

Comparison of Research Trends in Korean and International Family Medicine in Journals of Family Medicine

Original
Article

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Background: Research is important for the development of family medicine as a professional field in primary care. The aim of this study was to suggest directions for the development of family medicine research by analyzing research trends in original papers published in the Korean Journal of Family Medicine (KJFM) and international journals.

Methods: We investigated original research papers published in KJFM and 4 international journals from August 2009 to July 2010. Analysis was conducted according to research topics, authors, methods, participants, and data sources.

Results: 'Clinical research' was the most common research topic in both the KJFM (88.3%) and international journals (57.3%); however, international journals had more studies in other domains ('education and research,' 'health service,' and 'family medicine'). More authors other than family physicians participated in international journals than in the KJFM (58% and 3.3%, respectively). Most studies were 'cross-sectional' in KJFM (77.0%) and international journals (51.5%); however, the latter had more 'qualitative' studies, 'cohort' studies, and 'systematic reviews' than the former. The largest study population was 'visitors of health promotion center' in the KJFM and 'outpatients' in international journals. Most of the study sources were 'survey' and 'medical records' in both.

Conclusion: There were limitations of diversity in the papers of the KJFM. Future investigation on papers of other than family medicine journals should be planned to assess research trends of family physicians.

Keywords: Research; Korean Journal of Family Medicine; Family Practice

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INTRODUCTION

It has been more than 30 years since the Korean Journal of Family Medicine (KJFM) was first published. Over time, papers have suggested future directions for family medicine based on the quality and methodological weaknesses of various studies in the KJFM. However, these papers do not offer appropriate evaluations and directional suggestions for proper research methods and results regarding primary health care services.¹⁾ In particular, while comparative analysis of Korean

and internationally published family medicine journals may yield more objective and scientific evaluations, no study has yet compared Korean papers with their foreign counterparts, with the exception of one study comparing early KJFM studies with those of the Journal of Family Practice.²⁾

Thus, the current study aimed to determine the current state of family medicine research through comparative analysis of KJFM papers and those of both domestic and foreign journals to provide fundamental data for improving domestic family medicine research.

METHODS

1. Participant Selection and Data Collection

Original articles published between August 2009 and July 2010 in domestic and foreign family medicine journals were selected for analysis. Only family medicine journals dealing with problems in primary health care from a family medicine perspective were chosen;³⁾ original articles referred to articles with results analysis and discussion regarding original data that have not been published elsewhere.²⁾ Clinical reviews, case reports, and editorials were excluded from analysis.

The KJFM was selected as the domestic family medicine journal; foreign family medicine journals were selected according to the following process. First, 'family medicine,' 'general practice,' 'primary care,' 'primary health care,' 'family physician,' and 'general practitioner,' were entered as keywords into the PubMed MeSH database, and 52 journals were found. Second, by adding 'research' and 'publication' to the above keywords, seven studies cited in family medicine journals⁴⁻¹⁰⁾ were found in PubMed, and 46 journals were found by analyzing their content.

After excluding any journals results that (1) were repeated in the second search, (2) did not correspond to the definition of family medicine journals, (3) were devoid of original articles, (4) focused only on a specialized field of family medicine, (5) were too general in topic, or (6) were discontinued, 10 journals remained. These were included in analysis.

The selected journals were then sorted according to five regions corresponding to their countries of publication. Journals most representative of each region were selected according to the impact factors provided by the Thomson Reuters science citation

index. The Asia-Pacific Journal of Family Medicine was excluded from the study as it publishes original articles irregularly and infrequently, thereby being poor in regional representativeness.

Through these processes, the Annals of Family Medicine (US), the Canadian Family Physician (Canada), The British Journal of General Practice (UK), and the Australian Family Physician (Australia) occupation were selected as foreign family medicine journals for analysis in the current study (Table 1). In all, 292 original articles from these 4 foreign family medicine journals and KJFM were included in the final analysis.

