A Comparative Analysis of Research on LIS Information Behavior and Health Information Seeking Behavior

문헌정보학의 정보행동과 의학분야의 건강정보탐색행동에 대한 연구들의 비교 분석

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ABSTRACT

Information behavior (IB) research in LIS and Health Information Seeking Behavior (HISB) in Health Medicine are two subject areas of research that have matured in the past few decades. This research aimed to compare these two research areas using a bibliometric approach. To conduct this study two distinct datasets were created using the Scopus database: a) bibliographic records of IB in the LIS domain, and b) bibliographic records of the HISB domain. The bibliometric analysis was performed according to the following criteria: published papers, citations, journal articles, author keywords, unique words in the title, words preceding "information" in the title, words preceding "study" in the title, and author keywords along with index keywords. As a result, the major differences in the two IB research areas were evident in terms of definitions, main focus, and general demographic groups. These varying types of differences suggest that researchers of the two areas should have flexibility when examining issues related to IB by considering the context and the unique distinction between the two fields.

초 록

본 논문은 정보행동 분야에 상당한 연구가 진척된 문헌정보분야의 정보행동에 관한 연구와 의학분야의 건강정보탐색행동 연구를 비교하였다. 이 연구는 계량서지학적 접근으로 진행하였다. 연구 실행을 위해 Scopus 데이터베이스를 사용하여 서지기록들을 문헌정보학과 건강과의학 분야별로 데이터 세트를 구성하였다. 계량서지학적 분석은 다음과 같은 영역으로 실행하였다: 출판된 논문, 인용, 논문지, 저자키워드, 제목에서 고유한 단어, 제목에서 "information" 앞에 이용되는 단어들, 제목에서 "study" 앞에 이용되는 단어들, 제목에서 국가명을 표기한 단어들, 저자 키워드와 색인 키워드. 결과적으로, 두 분야에서 드러난 정보행동에 관한 연구 영역에서의 주요차이점은 정의, 주된 초점, 일반적인 인구통계학적 그룹에서 분명하게 나타났다. 이러한 다양한 차이점은 두 학계 연구자들에게 정보 탐색과 정보행동을 연구하는데 있어 학계별 특수한 차이와 상황들에 따라 유연하게 접근하고 적용해야 함을 시사하였다.

Keywords: Information Behavior, Health Information Seeking Behavior, Bibliographic Attributes, LIS, Health and Medicine
정보행동, 건강정보 탐색행동, 서지속성, 문헌정보, 건강과 의학

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1. Introduction

Information behavior (IB) is a general term that refers to a variety of methods people employ to discover and gain access to information resources. IB is an important issue in all areas of human society and have emerged as a noteworthy subject area in two notable fields of study - library and information science (LIS) and Health and Medicine (H&M). In LIS, IB has become a core subject area that has attracted many researchers, particularly in the past three decades (Bawden 2006; Case 2016; Wilson 2010). Consequently, a vast number of IB research papers have been produced. One possible reason for this is that IB can be examined within a variety of subjects and contexts. Two notable research domains of IB research are LIS and H&M (Kim 2017; Wilson 2018). IB is similar in each field, but approaches, research methodologies, and primary concerns often differ from one to another due to the characteristics of each field. By comparing the two research domains, it is possible to understand the fundamental uniqueness of each research area.

Notable previous studies highlight similarities and differences of the two research domains. Previous research on IB in LIS generally focused on information retrieval (Belkin 1993; Ingwersen 1996), information seeking (Marchionini 1989; Krikelas 1983; Greifeneder 2014; Buente and Robbin 2008; Case 2016), models, (Kuhlthau 1993; Wilson 1999), theories (Fisher 2005; Spink 2006; Jamali 2013), conceptual frameworks (Pettigrew 2001), contexts and situations (Courtright 2007), information needs (Savolainen 2012), information practice (Savolainen 2007), information literacy, and methodologies (Gaston 2017; Gonzalez-Teruel et al. 2015; Vakkari 2008).

On the other hand, previous research on IB in H&M has mainly been conducted in terms of health information seeking behavior (HISB). HISB is an umbrella term used to describe individuals' behavior in obtaining health-related information. Although this is a generally accepted term in the H&M discipline, scholars slightly differ in defining the focal points of HISB. Lambert and Loiselle (2007) and Weaver et al. (2010) pointed out that the concept of HISB is universally used in the context of illness and wellness information. Detlefsen (1998) observed that research of IB in the medical disciplines is generally concerned with physicians, multi-disciplinary groups of health professionals, medical students and faculty, nurses and other allied health personnel, life scientists, and basic science researchers. Cutilli (2010) narrowed the scope of HISB and pointed out that the concept of HISB focuses on how patients obtain information. Nonetheless, the general consensus is that HISB focuses on issues related to public health and health literacy (Maheswarappa and Bhadrashetty 2015; Sørensen et al. 2012; Nutbeam 2008), and HISB research is directed towards understanding behavior of specific demographic groups in finding health information (Longo 2005; Kim 2012; Lee 2018) as well as the use of internet as an information source (Morahan-Martin 2004; Younger 2010; Jacobs, Amuta, and Jeon 2017; Li et al. 2015).

