

Review Article

The trend of key results and strategies for improvement of Herbal Medicine Consumption Survey

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Objectives: To identify changes in the subjects and methods of Herbal Medicine Consumption Survey, and analyze trend of the key results

Methods: The population, methods, and items of the basic reports of all Surveys on Consumption of Herbal Medicine(HM) were organized in a time-series manner. The analysis items were trend in the purchase of standardized HM; consumption value share, and price of prepared HM; type of herbal dispensary; and awareness of HM policy in Koran Medicine(KM) institutions.

Results: The price of HM preparations showed an upward trend in 2011, 2014, and 2017 surveys, and decreased in the 2020 survey. However, despite this recent decrease, the 2021 survey also saw the highest proportion of HM users reporting that price of herbal decoction is expensive. Furthermore, the demand for expanded coverage of herbal decoction was the greatest for the expansion of health insurance benefits. Efforts such as adjusting the number of covered diseases and the cost of health insurance coverage would be necessary. Regarding decoction dispensaries the proportion of HM hospitals using only extramural herbal dispensaries increased. Finally, the consumption of HM and the size of the HM industry has continued to expand due to the large-scale branding of KM institutions and the expansion of health insurance coverage.

Conclusion: Future surveys must standardize and unify the items for the time-series continuity and compare the results with government statistics reports on HM to increase reliability. Moreover, specialized survey items may be developed for KM, to establish a better and efficient distribution system for domestic HMs.

Key Words : Herbal Medicine, Consumption, Survey

Introduction

Traditionally, Herbal Medicine(HM) has been one of the key treatment tools of Korean Medicine(KM), and it plays an essential role when the public uses KM services. In the 2020 HM Consumption Survey, 18.8% and 43.0% of

outpatients and inpatients, respectively, among those who visited KM institutions utilized herbal decoction (2020 Korean Medicine Utilization Survey). Notably, the total production cost of standard HM had increased 177% from 75.6 billion KRW in 2005 to 209.3 billion KRW in 2020, while the number of standard HM items

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had increased from 405 in 2005 to 509 in 2020 (Ministry of Food and Drug Safety, 2021). This demonstrates that the importance of HM is growing.

HM, however, due to its complicated distribution process and naturally-produced characteristics, has constantly suffered from safety issues. As one of many efforts to counteract such limitations, the Ministry of Health and Welfare conducted the first survey on HM consumption in 2009 to find and improve problems in the distribution process. This survey continued, and the sixth survey was completed in 2021. HM Consumption Survey investigated not only KM institutions, but also end consumers of all HMs, including medical institutions such as nursing and general hospitals, pharmacies and Korean traditional pharmacies, through a representative sampling using a regional stratified sampling method.(2021 HM Consumption Survey) In addition, the survey investigated institutional characteristics and various items related to HM, such as prescription, purchase, and awareness. It is the only national statistics on HMs approved by Statistics Korea(2021 HM Consumption Survey).

With its history of a decade, we could witness various changes in utilization of HM, following institutional and industrial changes. For example, the “HM Distribution Unification System” was implemented in 2011 to stipulate that KM institutions must purchase HMs through HM wholesalers. The self-standard product system was abrogated in the same year, which affected institutional changes in HM usage (Ministry of Health and Welfare Press Release, 2011). Moreover, the recently implemented health insurance

coverage project(pilot) for herbal decoction may also affect how people use HM. On the other hand, the growth of health functional foods, changes in HM prices, and changes in the public's preference for HMs would be industrial shifts affecting the use of HMs. Kim (2020) investigated the prices of 266 standard HMs for three years and found that the highest and lowest price was 23.2% higher and 19.1% lower than the mean price, respectively.

Understanding the results of the past ten years' survey, as well as other events that may have affected HMs' usage, can help us comprehend the longitudinal trend. Also, these insights can indicate how the survey should be adjusted to fit better with evolving circumstances and future needs. Nevertheless, studies have yet to longitudinally analyze the results of the Surveys on the Consumption of HM. Here, we investigated changes in the survey population and methods of all these surveys and analyzed the trend of critical results.

Methods

1. Historical analysis of the Survey on Consumption of Herbal Medicine

After the first survey in 2009, six surveys were conducted until 2021. The temporal flow was first investigated through the the survey's history to analyze the trend of the key survey results, and an overview of the six surveys, including the procedure and method, was analyzed to identify unique features of each survey. To understand the history and overview of these surveys, the introductory survey and internal documents of the

surveying institution were analyzed as well as the survey method, population, and time.

