A Study on Research Trends Analysis of Medical Information Management

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ABSTRACT

In this study, the author examined medical information management research trends in abroad and Korea from the perspectives of library and information science. LISA was used to collect research data in abroad from 2007 to 2010 (a total of 225 research articles). Korean studies were investigated using DBPIA to compare research trends. Content analysis results based on subject category show that research in abroad increased consistently and electronic resources and collection-related subjects were frequently studied. In Korea, the electronic resources and collection-related research proportion was also high, and much research was done in the areas of bibliometrics. However, medical information management researches did not increase in Korea between 2000 and 2010.

초 록

본 연구에서는 외국과 한국의 의학정보관리 연구 경향을 문헌정보학적 관점에서 분석하였다. 외국 데이터는 2007년부터 2010년까지 3년여 간을 대상으로 LISA 데이터베이스를 검색하였으며 대상 논문은 총 225건이다. 한국 데이터는 DBPIA를 이용하였다. 주제카테고리에 기반한 내용분석 결과, 외국의 경우에는 지속적으로 연구가 증가하고 있었으며, electronic resources and collection 관련 연구의 비중이 높았다. 한국의 경우도 역시 동일 주제영역인 electronic resources and collection의 비중이 높았고, 계량서지학적인 연구의 비중이 높은 것으로 나타났으나, 2000년부터 2010년까지 의학정보관리 영역 연구의 증가는 나타나지 않았다.

Keywords: medical information management, research trends analysis, comparative analysis, content analysis, medical library
의학정보관리, 연구경향분석, 비교분석, 내용분석, 의학도서관

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1. Introduction

The medical information management field is rapidly growing and changing due to the remarkable development of medical technology. Research projects related to the medical field have been carried out in diverse subject domains that include the social sciences as well as the medical sciences.

Accumulated studies related to medical subject areas can be also found in the field of library and information science. Site activities are evolving into greater specialization as well.

In the medical libraries field, the Medical Library Association and the National Library of Medicine are the two leading associations in the United States. The Korean Medical Library Association supports and guides medical libraries in Korea.

Dynamic interactive relationships between research areas and field areas can create a positive synergy effect. Research results might facilitate site application; conversely, site experience can be adjusted to research.

The purposes of this paper are to interpret medical information management research trends and to enhance the understanding of medical information management research subjects.

2. Related Research

Examinations of research trends have been carried out in numerous fields and analyses of medical research trends have used a variety of perspectives. Lee and Lee (2002) examined radiology papers published in Korea in the 1990s, investigated research trends, and compared their findings to international research trends.

Lee (2001) searched SciSearch Database for eight Korean medical journals listed between 1989 and 1998. The frequency of citations of each journal was measured and the journal impact factor was calculated.

Tonosaki (2006) retrieved Japanese authors' medical research in foreign journals and medical research results published in Japan journals from 2000 to 2006. The author examined outflow level of the results of Japanese medical research to foreign countries.

Claude et al. (2009) analyzed 2,443 papers published in 2006 by European Union authors on pain-related research. Five EU countries (the UK, Germany, Italy, the Netherlands, and France) were selected, articles from 592 journals were analyzed, and national research trends were compared.

Gore (2009) analyzed trends in research activity as represented by published research in the leading peer-reviewed professional journals for health sciences librarianship. After research articles were identified from the Bulletin of the MLA and the Journal of the MLA, research methodologies were examined. Of the 930 articles selected, 474 were identified as research articles. Survey was the most common methodology employed, and quantitative descriptive statistics was the most used analytical technique.

3. Data Collection

To examine medical information management research trends from the perspective of library and information science, the LISA (Library and Information Science Abstracts) database was searched in order to collect research articles.

The author searched for the keywords 'medical' or 'medicine' in article titles within a date range of 2007 to 2010. Searched articles were limited to those written in English and by journal article type. Search results are shown in Table 1.

There were 80 journals that included 225 articles. Thirty-one journals published medical information management articles more than twice. These journal names and article numbers are shown in Table 2.