2. Criteria for Subcategory Classification

1) Classification criteria

(1) Classification by topic

Based on existing research,^{2,3,11-13)} journal articles were classified into four major categories (education and research, clinical research, health service, and family medicine) and then into 25 topics, according to the data obtained from existing research^{3,13)} and 3 months of preliminary study. In order to avoid overlap among the topics, 'doctors' perception and opinions' and 'patients' perception and opinions' were investigated separately.

(2) Classification by author and institutional affiliation

The occupation of the first author in each paper was categorized as 'family physician (FP),' 'non-family physician (non-FP),' 'non-medical doctor (MD) clinician,' or 'researcher.' Non-MD clinicians included non-physician personnel who participated in clinical treatment, such as psychologists, sociologists, pharmacists, and nurses. The specialization and specialty of each family physician were verified.

The institutional affiliation of the first author was categorized as 'universities,' 'hospitals,' 'clinics,' or 'clinic-related institutions' (health centers, medical examination centers, sexual violence counseling centers, etc.). In order to determine each physician's research activities, the institutional affiliations of all other authors were also investigated.

(3) Classification by research methods

The selected studies were identified as observational studies, experimental studies, or systematic reviews. Observational

Table 1. International research journals of family medicine

Place of publication	Journal name	Publisher	SCI/ SCIE	Impact factor*	Journals included in final analysis
US	Annals of Family Medicine	American Academy of Family Physician	SCIE	4.570	Included
	Journal of the American Board of Family Medicine	The American Board of Family Medicine	SCIE	1.848	
Canada	Canadian Family Physician	College of Family Physicians of Canada	SCIE	1.403	Included
UK	The British Journal of General Practice	Royal College of General Practitioners	SCI	2.356	Included
	BMC Family Practice	BioMed Central	SCIE	1.735	
	Family Practice	Oxford University Press	SCIE	1.842	
	Scandinavian Journal of Primary Health Care	Joint Committee of the Nordic Medical Research Councils	SCIE	1.610	
	European Journal of General Practice	WONCA Europe	SCIE	0.810	
Australia	Australian Family Physician	Royal Australian College of General Practitioners	SCIE	0.570	Included
Singapore	Asia Pacific Family Medicine	WONCA Asia Pacific	NA	NA	

SCI: science citation index journals, SCIE: science citation index expanded journals, WONCA: World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians, NA: not applicable.

*2013 journal impact factor from journal citation reports of Institute of Scientific Information Web of Knowledge.

studies were divided into case-control, cohort, cross-sectional, and qualitative studies, while experimental studies were divided into clinical trials and preclinical studies; clinical trials either did or did not employ randomized control trials. Systematic reviews involved meta-analyses.

(4) Classification by participants

The participants of the selected studies were classified into 'outpatient visitors,' 'inpatients,' 'health promotion center visitors,' 'local community members,' and 'medical personnel.' In addition, studies employing practice-based research network (PBRN) were investigated. PBRN, also referred to as a primary-health research network, refers to a grouping of physicians that aims to collect data concerning problems in clinical treatment.¹⁴⁾

(5) Classification by data sources

Depending on the collection method, data were divided into primary data (those directly collected by researchers) and secondary data (those analyzed from existing databases). Primary data were obtained from surveys, medical records, and existing research, while secondary data were obtained from each corresponding nation's national health and nutrition examination surveys as well as social statistics.

2) Method of classification

Studies that pertained to more than two categories were sorted into the category that corresponded best to their purpose. The classification was double-checked by one program director and one physician specializing in family medicine; in the event that the two disagreed, a third member (a program director specializing in family medicine) finalized the classification.

3. Statistical Application

A frequency analysis was conducted on the collected data using Microsoft Excel.

RESULTS

Of the 292 studies analyzed, 61 were from the KJFM, and 231 were from foreign journals. Of the 231 foreign journal articles, 55 were from the US, 50 were from Canada, 87 were from the UK, and 39 were from Australia.

1. Classification by Research Topic

Domestic papers pertained to clinical research (88.3%), education and research (8.2%), health service (3.2%), and

family medicine (1.6%), while foreign papers dealt most with clinical research (57.3%), family medicine (17.9%), health service (15.6%), and education and research (9.6%). While both domestic and foreign papers focused most on clinical research, research regarding other fields of study was also active in the case of foreign journals. In particular, there was great disparity between domestic and foreign journals concerning the amount of family medicine-related research.