2. Analysis of the main results of Surveys on Consumption of Herbal Medicine

1) Data source

The Survey on the Consumption of HM comprises data organized by the Ministry of Health and Welfare to understand the prescription and consumption of HM, and produce primary data for the establishment of policies related to HM. The population of the survey included KM hospitals and clinics, nursing(general) hospitals with KM doctors that provide KM treatment, pharmacies with herbal dispensing pharmacists (who has passed the HM dispensing examination) or herb pharmacists, and Korean traditional pharmacies that provide KM preparation/sale services. Although there were differences by year, based on the 2017 survey, the data were first stratified by the number of hospital beds and KM; and then by institution type into 17 cities and provinces. Here, we analyzed the cycle data of the Surveys on the Usage and Consumption of HM, focusing on KM hospitals and clinics.

2) Analysis items

Analyzed items included trend of the purchase of standardized HMs; consumption amount share, and price of prepared HMs; type of herbal dispensaries; and awareness of HM policy in KM institutions.

3) Analysis method

We adopted a time-series analysis of the collected data. Note that time-series analysis

requires consistent survey units, items, and response categories by year. However, the 2009, 2011, and 2014 versions of the survey had different survey methods, populations, and items; therefore it limited the scope of the time-series analysis of the results. Thus, we only focused on the survey's technical aspects to identify changes in the trend and on items that could be used for a time-series analysis. Therefore, 2017, 2020, and 2021, which are available for time series analysis, were the main criteria for time-series analysis. The subjects of the survey were institutions related to HM, and all results except for the awareness surveys were presented with figures from the previous year, which was the reference year of the survey.

Results

1. History of the Survey on Consumption of Herbal Medicine

In 2009, HM Consumption Survey was first conducted in a two-year cycle. In 2011, the survey was approved as national statistical data (No. 117087), and integrated into the Survey on Korean Medicine Utilization and HM Consumption conducted every three years. After the integrated surveys in 2014, 2017, and 2020, the survey period was changed from three to two years to reflect the rapidly changing healthcare environment, which laid the foundation for quicker policy responses. Furthermore, the two surveys—Survey on Utilization of KM and Survey on Consumption of HM—were conducted separately to minimize the gap in the generation of the statistical data on HM. Thus, the latter was conducted in 2021.

In 2011, the survey population included KM hospitals, clinics, pharmacies, and Korean traditional pharmacies, which were the major institutions in the final consumption of HM, to investigate the amount of key HMs purchased. In 2014, the annual consumption (distribution) amount and consumption (distribution) of key HMs were investigated by surveying HM manufacturers and wholesalers. In 2017, 2020, and 2021, besides the final consumption of HM, and their awareness among institutions was examined by expanding the survey population, which now included KM hospitals, general and nursing hospitals, and KM clinics, pharmacies, Korean traditional pharmacies.

The survey contents and goals across years were as follows. The 2011 survey evaluated the amount of key HMs purchased to understand the purchasing behavior of HM providers who experienced difficulties in purchasing these medicines, as well as their awareness of various issues related to the purchase and distribution of HMs. Meanwhile, this survey suggested improvements, including outlining challenges and policies related to purchasing HMs. The 2014 survey evaluated the consumption (distribution) of main HMs to establish good supply, demand, and distribution management measures, such as stable procurement of medicinal herbs and improving the distribution system. This survey identified the effectiveness and awareness of distribution unification, and abrogation of self-standards related to the distribution of HM. In the 2017, 2020, and 2021 surveys, the current status of business management, decoction, purchase and awareness of HMs, and measures to increase the consumption of HMs were assessed to provide

evidence for formulating HM-related policy measures focusing on the reinforcement of insurance coverage (Table 1).

2. Changes in the main survey results by year

There were challenges in understanding the time series trend using the time-series analysis of the main survey results, including common items of all surveys, except for those on rare medicinal herbs and reasons for difficulties in purchasing. This was due to changes in the surveying institution and the revision in survey items in the 2017 survey (refer to Appendix 2).

The sales of Herbal Medicine out of the total sales are as follows. In the 2017 survey, the mean cost of purchasing HMs was 16.6% (18.9%), or 631 (52) million KRW of the estimated mean total sales of 3,805.2 (275.6) million KRW, for KM hospitals (KM clinics). In the 2020 survey, the mean cost increased to 19.1% (23.6%), or 628.9 (75) million KRW of the mean total sales of 3,292.8 (318.1) million KRW in KM hospitals (KM clinics). Finally, in the 2021 survey, of the mean total sales of 2,842.1 (329.2) million KRW in KM hospitals (KM clinics), the mean cost accounted for 19.9% (21.1%) or 565.5 (69.4) million KRW (Figure 1,2).