As shown in Table 2, the four top-ranked journals specialize in the medical field. The fifth-ranked journal, Scientometrics, is not a journal that specializes in the medical field, but it did publish medical-related articles more than ten times.

〈Table 1〉 Articles published by years

Year	2007	2008	2009	2010	Total
Articles	57	69	82	17	225

〈Table 2〉 Names of journals that published more than two articles

	Journal Name	Articles
1	Medical Reference Services Quarterly	29
2	Journal of the Medical Library Association (JMLA)	27
3	Journal of Hospital Librarianship	23
4	Journal of Electronic Resources in Medical Libraries	13
5	Scientometrics	12
6	Health Information and Libraries Journal	7
7	Journal of the American Society for Information Science and Technology	5
8	First Monday	4
9	Journal of Consumer Health on the Internet	4
10	Journal of Interlibrary Loan, Document Supply and Electronic Reserve	4
11	Informatics for Health & Social Care	3
12	Library Philosophy and Practice	3
13	Medical Informatics & The Internet in Medicine	3
14	Reference Reviews	3
15	Searcher	3
16	Journal of the Canadian Health Libraries Association	3
17	Collection Building	2
18	DESIDOC Journal of Library & Information Technology	2
19	EContent	2

〈Table 2〉 Names of journals that published more than two articles(continued)

	Journal Name	Articles
20	Information Research	2
21	International Journal of Information Science and Technology	2
22	Journal of Medical Internet Research	2
23	LIBRES: Library and Information Science Research Electronic Journal	2
24	New Review of Academic Librarianship	2
25	One-Person Library	2
26	Public Services Quarterly	2
27	The Electronic Library	2
28	Webology	2
29	Government Information Quarterly	2
30	Science & Technology Libraries	2
31	SCONUL Focus	2
	Total	225

4. Subject Frame for Content Analysis

A subject frame was created, based on descriptors given by LISA and MeSH classification system. Concurrent major subject themes were considered and assigned to a subject frame and this frame was used to perform content analyses of research articles. Descriptors assigned to the 225 articles totaled 785. Proper nouns, place names, corporation names, and nation names were omitted.

The basic subject frame for analysis, based on the frequency of occurrence of each descriptor, is shown in Table 3.

As shown in Table 3, six subject categories and 18 subcategories have been identified.

Category A is education and training. Themes that involve teaching, user education, and librarian training are included in this category.

Category B is the user service section. It includes various services types found in the library field, such as outreach services. Virtual reference services, which utilize web environments, and research support services are also included in this category.

Category C is collections and resources. The proportion of research about electronic resources has greatly increased. Research about collection development including electronic materials, software, tools that are useful for users and librarians, classifications, MeSH, and rsearch related to information management systems are assigned to this category.

Category D is management. Leadership, grants and funds management, management planning, collaboration with other organizations, and management evaluation subjects are included in this category.

Category E is libraries and organizations. Because many libraries and organizations must utilize medical information management, a high number of . research articles and case studies of libraries and institutions are assigned to this category.

〈Table 3〉 Subject frame and codes for analysis

Category	Code	Examples
A. Education Training	A1	teaching, information literacy
	A2	user education, universities
	A3	staff training, medical librarians
B. Services	B1	user services, outreach services
	B2	virtual information services, online services
	B3	research guides, research evaluation
C. Collections Resources	C1	(electronic) collection development
	C2	applications, software, tools
	C3	classifications, MeSH
	C4	information management system, retrieval
D. Management	D1	leadership, grants and funds management
	D2	planning, guidelines
	D3	collaborations with other organizations
	D4	management evaluation
E. Libraries Organizations	E1	medical libraries
	E2	medical associations, other institutions
F. Networks Bibliometrics	F1	social networks, scholarly communication
	F2	bibliometrics, webometrics, medical informatics, journal analyses

Category F is networks and bibliometrics. Various social networks based on web environments show rapid evolution. Many interesting studies have been performed about these trends, e.g. social networks, blogs, and folksonomy. Bibliometric- related research continues to be an important subject area particularly in the medical information management field, because of the influence of medical informatics.