In decreasing order of frequency, domestic research topics consisted mostly of the 'association of medical condition, lab finding, health behavior, and quality of life (QOL) (47.5%)' and 'interventions (i.e., for quitting smoking, integrative medicine treatments, etc.) and their effectiveness (13.1%).' Foreign study topics consisted mostly of 'interventions and their effectiveness (14.3%),' 'various practice patterns, associated factors, and their effectiveness (10.4%),' and 'clinical epidemiology and pathophysiology (10.0%),' in decreasing order.

As for studies concerning the 'association of medical condition, lab finding, health behavior, and QOL' (i.e., the most popular research topic, domestically), 75.9% of the first authors were found to be family physicians.

The frequency of studies concerning 'various practice patterns' was clearly varied between domestic (0%) and foreign (10.4%) journals. In the foreign countries, practice patterns included computer use and patient satisfaction, drug prescriptions (psychiatric drugs, antibiotics, etc.), euthanasia-related practices, and various treatments for external injuries. 'Doctors' perception and opinions' also differed largely inside (3.2%) and outside (13.0%) South Korea. These two topics were similar in that both pertained to physicians. 'Patients' perception and opinions' was a topic more frequently addressed in foreign (9.1%) than in domestic journals (6.6%).

In terms of regional characteristics outside of South Korea, 18.0% of the studies from Canada dealt with education and research. This statistic was higher for Canadian studies than those of other countries, which dealt mostly with education and training of specialist physicians. Further, 19.4% of the studies from the UK dealt with health service. This statistic was higher for British studies than those of other countries, which dealt mostly with the quality of medical practices. In addition, studies from Canada dealt with family medicine more frequently than those of other countries at 36.0%; many of these dealt with the role of

family medicine in primary health care settings (Table 2).

2. Classification by Author and Institutional Affiliation

Approximately 96.7% of the first authors of domestic family medicine papers had occupations pertaining to family medicine, while only 42.0% of the first authors outside of Korea had such occupations. Domestically, only two studies were submitted from authors specializing in emergency medicine—a field outside of family medicine—while, outside of Korea, authors of diverse work backgrounds contributed to family medicine journals. Authoring physicians included those specializing in psychiatry, general surgery, orthopedics, emergency medicine, pediatrics, and internal medicine, while other authors included psychologists, sociologists, nutritionists, pharmacists, physical therapists, asthmatic patient educators, statisticians, economists, and more. Domestically, of all the family medicine clinicians who acted as first authors in the selected studies, 79.7% were family physicians, and 19.6% were specialists. Outside of Korea, the proportions could not be calculated.

The institutional affiliation of the selected studies' first authors was most frequently the department of family medicine in university hospitals for both inside (95.1%) and outside (42.0%) of South Korea, but that of foreign countries was most frequently other departments in universities (36.4%), secondary hospitals (5.6%), and more. In domestic papers, there was no case in which the first author was a general practitioner; outside of the country, only 3.5% were found to be general practitioners. Other affiliations included government organizations, academia, and other research facilities (Table 3). As for studies from independent research institutions within South Korea, there was only one on account of a co-author.

3. Classification by Research Methods

In terms of research methods, cross-sectional studies made up the highest percentage of domestic (77.0%) and foreign studies (51.5%); 42.2% and 49.0% of them, respectively, were survey studies. The frequency of qualitative studies conducted domestically and outside of Korea differed largely, at 3.3% and 19.5%, respectively, while the frequency of cohort studies also varied between domestic journals and foreign journals, at 1.6% and 13.0%, respectively. The frequency of randomized control

