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December 2021

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# Patterns of Library and Information Science Research in Pakistan During 2020

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## Abstract

**Background and Aim:** Assessment of library and information science (LIS) publications reflect the standards of LIS education and practice. It is imperative to evaluate the research productivity frequently to highlight the various patterns of LIS publications. The current study aimed to present quantitative analysis of LIS research and its bibliometric indicators produced by Pakistani authors in the year 2020.

**Research Methodology:** The data of publications produced by Pakistani LIS authors were searched/extracted from online sources, e.g., Google Scholar, LISTA, LISA, ResearchGate, Scopus and Web of Science. The search was limited to one-year data from January 1<sup>st</sup> 2020 to December 31<sup>st</sup> 2020. All the retrieved records were saved in a text file and later transferred to Microsoft Excel-2016 for data analysis.

**Results:** A total of 246 papers contributed by 649 authors (including multiple counts) with an average of 2.63 authors per document were collected. Only 10.56% of the papers were written by a single author, while the rest of the papers (n=220; 89.44%) were the result of research collaboration. Rubina Bhatti and Salman Bin Naeem were found the most productive authors with 19 papers each, followed by Haroon Idress and Muhammad Asif Naveed with 18 papers each. The analysis of documents by the institution revealed that University of Sargodha, University of the Punjab and Islamic University of Bahawalpur contributed 41, 39 and 30 papers, respectively. All 246 papers were published in 67 journals, and exactly 100 (41%) papers were published in Library Philosophy and Practice (e-journal) followed by Pakistan Library and Information Science Journal (n=49). Bibliometric, Covid-19, and Information Literacy were found the top three most preferred areas of research by LIS authors of Pakistan in 2020.

**Conclusion:** The study exposed that research output and collaborative research in the field of LIS in Pakistan is increasing. The bibliometric studies were conducted on a high scale. The influence of Covid-19 on LIS has also been discussed significantly. Notable papers were found on information literacy, library quality and library anxiety but very few papers were found on emotional & artificial intelligence, library automation and the financial aspects of LIS. As a majority of research was contributed by the faculty, M.Phil., and Ph.D. scholars. The contribution of practicing librarians was nominal and more efforts are required to involve them in the research cycle.

**Key words:** Research productivity, Library and Information Science Research, Pakistan, Bibliometric

## Introduction

Pakistan has an inspiring historical background in Library and Information Science (LIS) education and research. Asa Don Dickenson started the library training class at the University of Punjab, Lahore in 1915-16 and before he left for the United States, he wrote a textbook “Punjab Library Premier”. (Anwar, 1990).

Pakistan came into being on 14<sup>th</sup> August 1947 and after the short gap, the University of Punjab resumed the certificate course of Librarianship and another development was recorded in 1953, when A. Rahim Khan, librarian of this University was sent to Canada for higher studies in librarianship (Haq, 2011). The University of Karachi started a Postgraduate Diploma course in Library Science in 1956, Master in Library Science in 1962 and Doctorate in 1967 (Haider & Mahmood, 2007). Now 13 universities are offering Bachelor to Doctorate level LIS courses in Pakistan (Hussain, Ansari, & Siddiqui, 2018).

The higher educational institutions and research activities are considered imperative for the sustainable development of the nation particularly and generally beneficial for the whole world. Creative research, innovative inventions and the creation of new theories of knowledge are some of the products of quality education. The economy of the world has been changing its shapes from agriculture to industrial and now, from industrial to knowledge or information based (Iqbal, Mahmood & Iqbal, 2018; Haq & Tanveer, 2020).

It is essential to measure the research progress in a by subject and by institution, periodically. Quantitative analysis of published research such as a bibliometric, is used to evaluate the patterns and trends of research in the explicit field of knowledge as well as in research organizations. Scholarly productivity constitutes one of the vital indicators in the creation of knowledge and it is also considered a fundamental measure in the success of academic organizations (Haq & Al Fouzan, 2017). Subsequently, the research output by LIS authors is regarded as an index of professional reputation (Haq, 2021).