Although HISB may seem different from IB in LIS, there are some common elements that occur in previous research. For example, the role of public libraries could be a common concern between the two research domains as investigated by Pettigrew et al. (2001). This commonality between the two fields has not been scrutinized in detail using empirical data. Although IB in both LIS and HISB is conceptually similar, each area has contrasting interests and subject matters.

Hence, the objective of this paper was to compare the IB research in LIS with HISB research as the results could provide valuable insights for understanding various areas of research, while possible areas of interaction between the two areas of research could be assessed. The wealth of research in both domains allows us to evaluate the relevance of certain topical areas of the research. The extent of IB research in other disciplines was examined by Kim (2017), Wilson (2018), and González-Teruel (2015). Similarly, this paper uses a bibliometric approach to examine the current state of LIS IB research and HISB research. In particular, this paper identifies various common elements as well as the differences between the two research domains.

2. Methodology

A bibliometric approach, along with network analysis, was used to conduct this research. To conduct this study, the relevant bibliographic record for years from 2001 to 2018 was extracted using the Scopus database. Two distinct datasets were created: a) bibliographic records of IB research articles, and b) bibliographic records of HISB research articles. The first dataset was created based on the journals that were categorized in *Library and Information Science* in the Scopus database.

A total of 195 LIS journals indexed in the 2017 Scimago Journal & Country Rank (https://www.scimagojr.com/) were included in this dataset. Similarly, using the 2017 Scimago Journal & Country Rank, the second dataset was created based on 563 journals that were categorized in *Health Professions*. The search query required appropriate terms and the appropriate selection of bibliographic attributes. There are some closely related concepts that are frequently used in IB research. These include: information behavior, information seeking, information needs, and information searching. Gonzalez-Teruel et al. (2015) and Kim (2017) used such conceptual notions as search terms. Similarly, in this study, the following IB search related terms were searched against the title and keyword fields. These include: “Information seeking”, “information behavior”, “Information behaviour”, “Information seeking behavior”, “Information seeking behaviour”, “user studies”, “user study”, “information practice*”, “information sharing behavior”, “information sharing behaviour”, “information searching behavior”, “information searching behaviour”, “information use behavior”, “information use behaviour”, and “information needs.”

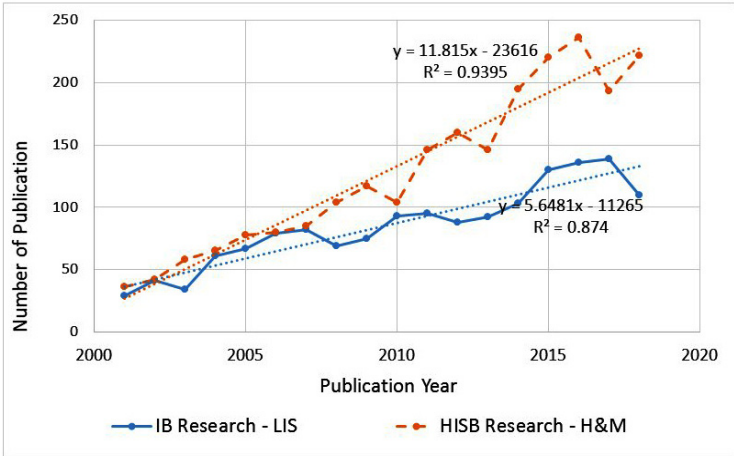
Then, various sub-datasets were created according to specific field types, and the sub-datasets were analyzed in terms of the number of publications,

authorship, the number of journals publishing research on IB, frequently used terms and country of affiliation. The bibliometric analysis was performed according to the following criteria: published papers, citations, journal articles, author keywords, unique words in the title, words used preceding “information” in the title, and author keywords along with index keywords. Visualization of author keywords has been used to gain insights into the topical areas and characteristics of the two domain areas. Furthermore, a frequency analysis of author keywords and index keywords was conducted to reveal additional characteristics of IB in H&M research. Lastly, various bibliographic attributes containing the country names were examined using the Unix based scripting tools such *awk* in order to determine the extent of country related research.

3. Results

3.1 Yearly Growth of Journal Articles on IB in LIS and HISB

A total of 1522 records was retrieved for IB research in LIS, whereas 2288 records were retrieved for HISB research in H&M. To examine the journal articles on IB in LIS and HISB in more detail, it is useful to investigate the yearly growth of the journals in the past two decades. Figure 1 displays the growth of journal papers. As shown, the growth of papers on IB has increased steadily over the years. Papers in both areas of research showed similar numbers at the beginning of 2001, but since then the growth of HISB research papers has increased at a faster rate than that of IB in LIS. The regression line suggests the growth pattern is mostly consistent along the line. Regardless of the field of IB research, based on previous studies (Kim 2017; Wilson 2018),



〈Figure 1〉 Yearly Growth of Journal Articles on IB and HISB

the steady growth of IB related publications was predicted beforehand.

There were a few overlapping areas between the two disciplines in some journals but these journals were of minor significance compared to the overall publications. Thus these journals were not distinguished in creating the datasets and they were categorized in both categories.

