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# The Utilization of Traditional Herbal Medicine for Treatment in Traditional Korean Medicine Clinics

*Ji Yeon Ryu, Jung Youn Park, Angela Dongmin Sung  
and Soo Hyun Sung*

## Abstract

A cross-sectional study has been conducted to detect the facts about the use of traditional herbal medicines (THMs) in South Korea. The questionnaire has been adopted from the 2017 National Survey for the usage of traditional Korean medicine (TKM) and consumption of THMs. A total number of 1346 participants have been involved in this study. Results showed that the non-decoction types of herbal medicines, which are mostly used for therapeutic purposes (89.0%), and the decoction types of herbal medicines were not only used for the purpose of treatment of diseases (62.5%) but also health improvement purposes (21.9%). Results presented that decoction types of THMs are used for musculoskeletal diseases (56.0%), digestive diseases (21.3%), and respiratory diseases (6.3%), whereas the non-decoction types of THMs are commonly used in musculoskeletal diseases (55.6%), respiratory diseases (20.5%), and digestive diseases (18.1%). Future studies are highly recommended to detect more details about the medical use of THMs in South Korea.

**Keywords:** medicinal herb, herbal medicine, traditional Korean medicine, traditional herbal medicine, medical use of herbal medicine

## 1. Introduction

### 1.1 Herbal medicine

Traditional herbal medicines (THMs) are the most popular and preferred forms of traditional medicines (TMs) [1–3]. The World Health Organization (WHO) estimated that 80% of the population in developing countries rely on traditional herbs for their primary health care [4]. Compared with the developed countries, in the United States of America (USA), 19% of the population uses THMs for their treatment [5].

THMs have gained an increasing popularity in the last two decades in the industrialized countries [6–8]. The Europe market for THMs is estimated to be valued at \$5.18 billion in 2016 [9]. The American botanical council reported that the sales of THMs in the USA reached a total of \$7.45 billion in 2016 [10]. Thus, the global THM market is expected to grow and reach \$129.68 billion by 2023 [11].

TMs, such as traditional Chinese medicines (TCMs), Ayurveda, Kampo, traditional Korean medicines (TKMs), and Unani, have used herbal medicines for hundreds or even thousands of years worldwide [6, 12–15]. Before Western medicine was introduced, TMs, especially herbal medicines, were used for preventing and treating diseases in many nations [16]. The use of THMs is well established, and it is widely known to be safe and effective [17].

TM practitioners in Asian countries, such as China, South Korea, and Taiwan, practice TM treatment in medical clinics as doctors defined by law [18, 19]. South Korea has the highest percentage (15.26%) of TM doctors in medical clinics in East Asia, followed by China (12.63%) and the Taiwan region (9.69%) [18].

## **1.2 Traditional herbal medicines in Korea**

Koreans have traditionally used herbs for treatment and prevention of diseases. In 1894, Je Ma Lee, a TKM doctor, established the theory of Sasang constitutional medicine (SCM), which is a unique TKM form [14, 20]. Based on the SCM theory, humans are categorized into four constitution types: Taeyangyin (Greater Yang type), Tae-eumin (Greater Yin type), Soyangyin (Lesser Yang type), and Soeumin (Lesser Yin type) [14, 20]. SCM has classified therapeutic THMs according to the four constitutions because THMs that respond to the characteristics of four constitutions are different [14, 20].

In South Korea, TKM is legally institutionalized and covered by national insurance [18]. Since 1987 herbal extracts based on good manufacturing practice (GMP) are covered by health insurance, but the decoction type of traditional herbal medicines (THMs) which is combined with two or more medicinal herbs is still not insured yet [18]. In addition, as a member of the WHO Pharmacovigilance, Korea is monitoring adverse drug reactions, including THMs [21].

### *1.2.1 Medicinal use of herbs in traditional Korean medicine clinics*

The Korean Ministry of Food and Drug Safety (MFDS) introduced the Good Manufacturing Practice for herbs (hGMP) in 2012 and made it mandatory in 2015 [22]. Thus, medicinal herbs must be manufactured by the hGMP facilities that are licensed by the Korean MFDS [22].