Table 2. Family medicine research topic

Topic	Korean	International				Total
	Journal of Family Medicine (Korea)	Annals of Family Medicine (US)	Canadian Family Physician (Canada)	The British Journal of General Practice (UK)	Australian Family Physician (Australia)	
Education and research						
Education and communication of patients	2 (3.3)	4 (7.3)	1 (2.0)	2 (2.3)	1 (2.6)	8 (3.5)
Education and training of medical students and doctors	2 (3.3)	2 (3.6)	7 (14.0)	0	3 (7.7)	12 (5.2)
Research capacity building/current research trend	1 (1.6)	1 (1.8)	1 (2.0)	0	0	2 (0.9)
Total	5 (8.2)	7 (12.7)	9 (18.0)	2 (2.3)	4 (10.3)	22 (9.6)
Clinical research						
Clinical epidemiology and pathophysiology	3 (4.9)	8 (14.5)	2 (4.0)	11 (12.6)	2 (5.1)	23 (10.0)
Various practice patterns, associated factors and their effectiveness	0	5 (9.1)	4 (8.0)	15 (17.2)	0	24 (10.4)
Interventions and their effectiveness	8 (13.1)	10 (18.2)	6 (12.0)	11 (12.6)	6 (15.4)	33 (14.3)
Diagnostic tools and their effectiveness	5 (8.2)	3 (5.5)	1 (2.0)	5 (5.7)	3 (7.7)	12 (5.2)
Screening tools, strategies and their effectiveness	0	0	2 (4.0)	0	3 (7.7)	5 (2.2)
Designing and testing of methods for screening and diagnosis	3 (4.9)	1 (1.8)	0	2 (2.3)	0	3 (1.3)
Process of medical decision making	0	2 (3.6)	0	0	3 (7.7)	5 (2.2)
Association of medical condition, lab finding, health behavior, and QOL	29 (47.5)	4 (7.3)	2 (4.0)	3 (3.4)	1 (2.6)	10 (4.3)
Measurement of health status and QOL	1 (1.6)	0	1 (2.0)	2 (2.3)	0	3 (1.3)
Patients health behavior including chronic care	2 (3.3)	1 (1.8)	0	3 (3.4)	1 (2.6)	5 (2.2)
Health risk assess and management	1 (1.6)	1 (1.8)	0	1 (1.1)	0	2 (0.9)
Others	1 (1.6)	2 (3.6)	0	4 (4.6)	1 (2.6)	7 (3.0)
Total	53 (88.3)	37 (67.2)	17 (36.0)	56 (65.2)	20 (51.4)	132 (57.3)
Health service						
Consultation and refer	1 (1.6)	0	1 (2.0)	4 (4.6)	0	5 (2.2)
Information management	0	1 (1.8)	0	1 (1.1)	2 (5.1)	4 (1.7)
Cost-effectiveness and financing	1 (1.6)	2 (3.6)	0	3 (3.4)	0	5 (2.2)
Health care system (insurance, reimbursement, accreditation)	0	2 (3.6)	1 (2.0)	2 (2.3)	2 (5.1)	7 (3.0)
Quality of care	0	2 (3.6)	3 (6.0)	5 (5.7)	2 (5.1)	12 (5.2)
Ethical/legal problems	0	0	0	2 (2.3)	1 (2.6)	3 (1.3)
Total	2 (3.2)	7 (12.6)	5 (10.0)	17 (19.4)	7 (17.9)	36 (15.6)
Family medicine						
Effectiveness of family medicine for screening, diagnosis and treatment	0	1 (1.8)	1 (2.0)	2 (2.3)	1 (2.6)	5 (2.2)
Comparison of roles of primary care physicians and non-medical doctor clinicians	0	1 (1.8)	0	2 (2.3)	2 (5.1)	5 (2.2)
Comprehensiveness, teamwork, community-oriented care	0	0	4 (8.0)	0	1 (2.6)	5 (2.2)
Scope and role of family medicine	1 (1.6)	2 (3.6)	6 (12.0)	5 (5.7)	1 (2.6)	14 (6.1)
Encounters in workplace (violence, emergency)	0	0	3 (6.0)	1 (1.1)	1 (2.6)	5 (2.2)
Others	0	0	4 (8.0)	1 (1.1)	2 (5.1)	7 (3.0)
Total	1 (1.6)	4 (7.2)	18 (36.0)	11 (12.5)	5 (12.9)	31 (17.9)
Overall total	61 (100.0)	55 (100.0)	50 (100.0)	87 (100.0)	39 (100.0)	231 (100.0)

Values are presented as number (%).