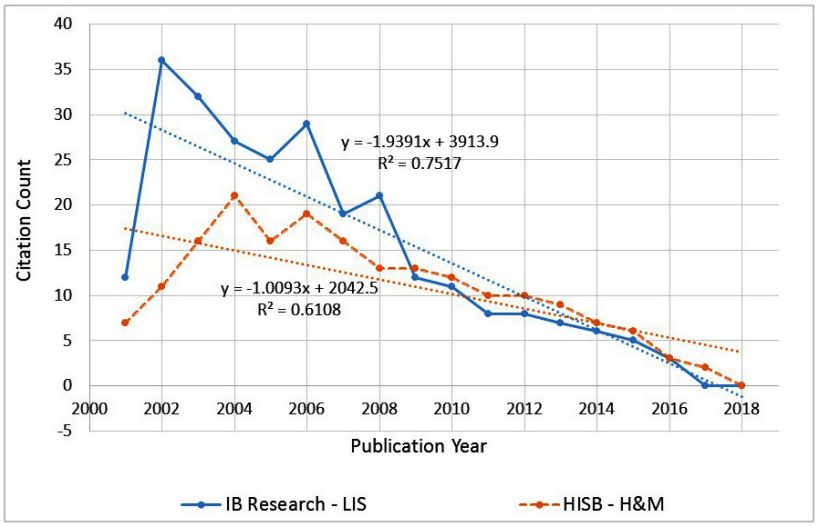
3.2 Citation Rate of IB Papers in LIS and HISB Papers in H&M

Citation counts of IB research in LIS and HISB research were compared in order to gain insights into the varying types of research conducted in each domain. Table 1 shows descriptive statistics of papers published on IB in the LIS and HISB domains. The fact that there is a vast number of papers in this area is indicative of IB's importance in both research domains. As shown, the mean and median citations of IB in LIS research are higher than those in the HISB research domain. The maximum in the HISB domain is much higher than that of IB research in LIS. Also, the standard deviation is higher in HISB research than in IB in LIS research. However, the mean and median citation counts of IB research are higher in LIS than in HISB research.

Figure 2 depicts the yearly growth of the citation

〈Table 1〉 Descriptive Statistics of Citations

Research Domain	N	Mean	Median	Min	Max	STD
IB in LIS	1521	17.9	7	0	269	29.0
HISB in H&M	2288	15.8	6	0	885	36.5



〈Figure 2〉 Yearly Trend of Median Citation Count of IB Related Papers, 2001-2018

count of IB research papers in LIS and HISB research papers. Alternatively, to avoid the problems associated with the outliers, the median citation count was considered rather than the average citation count. The figure indicates that the papers published on IB research in LIS tend to last longer in terms of citation counts compared to those on HISB research. As shown, the median citation count of IB in LIS papers is higher than that of papers on HISB research, especially for papers published between 2001 and 2009. The median citation counts of IB papers in the LIS domain peaked in 2002. The median citation count of papers displayed on the linear regression line indicates that the growth rate of the citation of IB research is higher than that of HISB research in the H&M domain. There is no substantial difference between average citation until 2009. Nonetheless, the underlying reasons for the higher citations are difficult to pinpoint as there are many factors associated with the citation counts (Bornmann and Hans-Dieter 2008).

3.3 Journals Publishing IB and HISB Research

Some journals published substantially more papers on the subjects related to IB than others. Table 4 shows the top 10 journals with the highest amount of papers on LIS IB and HISB. In this table, the number of papers, total citation count, and the median citation count are shown. The top journal in terms of all three variables is the *Journal of the Association for Information Science and Technology*, which was formerly referred to as the *Journal of the American Society for Information Science and Technology*. The *Journal of Health Communication* appeared in both lists due to being an inter-disciplinary journal.

The median citation count in this case is useful to measure the journals' published papers' ability to obtain citations. In the case of *Library Philosophy and Practice*, a vast number of papers on IB was published but received relatively low overall citations - the median citation number is 0. In the HISB domain, the *Journal of Medical Internet Research* published the largest number of papers, and *Patient Education and Counseling* received the highest total number of citations and the highest median citations. Compared to H&M journals, LIS journals shown in this table published more papers and received more citations.

3.4 Highly Cited Papers in IB and HISB Research

Highly cited papers can reveal the profile of a research domain and give a historical perspective of a research domain (Chuang and Ho 2015). As for the benefits of reviewing highly cited papers, those belonging to two distinct research domains can be differentiated in terms of the subjects, the types of information seeking, and the types of information sources. In this study, a comparison of the top 10 highly cited papers on IB in LIS and HISB was made in terms of citations and topical areas.

〈Table 2〉 Top 10 Journals Publishing IB and HISB Research

Type	Journal	Total No. of Papers	Total Citation	Median Citation
LIS Journals on IB	Information Research	169	2441	6
	Journal of Documentation	155	2610	7
	Journal of the American Society for Information* Science and Technology	121	4524	32
	Library Philosophy and Practice	113	159	0
	Information Processing and Management	90	3765	23
	Journal of the Association for Information Science and Technology*	82	705	6
	Journal of Health Communication	80	1756	9.5
	Library and Information Science Research	71	2067	23
	Journal of Information Science	66	1139	11.5
	Journal of Academic Librarianship	47	1204	16
	Total	994	20370	134
Journals on HISB	Journal of Medical Internet Research	97	2281	13
	Health Information and Libraries Journal	93	1091	6
	Patient Education and Counseling	80	3446	26
	Journal of Health Communication	76	1759	11
	Journal of Cancer Education	49	500	4
	AMIA Symposium	42	279	2
	International Journal of Medical Informatics	39	1320	13
	Journal of the Medical Library Association	33	1028	16
	Supportive Care in Cancer	25	478	13
	Medical Reference Services Quarterly	24	123	4
	Total	558	12305	108

Note: * these two journals are essentially the same but categorized differently due to name changes.