Thus, while the proportion fluctuated for both institutions, it generally increased with time. In addition, the total market value of HM increased 10.8% from the previous year to reach 366.7 billion KRW in 2020 and has shown a continuously increasing trend (2021 Korea Food & Drug Statistical Year Book. Ministry of Food and Drug Safety. 2021.).

Table 1. Overview of Herbal Medicine Consumption Survey

	2009	2011	2014	2017	2020	2021
Surveying institution (Author)	Jeollanam-do National Development Institute of Korean Medicine	Korea Institute for Health and Social Affairs	Korea Health Industry Development Institute	National Institute for Korean Medicine Development(NIKOM) & Gallup Korea	National Institute for Korean Medicine Development(NIKOM) & Gallup Korea	National Institute for Korean Medicine Development(NIKOM) & Gallup Korea
Investigati on Period	- postal : June 1. -12,2009. - One-to-one interview : June 18, 23, 2009	August 29, 2011~ October 31,2011	N/A	July 2017~ December 2017	September 2020~ February 2021	October 2021~ February 2022
Methods	postal survey, fax/email, One-to-one interview	postal survey, One-to-one interview	telephone survey, One-to-one interview	One-to-one interview, Placement survey(provide the questionnaire and collect), fax/email	One-to-one interview, Placement survey(provide the questionnaire and collect), fax/email	One-to-one interview, Placement survey(provide the questionnaire and collect), fax/email
Total	877	2,671	1,143	2,800	Total 2,809	Total 3,295
KM hospitals	66 KM hospitals	171	herbal medicine manufacturer	82 KM hospitals	101 KM hospitals	155
KM clinics	570 KM clinics	1,500	wholesaler of KM	374 KM clinics	1,386 KM clinics	1,850
pharmacies*	150 pharmacies*	1,000		pharmacies* 1,354	pharmacies* 580	pharmacies* 606
Korean traditional pharmacies	54			Korean traditional pharmacies 563	Korean traditional pharmacies 350	Korean traditional pharmacies 380
pharmaceutical company	7			nursing hospitals & general hospitals with KM doctors	nursing hospitals & general hospitals with KM doctors	nursing hospitals & general hospitals with KM doctors

Table 1. Overview of Herbal Medicine Consumption Survey

	2009	2011	2014	2017	2020	2021
	- KM hospitals and pharmaceutical company were complete enumeration	- KM hospitals were complete enumeration and Korean traditional pharmacies were sampled region as a stratified variables and applied the proportional allocation by institution	- Herbal medicine manufacturer and wholesaler were complete enumeration	- KM hospitals were complete enumeration , - KM clinics, pharmacies*, Korean traditional pharmacies, and nursing(general) hospitals were sampled region as a stratified variables and applied the proportional allocation by institution		
Sampling	- KM clinics, pharmacies*, and Korean traditional pharmacies were sampled region as a stratified variables and applied the proportional allocation by institution	- KM clinics, pharmacies*, and Korean traditional pharmacies were sampled region as a stratified variables and applied the proportional allocation by institution				
Reference point	2007, 2008	2009, 2010	2012, 2013	2016	2019	2020
Major Items	2007, 2008 20 Items of HM Consumption Status	2009, 2010 33 Items of HM Consumption Status, the purchase of herbal medicine, Awareness of the distribution of herbal medicines	2012, 2013 59 Items HM sales volume, HM Supply and demand management plan	2016 Management status, decoction status, HM purchase status, Recognition of herbal medicine, Expansion of the Use of HM	2019 Management status, decoction status, HM purchase status, Recognition of herbal medicine, Expansion of the Use of HM	2020 Management status, decoction status, HM purchase status, Recognition of herbal medicine, Expansion of the Use of HM
Reference report	2009 Korean Medicine Utilization and Herbal Medicine Consumption Survey, Ministry of Health and Welfare. 2010 Health and Welfare.	2011 Korean Medicine Utilization and Herbal Medicine Consumption Survey, Ministry of Health and Welfare. 2012 Health and Welfare.	2014 Korean Medicine Utilization and Herbal Medicine Consumption Survey, Ministry of Health and Welfare. 2015 Health and Welfare.	2017 Korean Medicine Utilization and Herbal Medicine Consumption Survey, Ministry of Health and Welfare. 2018 Health and Welfare.	2020 Korean Medicine Utilization and Herbal Medicine Consumption Survey, Ministry of Health and Welfare. 2021 Health and Welfare.	2021 Herbal Medicine Consumption Survey, Ministry of Health and Welfare. 2022