QOL: quality of life.

Table 3. Occupation and affiliation of first authors

	Korean Journal of Family Medicine (Korea)	International				Total
		Annals of Family Medicine (US)	Canadian Family Physician (Canada)	The British Journal of General Practice (UK)	Australian Family Physician (Australia)	
Occupation						
Medical doctor (FP)	59 (96.7)	30 (54.5)	23 (46.0)	26 (29.9)	18 (46.2)	97 (42.0)
Medical doctor (non-FP)	2 (3.3)	10 (18.2)	11 (22.0)	18 (20.7)	5 (12.8)	44 (19.0)
Researcher, clinician (non-medical doctor)	0	14 (27.2)	10 (20.0)	42 (48.2)	13 (33.4)	63 (27.3)
Others	0	0	6 (12.0)	1 (1.1)	3 (7.7)	10 (4.3)
Total	61 (100.0)	54 (100.0)	50 (100.0)	87 (100.0)	39 (100.0)	231 (100.0)
Affiliation						
Department of family medicine in university	58 (95.1)	39 (70.9)	26 (52.0)	27 (31.0)	5 (12.8)	97 (42.0)
Other department in university	2 (3.3)	8 (14.5)	16 (32.0)	44 (50.6)	17 (43.6)	85 (36.8)
Hospital	0	3 (5.5)	1 (2.0)	4 (4.6)	5 (12.8)	13 (5.6)
Local clinic	0	0	0	2 (2.3)	3 (7.7)	5 (2.2)
Other health department	0	0	2 (4.0)	2 (2.3)	4 (10.3)	8 (3.5)
Others	1 (1.6)	5 (9.1)	5 (10.0)	8 (9.2)	5 (12.8)	23 (10.0)
Total	61 (100.0)	55 (100.0)	50 (100.0)	87 (100.0)	39 (100.0)	231 (100.0)

Values are presented as number (%).

FP: family physician.

studies was similar for domestic and foreign journals, at 4.9% and 5.2%, respectively. None of the experimental studies could be considered pre-clinical studies. Systemic reviews (8) were found in foreign journals only, and 50% (4) of these involved meta-analysis. Other research methods included cost-effective analysis and questionnaire validity studies (Table 4).

4. Classification by Participants and Research Data

Domestically, participants consisted mostly of health promotion centers (31.1%) with outpatients, local-community members, and medical personnel making up the next largest majorities. Other participants included students and seniors on welfare.

On the other hand, no foreign study focused on health promotion centers, and most frequently they focused on outpatients (50.2%), with medical personnel and local-

community members making up the next largest majorities. Other participants included students, office workers, retirees, health management assistants, and homeless people in the local community.

Domestically, no study utilized PBRNs, while 10.8% (25) of the selected foreign studies did. Particularly, 25% (4) of the cohort studies from the UK and 20% (2) of the randomized control studies from the US were PBRN studies, relatively higher than in other countries.

In terms of data analysis, both domestic and foreign studies most frequently employed primary data (domestically, 93.4%; outside the country, 97.4%), survey data making up the biggest portion (domestically, 68.9%; outside the country, 67.5%). Medical records made up the next largest majority of the data; domestic medical records were, interestingly, mostly records from medical examination centers. As for secondary data, national health and nutritional examination survey was found to be the