As shown in Table 3, the top 10 papers in HISB received generally higher frequency counts than LIS IB papers. The paper on avoidance versus seeking authored by Case et al. (2005) received the highest citation count (269 citations) in the IB in LIS domain. On the other hand, the paper on consumer health information seeking authored by Cline and Haynes (2001) received the highest citation counts (885 citations) in the HISB domain. The papers that appear in both domains were published in inter-disciplinary journals and are shown in shaded rows. The highly cited papers on IB in the LIS domain addressed varying aspects of information seeking, assessment, social capital and knowledge, information retrieval, information practices, and information sharing. On the other hand, the highly cited papers in the HISB domain dealt with the following subject matters: Internet HISB, cancer-related HISB and information source, diabetes information, research methods, information sharing, and HISB of health professionals. In both domains, papers dealt with various aspects of information seeking.

〈Table 3〉 Top 10 Highly Cited Papers on Information Behavior

Domain	RANK	Authors	Title	Year	Journal	Cited
IB in LIS	1	Case D.O., Andrews J.E., Johnson J.D., Allard S.L.	Avoiding versus seeking: The relationship of information seeking to avoidance, blunting, coping, dissonance, and related concepts	2005	*Journal of the Medical Library Association*	269
	2	Foster A., Ford N.	Serendipity and information seeking: An empirical study	2003	*Journal of Documentation*	242
	3	Hilligoss B., Rieh S.Y.	Developing a unifying framework of credibility assessment: Construct, heuristics, and interaction in context	2008	*Information Processing and Management*	227
	4	Weiler A.	Information-seeking behavior in Generation Y students: Motivation, critical thinking, and learning theory	2005	*Journal of Academic Librarianship*	219
	5	Miranda S.M., Saunders C.S.	The social construction of meaning: An alternative perspective on information sharing	2003	*Information Systems Research*	216
	6	Robert Jr. L.P., Dennis A.R., Ahuja M.K.	Social capital and knowledge integration in digitally enabled teams	2008	*Information Systems Research*	209
	7	Hansen P., Järvelin K.	Collaborative Information Retrieval in an information-intensive domain	2005	*Information Processing and Management*	195
	8	McKenzie P.J.	A model of information practices in accounts of everyday-life information seeking	2003	*Journal of Documentation*	194
	9	Yang T.-M., Maxwell T.A.	Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors	2011	*Government Information Quarterly*	184
	10	Li Y., Belkin N.J.	A faceted approach to conceptualizing tasks in information seeking	2008	*Information Processing and Management*	173
HISB	1	Cline R.J.W., Haynes K.M.	Consumer health information seeking on the internet: The state of the art	2001	*Health Education Research*	885
	2	Jenkins V., Fallowfield L., Saul J.	Information needs of patients with cancer: Results from a large study in UK cancer centres	2001	*British Journal of Cancer*	578
	3	Rutten L.J.F., Arora N.K., Bakos A.D., Aziz N., Rowland J.	Information needs and sources of information among cancer patients: A systematic review of research (1980-2003)	2005	*Patient Education and Counseling*	541
	4	Rice R.E.	Influences, usage, and outcomes of Internet health information searching: Multivariate results from the Pew surveys	2006	*International Journal of Medical Informatics*	387
	5	Greene J.A., Choudhry N.K., Kilabuk E., Shrank W.H.	Online social networking by patients with diabetes: A qualitative evaluation of communication with Facebook	2011	*Journal of General Internal Medicine*	365
	6	Daudt H.M.L., Van Mossel C., Scott S.J.	Enhancing the scoping study methodology: A large, inter-professional team's experience with Arksey and O'Malley's framework	2013	*BMC Medical Research Methodology*	301
	7	Case D.O., Andrews J.E., Johnson J.D., Allard S.L.	Avoiding versus seeking: The relationship of information seeking to avoidance, blunting, coping, dissonance, and related concepts	2005	*Journal of the Medical Library Association*	269
	8	Lambert S.D., Loiselle C.G.	Health information-seeking behavior	2007	*Qualitative Health Research*	248
	9	Rosenthal A., Mork P., Li M.H., Stanford J., Koester D., Reynolds P.	Cloud computing: A new business paradigm for biomedical information sharing	2010	*Journal of Biomedical Informatics*	215
	10	Davies K.	The information-seeking behaviour of doctors: A review of the evidence	2007	*Health Information and Libraries Journal*	193