Bashir (2013) reported that the share of Pakistan in global research productivity from 1996 to 2010 was just 0.32% and Haq and Tanveer (2020) updated the record and revealed that the share of Pakistan reached 0.52% in 2018. This study also exposed that the population of the Muslim world consisted of 24% of the total and its share in research publications was just 8.29%. Iqbal, Mahmood and Iqbal (2018) stated that quality higher education directly corresponded with research productivity and this factor played a pivotal role in the long-term socio-economic development of the country. This study assessed the research growth of Pakistan from 1981 to 2015 and revealed that Quaid-e-Azam University, Chemistry and the United States were found the most productive research producing organization, preferred area of research and research collaborative country, respectively. Haq and Faridi (2021) examined the research growth of Pakistan in 21<sup>st</sup> Century (2000-2019). The majority (42%) of the research was produced during the last three years of study. COMSATS University Islamabad emerged as the most productive institution, medicine was found to be the preferred area of research and China stood on the top in research collaborative countries.

Journals are important sources for scholarly and scientific communications. The history of the LIS journal in the area now located in the Pakistan, was started in 1930 when Punjab Library Association started an English language library science journal entitled “Modern Librarian” from Lahore, this journal remained active till 1946 (Haider, 1985; Mahmood, 1996).

Mahmood and Samdani (1999) compiled the index of literature published in LIS journals of Pakistan from 1947 to 1997. A total of 1,163 articles, contributed by 437 authors were indexed. The distribution of authors by gender showed that male authors (n=380; 87%) dominated and more than

three-fourth (n=807; 77%) of the articles were written in the English language. One-fourth (n=289; 25%) of the literature was produced from 1947 to 1972, while 75% (n=874) of the literature was published from 1973 to 1997. The highest number of articles (n=88) was published in 1990. This index provides the comprehensive detail and history of LIS journals being published in Pakistan. The first LIS journal was started in Lahore in 1949 as “Modern Librarian – New Series” under the editorship of Fazil Elahi and Abdul Moid but it survived for three issues only. Pakistan Library Review started its publication in 1958 and the last issue of this journal published in 1969. A total of 109 articles were published in 11 years. PLA Journal was commenced by Pakistan Library Association in 1960, a total of 193 articles were recorded in 25 issues till 1997. Forty-three percent (n=498) of the literature was published in Pakistan Library Bulletin (PLB) now renamed as Pakistan Library and Information Science Journal (PLISJ). The University of Punjab started a yearly LIS journal, “Pakistani Librarian” in 1995. Now it is renamed and published as Pakistan Journal of Information Management and Libraries (PJIM&L), the only Scopus indexed LIS journal from Pakistan. Hussain and Jan (2021) presented the detail of seven LIS journals being published from Pakistan, three are HEC recognized and two demanded publications fees.

According to the Scimago Journal and Country Rank (SJR) portal, a total of 17,000 documents on the subject category of LIS were produced globally in 2020. The LIS researchers affiliated to 145 countries contributed and the highest number of documents (n=3,494; 20.55%) were produced by the United States, followed by China (n=1,300; 7.64%), United Kingdom (n=940; 5.52%), India (n=936; 5.50%) and Germany (n=740; 4.35%). These top-five countries contributed almost 44% (n=7,410) of the total LIS research in 2020. Pakistan stood on 21<sup>st</sup> rank with 200 LIS documents in 2020 and contributed 1.17% in global LIS research productivity. In the SJR portal, 62 countries (43%) were identified with low productivity, these countries contributed documents in single-digit varies from one to nine documents each and collectively, it's counted 183. So, it is stated the share of Pakistan in LIS research is more than the total of 62 countries. The SJR portal provides the global data of publications, a total of 48,75,829 documents were produced by the whole world in 2020 and the share of LIS was less than one percent (n=17,000; 0.34%). Pakistan contributed 30,453 documents, its share counted 0.62% of the global perspective and out of 30,453 documents, 200 (0.65%) documents included in the category of LIS (<https://www.scimagojr.com/>).

Sheikh, Malik and Mahmood (2020) highlighted the factors of low research productivity in LIS sector of Pakistan. The majority of the LIS professionals aspired to participate in research but due to lack of time, lack of support from the administration, lack of research expertise and ideas barred them. Potnis et al., (2021) affirmed that most of the LIS research has been produced by the developed world and revealed that the most important reason for low research output by developing countries is a lack of a conducive research environment.

The rising tendency in LIS research in Pakistan was observed after 2000. Siddique et al., (2021) reported that out of 1,305 papers produced by Pakistan in LIS from 1957 to 2018, only 279 (21.37%) papers were published before 2001 and almost 79% of the research was published from 2001 to 2018.

