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Commentary

How can the concurrent use of conventional medicine and Korean medicine be defined in the National Health Insurance Service database?

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Worldwide, many patients with various healthcare problems use both conventional medicine and complementary medicine according to their preferences.[1–4] The concurrent use of multiple treatments can enhance the effect, decrease the effect, alleviate side effects, and cause unexpected side effects, which are related to the interactions between multiple interventions.[5–10] Outcomes research using secondary data is needed to obtain evidence of the effectiveness of concurrent use, particularly in countries where the healthcare systems have officially approved and cover both conventional medicine and traditional medicine through health insurance service. Secondary data were not collected prospectively according to the specific research purpose. Therefore, there is a limit to the validity of the research. On the other hand, there is an advantage of being able to observe a large number of participants over a long period, particularly when primary research is difficult to conduct because of the high cost, limited research design, and ethical issues.[11,12]

In actual clinical situations in the Republic of Korea, it is the patients, not the medical doctors (MDs) and Korean medicine doctors (KMDs), who usually decide to use conventional medicine and complementary therapies together to prevent or treat their diseases. While this behavior of healthcare consumers can be based on self-obtained information, personal preferences, and personal beliefs, it is important to identify this healthcare utilization status, provide credible evidence for the efficient allocation of healthcare resources, and allow the cost-effective and safe use of healthcare services. Generating evidence using primary data is difficult because of various limitations, such as insufficiency of integrative care between MDs and KMDs. Therefore, researchers need to obtain evidence using secondary data, such as the National Health Insurance Service (NHIS) database, which covers all citizens of the Republic of Korea. The NHIS database, which is managed by the NHIS and Health Insurance Review and Assessment (HIRA), is a collection of health insurance records claimed by all healthcare institutions and pharmacies.[13] The healthcare benefits data is a record of providing healthcare services, such as prescription, treatment, surgery, rehabilitation treatment, nursing, and hospitalization, to the insured population suffering from diseases and injuries.

Through their remote servers and their analysis labs, the NHIS provides two types of cohort data: National Sample Cohort (NSC) and customized cohort data from 2002 to the present. In contrast, the HIRA provides customized cohort data and four sets of national cross-sectional data: National Patient Sample (NPS), Through their remote servers and their analysis labs, the NHIS provides two

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Table 1
Method to define concurrent use.

Definition	Concurrent use of prescription drugs and herbal medicines		Concurrent use of conventional medicine and Korean medicine (KM)	
	All patients	Patients with a specific disease	All patients	Patients with a specific disease
D1	**D1_DW** Patients who had been prescribed both prescription drugs and herbal medicines for a specified period	**D1_DS** Patients who had been prescribed both prescription drugs and herbal medicines for a specified period	**D1_IW** Patients who had been taking both conventional medicine and KM interventions for a specified period	**D1_IS** Patients who had been taking both conventional medicine and KM interventions for a specified period
D2	**D2_DW** Patients who had overlapped over one day of prescription periods of both prescription drugs and herbal medicines for a specified period		**D2_IW** Patients who had overlapped over one day of treatment periods of both conventional medicine and KM interventions for a specified period	
D2-1	**D2-1_DW** For the same main (or sub) diagnosis②, patients who had overlapped over one day of prescription periods of both prescription drugs and herbal medicines for a specified period	**D2-1_DS** For the same main (or sub) diagnosis, patients who had overlapped over one day of prescription periods of both prescription drugs and herbal medicines for a specified period	**D2-1_IW** For the same main (or sub) diagnosis, patients who had overlapped over one day of treatment periods of both conventional medicine and KM interventions for a specified period	**D2-1_IS** For the same main (or sub) diagnosis, patients who had overlapped over one day of treatment periods of both conventional medicine and KM interventions for a specified period
D2-2	**D2-2_DW** For the same main diagnosis①, patients who had overlapped over one day of prescription periods of both prescription drugs and herbal medicines for a specified period	**D2-2_DS** For the same main diagnosis, patients who had overlapped over one day of prescription periods of both prescription drugs and herbal medicines for a specified period	**D2-2_IW** For the same main diagnosis, patients who had overlapped over one day of treatment periods of both conventional medicine and KM interventions for a specified period	**D2-2_IS** For the same main diagnosis, patients who had overlapped over one day of treatment periods of both conventional medicine and KM interventions for a specified period
D3	**D3_DW** Patients who had been prescribed herbal medicines within ±7 (or ±15 or ±30 or ±90 or ±180) days from the prescription date of prescription drugs for a specified period		**D3_IW** Patients who had been taking KM interventions within ±7 (or ±15 or ±30 or ±90 or ±180) days from the treatment date of conventional medicine interventions for a specified period	
D3-1	**D3-1_DW** For the same main (or sub) diagnosis, patients who had been prescribed herbal medicines within ±7 (or ±15 or ±30 or ±90 or ±180) days from the prescription date of prescription drugs for a specified period	**D3-1_DS** For the same main (or sub) diagnosis, patients who had been prescribed herbal medicines within ±7 (or ±15 or ±30 or ±90 or ±180) days from the prescription date of prescription drugs for a specified period	**D3-1_IW** For the same main (or sub) diagnosis, patients who had been taking KM interventions within ±7 (or ±15 or ±30 or ±90 or ±180) days from the treatment date of conventional medicine interventions for a specified period	**D3-1_IS** For the same main (or sub) diagnosis, patients who had received KM within ±7 or ±15 or ±30 or ±90 or ±180 days from the treatment day of conventional medicine for a specified period
D3-2	**D3-2_DW** For the same main diagnosis, patients who had been prescribed herbal medicines within ±7 (or ±15 or ±30 or ±90 or ±180) days from the prescription date of prescription drugs for a specified period	**D3-2_DS** For the same main diagnosis, patients who had been prescribed herbal medicines within ±7 (or ±15 or ±30 or ±90 or ±180) days from the prescription date of prescription drugs for a specific period	**D3-2_IW** For the same main diagnosis, patients who had been taking KM interventions within ±7 (or ±15 or ±30 or ±90 or ±180) days from the treatment date of conventional medicine interventions for a specified period	**D3-2_IS** For the same main diagnosis, patients who had received KM within ±7 or ±15 or ±30 or ±90 or ±180 days from the treatment day of conventional medicine for a specific period