Table 4. Research methods

	Korean Journal of Family Medicine (Korea)	International				Total
		Annals of Family Medicine (US)	Canadian Family Physician (Canada)	The British Journal of General Practice (UK)	Australian Family Physician (Australia)	
Observational						
Qualitative study	2 (3.3)	9 (16.4)	6 (12.0)	24 (27.6)	6 (15.4)	45 (19.5)
Cross-sectional study	47 (77.0)	25 (45.5)	34 (68.0)	33 (37.9)	27 (69.2)	119 (51.5)
Case-control study	0	1 (1.8)	0	2 (2.3)	0	3 (1.3)
Cohort study	1 (1.6)	5 (9.1)	7 (14.0)	12 (13.8)	6 (15.4)	30 (13.0)
Experimental						
Clinical trial (RCT)	4 (4.6)	8 (14.5)	2 (4.0)	4 (4.6)	0	14 (6.1)
Clinical trial (non-RCT)	3 (3.4)	2 (3.6)	0	3 (3.4)	0	5 (2.2)
Systematic review	0	3 (5.5)	0	5 (5.7)	0	8 (3.5)
Others	4 (6.6)	2 (3.6)	1 (2.0)	4 (4.6)	0	7 (3.0)
Total	61 (100.0)	55 (100.0)	50 (100.0)	87 (100.0)	39 (100.0)	231 (100.0)

Values are presented as number (%).

RCT: randomized control trial.

most frequent source of the data both domestically and outside of Korea (Table 5).

DISCUSSION

The purpose of family medicine research is to provide foundations for finding answers to many questions and gathering new knowledge and to be as recognized academically as a field of specialization as any other.¹⁴⁾ In order to determine the current state of family medicine research, research topics had to be appropriately categorized, but past studies^{2,3,12,15,16)} tended to deduce trends in research by dividing the topics into only four to five large categories. There were efforts to better categorize topics in research, one being Maeseneer's approach,¹⁷⁾ which included three dimensions (structure, process, and outcome) and five clinical approaches (basic knowledge, diagnostic and therapeutic problem solving, practice implementation, policy context, and education), but this approach could not realistically encompass all studies being conducted in real life. Starfield³⁾ divided topics in family medicine into three dimensions (basic, clinical, and health service) and then subdivided these into 32 topics, but, despite

being more realistic and detailed than Maeseneer's approach, it was still inadequate for addressing all ongoing studies. It also inappropriately attempted to include family medicine-oriented approaches in the 'health service' category. The current study may, thus, be said to propose a more realistic and detailed method of classification, as it categorizes family medicine research into groups by keeping the aforementioned studies as a basis and taking recent studies into account.

As for studies that analyzed KJFM papers, Seo et al.¹⁵⁾ analyzed studies published in the KJFM between 1980 and 1989 and found many studies pertaining to awareness of family medicine, likely due to early efforts involved in the establishment of family medicine. On the other hand, by analyzing the original articles published in KJFM between 1999 and 2001, Song¹⁾ found that many concerned clinical matters, such as lifetime health management and chronic illnesses. The high number of clinical topics may be attributable to the time period; at that time, family medicine was already established as a field of study and was developing into a field of specialized treatment. Similar trends occurred in the UK, the US, and Australia^{3,5,7,8)} after family medicine became established as a medical specialization; the current study also shows that clinical research was the most

Table 5. Participants and data sources

	Korean	International				Total
	Journal of Family Medicine (Korea)	Annals of Family Medicine (US)	Canadian Family Physician (Canada)	The British Journal of General Practice (UK)	Australian Family Physician (Australia)	
Participants						
Outpatient department	13 (21.3)	30 (54.5)	17 (34.0)	48 (55.2)	21 (53.8)	116 (50.2)
Health promotion center	19 (31.1)	0	0	0	0	0
Community resident	13 (21.3)	11 (20.0)	6 (12.0)	7 (8.0)	2 (5.1)	26 (11.3)
Medical personnel	7 (11.5)	10 (18.2)	22 (44.0)	24 (27.6)	12 (30.8)	68 (29.4)
Others	8 (13.1)	4 (7.3)	5 (10.0)	8 (9.2)	4 (10.3)	21 (9.1)
Total	61 (100.0)	55 (100.0)	50 (100.0)	87 (100.0)	39 (100.0)	231 (100.0)
Data sources						
Primary source						
Survey	42 (68.9)	35 (63.6)	38 (76.0)	62 (71.3)	21 (53.8)	156 (67.5)
Medical records	14 (23.0)	10 (18.2)	8 (16.0)	14 (16.1)	11 (28.2)	43 (18.6)
Other journals	1 (1.6)	5 (9.1)	0	1 (1.1)	0	6 (2.6)
Others	0	2 (3.6)	3 (6.0)	9 (10.3)	6 (15.4)	20 (8.7)
Secondary source						
National health and nutrition examination survey	3 (4.9)	3 (5.4)	1 (2.0)	0	0	4 (1.7)
Others	1 (1.6)	0	0	1 (1.1)	1 (2.6)	2 (0.9)
Total	61 (100.0)	55 (100.0)	50 (100.0)	87 (100.0)	39 (100.0)	231 (100.0)