Standards for commonly used herbal materials and preparations are included in the “Korean Pharmacopoeia (KP)” and “Korean Herbal Pharmacopoeia (KHP)” [23]. As of 2019, there are 601 kinds of herbal materials called medicinal herbs listed in the “Korean Pharmacopoeia” and “Korean Herbal Pharmacopoeia” [24, 25]. The amount of hazardous substances (e.g., heavy metals, pesticides, aflatoxins, sulfur dioxide, and benzopyrene) in herbal materials is restricted by the “Regulations on Limits and Test Methods for Residues and Contaminants in Herbal Medicines” [26].

According to the Korea medical law, TKM clinics should utilize medicinal herbs certified by the Korean MFDS [22]. Since 2015, TKM clinics have been using THMs composed of medicinal herbs for treating diseases and promoting health.

THMs are the second most commonly used treatment in South Korea, mainly utilized as a combination of two or more medicinal herbs [27, 28]. In addition, they are used in various forms, such as a decoction, powder, tablet, soft extract, paste, and pill [27].

In previous studies related to Korean THMs, Fan [23] reviewed the role of MFDS in THM management: pre-market approval, post-market inspection, and management of the product quality system. Choi [29] reported that THMs are

standardized, regulated, and quality controlled by MFDS guidelines such as KP and KHP. Park [18] investigated the TKM system and summarized development of TM system, policy, education system, medical insurance coverage, and herbal drug monitoring system. Yarnell [30] introduced herbal medicine market and modernized decoction device of TKM hospitals.

To the best of our knowledge, this is the first study aims to *shed some light on* the overall status of THM usage in South Korea (TKM clinics). The objective of this research was to examine the medical use of THMs, particularly mixtures of THMs, in South Korea, a country with an extensive knowledge and experience in THM use for preventing and treating diseases.

2. Methods

2.1 Study design

The cross-sectional study design has been used to address the research goals.

2.2 Study population

The population of the study included TKM doctors who worked at the TKM clinics. Inclusion and exclusion criteria are as follows:

2.2.1 Inclusion criteria

All TKM doctors who used to prescribe THMs and provide their consent form have been included.

1. How many prescription cases are being used in the practice? (1) Decoction types of THMs: _____ cases (2) Non-decoction types of THMs: _____ cases
2. What is the prescription purpose rate when prescribing herbal medicines? (total 100%) (1) Diseases treatment _____ % (2) Health improvement _____ % (3) Beauty _____ % (4) Traffic accident _____ % (5) Others _____ %
3. Which disease prescribed herbal medicine the most when treating the disease? (1) Which disease prescribed decoction types of THMs the most when treating the disease? ① Musculoskeletal disease ② Neurological disease ③ Cerebrovascular disease ④ Cardiovascular disease ⑤ Cancer ⑥ Endocrine disease ⑦ Digestive disease ⑧ Respiratory disease ⑨ Mental disease ⑩ Obstetrics and gynecology disease ⑪ Urogenital disease ⑫ Skin disease ⑬ Disease in eyes and ears ⑭ Others (2) Which disease prescribed non-decoction types of THMs the most when treating the disease? ① Musculoskeletal disease ② Neurological disease ③ Cerebrovascular disease ④ Cardiovascular disease ⑤ Cancer ⑥ Endocrine disease ⑦ Digestive disease ⑧ Respiratory disease ⑨ Mental disease ⑩ Obstetrics and gynecology disease ⑪ Urogenital disease ⑫ Skin disease ⑬ Disease in eyes and ears ⑭ Others
4. Which disease prescribed herbal medicine the most when treating the disease? 1. Which disease prescribed decoction types of THMs the most when treating the disease? 2. Which disease prescribed non-decoction types of THMs the most when treating the disease?
TKM: Traditional Korean medicine THM: Traditional herbal medicine

Table 1.  
Questionnaire on THM prescriptions of TKM doctors.

## 2.3 Sample selection

The survey group of THM consumption included individuals who worked at TKM clinics, hospitals (TKM, long-term care, and general hospitals), traditional herbal medicine pharmacies, and community pharmacies. In the study, 1354 TKM doctors working in TKM clinics were included. Among them, 1346 respondents were selected for the final analysis, excluding 8 who said they do not prescribe THMs.

