yoon J, Choi S, Chong M. A study on the characteristics of patients with musculoskeletal diseases (MSDs) among outpatients using Korean medical institutes: based on the Ministry of Health and Welfare’s 2011 report on usage of Korean medicine. J Soc Prev Korean Med 2014 Aug;18(2):31–45 [In Korean].
6. Kang SJ, Lee YJ. Patterns of Korean traditional medical services utilization in Daegu. Korean J Orient Prev Med 2010 Aug;14(2):67–75 [In Korean].
7. Navo MA, Phan J, Vaughan C, et al. An assessment of the utilization of complementary and alternative medication in women
Characteristics of visitors to KTM facilities

with gynecologic or breast malignancies. J Clin Oncol 2004 Feb; 22(4):671–7.
8. Ashikaga T, Bosompra K, O’Brien P, Nelson L. Use of complementary and alternative medicine by breast cancer patients: prevalence, patterns and communication with physicians. Support Care Cancer 2002 Oct;10(7):542–8.
9. Ministry of Health and Welfare. Reports about usage and consumption of Korean medicine. Seoul (Korea): Ministry of Health and Welfare; 1998 [In Korean].
10. Ministry of Health and Welfare. Reports about usage and consumption of Korean Medicine. Seoul (Korea): Ministry of Health and Welfare; 2011 [In Korean].
11. Ministry of Health and Welfare. Reports about usage and consumption of Korean medicine. Sejong (Korea): Ministry of Health and Welfare; 2014 [In Korean].
12. Lee S, Jo J, Kim H, Park H, Yang JM, Choi SY. Nationwide study on the usage and characteristics of patients visiting Korean medical facilities. Korean J Orient Prev Med Soc 2013 Aug;17(2): 29–46 [In Korean].
13. Choi SY, Shin HK, Park H, Lee S. An analysis of patients using Korean medicine clinics: analysis of outpatients and inpatients by age, sex and regions. Korean J Orient Prev Med Soc 2012 Aug; 16(2):67–81 [In Korean].
14. Lee WC, Choi SY, Lee S. Comparison of service usage of outpatients at Korean medical clinics by regions and gender. J Soc Prev Korean Med 2014 Dec;18(3):41–55 [In Korean].
15. Kang YM. Variation analysis of medical service utilization in oriental medicine frequent disease of rural area. J Korea Acad Industr Coop Soc 2013 Feb;14(2):713–20 [In Korean].
16. Park JE, Kwon S. Determinants of the utilization of oriental medical services by the elderly. J Korean Oriental Med 2011 Jan; 32(1):97–108 [In Korean].
17. Oh JS, Han D, Im MH, Hong YS, Lee YH, Noh HI. The use of traditional Korean medicine and its affecting factors among patients with chronic disease in Jeju province, Korea. Korean J Orient Prev Med Soc 2009 Dec;13(3):55–71 [In Korean].
18. Lee HJ, Yoo W, Chung SK. Determining factors for the use of oriental healthcare services for survey subjects with chronic illness: 2005 National Health and Nutrition Examination Survey. Korean J Orient Prev Med Soc 2011 Dec;15(3):115–25 [In Korean].
19. Han DW, Kim YY, Choi SJ, Hwang HH. Determinants on Korean medicine use among breast cancer patients. Korean J Orient Prev Med Soc 2012 Dec;16(3):37–51 [In Korean].
20. SAS Institute Inc. 2009. Base SAS® 9.2 Procedures Guide. Cary, NC.
21. Yang H, Zhao Z, Wang M, et al. Advantage of traditional Chinese medicine and disease characteristics. J Tradit Chin Med 2012 Feb; 53(4):285–7 [In Chinese].
22. Yun YJ, Nah SS, Park JH, et al. Assessment of prescribed herbal medicine on liver function in Korea: a prospective observational study. J Altern Complement Med 2008 Nov;14(9):1131–6.
23. Yang JI, Lee KH, Kim YS, Shin MK, Yoo JH, Chang GT. A report on liver function tests of 82 psoriasis patients taking herbal medication over 3 months. J Korean Orient Med 2012 Sep;33(3): 95–104.
24. Sakuri M. Perspective: herbal dangers. Nature 2011 Dec; 480(7378):S97.
25. Kim HK, Lee JU, Park KW, Moon OR. Regional variations in the cesarean section rate and its determination in Korea. Korean J Prev Med 1992 Sep;25(3):312–29.
26. Yoo WK. A study on recognition level of the people on oriental medical services and the need for its improvement. Korean J Orient Prev Med Soc 2003 Dec;7(2):45–64.