The trend of growing research has been observed all around the world and it increased in manifold during the last two decades (Ameen & Warraich, 2014). After the restructuring of University Grant Commission into Higher Education Commission in 2002, accessibility of scholarly databases to higher education institutions through National Digital Library, the introduction of doctorate programs, and research funding, extensively help to develop the research culture in Pakistan (Meo, et al., 2013; Ameen & Warraich, 2014; Iqbal, Mahmood & Iqbal, 2018).

## Literature Review

The first paper on the evaluation of LIS research in Pakistan was performed by Haider (1978). He examined the 275 unpublished theses written by LIS students in the University of Karachi, more than one-third (n=100; 36%) of the theses written on the subject of “bibliographies, union catalogues & indices”. Later Anwar (1981) replicated the same study in the University of Punjab. He observed that a large number of theses (23.2%) were written on the subject “information needs of users” in the University of Punjab.

Some more studies were found on the assessment of theses, Samdani and Bhatti (2011) reviewed the 28 Doctoral research by LIS Pakistani authors from 1967 to 2010 and the majority of LIS authors (n=18; 64%) obtained their Ph.D. degree from abroad. Siddiqui and Hussain (2019) assess the trends of LIS theses produced by the students of University of Karachi from 2000 to 2015. A total of 105 theses were written, the survey of different libraries (31.42%) was the preferred area of theses and 59% of the research was written in the Urdu language. Sheikh and Jan (2017) reviewed the patterns of LIS theses written by M.Phil. and Ph.D. students of Pakistan, he revealed that only five universities offering M.Phil. and Ph.D. programs, out of the 12 universities. He also mentioned that only 19 and 125 LIS professionals obtained the Ph.D. and M.Phil. degrees, respectively, till the end of 2015.

PLB/PLISJ is the only LIS journal that is publishing regularly since 1968 under the flag of the Library Promotion Bureau. Some bibliometric studies highlighted the attributes of the literature published in this journal. The earliest study was conducted by Samdani and Khan (1997) on the 506 articles, published from 1968 to 1997, another study was done by Naseer and Mahmood (2009) on 236 papers published from 1997 to 2007, one study was conducted by Haq and Alfouzan (2019) on 369 papers published 2008 to 2017, and in the recent study, Haq (2021) analyzed the 361 articles published in PLISJ from 2004 to 2020 that was indexed in LISTA database. These articles were contributed by 678 authors with an average of 1.88 authors per article and these articles gained 645 citations as reflected in Google Scholar. About two-third (n=213; 64%) of the articles were written by multi-author pattern.

The second prominent Pakistani LIS journal is PJIM&L. It was started as Pakistani Librarian in 1995, later it was renamed as Pakistan Journal of Library and Information Science (PJLIS) and renamed again as PJIM&L. This journal is being published by the Department of Information Management, University of Punjab. Warraich and Ahmed (2016) scrutinized the properties of 111 papers published in PJLIS from 1995 to 2010 and they found that about 14% of the total research was contributed by multi-authors pattern. Another study was found in the same journal, that assessed the 96 papers published from 2010 to 2019 and 63% of the papers were multi-authors. So the trend shifted from a single-author to collaborative research in PJIM&L over time. (Haq, Faridi & Tanveer, 2020)

Mahmood (1996) analyzed the characteristics of 97 articles on LIS services in Pakistan published in international journals from 1947 to 1995. The majority of papers were written on the subject of LIS education & research and Syed Jalaluddin Haider was found the most productive author. Anwar and Saeed (1999) examined the LIS literature produced by Pakistan from 1969 to 1995 that was indexed in LISA-PLUS database. More than half of the papers were published in PLB and Anis Khurshid emerged as the most prolific author. Khurshid (2013) evaluated the 516 articles contributed by Pakistani authors in foreign journals from 1957 to 2011. The highest number of articles (n=323; 63%) were published from 2001 to 2011, more than half (57%) of the work was multi-authors and Khalid Mahmood emerged as the most contributing author with 68 articles. Anwar and Jan (2017) surveyed the 601 articles written by Pakistani LIS authors. Ahmed and Warriach (2013) reviewed the LIS

research in Punjab from 2007 to 2012 and revealed that 67% of the research was published in international journals. Recently, Siddique et al., (2021) measured the LIS research growth in Pakistan from 1957 to 2018. The University of Punjab produced the highest number of papers and maximum articles were published in PLISJ.