## 2.4 Questionnaire

The questionnaire adopted and used in this study has been developed by the Korea Ministry of Health and Welfare (MHW), and the National Statistics of Korea reviewed and approved the questionnaire [27]. The 10-page structured questionnaire contained questions on the use, experience, treatment, management status, preference form, number of prescriptions, prescription purpose, frequently prescribed THMs for treatment, ways to purchase herbs, reasons for difficulty in purchase herbs, and plans to expand the use of THMs [27].

There are four sections used in the analysis: the number of THM prescriptions per year, prescription purpose when prescribing THMs, diseases treated with THMs, and THMs used for the disease [27]. The used questionnaire is shown in **Table 1**.

## 2.5 Data analysis

Descriptive statistics (mean and proportions) were used to describe the characteristics of the representatives of TKM clinics in the sample. Cross-analysis was used to determine the relationships between the high frequency of disease and prescription. All data analyses were performed using SPSS software (version 21.0 for Windows; IBM cop., Armonk, United States).

## 3. Results

### 3.1 Basic characteristics of participant TKM doctors

A total number of 1346 TKM doctors participated in this study, 1204 were men (89.5%) and 142 were women (10.5%). Most of them (73.5%) aged between 41 and 60. Out of the 1346 clinics, 779 (57.9%) were located in the capital area, while the rest 567 (42.1%) were located in the noncapital area. Majority of the participants 882 (65.5%) were with less than 20 years of clinical experience, 417 (31.0%) were with 21–38 years of treatment experience, and 47 (3.5%) of them were with 39–56 years of experience, as shown in **Table 2**.

### 3.2 Types of THMs prescribed in TKM clinics

#### 3.2.1 Dispensing of decoction types of THMs

Results showed that 1346 of the TKM doctors prescribed an average of  $590.4 \pm 1105.5$  decoction types of THMs/year, and the prescription distribution was as follows: 378 (28.1%) had  $\leq 200$  cases, 428 (31.8%) had 201–400 cases, 256 (19.0%) had 401–600 cases, and 284 (21.1%) had  $\geq 601$  cases (**Table 3**).

Factors	N (%)
Gender	
Male	1204 (89.5)
Female	142 (10.5)
Age (years)	
30–40	191 (14.2)
41–50	550 (40.8)
51–60	440 (32.7)
≥61	165 (12.3)
Place of work	
Capital area	779 (57.9)
Chungcheong Province	122 (9.1)
Gyeongsang Province	287 (21.3)
Jeolla Province	158 (11.7)
Clinical experience	
≤20	882 (65.5)
21–38	417 (31.0)
39–56	47 (3.5)

TKM: Traditional Korean medicine

**Table 2.**  
*Demographics of participating TKM doctors.*

Prescription frequency	N (%)	Mean ± SD
≤200	378 (28.1)	590.4 ± 1105.5
201–400	428 (31.8)	
401–600	256 (19.0)	
≥601	284 (21.1)	

THM: Traditional herbal medicine  
TKM: Traditional Korean medicine

**Table 3.**  
*Decoction types of THMs prescribed in TKM clinics.*

3.2.2 Dispensing of non-decoction types of THMs

Out of the total 1346 respondents, 1070 TKM doctors prescribed non-decoction types of THMs. The average of prescription cases was  $1775.9 \pm 2349.1$  non-decoction types of THMs/year, and prescription distribution was as follows: 222 (20.7%) had ≤200 cases, 120 (11.2%) had 201–400 cases, 92 (8.6%) had 401–600 cases, and 636 (59.4%) had ≥601 cases (**Table 4**).

3.3 Purpose of prescribed THMs

3.3.1 Purpose of prescribed decoction types of THMs

Decoction types of THMs have been prescribed in the TKM clinics for various reasons: disease treatment (62.5%), health promotion (21.9%), traffic accidents

Prescription frequency	N (%)	Mean ± SD
≤200	222 (20.7)	1775.9 ± 2349.1
201–400	120 (11.2)	
401–600	92 (8.6)	
≥601	636 (59.4)	

THM: Traditional herbal medicine  
TKM: Traditional Korean medicine

**Table 4.**  
*Non-decoction types of THMs prescribed in TKM clinics.*

(8.6%), beauty (5.9%), and others (1.1%). It was found that most TKM clinics prescribe decoction of Korean medicine herbs for treatment of diseases, as shown in **Table 5**.

