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Research paper

Determinants of the concurrent use of biomedicine and Korean Medicine: A study based on the Korean Health Panel survey (2008–2014)

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ABSTRACT

Introduction: This study was conducted to analyze the factors associated with the concurrent use of biomedicine and Korean Medicine (KM) in an outpatient medical service using data from the Korean Health Panel (KHP) 2008–2014.

Method: Using the KHP, which is an ongoing longitudinal survey of a nationally representative Korean population, descriptive analysis was employed to present the frequency and percentage of concurrent use of biomedicine and KM with those who only used biomedicine. In addition, factors associated with the types of medical institutions receiving outpatient medical services were analyzed using the random effects panel probit model and the random effects panel logit model.

Results: Analysis of the KHP data from 2008 to 2014 revealed that 16–18% of the population used both biomedicine and KM services concurrently. Moreover, concurrent users were more likely to be female, over 40 years old, have a lower confidence in healthcare services quality, have chronic disease, have used medication for more than three months and to have a high mean frequency of medical services use.

Conclusion: Identifying determinants associated with concurrent use of biomedicine and KM might help medical professionals and policy makers to make wise judgments, plan treatments successfully and allocate resources efficiently.

1. Introduction

Worldwide, many patients of all ages are concurrently using biomedicine and Complementary and Alternative Medicine (CAM) for the treatment of diseases [1–5]. Patients may be more likely to receive multidisciplinary health services for treatment and prevention of the same disease in countries with healthcare systems that officially approve both biomedicine and traditional medicine (TM). In one such country, China, a national survey of oncologists estimated that 40% of their cancer patients used CAM in 2015 [6]. The Republic of Korea also legally permits the use of Korean Medicine (KM) as a traditional medicine along with biomedicine. In Korea, 33.9% of patients with musculoskeletal disease reported the concurrent use of both biomedicine and KM in a study by the Korean Health Panel 2009 [7], while 66% of KM users had received biomedicine to treat the same disease in a 2008 national survey [5]. Although there are limitations associated with the various definitions of CAM and the difference in healthcare system, the lifetime prevalence of CAM usage was as high as 86% in Europe [8].

Consequently, when patients receive various medical services, there is an increasing possibility of the risk of poor medication adherence because of polypharmacy, as well as increased risk of unexpected adverse events including drug-drug interactions and herb-drug interactions [9,10]. However, medical practitioners cannot prepare for these possible risks if they do not know that patients are concurrently using biomedicine and TM [11,12]. Accordingly, it is necessary for medical professionals to know what characteristics concurrent users are likely to have; however, there is insufficient evidence regarding the utilization and factors associated with concurrent use of biomedicine and TM.

Therefore, this study was conducted to investigate the utilization and factors associated with the concurrent use of biomedicine and KM in the outpatient medical service using the Korean Health Panel (KHP) 2008–2014.

2. Methods

2.1. Analytic framework

We used Andersen's Behavioral Model of Health Services Utilization, which is the most well-known model for identification of factors that either facilitate or impede utilization [13]. The initial behavioral model

Abbreviations: KM, Korean Medicine; CAM, Complementary and Alternative Medicine

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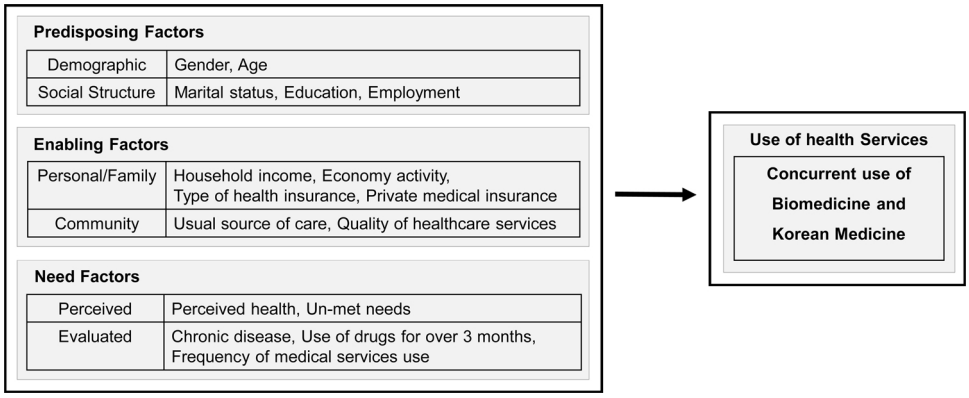

Fig. 1. Analytic Framework: Andersen's Behavioral Model of Health Services Utilization.

suggested that health services utilization is affected by factors from three domains: predisposing characteristics, enabling factors, and need variables [13]. Predisposing factors are the socio-cultural characteristics of individuals that exist prior to their illness, while enabling factors are the logistical aspects of obtaining care. Additionally, need factors are the most immediate cause of health services use, including functional and health problems that generate the need for such services [13]. In this study, we selected variables that related to all three factors (Fig. 1).