Pharmacies with herbal dispensing pharmacists (who has passed the herbal medicine dispensing examination) or herb pharmacist

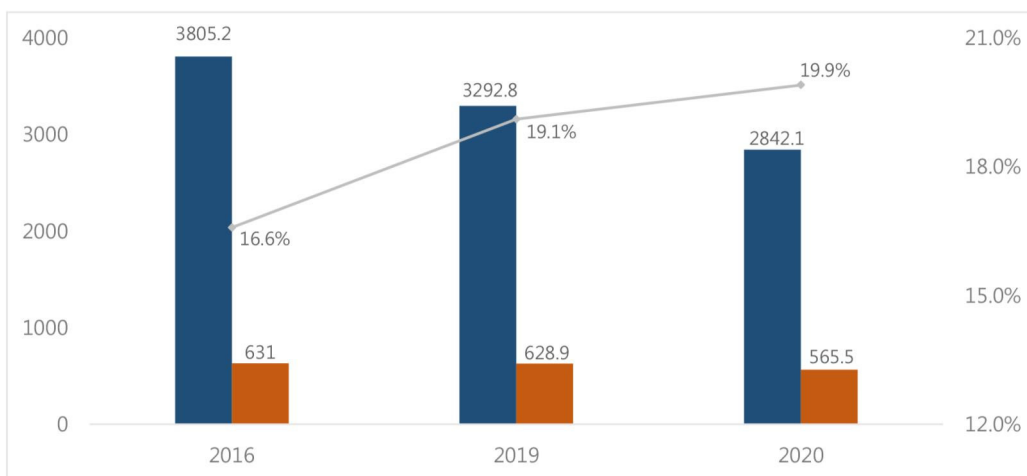


Fig. 1. Cost of HM out of the total sales in KM hospitals (unit: million KRW, %)

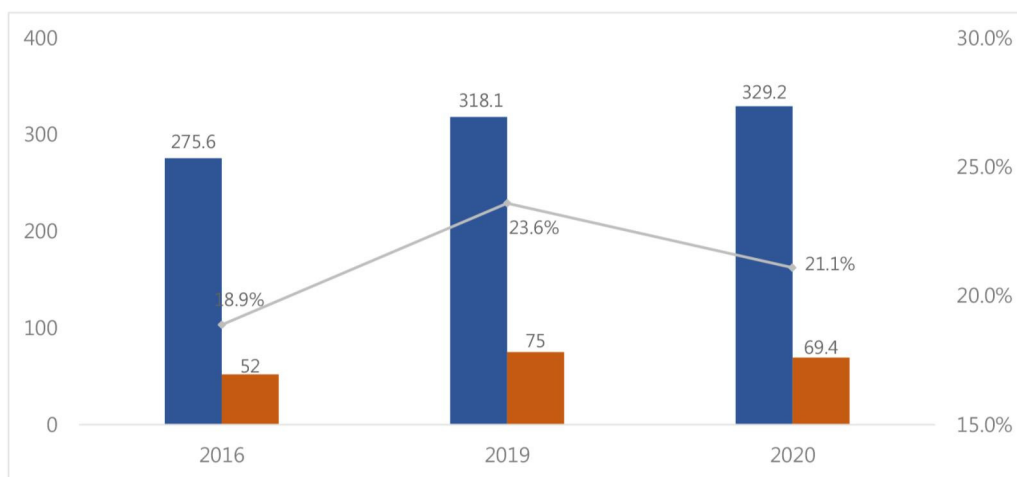


Fig. 2. Cost of HM out of the total sales in KM clinics (unit: million KRW, %)

In every survey, the proportion of HM consumption by KM hospitals and KM clinics exceeded 94%. In the last three surveys, KM clinics surveyed the highest consumption on average at 86.4%, followed by KM hospitals at 9.1%, pharmacies at 2.9%, Korean traditional pharmacies at 1.0%, and nursing (general)

hospitals at 0.9%(Figure 3).