Values are presented as number (%).

frequent topic for both domestic and foreign papers. However, while foreign journals include studies dealing with topics outside of clinical research, domestic journals do not. This shows that family medicine research in South Korea is skewed towards clinical research. Thus, family medicine research should be more actively studied as family medicine, while being the least frequently studied topic in Korea, forms the foundation on which primary health care is established. In particular, studies that examine the 'association of medical condition, lab finding, health behavior, and QOL' were too frequent in publication at 47.5% of all selected domestic studies in the current study. Though this is a frequent topic in research because it only requires an existing database and a little time and effort, other topics should be given more attention in the future. Considering that a majority of studies regarding this 'association' involved family physicians, who

needed to complete research over short periods of time, it may be crucial for program directors to begin planning adequately-timed, well-planned studies in the future. In addition, there was little research regarding the doctors themselves, such as those regarding 'various medical practices' and 'doctors' perception and opinions.' One possible reason for this is that it is difficult to gather a large number of doctors to act as participants. In particular, researching 'doctors' perception and opinions' requires approaches involving direct qualitative research methods, which are not familiar in Korea; the reality is that only quantitative research methods have garnered recognition in Korea.¹⁸⁾

Family physicians formed the majority of first authors for both domestic and foreign family medicine journal articles. Domestically, very few studies were submitted by professionals of other fields, a trend that contrasts with that of foreign papers

and has to do with the quality and quantity of the papers. It is undoubtedly the case that participation of researchers with diverse backgrounds will increase the quality and quantity of journal articles. The diversity of participating researchers has been consistent across foreign journals,^{5,9,10} and this may be because individual research history is evaluated via registration in the Science Citation Index (SCI)/SCI Expanded (SCIE) journal list. Researchers may be submitting papers across a diverse array of foreign SCI/SCIE journals in order to find recognition for their work, thereby contributing to the diversity of researchers across foreign journals. This may also be the reason that program directors make very little contribution to the KJFM. This fact has significant implications for improving the journal's quality.

Given that the focus of family medicine is primary health care, the participation of independent general practitioners is necessary in the advancement of family medicine. However, as shown in this study, the majority of research institutions inside and outside of the country are universities, and few independent general practitioners participated in the research. However, outside of the country, general practitioners directly and actively contribute to research via PBRNs, and advanced studies, such as cohort and randomized control studies, are being conducted. PBRN is the foundation of primary care research¹⁹ and serves as a medium for imparting new knowledge obtained through research.²⁰ Introduced in the late 1960s, PBRNs have now expanded worldwide to North America, Europe, Australia, and more. In the US, one in 10 family physicians is said to belong to an institutional affiliation.¹⁹ PBRNs exist in Korea but are small in size.^{20,21} The quantitative and qualitative expansion of PBRN may help broaden domestic family medicine research.

McWhinney²² claimed that observational studies regarding disease mortality rates will suit family medicine studies, as family medicine is characterized by care of all patients, regardless of age, disease, or stage of disease. The current study also found that most family medicine studies, both inside and outside the country, were observational studies, many of these being cross-sectional studies, which are relatively low in quality. The current study found that, when compared to a study by Song, the proportion of cross-sectional studies has shrunk from 91.9% to 80.3% (qualitative studies included) over time, while the proportion of randomized trial studies has increased. On the other hand, the proportion of cohort studies has shrunk from 6.7% to 1.6%, a point that should

be addressed in future studies.