2.2. Database

Data from individuals collected in the KHP from 2008 to 2014 were used in the present study [14]. The KHP is an ongoing longitudinal survey of a nationally representative Korean population, and its sampling design is a 2-stage cluster, stratified with probability proportionate to size. This survey, which is conducted regularly by the Korea Institute for Health and Social Affairs and the National Health Insurance Corporation to assess dynamic changes in medical expenditures and its distribution, is conducted by trained interviewers face-to-face in households and individuals [14].

2.3. Dependent variables

2.3.1. Use of outpatient medical service

The type of outpatient medical service use was used as the dependent variable, and the dependent variables were set as the binomial variable based on the answer to the question, "What kind of hospital (or clinic) did you use?" in the KHP questionnaire.

1) Only biomedicine users: defined as respondents who only used biomedicine during one year
2) Concurrent users: defined as respondents who used both biomedicine and KM during one year.

2.4. Independent variables

2.4.1. Predisposing factors

Demographics included gender, age, marital status, education, and employment

2.4.2. Enabling factors

Enabling factors included household income, economic activity, health insurance type, private medical insurance, usual source of care and quality of healthcare services.

2.4.3. Need factors

The variables perceived health, un-met needs, chronic disease, use of medication for over 3 months and frequency of medical service use were considered need factors in this study.

2.5. Statistical analysis

Descriptive analysis was used to present the frequency and percentage of concurrent use of biomedicine and KM and those of only biomedicine use. Analysis were conducted using the random effect panel probit model and random effect panel logit model. The Hausman specification test was then applied to select between fixed and random effects models [15].

A two-sided p-value of < 0.05 was considered to indicate statistical significance in this study. Statistical analyses were conducted using Stata/MP version 15 (StataCorp LP, College Station, Texas, USA).

3. Results

3.1. Pattern of outpatient medical services use from 2008 to 2014

Overall, 80% or more outpatient medical service users received only biomedicine services, while 16–18% received both biomedicine and KM services from 2008 to 2014. Conversely, only about 1% of people received KM services without biomedicine services (Fig. 2). The proportion of concurrent users among the total outpatient medical services receivers increased slightly by year.

3.2. Characteristics according to outpatient medical services user type

Concurrent users of biomedicine and KM tended to be female (66.06%), have a high mean age (49.20 years old), be over 60 (36.51%), married (64.80%), have a usual source of care (42.87%), 'bad' perceived health (23.29%), chronic diseases (73.68%), to have used medicine for over 3 months (13.52%) and have a high mean frequency of medical services use (32.23) (Table1).

3.3. Factors associated with the concurrent use of biomedicine and KM

Individuals with the following characteristics were more likely to be concurrent users of biomedicine and KM than biomedicine only: female, over 40 years old, having private medical insurance, having lower confidence in the quality of healthcare services, having chronic illness, using medicine for over 3 months and having a high mean frequency of medical services use. On the other hand, individuals receiving medical

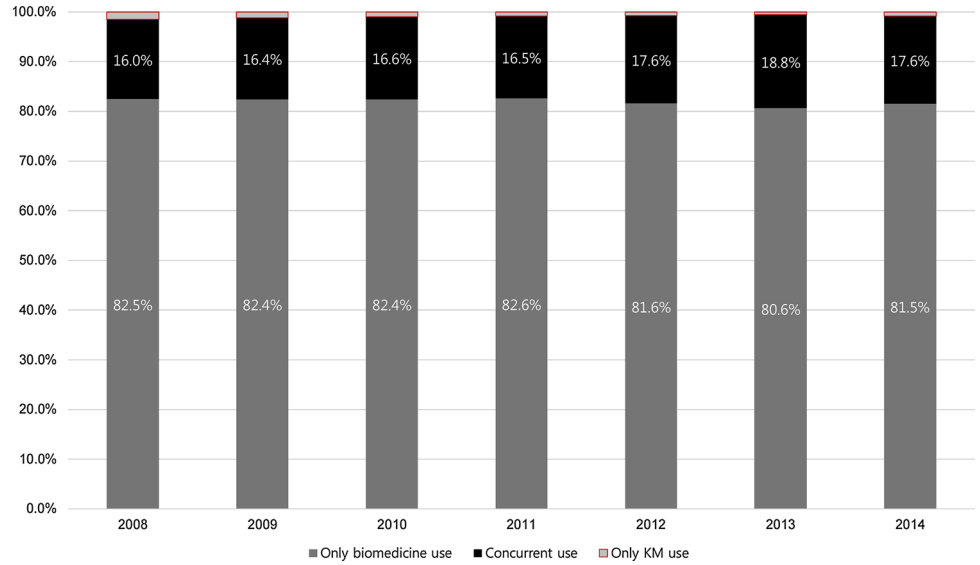

Fig. 2. Pattern of outpatient medical services use from 2008 to 2014.

aid and having a usual source of care had a lesser probability of being concurrent users of biomedicine and KM (Table 2).