Note.
1.D1_DW, D2_DW, D2-1_DW, D2-2_DW, D3_DW, D3-1_DW, and D3-2_DW: Classification code of how to define concurrent use of prescription and herbal medicines in all patient data.
2. D1_DS, D2-1_DS, D2-2_DS, D3-1_DS, and D3-2_DS: Classification code of how to define concurrent use of prescription and herbal medicines in patient data with a specific disease. In addition, D1_DS is unnecessary if there is only one KCD code for a specific disease.
3. D1_IW, D2_ IW, D2-1_IW, D2-2_IW, D3_IW, D3-1_IW, and D3-2_IW: Classification code of how to define concurrent use of conventional medicine and KM in all patient data.
4. D1_IS, D2-1_IS, D2-2_IS, D3-1_IS, and D3-2_IS: Classification how to define concurrent use of conventional medicine and KM in patient data with a specific disease, In addition, D1_IS is unnecessary if there is only one KCD code for a specific disease.
① main diagnosis is a disease with the greatest patient demand for treatment or examination (the disease that caused the most use of medical resources).
② sub diagnosis is a disease that exists or has occurred simultaneously with the main disease and is a disease that affects patient treatment.

types of cohort data: National Sample Cohort (NSC) and customized cohort data from 2002 to the present. In contrast, the HIRA provides customized cohort data and four sets of national cross-sectional data: National Patient Sample (NPS).[14,15]

As mentioned previously, however, to identify concurrent use, which are the results determined by the patient's choice, researchers first need to define the concurrent use of patients operationally using the variables related to the medical utilization of those patients in the databases. First, it was divided into four categories depending on whether it was a study of the drugs (or whole interventions) for all patients (or for patients with a specific disease). In Table 1, prescription drugs refer to insured prescription medicines prescribed by an MD, and herbal medicines denote insured herbal formulas and single herbal preparations prescribed by a KMD. Conventional medicine refers to all insured biomedical practices, such as examination, optometrist, prescription, medica-

tion, or surgical operations performed to prevent or treat diseases and other health care risks. In contrast, KM interventions refer to all insured KM interventions, such as herbal formulas and single herbal preparations, acupuncture, cupping, and moxibustion practiced to prevent or treat diseases.

Each category can be divided into seven methods depending on when the interventions were used concurrently and whether the interventions were conducted for the same disease. At this time, the same disease can be subdivided according to whether it was an intervention to treat the same main or sub disease or to treat the same main disease. The main diagnosis is a disease with the greatest patient demand for treatment or examination (the disease that uses the most medical resources), and a sub diagnosis is a disease that exists or occurs concurrently with the main disease and affects the patient's treatment (Table 1). Both main and sub diagnoses in the data are expressed in the Korean Standard Classification of Diseases (KCD), which is the Korean version of the International Classification of Diseases, ICD. In addition, calculations of the period of concurrent use are based on the start date of the biomedical interventions because the frequency of conventional medicine use, which is mainstream medicine, is much higher.

Researches using the NHIS database, especially studies of the concurrent use of prescription drugs and herbal medicines, can be underestimated because Korea insures fewer herbal medicines than Taiwan and Japan. Moreover, a KMD can also prescribe non-insured herbal decoctions that have not been identified in the NHIS database. To overcome this limitation, the electronic health record data from medical institutions collected after obtaining patient consent can also be studied in conjunction with the NHIS data.

This commentary is expected to provide a useful guide to conduct outcomes research on the concurrent use of conventional medicine and Korean medicine using secondary data.

Conflict of interest

The author has no conflict of interest.

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Ethical statement

Not applicable.

Data availability

Not applicable.

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