Haq and Satti (2021) evaluated the LIS research output by Pakistan in 2019. A total of 154 papers were found, 87% of papers were written by multi-author pattern and 63% of the papers were published in foreign journals. University of the Punjab and Kanwal Ameen were found to be the productive institution and prolific author, respectively. The highest number of papers were published in PLISJ, followed by Library Philosophy and Practice (e-journal). Further, bibliometric and social media were found the preferred areas of research.

A bio-bibliometric study depicted the research profile of a single researcher. A number of such studies were conducted to uncover the attributes of publications output of prominent LIS professionals of Pakistan. These studies reviewed the publications output of Dr. Anis Khurshid, Dr. Syed Jalalud Haider, Dr. Khalid Mahmood, Dr. Mumtaz Ali Anwar and Dr. Kanwal Ameen (Mahmood & Rehman, 2009; Kousar & Mahmood 2010; Qayyum & Naseer 2013; Naveed, 2018; Haq & Ahmad, 2019).

Shukla et al., (2020) examined the Web of Science indexed LIS research by Indian authors from 1980 to 2019. A total of 4,304 documents were found and these documents gained 17,523 citations with an average of 4.07 citations per document. India contributed 1% of the global LIS literature and 12% (n=517) of the documents were the result of international research collaboration. Slightly more than one-third (n=1479; 35%) of the documents were written by a single author pattern and Satija MP was found to be the most productive author with 118 papers.

Islam and Roy (2021) measure the LIS research in Bangladesh from 1971 to 2020. A total of 266 papers were found and the highest number of the papers (n=182; 69%) were published from 2011 to 2020. The University of Dhaka and Ahmed SMZ were found productive institution and author with 131 and 36 papers, respectively. The highest number of papers were published in Library Philosophy and Practice (e-journal),

The aim of the current study is to review the patterns of LIS research produced by Pakistani authors during the year 2020.

## **Research Questions**

The published papers contributed by Pakistani LIS researchers from January 1<sup>st</sup> 2020 to December 31<sup>st</sup> 2020 were collected to find out the answers to the following research questions:

1. How many papers were published in the year 2020 and identify the prolific authors with their affiliation and number of papers?
2. What were the authorship patterns and number of authors by gender?
3. Which organizations/institutions produced most of the research?
4. Which sources of publications were used most frequently?
5. What was the strong area of LIS research in Pakistan during 2020?

## Research Methodology

The data of articles produced by Pakistani LIS authors was collected from the different online sources, including Google Scholar, ReserachGate, LISA, LISTA, Scopus, Web of Science, and the website of the Pakistani LIS/IM departments, etc. Further, smart searching techniques and Boolean operators were also applied to get the maximum results. There should be at least one author belonged to LIS community of Pakistan was selection criteria of article. The methodology used by similar studies done in the past was also reviewed (Khurshid, 2013; Siddique et. al., 2020; Haq & Satti 2021). My knowledge and observation throughout the year on the research activities in the LIS field in Pakistan has also facilitated me to get the maximum data.

To achieve the answers to the research questions, the retrospective research method was used to assess the bibliometric indicators of the retrieved articles. The data was typed in text file and later transferred in Microsoft Excel-2016 under different columns for analysis and the findings were presented in tabular and graphic format.

The comprehensive bibliography of all collected articles has been prepared and arranged in alphabetical order, based on the full name of the first author. The list has been added as Appendix for evidence.

## Limitations

Albeit, the author of this manuscript tried hard to collect all the data of published papers but despite all his effort. It might be a chance that some article(s) has/have been missed. The articles “Ahead to print” have not been used in this analysis. The articles published in Urdu and other regional languages, and essay-type papers published in local newspapers, magazines as well as unpublished theses/conference papers have not been considered in this study. The papers contributed by international authors in local LIS journals were exempted from this analysis. Two papers were excluded although these were published in LIS journals but contributed by authors other than the LIS profession (Jamshed, 2020; Adeeb, 2020).

## Results

A total of 246 papers were identified contributed by 649 authors including multiple counts with an average of 2.63 authors per paper. The distribution of authors by gender showed that 485 (74.73%) authors were male, who contributed in 221 (89.83%) papers, while 164 (25.27%) female authors contributed in 112 (45.52%) papers. As a distinct name, 279 authors were identified. 176 (63%) of the authors contributed in a single paper each, whereas 46 (16.48%) authors contributed in two papers each. There were 53 (19%) authors who contributed three or more than three papers each.