5. Analysis of Medical Information Management Research

Based on the subject categories in Table 3, 225 articles were classified. Article contents were analyzed by titles, abstract, and descriptors.

Article numbers assigned to each subject categories are shown in Table 4.

Table 4 shows that from 2007 to 2010, the most common research subject theme related to medical information management research was Category C, electronic resources.

The number of resources that will be helpful to medical information services and users are increasing according to the development of web environments and IT technologies. Reflecting this trend, many studies related to electronic resources development have been carried out during this four-year period.

The second most frequent research theme was category F, networks and bibliometrics. Social network themes, especially related to web environment

〈Table 4〉 Article numbers for subject categories

Category	Code	Articles (2007~2010)	Total
A. Education/Training	A1	15	36
	A2	7	
	A3	14	
B. Services	B1	13	35
	B2	10	
	B3	12	
C. Collections/Resources	C1	23	51
	C2	11	
	C3	8	
	C4	9	
D. Management	D1	7	33
	D2	9	
	D3	8	
	D4	9	
E. Libraries/Organizations	E1	17	33
	E2	16	
F Networks/Bibliometrics	F1	21	37
	F2	16	
Total		225	225

communication (e.g., social tagging, blogs, folksonomy and scholarly communication) are included in this category.

Category A, education and training, and category B, user services, closely follow category F. To keep pace with the evolved environment, education and user services should be improved so that they can provide appropriate help.

Research shows a close relationship between web environment trends and communications, which reflects the rapid changes in social communication due to Internet influence. In order for a library environment to provide qualified service to users and to maintain extensive and up-to-date collections, understanding the newest technologies and environment is essential.

Table 5 provides article publication numbers for subject categories by year. Each article has been assigned a subject code through content analysis using abstracts and concrete descriptors.

As shown in Table 5, the number of medical information management research articles increased over the four-year period. Because publications are not yet complete for 2010, data from 2007 to 2009 can be used.

Category A, education and training, and category E, libraries and organizations, show a consistent increase of research in all subcategories. However, category B, user services, shows a decrease across subcategories.

〈Table 5〉 Article numbers for subject categories

Year	A Education Training			B Services			C Collections Resources				D Management				E Libraries		F Networks	
	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	D4	E1	E2	F1	F2
2007	2	1	4	7	4		3	2	2	2		1	5	4	4	4	5	4
2008	6		4	5		7	8	4	3	2	2	2	1	4	6	5	10	4
2009	6	3	5	1	4	4	10	2	3	5	4	6	2	1	6	6	6	7
2010	1	3	1		2	1	2	3			1				1	1		1
Total	15	7	14	13	10	12	23	11	8	9	7	9	8	9	17	16	21	16
	36			35			51				33				33		37	

Among all subcategories, C1, research related to electronic collection development, was performed the most. Subcategory F1, social networks and related themes, was second most examined research area.

Subcategory A2, user education and education related to universities; and subcategory D1, leadership, grants and funds management, are the areas in which the least amount of research was performed.

6. Analysis of Medical Information Management Research in Korean Journals

To determine the extent of medical information management research in Korea, DBPIA was used. To extract articles in the library and information field, the classification scheme assigned by National Research Foundation of Korea was applied.

As with the LISA search, articles with ‘medical’ or ‘medicine’ in their titles were searched.

Not many research articles related to the medical information management areas were found using DBPIA. Therefore, the time span was extended back to 2000 to draw statistically meaningful result.

Numbers of research articles published from 2000 to 2010 are shown in Table 6.

Unlike the tendency of research abroad, Korean studies don’t show an increase over time; instead, they slightly decreased.

Journals that published articles related to medical information management were examined. Results are shown in Table 7.

Eighteen journal titles within the library and information science area have been assigned by the National Research Foundation of Korea. Only seven journals, as shown in Table 7, include research articles related to medical information management.