In terms of research methods, a marked difference was observed between domestic and foreign papers concerning qualitative research. Qualitative studies refer to studies incorporating qualitative data, such as interview and observational results, as well as documents,²³ as opposed to quantitative aspects of certain subjects. Because family medicine focuses on holistic treatment of not only clinical symptoms but also patient environment, beliefs, and physician-patient relationships, it is intimately related to qualitative studies.^{24,25} As for previous domestic articles^{1,2,15,16} from both early and recent times, barely any were qualitative studies. However, in foreign journals, qualitative studies made up 7% to 30% of all studies,^{5,6,9} as they did in the current study. This seems to demonstrate the importance of qualitative studies. Few domestic studies have been qualitative,²⁶ as qualitative research methods are imprecise, unfamiliar, and take much time and effort. However, owing to the establishment of workshops and guidelines at the academic level, qualitative studies are now being conducted.^{24,27} The same focus may be needed domestically.

Unique to domestic studies, the majority of participants were found to be visitors to health examination centers. This may be because family medicine departments often manage health examination centers. While it may be favorable that examination visitors are so similar to local-community members in comparison to outpatients or inpatients,²⁸ care should be taken to avoid skewed participation selection.

The limitations of the current study are as follows. First, it is unclear whether the selected journals represent foreign research trends. However, while it may have been limiting to select certain journals on the basis of impact factors and regional characteristics, the differences between these journals and KJFM could still be deduced, and this was sufficient in meeting the study's aim to provide rudimentary data for the improvement of domestic family medicine. Second, the investigation period was limited to the most recent year. Though this is a short time period, it may still have been enough to show recent research trends to a certain extent, based on the comparison of regionally different journals. Third, it is doubtful whether the conclusions drawn from the current study may be generalizable to real life. In particular, it has been reported that KJFM publishes only 18% to 58% of all papers submitted by family physicians.^{9,10} However, because the selected journals take regional research activities into account, thereby

being representative of regional research trends,⁵⁾ findings of the current study may indeed be generalizable. Fourth, most first authors of domestic studies are family physicians. Since family medicine research is conducted mainly by specialized doctors at universities, the representativeness of the findings may be limited. However, because specialist doctors are inexperienced with research and, thus, work with program directors, their work may not be limited to papers concerning their specialization only. KJFM studies are the work of principal investigators, who are program directors; thus, they may be said to represent domestic trends in family medicine research. Fifth, regarding research methodology, the quality of the papers was not compared for analysis. Randomized control studies may differ in quality, even amongst themselves, due to differences in planning and execution. However, this limitation did not interfere with the purpose of the present research, which was to investigate current trends in research and supply fundamental data for future search.

The KJFM's readers include Korean family physicians. However, it is difficult to gather the work of all Korean family physicians (many of whom direct universities as well as primary health care) in a single journal. In fact, it is presently the case that specialist doctors, who are central to research activities regarding family medicine, seldom participate in research. Following 2011, KJFM was divided into (1) an English-language journal that focused on original articles and publication in the SCI and (2) a Korean-language journal that focused on clinical reviews. This may have been a realistic and effective measure for engaging program instructors, general practitioners, and family physicians.

On the other hand, it is also important to improve the quality of specialized journals of which original articles make up the majority. For this purpose, education regarding the importance of research, mentor-mentee relationships between family physicians and program directors, provision of time for research, systemic education regarding research, opportunities for presenting research, and attendance in foreign conferences are encouraged.²⁹⁻³¹⁾ Program directors should continuously provide research-related measures that suit each hospital, and academia should provide continuous attention and effort. Research publication will become a requisite in medical specialization exams starting in 2016 at the 59th medical specialization exams; this may also help improve the quality of family medicine studies.

The current study is significant in that it was the first study to

systematically select, as well as comparatively analyze, domestic and foreign family medicine journals. The present study should serve as a starting point for reviewing the current state of medical research in South Korea and improving family medicine practices. In the future, further studies need to be performed to evaluate the changes of the KJFM as it becomes an English journal. In addition, the KJFM, as well as other journals publishing domestic family medicine studies, should be considered for analysis.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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