The price of one pack of Herbal decoction was the lowest at 154,500 and 146,400 KRW for KM hospitals and clinics, respectively, in the 2011 survey. After currency value adjustment by year for time-series analysis of prices, this had consistently increased to 241,907 and 250,371

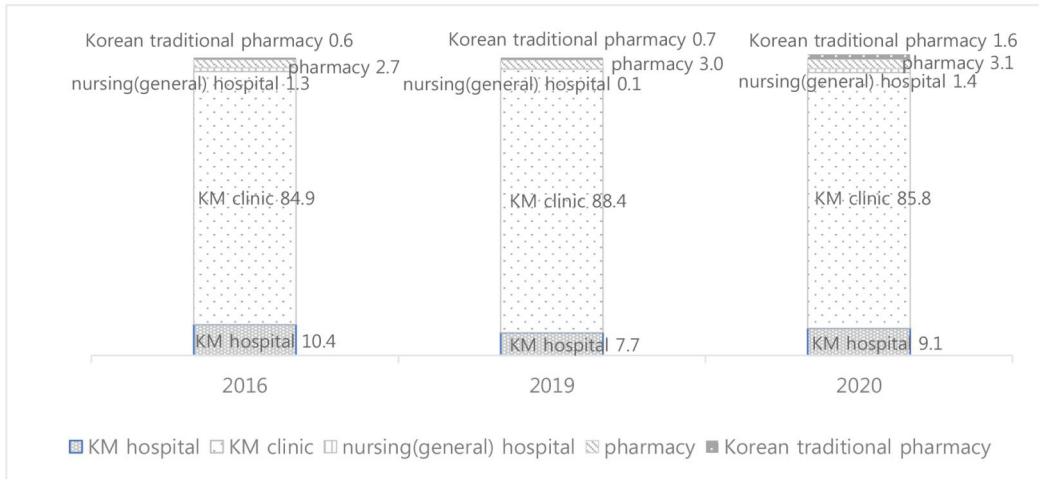


Fig. 3. Consumption of HM by institution and year (unit: %)

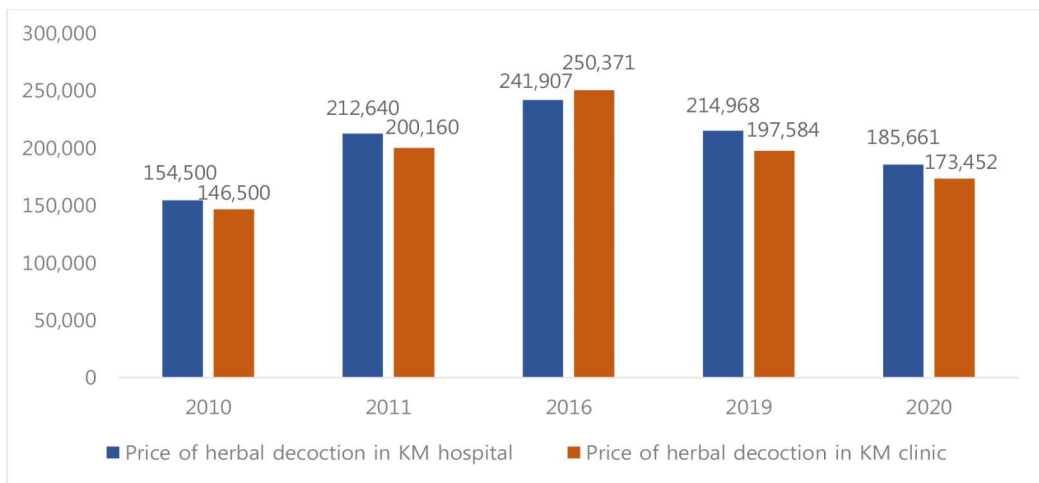


Fig. 4. Price of one pack of herbal decoction by institution and year (unit: KRW)

KRW for KM hospitals and clinics, respectively, until 2017. Thereafter, the price had gradually decreased to 185,661 and 173,452 KRW for KM hospitals and clinics, respectively, until 2021 (Figure 4).

Decoction usage was as follows. From 2017 to 2020, the proportion of KM hospitals using only

intramural decoction decreased from 56.2% to 38.5%. In contrast, those using only extramural, and both intramural and extramural decoction increased from 15.2% to 22.2% and 27.5% to 38.3%, respectively. Meanwhile, the proportion of KM clinics using only intramural and extramural decoction increased from 58.3% to 64.9% and