3.3.2 Purpose of prescribed non-decoction types of THMs

Same as above, non-decoction types of THMs have been prescribed for several reasons: disease treatment (89.0%), health promotion (6.0%), car accidents (2.8%), beauty (1.4%), and others (0.9%), as shown in **Table 6**.

3.4 Disease proportions and THMs prescribing pattern

3.4.1 Decoction types of THMs

The decoction types of THMs were prescribed for patients suffering from musculoskeletal diseases (56.0%), digestive diseases (21.3%), respiratory diseases (6.3%), and obstetrics and gynecology disease (4.2%).

Results showed that decoction types of THMs frequently used for musculoskeletal diseases were Ojeoksan (22.5%), Bojungikgitang (10.3%), and Sipjeondaebotang (7.5%); for digestive diseases were Bojungikgitang (12.5%), Sipjeondaebotang (8.8%), and Ojeoksan (8.8%); for respiratory diseases were Bojungikgitang (9.9%), Socheongryongtang (9.9%), Sipjeondaebotang (8.6%), and Ojeoksan (8.6%); for obstetrics and gynecology diseases were Jogyeongjongogtang (11.1%), Ojeoksan (9.3%), and Bojungikgitang (7.4%); for skin diseases ( $n = 38$ ) were Ojeoksan (10.5%) and Bojungikgitang (7.9%); for neurological diseases were Ojeoksan (16.7%), Galgeuntang (8.3%), and Yukmijihwangtang (8.3%); for cerebrovascular diseases were Ojeoksan (18.8%), Ganghwangyupungtang (12.5%), and Sipjeondaebotang (9.4%); for mental diseases were Gamiondamtang (11.5%), Kwibitang (7.7%), Bunsimgieum (7.7%), and Ojeoksan (7.7%); for cardiovascular diseases was Gamiondamtang (30.0%); for endocrine diseases was Sipjeondaebotang (25.0%); for urogenital diseases were Ssanghwatang (33.3%), Ojeoksan (33.3%), and Yukmijihwangtang (33.3%); for diseases in eyes and ears was Ojeoksan (100.0%); and for cancer was Banhasasimtang (100.0%), as shown in **Table 7**.

3.4.2 Non-decoction types of THMs

The non-decoction types of THMs were prescribed for patients suffering from musculoskeletal diseases (55.6%), respiratory diseases (20.5%), and digestive diseases (18.1%).

Prescription purpose	Mean ± SD
Disease treatment	62.5 ± 24.7
Health improvement	21.9 ± 19.6
Traffic accidents	8.6 ± 12.5
Beauty	5.9 ± 12.5
Others	1.1 ± 4.6

THM: Traditional herbal medicine

**Table 5.**  
Purpose of prescribed decoction types of THMs.

Purpose of prescription	Mean ± SD
Disease treatment	89.0 ± 19.3
Health improvement	6.0 ± 13.3
Beauty	2.8 ± 6.5
Traffic accidents	1.4 ± 9.1
Others	0.9 ± 5.1