The analysis of productive authors in terms of the number of papers during the year 2020 showed that Rubina Bhatti and Salman Bin Naeem of Islamia University of Bahawalpur emerged as the most prolific authors with 19 papers each. Haroon Idress and Muhammad Asif Naveed, both belonged to University of Sargodha, stood on the second rank with 18 papers each. Saeed Ullah Jan of Khushal Khan Khattak University Karak, Shafiq ur Rahman of University of the Punjab & Imam Abdulrahman Bin Faisal University, Saudi Arabia and Kanwal Ameen of University of Home Economics & University of the Punjab, produced 14, 12 and 11 papers, respectively. Muhammad Anwar of University of Balochistan, and Ph.D. Scholar at University of Electronic Science and Technology produced 11 papers, Murtaza Ashiq (Islamabad Model College for Boys Islamabad), Abid Hussain, (PhD Scholar at Allama Iqbal Open University Pakistan & Elementary and Secondary

Education Department, KPK), Khurshid Ahmad (Islamia University of Bahawalpur), Nosheen Fatima Warraich (University of the Punjab), Sajjad Ahmed (University of Peshawar) and Shehzad Ahmad (Edward College Peshawar) also contributed significantly. There were ten authors that contributed more than ten papers each. The maximum authors are either the LIS faculty members or M.Phil./Ph.D. students, the contribution of practicing librarians was not very impressive.

Non-resident Pakistani LIS authors, Ikram Ul Haq, Zameer Hussain Baladi, Shafiq ur Rehman, Muhammad Tanveer and Muhammad Ajmal Khan produced 16, 15, 12, 9, and 4 papers, respectively.

One-fifth of the articles (n=55; 22.35%) were contributed by non-resident Pakistan LIS authors. The majority of the contributions come from the LIS professionals working in three universities of Saudi Arabia, Imam Abdulrahman Bin Faisal University, Prince Sultan University and King Saud bin Abdulaziz University for Health Sciences. One paper each was contributed by the two non-resident Pakistani authors presently affiliated with the institutions of Kuwait and Singapore.

Figure 1 elucidated the authorship patterns of papers produced by Pakistani LIS authors during the year 2020. A small number of papers were contributed by single author pattern (n=26; 10.56%) while the majority of the papers (n=220; 89.46%) were the result of research collaboration. A two-author pattern (n=97; 39.43%) was found to be the most preferred model, followed by three author pattern (n=79; 32.11%). Only 12 papers were written by more than four-author pattern.