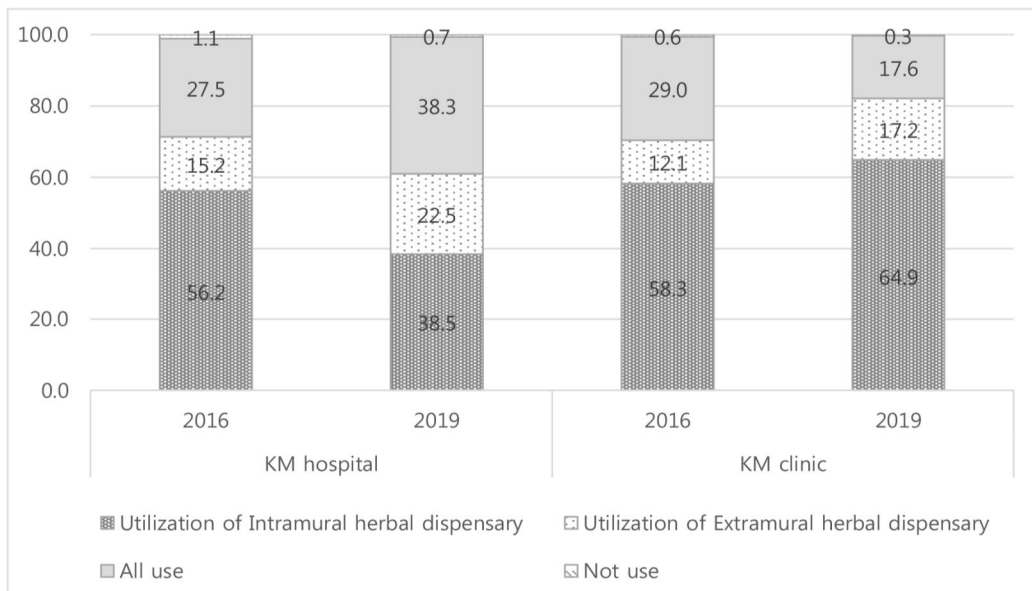


Fig. 5. Utilization of herbal dispensaries by institution and year (unit: %)

Note) Due to changes in the items, the 2021 survey could not be included in time-series analysis

12.1% to 17.2%, respectively. Meanwhile, those using both decoctions decreased from 29% to 17.6%.

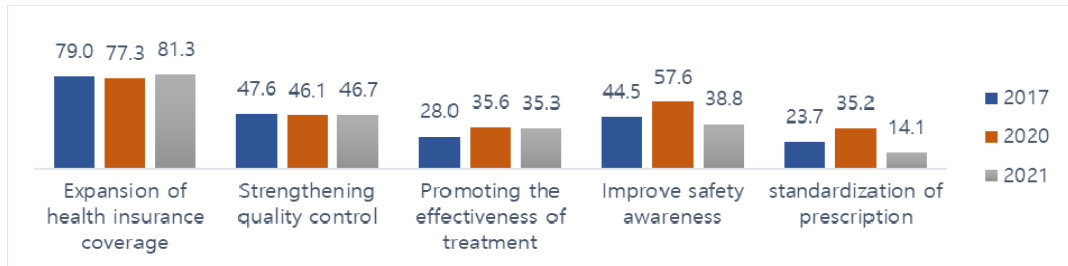
HM policy awareness in KM institutions was as follows. In 2017, 2020, and 2021 surveys, awareness of the expansion of health insurance coverage for the use of HMs was the greatest, followed by improvement of safety awareness and reinforcement of quality control. For health insurance Korean medicinal products, in the 2020 survey, KM hospitals and clinics showed the highest response rate for the improvement of safety awareness and promotion of treatment effects, respectively. However, in the 2021 survey, both institutions showed the highest response rate for the reimbursable fee increases. For non-health insurance Korean medicinal products, awareness of the expansion of health

insurance coverage was the greatest interest for all institutions, followed by the promotion of treatment effects and strengthening of quality control.

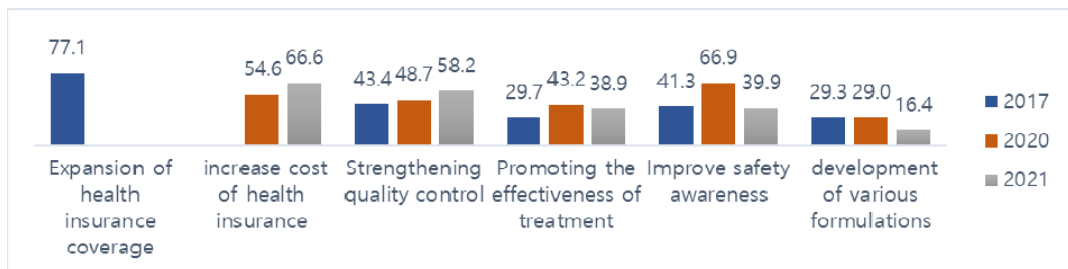
Discussion

The Survey on Consumption of Herbal Medicine(HM) first started in 2009 and the latest survey was conducted in 2021. Endorsed as National Approval Statistics in 2011 the survey assesses the consumption and distribution of HM as well as the awareness of consumers on herbal medicine. The survey questions and items were revised each year, following the changes in the needs. Herein, we analyzed the trend of results for items in common to assess time-series trend, and these are the key findings :