4. Discussion

Analysis of patterns of outpatient medical services use based on KHP data from 2008 to 2014 revealed that 80% of total outpatient medical service users had used only biomedicine services, while 16–18% had used both biomedicine and KM services. Concurrent users may interpret that there is a demand for integrative treatment by officially licensed professionals. Analysis of the 2014 European Social Survey revealed that 25.9% of the general population (minimum = 10% in Hungary; maximum = 40% in Germany) had used CAM during the last 12 months [16]. In a systematic review of nationwide surveys in Germany conducted in 2014, the use of CAM in previous years varied from 40% to 62%. However, it should be noted that direct comparison between countries is difficult because the healthcare systems differ and KM is considered CAM in other countries. Nevertheless, there is a worldwide demand for the concurrent use of both biomedicine and CAM by patients or healthcare professionals. Therefore, it is necessary to understand the characteristics of these patients.

Analyses to identify the factors related to concurrent use of both biomedicine and KM revealed that the following factors are associated with concurrent use of biomedicine and KM: female, over 40 years old, having private medical insurance, having lower confidence in the quality of healthcare services, having chronic illness, using medicine for over 3 months and having a high mean frequency of medical services use. When compared with other studies, Tsai also reported that being female, having a high frequency of outpatient clinic visits per month and having a high frequency of distinct medications prescribed were associated with concurrent use of biomedicine and Chinese medications [2], but age showed the opposite results. However, several other studies showed that high age was associated with concurrent use of biomedicine and KM [5,6,16]. In general, when people get older, their health worsens, making them more likely to have a chronic disease, to have more frequent medical use, and to use multiple types of medical services. It may be the patient's right to pursue various treatment services for the prevention and treatment of diseases. Although use of several medical services may complement each other to increase the therapeutic effects for patients, there could be some unexpected results such as herb-drug interactions and high medical expenditures. Therefore, it is necessary to conduct additional studies to evaluate the benefits and adverse effects of use among groups with a high possibility of concurrent use of both biomedicine and CAM (or TM and KM).

However, two studies used Andersen's Model to investigate use of KM to treat musculoskeletal disorders and use of acupuncture in KM clinics [17,18]. As in our study, age and chronic diseases were the determining factors. Wang reported that the determinants of the frequency of KM usage are age, restrictions on daily life, number of chronic diseases, hospitalization history, and number of visits to conventional hospitals and clinics for musculoskeletal disorders [17]. Lee reported that the determinants of the frequency of acupuncture treatment utilization are age, gender, number of chronic diseases and the presence of physical disabilities [18].

It should be noted that this study has some limitations. First, the specific types of treatment, such as medicine, surgery, herbal formulas, and acupuncture, could not be identified because of data limitations. Therefore, it was not possible to compare the benefits of concurrent use with those of biomedicine alone. Second, the number of people who received KM alone without biomedicine was very small, so comparative analysis including only KM was meaningless. Third, we found that having chronic illness was associated with the concurrent use of biomedicine and KM, but we could not analyze this according to each chronic disease because of limitations of the data. A previous study based on the European Social Survey in 2014 reported health problems according to CAM types and found that back pain and digestion were associated with all types of CAM [16]. Based on these studies, it is also necessary to study the association between each chronic diseases and concurrent use.

5. Conclusions

Analysis of the KHP data from 2008 to 2014 revealed that 16–18% of the population used both biomedicine and KM services concurrently. Therefore, it is necessary for medical professionals to know that predisposing factors such as gender and age, enabling factors such as private medical insurance and quality of healthcare services, need factors such as chronic disease, use of drugs for over 3 months and frequency of medical services significantly influence the concurrent use of biomedicine and KM. Identifying determinants associated with concurrent use of biomedicine and KM might help medical professionals and policy makers to make wise judgments, plan treatments successfully and allocate resources efficiently.

Table 1
Characteristics according to the outpatient medical services user type.