〈Table 6〉 Articles published in Korea by year

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Articles	5	6	6	4	5	4	5	0	2	4	1	42

〈Table 7〉 Korean journals that published medical information management research

Journal Title	Articles
Journal of the Korean Society for Information Management	14
Proceedings of the Conference of Korean Society for Information Management	9
Journal of the Korean Society for Library and Information Science	5
Journal of Korean Library and Information Science Society	7
Journal of the Korean Biblia Society for Library and Information Science	4
Proceedings of the Conference of Korean Society for Library and Information Science	2
Proceedings of the Conference of Korean Biblia Society for Library and Information Science	1
Total	42

Six subject categories and 17 subcategories that applied to research articles abroad also applied to 42 articles published in Korea. Titles and abstracts were reviewed and through content analysis; each article has been assigned to the proper subcategory. Results are shown in Table 8.

Analysis of research publications categories shows that during the past decade, category C, collections, and category F, bibliometrics, were the most examined. Category A, education and training, was the least researched.

〈Table 8〉 Article numbers for subject categories

Category	Code	Articles (2000~2010)	Total
A. Education / Training	A1	0	2
	A2	1	
	A3	1	
B. Services	B1	1	5
	B2	3	
	B3	1	
C. Collections / Resources	C1	1	12
	C2	0	
	C3	7	
	C4	4	
D. Management	D1	0	7
	D2	1	
	D3	3	
	D4	3	
E. Libraries / Organizations	E1	3	4
	E2	1	
F. Networks / Bibliometrics	F1	0	12
	F2	12	
Total			42

Of the 18 subcategories, no research was performed in A1, C2, D1, and F1. These are, respectively, teaching and information literacy in education;, applications, software, tools in collection and resources;, leadership, grants and funds management, in management; and social networks and scholarly communication in networks.

On the other hand, subcategory F2 shows top-ranked article publications. This result implies that research related to bibliometrics was actively performed during the past decade in Korea.

Table 9 shows research publication statistics by year. Each year shows a similar research articles publication pattern of 4 to 6 articles. However, in 2007,no research related to medical information management was performed and in 2008 only two research articles were published.

7. Conclusion

In this study, medical information management research articles were collected and analyzed using content analysis. For articles not published in Korea, the LISA database was used to collect 225 articles with title keywords ‘medical’ or ‘medicine’ that were published between 2007 and 2010. Articles were assigned to six subject categories and eighteen subcategories. Analysis results showed that the number of studies has increased over time. The most-examined research subject areas were electronic resources and collections. Social networks and web environment communication subjects related to medical information management were also frequently studied.

However, Korean medical information management research did not clearly increase during 2000

〈Table 9〉 Article numbers for subject categories

Year	A Education Training			B Services			C Collections Resources				D Management				E Libraries		F Networks	
	A1	A2	A3	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	D4	E1	E2	F1	F2
2000						2							1					2
2001					1					2						1		2
2002									1			1	1					3
2003			1			1			1									1
2004									2	2					1			
2005					1									1	1			1
2006					1								1	2	1			
2007																		
2008		1							1									3
2009				1														3
2010							1											
Total	0	1	1	1	3	3	1	0	5	4	0	1	3	3	3	1	0	12
	2			7			10				7				4		12	

and 2010. To identify subjects and trends in Korean research, DBPIA was searched and the same categories and subcategories were used. Similar to the results for research outside Korea, the Korean research analysis results also showed frequent studies related to category C, electronic collection and resources. Category F, bibliometrics analysis, was also often examined during the past decade.

Medical information management research in abroad have been performed in various subject fields with a balanced amounts.

Many subject themes still to be explored remain in the medical information management area. Unlike other subject areas, the medical information management area has not been extensively researched in Korea compared to abroad.

However, the themes of resources and collections and bibliometrics were frequently examined in Korea. More studies related to other important subject areas, such as education, services, and management, will enhance Korea's research competence in medical information management research.

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