〈Herbal decoction〉



〈Health insurance covered Korean medicinal product〉



〈Non-health insurance covered Korean medicinal product〉

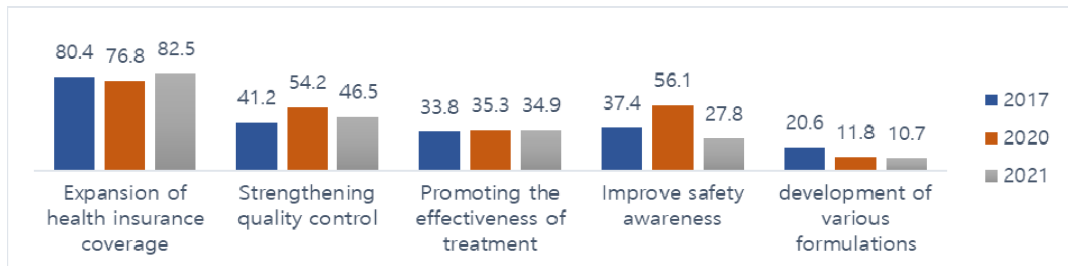
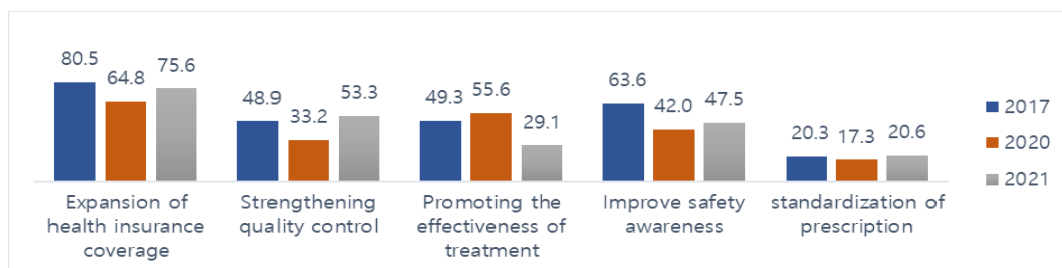


Fig. 6. Opinions on the usage of herbal decoction, health insurance covered HM, and non-health insurance covered HM in KM hospital by year (unit: %)

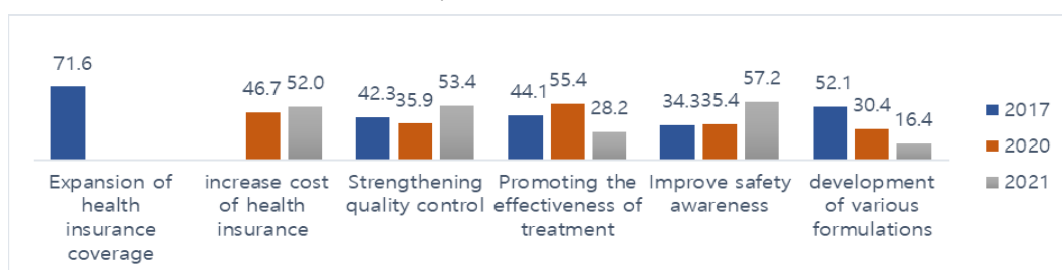
First, the price of HM showed an upward trend in 2011, 2014, and 2017 surveys and decreased in 2020 survey. The individual medicinal herbs that affect the price of HMs are agricultural products with uncontrollable demand and production. Also, predicting these products' prices is difficult as they repeatedly show upward and downward trend(Kim BC, 2019). Studies show high price

differences in HMs by production year, region, and company - for instance, price changes by companies led to the highest and lowest prices at 117.5% higher and 57.3% lower than the mean price, respectively (Kim DS, 2020). Nevertheless, the trend in these price fluctuations in a particular period may be related to internal and external environmental and policy factors. Firstly, the

<Herbal decoction>



<Health insurance covered Korean medicinal product>



<Non-health insurance covered Korean medicinal product>

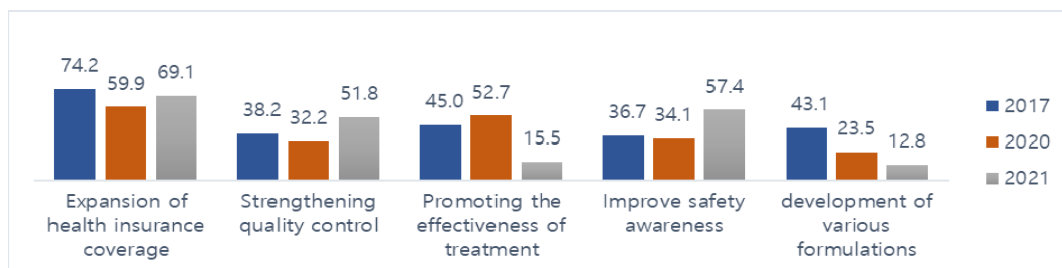


Fig. 7. Opinions on the usage of herbal decoction, health insurance covered HM, and non-health insurance covered HM in KM clinic by year (unit: %)