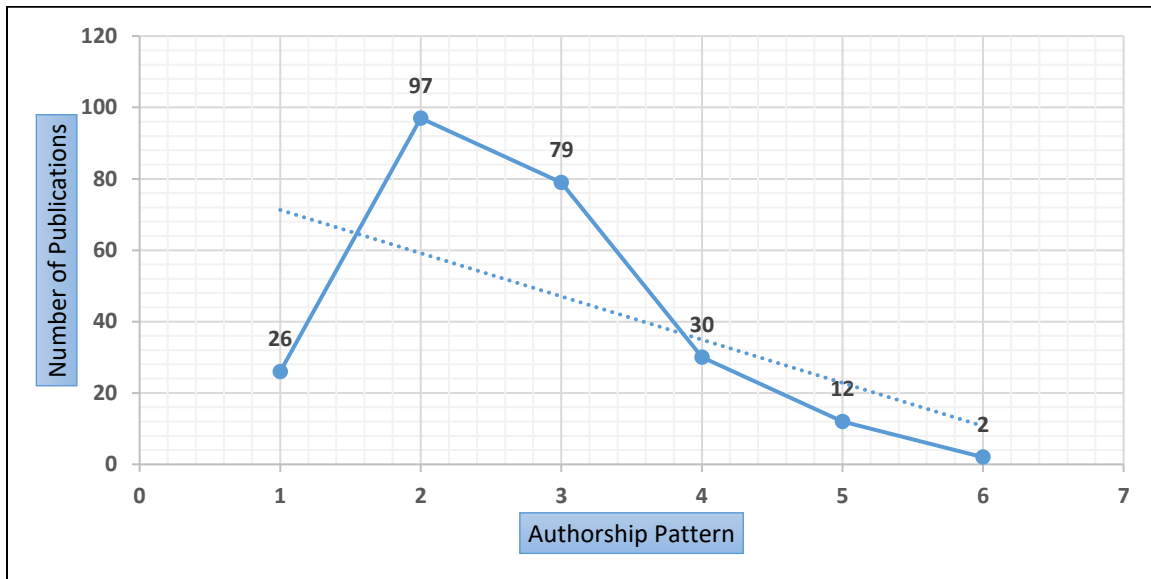


Figure 1, Authorship Pattern with number of papers

Table 2 presented the detail of top-ranked Pakistani institutions with their contribution. The authors affiliated to the University of Sargodha produced the highest number of papers (n=41), followed by the University of Punjab (n=39), Islamia University of Bahawalpur (n=30), and Khushal Khan Khattak University Karak (n=20). Seven influential institutions were having ten or more than ten papers each during the year, 2020.



**Table 1, List of most contributing Pakistani institutions in LIS research during 2020**

Rank	Institutions	Number of Articles
1.	University of Sargodha	41
2.	University of the Punjab	39
3.	Islamia University of Bahawalpur	30
4.	Khushal Khan Khattak University Kark	20
5.	University of Peshawar	14
5.	University of Balochistan	14
6.	Allama Iqbal Open University	10
7.	Islamabad Model College for Boys	9
8.	COMSATS University	7
8.	Edward College Peshawar	7
9.	Government College University Lahore	6
9.	Khyber Medical College Peshawar	6
10.	Aga Khan University Karachi	5
10.	University of Karachi	5

Pakistani LIS authors contributed to 67 journals and there were 46 and 13 journals with one and two papers each, respectively. The highest number of papers (n=100; 40.65%) were published in Library Philosophy and Practice (e-journal), an open-accessed and Scopus indexed journal published from the United States. The second preferred source of publication was PLISJ with 49 papers, usually, four issues of PLISJ are published per year but in 2020, PLISJ published one special issue, containing the papers presented in the 2nd International Conference on Emerging Issues of Information Landscape (ICEIL-II), University of Sargodha. More than 60% of the literature was published in these top two sources. International Journal of Librarianship and Information Science (*IJoLIS*), a LIS journal published from the Department of LIS of Allama Iqbal Open University, Pakistan stood on the third rank with 6 papers, followed by PJIM&L and Journal of Information Management and Library Studies with 5 papers each.

**Table 2, List of preferred sources of publications by Pakistani LIS authors (n=67)**

Serial No.	Name of Journal	Number of articles
1.	Library Philosophy and Practice (e-journal)	100
2.	Pakistan Library & Information Science Journal	49
3.	International Journal of Librarianship and Information Science ( <i>IJoLIS</i> )	6
4.	Pakistan Journal of Information Management and Libraries	5
5.	Journal of Information Management and Library Studies	5
6.	Digital Library Perspectives	3
7.	Health Information and Libraries Journal	3
8.	Information Discovery and Delivery	3
9.	Global Knowledge, Memory and Commination	2
10.	International Journal of Library and Information Studies	2

11.	Journal of Entrepreneurship Education	2
12.	Journal of Librarianship and Information Science	2
13.	Journal of Seybold Report	2
14.	Library Hi-Tech News	2
15.	Libri	2
16.	Performance Measurement and Metrics	2
17.	portal: Libraries and the Academy	2
18.	Scholars Journal of Applied Medical Sciences	2
19.	Scholars Journal of Engineering and Technology	2
20.	The Bottom Line	2
	46 Journals with one article each	

Figure 2 demonstrated the subject dispersion of 246 papers. The top 21 keywords/subjects had occurred more than three times each. The maximum number of papers were published on the theme of bibliometric, followed by Covid-19 and Information Literacy. There were six keywords that were used more than nine times. A sufficient number of papers were found on themes of knowledge sharing practices, users’ satisfaction, library quality, professional development of LIS and library anxiety. Low research was found on the subject of emotional and artificial intelligence and financial aspects of LIS.