		Concurrent use of biomedicine and KM		Only biomedicine use	
		n	%	n	%
Predisposing Factors					
Gender	Male	5,561	33.94	37,089	46.90
	Female	10,825	66.06	41,992	53.10
Age (years)	Mean, SD	49.20	21.11	39.92	23.38
	Median, range	52	100	41	98
	0–19	2,247	13.71	22,029	27.85
	20–39	2,394	14.61	15,205	19.22
	40–59	5,763	35.17	22,266	28.15
	60≦	5,983	36.51	19,592	24.77
Marital status	Single	54.13	35.20	36,264	45.87
	Married	35.20	64.80	42,796	54.13
Education (years)	≤6	5,888	35.93	27,287	34.51
	6–12	7,048	43.01	32,052	40.53
	≥16	3,450	21.05	19,742	24.96
Employment	No	8,017	58.17	39,902	60.77
	Waged	3,871	28.09	17,865	27.21
	Self-employed	1,894	13.74	7,898	12.03
Enabling Factors					
Household income (Quintile)	First (lowest)	2,640	16.17	10,170	12.90
	Second	3,095	18.96	15,484	19.64
	Third	3,374	20.67	18,083	22.94
	Fourth	3,492	21.39	17,981	22.81
	Fifth (highest)	3,721	22.80	17,112	21.71
Economic activity	No	8,656	52.82	45,502	57.53
	Yes	7,731	47.18	33,590	42.47
Type of health insurance	Employee	10,997	67.11	51,339	64.92
	Self-employed	4,520	27.58	23,373	29.56
	Medical aid	869	5.30	4,369	5.52
Private medical insurance	No	3,814	24.41	18,091	23.90
	Yes	11,808	75.59	57,615	76.10
Usual source of care	No	3,461	57.13	14,056	61.03
	Yes	2,597	42.87	8,975	38.97
Quality of healthcare services	Good	4,252	74.36	15,728	74.40
	Not good	1,466	25.64	5,412	25.60
Need Factors					
Perceived health	Good	2,618	33.48	12,745	42.99
	Average	3,381	43.24	12,304	41.50
	Bad	1,821	23.29	4,600	15.51
Un-met needs	No	8,078	81.90	32,045	83.67
	Yes	1,785	18.10	6,255	16.33
Chronic disease	Number: Mean, SD	2.08	2.44	1.19	1.80
	No	4,313	26.32	35,534	44.93
	Yes	12,073	73.68	43,547	55.07
Use of medicine for over 3 months	No	12,097	86.48	61,129	90.98
	Yes	1,892	13.52	6,062	9.02
Frequency of medical services use	Mean, SD	32.23	32.57	15.06	19.71
	Median, range	23	464	9	363

Abbreviations: KM, Korean Medicine.

Table 2
Factors associated with the concurrent use of biomedicine and KM.

		(Base outcome: Only biomedicine use)			
		Random effect panel probit model		Random effect panel logit model	
		Coef.	SE	Coef.	SE
Predisposing Factors					
Gender	Female	**0.50***	**0.05**	**0.88***	**0.08**
Age (years)	20–39	0.34	0.20	0.60	0.36
	40–59	**0.64***	**0.20**	**1.13***	**0.37**
	60≦	**0.54***	**0.21**	**0.94***	**0;37**
Marital status	Married	−0.09	0.05	−0.15	0.09
Education (years)	6–12	−0.02	0.06	−0.04	0.10
	≥16	−0.03	0.07	−0.05	0.13
Employment	Waged	−0.02	0.09	−0.02	0.16
	Self-employed	−0.01	0.10	−0.01	0.17
Enabling Factors					
Household income (Quintile)	Second	0.04	0.07	0.08	0.12
	Third	0.02	0.07	0.04	0.12
	Fourth	0.07	0.07	0.13	0.13
	Fifth (highest)	0.14	0.08	0.25	0.13
Economic activity	Yes	0.12	0.09	0.20	0.15
Type of health insurance	Self-employed	−0.07	0.05	−0.12	0.08
	Medical aid	**−0.35***	**0.10**	**−0.60***	**0.18**
Private medical insurance	Yes	**0.42***	**0.06**	**0.74***	**0.10**
Usual source of care	Yes	**−0.12***	**0.04**	**−0.20***	**0.07**
Quality of healthcare services	Not good	**0.09***	**0.04**	**0.15***	**0.07**
Need Factors					
Perceived health	Average	0.07	0.04	0.12	0.07
	Bad	0.04	0.06	0.05	0.10
Un-met needs	Yes	0.09	0.05	0.15	0.08
Chronic disease	Yes	**0.21***	**0.05**	**0.35***	**0.09**
Use of medicine for over 3 months	Yes	**0.13***	**0.05**	**0.22***	**0.09**
Frequency of medical services use		**0.02***	**0.001**	**0.04***	**0.001**

* $p < 0.05$*.

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Conflict of interest

None.

Availability of data and materials

The datasets analyzed during the current study are available from a public database of the KHP upon reasonable request (https://www.khp.re.kr:444).

Ethics approval and consent to participate

This study was approved by the Institutional Review Board of Dongguk University, Gyeongju (DRG IRB 20160002). Patient consent was exempted because of the total anonymity of all research data used in this study.

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