COVID-19 pandemic negatively affected the KM market, and the diversification of treatment regimes, including using HM treatments to prevent respiratory infection, may have affected HM prices. Previous research notes that the price of HM not covered by health insurance was significantly higher for patients with chronic musculoskeletal disease (Kim DS, 2018). Secondly,

policy factors may have also affected prices, such as the government's supply and demand management of HM, and the health insurance coverage project(pilot) for herbal decoction.

Despite the decrease in HM prices, the highest proportion of respondents replied that HMs are expensive and that the expanded coverage of HMs (or increase in medical cost for insurance

-covered HMs) would be the top priority when expanding the benefits of health insurance(Korean Medicine Utilization and Herbal Medicine Consumption Survey, 2021).In this regard, more efforts should be made to increase the number of reimbursable diseases and to adjust the cost of health insurance. Simultaneously, the health insurance coverage project(pilot) for herbal decoction needs to undertake proper measures to adjust the cost of health insurance, expand the insurance coverage, and simplify the health insurance claim system.

Second, the proportion of KM hospitals using only intramural dispensaries decreased while those using only extramural dispensaries increased - hospitals widely use extramural dispensaries instead of intramural dispensaries. Extramural herbal dispensaries have become more common following the revision of Medical Act Enforcement Regulations on the installation and shared use of extramural herbal dispensaries in 2009.However, there are limitations in regulating the facilities as it is challenging to explore the status of management and maintenance(Ahn HC, 2016). To resolve this problem, the government implemented a Dispensary Certification System starting from 2018 to ensure adequate facility standards for and efficiency of extramural herbal dispensaries. Currently, the Korean government is actively planning to expand the certification system further to strengthen the management of sanitary and safety preparations through the 4th Comprehensive Plan for Promotion and Development of Korean Medicine. However, despite the high awareness of this certification system, users have limited experience using

certified extramural dispensaries (2021 KHM Consumption Survey, 2022), and there should be further efforts needed for greater penetration and adoption of the certification system, such as providing incentives for using certified dispensaries and promoting awareness.

Third, the ratio of HM purchased in KM hospitals and total sales of HM in KM clinics are increasing. Moreover, from the total sales value of HM, the domestic KHM industry continues to grow (Food and Drug Statistical Yearbook, 2021). This increasing tendency possibly interpreted as a result of a quantitative increase in KM hospitals and the expansion of health insurance coverage. According to the advisory council about the consumption of HM conducted by the National Institute for Korean Medicine Development, this increase in consumption was driven by the increase in the number of inpatient KM hospitals, the expansion of health insurance coverage of KM, and the scaling-up of Korean medical institutions.

The HM Consumption Survey is the only nationally approved statistics on KHM and provides representative statistical data on changes in the usage and awareness of HMs. Nevertheless, this survey and its usage have some limitations - surveys conducted from 2009 to 2014 had varied sample sizes, survey methods, and populations due to changes in the organizer and survey items. Also, changes in the sampled population and scope following changes in the social circumstances led to difficulties with time-series analysis. Thus, the items must be standardized and unified to maintain the time-series continuity of the survey. Lastly, the survey provides statistical data from

the general public, the final consumers of HM, and easily accessible HM-consuming organizations. Thus, the survey provides results acquired in a limited environment, focusing on the performance of KM institutions. In this regard, future surveys must compare the results with the government statistics data on HM to increase the reliability of the results and develop specialized survey items for establishing the HM distribution system.

Conclusion

1. Herbal Medicine sales account for 15-25% of the total sales of KM institutions in Korea.
2. The ratio of Herbal Medicine purchased in KM hospitals and total sales of Herbal Medicine in KM clinics are increasing. Moreover, the domestic Herbal Medicine industry showed an increasing growth trend.
3. In all surveys (Herbal Medicine consumption survey), KM institutions, including KM hospitals and clinics, consumed more than 94% of Herbal Medicine.
4. The price of Herbal Medicine preparations showed an upward trend in 2011, 2014, and 2017 surveys, and a downward trend in 2020, 2021 surveys.
5. The proportion of KM institutions using only extramural herbal dispensaries has increased.

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