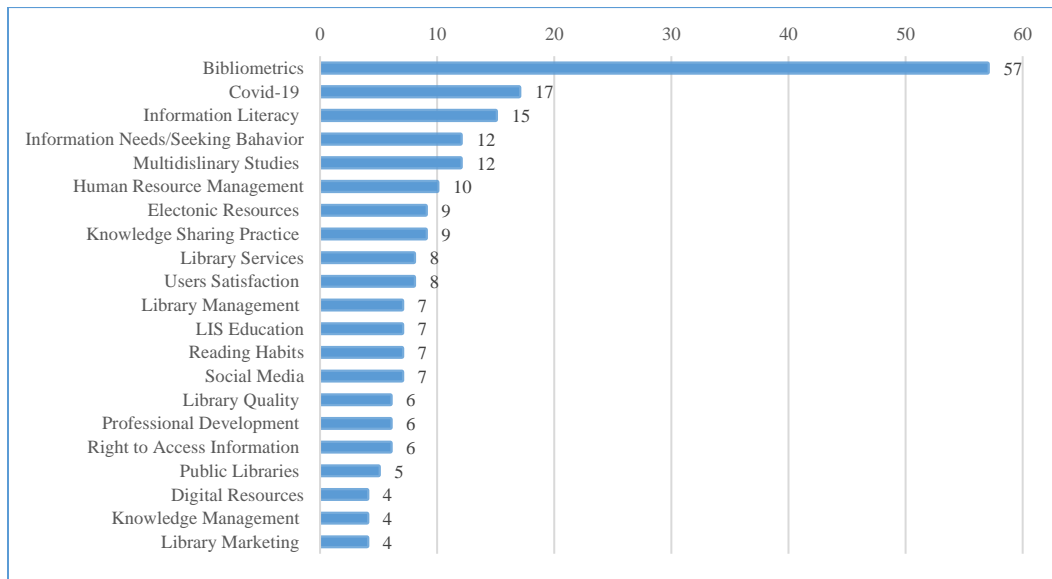


Figure 2, Frequently used keywords

## Discussion

The pandemic of COVID-19 (coronavirus) changed every aspect of human life around the globe. The LIS community of Pakistan has also been affected but sustained successfully because they moved their educational and professional activities on a virtual set-up well in time. LIS professionals have been fulfilling the requirements of their users in befitting manners (Rafiq et al., 2021; Ali & Gatiti, 2020). This study is witnessed that they have been using their time in producing valuable research.

Pakistani LIS authors demonstrated a promising growth in research during the calendar year of 2020. In 2019, they produced 154 papers (Haq, Satti, 2021) this number reached on 246 in 2020, it means that a 60% growth was observed. Exactly, 100 papers were published in *Library Philosophy and Practice* (e-journal) followed by 49 papers in *PLISJ*. *PLISJ* published a special issue in 2020, containing the papers presented the International Conference held at the University of Sargodha. It might be one of the reasons that due to the publication of the conference papers, the University of Sargodha stood on the top in terms of the number of papers published in the year 2020.

In the current study, Rubina Bhatti and Salman bin Naeem of Islamia University of Bahawalpur occupied the status of most productive authors. Rubina Bhatti also emerged as a most prolific author in three previous studies. Firstly, a study dealt the publications pattern of *PLISJ* from 2008 to 2017, secondly, the paper calculated the share of Pakistani authors in the *Library Philosophy and Practice*, and recently the bibliometric analysis of *Library Philosophy and Practice* from 2008 to 2020, all these studies acknowledged the research contribution of Rubina Bhatti (Haq & Alfouzan, 2019; Haq, 2015; Hussain & Yar, 2021).

Naseer (2015) examined the LIS literature produced by Pakistan from 1957 to 2008, and Anis Khurshid emerged the most productive author in that period. Nasim Fatima was found the most contributing author in Shadab's (2009) study on the *PLISJ* contents from 1968 to 2007. In the LIS research analysis of 2019, Kanwal Ameen was the most productive author (Haq & Satti, 2021), she has also shared the title of the productive author with Khalid Mahmood in the analysis of *PJLIS* (Warraich & Ahmed, 2016). One thing is clear in all these analyses that faculty members of LIS schools are securing the position of the productive authors.

A positive aspect of Pakistan LIS research was perceived in the study that about 90% of the publications were the results of research collaboration and a two-author pattern was found most preferred design in authorship pattern. In the past, a single-author pattern was dominated, as in Anwar and Saeed (1999) pointed out that 92.4% of the LIS papers were contributed by solo author pattern from 1969 to 1995, Naseer and Mahmood (2009) assessed the papers of *PLISJ* from 1998 to 2007 and stated that 89% of the papers were written by single-author. Another study also confirmed that 89% of the papers published in *PJLIS* were single-authored (Warraich and Ahmad, 2011).