3.5 Visualization of the Author Keywords

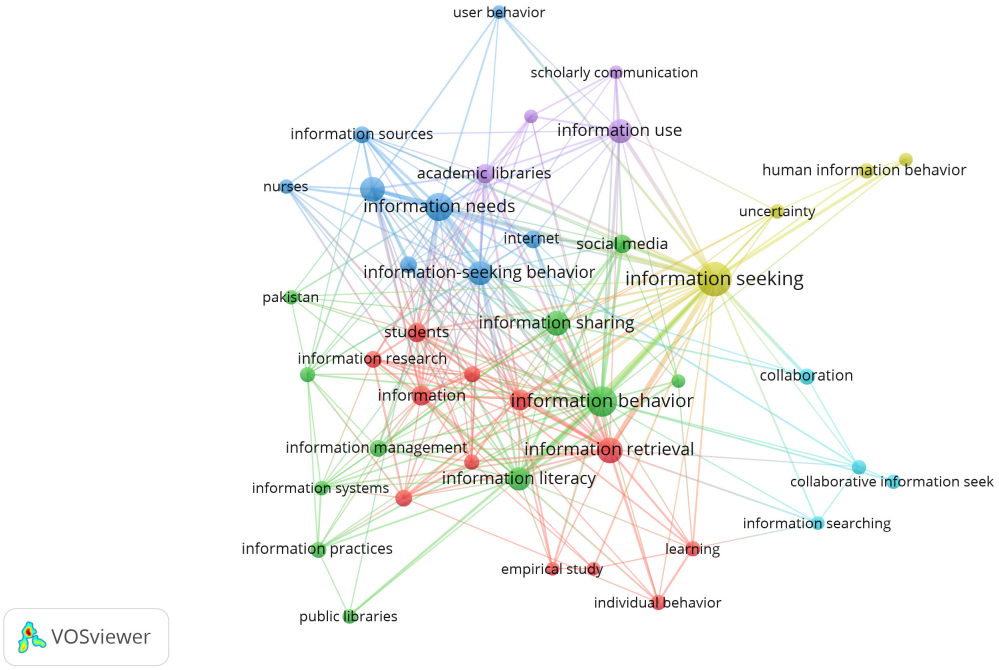
Visualization of author keywords has been commonly used to gain insights into the topical areas and characteristics of a research domain (González, Luis-Millán et al. 2018; Su and Lee 2010; Zancanaro, Todesco, and Ramos 2015). Using VOSViewer (Van Eck and Waltman 2009), the maps of IB in LIS and the HISB research domain are generated with the author keywords as shown in Figure 3. In order to visualize the author keywords using the network, a selection of a limited number of keywords was desirable. To select approximately the same number of keywords for the IB and HISB domain, keywords with a frequency of more than 7 appearances (45 keywords) were selected for the IB side, and keywords with a frequency of more than 17 appearances (43 keywords) were selected for the HISB side.

In this figure, the strength of the relationship among the keywords is represented by their size. The frequency count of author keywords is represented by the size of the author keywords. In the IB research domain, the author keywords show the following themes: the source of information' (e.g., "public library"), type of human subject (e.g., "students"), sub-categories of human IB (e.g., "information retrieval"), service-oriented topics (e.g., "information services"), and methods related to finding information (e.g., "collaboration"). In contrast, in the HISB domain, the author keywords depict the following concepts: human conditions ("quality of life"). health information (e.g., "consumer health information"), research methods ("qualitative research"), type of cancer ("breast cancer"), type of education (e.g., "patient education"), and primary source of information (e.g., "internet").

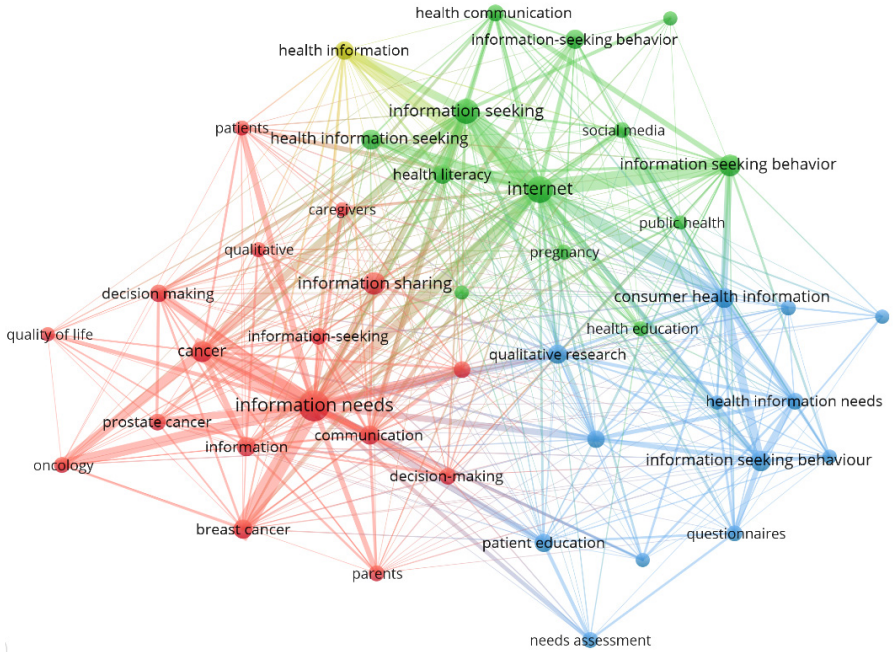
In sum, while there are similarities between the two areas of research, the author keywords in HISB show slightly different emphasis and concerns with the use of terms related to health and medicine. In comparison, the author keywords concerning libraries are present in LIS but not in the H&M side. In contrast, with the exception of "nurses", keywords that concern health and diseases are not present on the LIS side. Additionally, we can see that the Internet is an important issue in H&M information research.