THM: Traditional herbal medicine

**Table 6.**  
Purpose of prescribed non-decoction types of THMs.

Types of diseases	Top 3 used THMs	N (%)
Musculoskeletal disease (n = 716)	Ojeoksan (五積散)	161 (22.5)
	Bojungikgitang (補中益氣湯)	74 (10.3)
	Sipjeondaebotang (十全大補湯)	54 (7.5)
Digestive disease (n = 272)	Bojungikgitang (補中益氣湯)	34 (12.5)
	Sipjeondaebotang (十全大補湯)	24 (8.8)
	Ojeoksan (五積散)	
Respiratory disease (n = 81)	Bojungikgitang (補中益氣湯)	8 (9.9)
	Socheongryongtang (小青龍湯)	
	Sipjeondaebotang (十全大補湯)	7 (8.6)
Obstetrics and gynecology disease (n = 54)	Ojeoksan (五積散)	
	Jogyaeongjongogtang (調經種玉湯)	6 (11.1)
	Ojeoksan (五積散)	5 (9.3)
Skin disease (n = 38)	Bojungikgitang (補中益氣湯)	4 (7.4)
	Ojeoksan (五積散)	4 (10.5)
	Bojungikgitang (補中益氣湯)	3 (7.9)
Neurological disease (n = 36)	Danguisusan (當歸鬚散)	2 (5.3)
	Wolbitang (越婢湯)	
	Hwangryunhaedoktang (黃蓮解毒湯)	
Cerebrovascular disease (n = 32)	Ojeoksan (五積散)	6 (16.7)
	Galgeuntang (葛根湯)	3 (8.3)
	Yukmijihwangtang (六味地黃湯)	
	Ojeoksan (五積散)	6 (18.8)
	Ganghwangyupungtang (羌活愈風湯)	4 (12.5)
	Sipjeondaebotang (十全大補湯)	3 (9.4)

Types of diseases	Top 3 used THMs	N (%)
Mental disease (n = 26)	Gamiondamtang (加味溫膽湯)	3 (11.5)
	Kwibitang (歸脾湯)	2 (7.7)
	Bunsimgieum (分心氣飲)	
	Ojeoksan (五積散)	
Cardiovascular disease (n = 10)	Gamiondamtang (加味溫膽湯)	3 (30.0)
	Ganghwangyupungtang (羌活愈風湯)	1 (10.0)
	Bojungikgitang (補中益氣湯)	
	Sipjeondaebotang (十全大補湯)	
	Ojeoksan (五積散)	
	Yukmijihwangtang (六味地黃湯)	
	Insamnyangyeongtang (人蔘養榮湯)	
	Galgeuntang (葛根湯)	
Endocrine disease (n = 8)	Sipjeondaebotang (十全大補湯)	2 (25.0)
	Gwakhyangjunggisan (藿香正氣散)	1 (12.5)
	Banhasasimtang (半夏瀉心湯)	
	Bangpungdongseongsan (防風通聖散)	
	Yukgunjatang (六君子湯)	
	Yukmijihwangtang (六味地黃湯)	
	Palmultang (八物湯)	
Urogenital disease (n = 3)	Ssanghwatang (雙和湯)	1 (33.3)
	Ojeoksan (五積散)	
	Yukmijihwangtang (六味地黃湯)	
Disease in eyes and ears (n = 1)	Ojeoksan (五積散)	1 (100.0)
Cancer (n = 1)	Banhasasimtang (半夏瀉心湯)	1 (100.0)
THM: Traditional herbal medicine		

**Table 7.**  
Disease proportions and pattern of prescribed decoction types of THMs.

Types of diseases	Top 3 used THMs	N (%)
Musculoskeletal disease (n = 591)	Ojeoksan (五積散)	216 (36.5)
	Gunghatang (芎夏湯)	92 (15.6)
	Ijintang (二陳湯)	45 (7.6)
Respiratory disease (n = 218)	Ojeoksan (五積散)	35 (16.1)
	Samsoeum (蔘蘇飲)	30 (13.8)
	Socheongryongtang (小青龍湯)	
Digestive disease (n = 192)	Pyeongwisan (平胃散)	38 (19.8)
	Ojeoksan (五積散)	37 (19.3)
	Hyangsapyungwisan (香砂平胃散)	21 (10.9)
Neurological disease (n = 16)	Socheongryongtang (小青龍湯)	3 (18.8)
	Galgeuntang (葛根湯)	2 (12.5)
	Ojeoksan (五積散)	
	Gumiganghwaltang (九味羌活湯)	
	Samsoeum (蔘蘇飲)	
	Pyeongwisan (平胃散)	

Types of diseases	Top 3 used THMs	N (%)
Cerebrovascular disease (n = 11)	Ojeoksan (五積散)	3 (27.3)
	Yeongyopaedoksan (蓮翹敗毒散)	2 (18.2)
	Gunghatang (芎夏湯)	1 (9.1)
	Bojungikgi-tang (補中益氣湯)	
	Socheongryongtang (小青龍湯)	
	Ijintang (二陳湯)	
	Jaeumganghwatang (滋陰降火湯)	
	Pyeongwisan (平胃散)	
Cardiovascular disease (n = 9)	Banhabackchulchunmatang (半夏白朮天麻湯)	2 (22.2)
	Gumiganghwaltang (九味羌活湯)	1 (11.1)
	Gunghatang (芎夏湯)	
	Bojungikgitang (補中益氣湯)	
	Sosihotang (小柴胡湯)	
	Ijungtang (理中湯)	
	Ijintang (二陳湯)	
	Pyeongwisan (平胃散)	
Obstetrics and gynecology disease (n = 8)	Ojeoksan (五積散)	2 (25.0)
	Gamisoyosan (加味逍遙散)	1 (12.5)
	Gunghatang (芎夏湯)	
	Bulhwangeumjeonggisan (不換金正氣散)	
	Samsoeum (蔘蘇飲)	
	Ijintang (二陳湯)	
	Pyeongwisan (平胃散)	
Skin disease (n = 5)	Gamisoyosan (加味逍遙散)	1 (20.0)
	Gunghatang (芎夏湯)	
	Ojeoksan (五積散)	
	Insampaedoksan (人蔘敗毒散)	
	Pyeongwisan (平胃散)	
Mental disease (n = 5)	Ojeoksan (五積散)	2 (40.0)
	Gamisoyosan (加味逍遙散)	1 (20.0)
	Gumiganghwaltang (九味羌活湯)	
	Daecheongnyongtang (大青龍湯)	
Urogenital disease (n = 3)	Ojeoksan (五積散)	2 (66.7)
	Pyeongwisan (平胃散)	1 (33.3)
Endocrine disease (n = 2)	Gumiganghwaltang (九味羌活湯)	1 (50.0)
	Pyeongwisan (平胃散)	
Disease in eyes and ears (n = 1)	Ojeoksan (五積散)	1 (100.0)
Cancer (n = 1)	Gunghatang (芎夏湯)	1 (100.0)
THM: Traditional herbal medicine		

**Table 8.**  
 Disease proportions and pattern of prescribed non-decoction types of THMs.

Results showed that decoction types of THMs frequently used for musculoskeletal diseases were Ojeoksan (36.5%), Gunghatang (15.6%), and Ijintang (7.6%); for respiratory diseases were Ojeoksan (16.1%), Samsoeum (13.8%), and Socheongryongtang (13.8%); for digestive diseases were Pyeongwisan (19.8%), Ojeoksan (19.3%), and Hyangsapyungwisan (10.9%); for neurological diseases was Socheongryongtang (18.8%); for cerebrovascular diseases were Ojeoksan (27.3%) and Yeongyopaedoksan (18.2%); for cardiovascular diseases was Banhabackchulchunmatang (22.2%); for obstetrics and gynecology diseases was Ojeoksan (25.0%); for skin diseases were Gamisoyosan (20.0%), Gunghatang (20.0%), Ojeoksan (20.0%), Insampaedoksan (20.0%), and Pyeongwisan (20.0%); for mental diseases was Ojeoksan (40.0%); for urogenital diseases were Ojeoksan (66.7%) and Pyeongwisan (33.3%); for endocrine diseases were Gumiganghwaltang (50.0%) and Pyeongwisan (50.0%); for diseases in eyes and ears was Ojeoksan (100.0%); and for cancer ( $n = 1$ ) was Gunghatang (100.0%), as shown in Table 8.

#### 4. Discussion

This study investigated the use of THMs in TKM clinics in South Korea.

Results showed that average prescription cases of  $590.4 \pm 1105.5$  decoction types of THMs and  $1775.9 \pm 2349.1$  non-decoction types of THMs had been prescribed by doctors per year in the TKM clinics. According to the Korean national survey [27], the use of decoction types of THMs was 54.8%, and non-decoction types of THMs with the exception of insurance herbal extracts was 45.2% [27].

The reason for the preference for decoction types of THMs in South Korea is that the traditional way to boil herbs is familiar to the people, and it is possible to prescribe customized prescription according to the symptoms of the patients [31]. Non-decoction types of THMs such as granule, pill, tablet, soft extract, paste, and powder are convenient to store and carry because it is smaller in size than the decoction types of THMs [27]. In the case of the same prescription, the non-decoction types of THMs found to be cheaper than decoction types of THMs, so that patients may prefer non-decoction types of THMs for economic reason [27].