3.6 Unique Title Words

Some words in the field can signify topical areas of research. The title words having a high frequency in one domain but low frequency in an opposing domain can be considered as unique title words belonging to domains with distinctive characteristics. Table 4 shows the top 20 unique words that appear in the title field for the two respective domain types. To obtain the unique words, the title words in each domain were ranked first based on the frequency count. Then, the rank of the top unique words was obtained by calculating the difference between the frequency ranks of unique title words in LIS IB and HISB. The rank of the top unique words in this table depends on the rank difference between the frequency count rank of the LIS domain and the H&M domain. That is, the greater the difference



(IB in LIS)



(HISB in H&M)

〈Figure 3〉 Visualization of Two Domains of IB Research

in ranks, the higher the rank of top unique words becomes.

Consequently, the most unique word in the LIS domain was “affective”, whereas the most unique word in HISB was “caregiver.” IB in the LIS domain consisted mostly of words used in theories of IB that discuss factors that influence it, such as affective factors (Kuhlthau 2005; Nahl 2005), accessibility of information sources (Fidel and Green 2004; Menon 1993), and boundary of context in IB (Agarwal, Xu, and Poo 2009). Commonly used methodological approaches in LIS, such as “citation” also appeared. In contrast, the HISB domain mostly consisted of words related to health conditions, such as “cardiac” and “caregiver.” To further reveal distinctive tendencies of HISB research, some words on the HISB side are highlighted on the right side of Table 4. The most unique words used in HISB are health and illness-related terms. Collectively, various frequently used words in the title provide additional insights into the type of IB research conducted in each field. In this approach, some words that have lesser content value, such as “the”, “of”, and “based” have been removed from the list.

3.7 Preceding Words

Information seeking can be examined from many different angles. Identifying the words that precede other key terms, such as “information” and “study”, can aid in depicting the types of works that are present in the dataset. The adjectives indicate the type of information that each domain commonly deals with. Table 5 depicts the adjectives used to qualify the word “information.” The listed phrases in this table were searched against the title field or the author keyword field. There are many words that are used to qualify the word in the HISB research dataset.

〈Table 4〉 Top 20 Frequently Used Unique Words in the Title Field

Rank of Top Unique Words	Top Unique Words in LIS				Top Unique Words in HISB			
	Word	Rank of Freq. Count (LIS)	Rank of Freq. Count (H&M)	Diff Between the Two Ranks	Word	Rank of Freq. Count (LIS)	Rank of Freq. Count (H&M)	Diff Between the Two Ranks
1	affective	268	4219	3951	caregiver	2733	68	2665
2	accessibility	463	4250	3787	carer	2732	106	2626
3	citation	204	3925	3721	accessing	2939	472	2467
4	capital	264	3969	3705	address	2925	537	2388
5	browsing	354	3993	3639	clinic	2694	314	2380
6	boundaries	458	4015	3557	control	2626	252	2374
7	company	350	3869	3519	assess	2840	467	2373
8	complexity	348	3858	3510	adoption	2923	611	2312
9	document	225	3668	3443	disorder	2516	207	2309
10	affordance	804	4217	3413	cardiac	2734	465	2269

〈Table 5〉 Top 10 Words Preceding the Term "Information"

RANK	IB in LIS		HISB	
	FREQ	Word Preceding Information	FREQ	Word Preceding Information
1	115	health information	850	health information
2	53	collaborative information	82	cancer information
3	40	online information	74	patient information
4	36	international information	46	drug information
5	35	government information	38	online information
6	33	human information	30	medical information
7	25	patent information	28	clinical information
8	25	life information	23	unmet information
9	18	cancer information	14	risk information
10	12	electronic information	13	perceived information

Since more records are found in the dataset, the frequency count of the matched words is higher than that of IB in LIS in the title or the author keywords. In contrast, most words in the HISB domain that describe information are associated with health and medical information. It is worth noting that some words that are associated with HISB appear in LIS as the top words (e.g., "health" and "cancer"). This signifies the importance of HISB research even for the journals related to the LIS field and demonstrates the diffusion of the two research domains.

As shown in Table 6, the frequency count of index keywords is higher than that of the author keywords of LIS IB papers and HISB papers due to the number of terms used to assign each paper. Table 6 is useful in terms of viewing the types of studies that are associated with the LIS IB research and HISB research. The author keyword indicating the type of study that appeared the most in HISB papers was "qualitative study" (91 incidences).

Also, "cross-sectional study" was also more common in HISB (23 incidences). This supports the findings in Anker et al. (2011). In IB in LIS, "case study" appeared the most (49 incidences). The second most frequent type of study mentioned was the "exploratory study." In terms of methodology, using preceding words has a limitation since many authors are not compelled to explicitly mention the type of conducted studies. Despite this limitation, the result shown in this table provides insight on the common type of research conducted in LIS and H&M.

3.8 Author Keywords Versus Index Keywords

As shown in Table 7, keywords are divided into two types: author keywords and index keywords. Author keywords are supplied by an author, whereas index keywords are specified by an indexer. The advantage of using author keywords is that the authors have better domain knowledge than indexers. However, an indexer may have better knowledge in selecting terms that could enhance the paper's retrievability. In general, the index keywords are controlled vocab-

〈Table 6〉 Top 10 Words Preceding the Word "Study"

RANK	IB in LIS		HISB in H&M	
	FREQ	Word Preceding "Study"	FREQ	Word Preceding "Study"
1	49	case study	91	qualitative study
2	22	exploratory study	23	cross-sectional study
3	17	empirical study	23	case study
4	15	user study	14	pilot study
5	12	qualitative study	14	exploratory study
6	4	longitudinal study	10	mixed-methods study
7	3	observational study	7	longitudinal study
8	3	field study	7	cohort study
9	3	comparative study	6	descriptive study
10	2	preliminary study	5	observational study

〈Table 7〉 Top 20 Author Keywords and Index Keywords in HISB Research

Rank	Author Keyword		Index Keyword	
	Keyword	Frequency	Keyword	Frequency
1	information need	388(4.3%)	human	3516(5.8%)
2	internet	205(2.3%)	female	2243(3.7%)
3	information seeking	170(2.3%)	male	1914(3.2%)
4	information seeking behavior	153(2.3%)	middle aged	1286(2.1%)
5	information sharing	118(1.3%)	article	1252(2.1%)
6	cancer	86(1.3%)	adult	1208(2.0%)
7	information-seeking behavior	83(1.3%)	internet	1067(1.8%)
8	health information seeking	75(1.3%)	aged	880(1.5%)
9	consumer health information	67(1.3%)	questionnaire	783(1.3%)
10	communication	66(1.3%)	information seeking	638(1.1%)

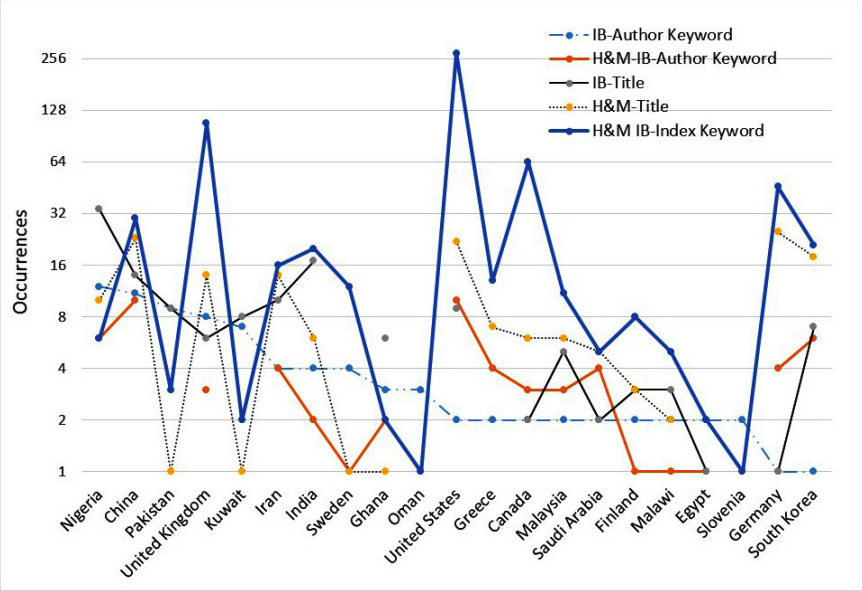
ularies by definition (Svenonius 1989). On the other hand, each author is different in formulating the author keywords (Babaii and Taase 2013). In the Scopus database, we may assume that the index keywords in H&M come from the terms used in Medical Subject Headings (MESH) (Scopus Content Coverage Guide 2017). In particular, we can see that studies involving different age groups and genders were the focal point of the research. Also, different types of research were evident in this figure. Nonetheless, a combination of these keywords should be useful in domain analysis. In this case, the keywords seem to be useful in determining the trends of IB in M&H research.

3.9 Keywords and Titles Containing Country Names

IB research is often conducted at the country level since the context of a country can be a worthy consideration in IB research. For this reason, country names

in the keywords or title signify the extent of research concerning particular countries. It should be noted that the index keywords are mainly used by journals of H&M. Scopus provides the two types of keywords: author keywords and index keywords. For H&M journals, index keywords are primarily produced by using the MESH descriptors, which fundamentally differ from the author keywords in terms of the number of keywords and the way in which these words are initially created. The past empirical studies examined the differences between these types of keywords (Gil-Leiva and Alonso-Arroyo 2007; Cho and Lee 2009; Lee and Moon 2000). Nevertheless, there were a total of 755 keywords that identified certain countries. In generating this list, varying country names were normalized into one (e.g., USA to United States).

Various bibliographic attributes that contain the country name are portrayed in Figure 4. This figure is sorted from left to right based on the author keywords of IB. The highest amount of LIS IB research on a country level is linked to Nigeria. The result suggests that IB research in LIS is also often conducted in developing countries. These are most likely empirical studies that mention the country name in the title. The United States is mentioned less frequently in the author keywords (11.5%) compared to other countries. Despite the interesting result, a limitation of using this approach must be mentioned. In the case of the United States, authors may not be compelled to explicitly mention the country name in the title. This is due to the dominance of the United States in the academic world. Thus, in the case of this country, the figure is most likely an inaccurate reflection of IB related research.