According to the 2017 national survey, Koreans responded that decoction types of THMs were too expensive (44.3%) and required health insurance coverage with a top priority (55.2%) [27]. This point will be solved soon since the Korean MHW has a plan to conduct a pilot program for insurance coverage expansion to the THMs in the latter half of 2019 [32].

The Korean MHW has a plan to conduct a pilot program for insurance coverage expansion to the THMs in the latter half of 2019 [32]. This point will make decoction types of THMs more affordable; this is mainly because the decoction type is found to be more potent and used in a wide range than the non-decoction type. As mentioned by Yoo and Son [33], unlike the non-decoction types of THMs, which were mostly used for therapeutic purposes (89.0%), the decoction types of THMs were not only used for the purpose of treatment of diseases (62.5%) but also for health improvement purposes (21.9%). THMs, especially decoction types of THMs, have played an important role in the prevention of diseases and health promotion in people in South Korea [33]. It is related to the viewpoint of TKM, which improves the vitality by correcting the imbalance of the human body, and the traditional way of boiling herbs reflects this [33].

In respiratory diseases, non-decoction types of THMs (20.5%) were more frequently prescribed than decoction types of THMs (6.3%). It is important to take the medication early during a cold, because of the need to combat the virus. It relieves

symptoms such as cough, nasal congestion, and rhinorrhea [34]. The decoction types of THMs require about 1 day of preparation time because it takes time to boil the mixed herbs. In the case of non-decoction types of THMs, it is presumed that it is used in respiratory diseases such as cold, because it can be prepared in advance, or ready-made products (pharmaceutical products) can be prescribed immediately.

Koreans suffer from digestive diseases due to the preference of spicy and salty Foods, and frequent use of antibiotics [35, 36]. In general, decoction types of THMs are used for treating digestive diseases [27]. The reason for using decoction types of THMs for treating digestive diseases is related to drug manufacturing method and patient's digestive condition [37]. As a result of that, decoction types of THMs seem to be more preferable and suitable for digestive diseases [27, 37].

There are several limitations in this study. First, some data were limited or deficient due to their limited sources, and the information may be biased despite our efforts to obtain objective data. Since this study was particularly purposed to identify the prescription of THMs for each disease, there is a limitation to the analysis by excluding "other" diseases.

Second, we could not analyze the results of the use of all Korean THMs because the questionnaire was designed specifically for decoction types of THMs. In addition, we could not assess the utilization status of different THM forms (e.g., granule, pill, tablet, soft extract, paste, and powder) and their target diseases, except for the decoction types of THMs. The dosage has an important influence on the treatment [38]. In order to examine the whole use and status of dosage forms of THMs, the questionnaire needs to be revised in a future survey.

Third, we investigated the disease categories, not the specific diseases that THMs were prescribed for. In the 2020 national survey, the questionnaire needs to be corrected so that the respondents can reply in regard to specific diseases.

## 5. Conclusions

Our study, based on a national survey of TKM doctors, presented the overall status of medical use of THMs in South Korea. However, the 2017 national survey was conducted separately for decoction and non-decoction types of THMs. Therefore, we could not assess the whole status of THM usage and therapeutic effects of each THM formulation. In future survey, we hope to be able to assess the details of medical use of THMs in South Korea.

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## Conflict of interest

The authors declare no conflict of interest.

## Abbreviations

THM	Traditional herbal medicine
TM	Traditional medicine

TKM	Traditional Korean medicine
MFDS	Ministry of Food and Drug Safety
MHW	Ministry of Health and Welfare

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### Author details


Ji Yeon Ryu<sup>1</sup>, Jung Youn Park<sup>2</sup>, Angela Dongmin Sung<sup>1</sup> and Soo Hyun Sung<sup>1\*</sup>

1 National Institute of Korean Medicine Development, Seoul, South Korea

2 Yuhan University, Bucheon, South Korea

\*Address all correspondence to: koyote10010@nikom.or.kr

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