〈Figure 4〉 Frequency Count of Country Name in the Keywords

As a whole, HISB index keywords indicate that HISB research is more commonly produced within Western countries. The results support the statement made by Maheswarappa and Bhadrashetty (2015) that HISB research is mostly conducted in Western countries and on disease-oriented groups. In contrast to IB, the frequency count of index keywords also suggests that many published papers are related to the United States. Meanwhile, the United Kingdom ranked second in terms of index keywords of HISB research. The result shown in this figure, in essence, suggests that HISB research is more active among developed countries than non-Western countries. Lastly, it should be noted that the MESH type of index keywords is commonly used in non-medical journals.

4. Summary and Conclusion

There were numerous distinctive differences between the fields that focus on IB related studies. As shown in Table 8, the detailed differences are summarized in terms of the following criteria: publications, citations, journals, keywords, unique title words, title words preceding the word “information”, title words preceding the word “study”, title words containing country names, and author keywords along with index keywords. In a nutshell, HISB should be viewed as a special type or a subset of the IB subject area. Taking the previous studies into account, key differences can be observed in terms of definition, main focus, and demographical concerns. The overall difference between the two domains is that HISB is concerned with more specific types of information. The context of the research in IB in LIS and HISB research domains can be clearly differentiated since HISB deals with health and medical topics. However, the fundamental human behavior in terms of seeking information should have universal characteristics.

A distinction between the two research domains can be further illustrated with HISB regarding cancer, which is a major topic in HISB. Cancer is a detrimental, widespread health disease that affects a huge population regardless of country. The practical need for cancer information would be evidently great in every type of society. However, while offering valuable insights on IB in the LIS domain, this issue is not central to IB in that domain due to its specific context. On the other hand, library-related issues are central to the LIS domain. Hence, IB research in LIS often tends to be centered on libraries regardless of how individuals seek information in real life. Most people, including health-professionals, rely on the internet for health information. Since library-related issues are not the main concern of H&M, research most often ignores various information services available through libraries. Accordingly, the interactions between IB research in LIS and HISB research do not appear to be substantial except in interdisciplinary journals.

There are two main limitations of this study that need to be taken into account. First, there is a methodological limitation to relying on the frequency count of the bibliographic attributes. Many useful studies in both research domains are unlikely to be

〈Table 8〉 Summary of IB in the LIS Domain and HISB in H&M Domain

Detailed Similarities And Differences		
Bibliographic Attributes And Criteria	IB in the LIS Domain	HISB in the H&M Domain
Publications	Lower number of publications	Higher number of publications
Citations	Longer citation life span; fewer total citations received by highly cited papers on IB in LIS	Shorter life span; more citations received by highly cited papers on HISB
Journals	Various LIS journals; some LIS and H&M interdisciplinary journals	Various H&M journals; some LIS and H&M interdisciplinary journals
Keywords	Mostly not available	MESH is often used to index HISB papers
Unique Title Words	Mostly words used in theories of IB that discuss factors that influence IB, such as affective factors and accessibility of information sources.	Mostly words related to health conditions, such as "cardiac" and "caregiver."
Title Words Preceding the Word "Information"	Showed various types of studies and type of information, including health-related information	Showed various types of studies and mostly health-related information
Title Words Preceding the Word "Study"	Case studies; theoretical studies; empirical studies; bibliographic indicators such as citation	Case studies; cross-sectional studies; qualitative studies
Title Words Containing Country Names	Active developing countries	Predominantly the U.S.; less frequent for developing countries
Author Keywords and Index Keywords	Terms related to the following: information seeking, information needs, information uses, information sharing, information, information literacy, public library, academic library, students	Terms related to the following: illness and wellness related information; physicians, medical students, faculty, nurses and other allied health personnel; general public's health; health literacy and understanding health information; internet based information sources; demographic tendencies

revealed due to relying on using the frequency count of these bibliographic attributes. Secondly, this study relied on the Scopus database as a source of research on IB in LIS and HISB. A vast number of domestic journals not indexed in the Scopus database were not included in this study. Despite these limitations, the results clearly indicate specific similarities and differences in the research works related to IB.

In a larger sense, the findings of this study imply that learning about both IB research in LIS and HISB research could reinforce some important IB related concepts by exploring a variety of contexts and situations in which they occur. As Wilson (2018) pointed out, both fields are concerned with IB and they need to learn more about each other's research. Various differences suggest that researchers of the two areas should have flexibility in their approach to examining the issues related to IB by considering the context and the unique distinctions between the two fields. One can benefit from the other by recognizing the strength of different types of knowledge developed in each research domain.

For instance, on the IB side, theories on IB that address various affective factors can be examined in H&M, whereas cross-sectional studies often used in the H&M field can be used as research method in LIS. In essence, because of common characteristics between IB in LIS and HISB, the authors of both domains should collaborate more to examine various aspects of research related to IB. In this respect, the detailed comparisons of the two research domain that this study illustrated should be useful for academics in both subject areas.

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