Another promising thing discovered in the analysis is that some of the Pakistani LIS authors contributed with the foreign authors also. In one such study, Kanwal Ameen served as a principal author with the authors of three countries, New Zealand, United States and South Africa (Kanwal, et al. 2020). In two papers, an American author, Abebe Rorissa, collaborated with Nosheen Fatima Warraich (Warraich & Rorissa, 2020; Rasool et al., 2020). Muhammad Tariq, Saeed Ullah Jan and Khalid Mahmood also produced papers with international authors. Pakistani Scholars doing their Doctorate from the China, Malaysia and non-residents Pakistani LIS authors have also been collaborating with international authors. All these efforts help strengthen the LIS profession in Pakistan. Over time, Pakistani LIS authors realized the importance of collaboration and the avenues of collaboration have also been increased. When we are talking about developing the research culture in society, it means the creation of awareness in the prospects of research collaboration on both national and international levels.

In the analysis of productive research institutions/universities in Pakistan, the top seven institutions are contributed ten or more than ten papers each. All these universities have LIS or Information Management departments. The collaboration model of faculty and students has been very common. There is a need to enhance the research collaboration between professional librarians and faculty. The

national and regional LIS association should also come forward to establish some research groups to carry out productive and problem-solving research.

Library Philosophy and Practice (e-journal) emerged as the top preference by LIS authors of Pakistan, because it is open-accessed, published articles without publication charges and speedy article processing period. All the Pakistani LIS journals published once in the year except PLISJ, PJIM&L and PLISJ have publication charges, and the processing time of articles is a bit lengthy, these factors forced the Pakistan LIS authors to submit their papers in Library Philosophy and Practice (e-journal). The study conducted by Islam and Roy (2021) on the LIS research productivity by Bangladeshi authors also revealed that most of their papers were also published in Library Philosophy and Practice (e-journal).

Bibliometrics was found the favorite area of research in the present study. Even the analysis of LIS research in Pakistan carried out in 2019 was also confirmed the same findings. Out of 154 papers, 25 (16.23%) papers were written on the subject of bibliometric. The trend of bibliometric was also common in LIS research published in India (Shukla et al., 2020).

It is suggested that Pakistan LIS journals expect PLISJ, should increase the frequency of publications, at least two issues per year. They should decrease the article processing time and can introduce the format of ahead to print version of accepted articles. The editorial board of LIS journals needs a marketing plan; they can write a letter to LIS departments of developing and even developed countries to submit their research for publication. They should also approach the LISA, LISTA and Scopus authorities to recognize and indexed their journals in their respective database. As the University of Sargodha published their conference papers in the special issues of PLISJ, and in the past, University of Punjab did the same practice. The other LIS department should also organize conferences once a year and publish all conference papers in their LIS journals. The students of MLIS and M.Phil. should be encouraged to extract papers from their theses. A large number of students completed their M.Phil from the Minhaj University, Superior University and Sarhad University, but very few papers were extracted from them. Pakistan Library Association should activate the PLA Journal on regular basis and they can upload the articles published in the past issues of PLA Journals on its website for global visibility.

## **Conclusion**

The current study shows that LIS research efficiency in Pakistan is impressive and growing. In the year 2019, a total of 154 papers were published, as compared to this total, a 60% increase was observed in 2020. In the analysis of productive authors, two authors of the Islamia University of Bahawalpur were found on the top but as a whole, this university occupied the 3<sup>rd</sup> position in the institutional ranking. The University of Sargodha and the University of Punjab secured the first and second positions because most of the faculty/students of these universities are contributing significantly. The subject dispersion shows that the bibliometric studies were conducted on a high scale because most of the non-residents Pakistani LIS authors contributed to this theme. The influence of Covid-19 on LIS has been discussed, it shows that Pakistan LIS authors are concerned about the changing environment and the role of libraries/librarians in the pandemic. Notable papers were found on information literacy, library quality, and library anxiety but few papers were found on emotional & artificial intelligence and financial aspects of LIS. As the majority of research was contributed by the LIS faculty, M.Phil, and Ph.D. scholars, the contribution of practicing librarians was nominal and more efforts are required to involve them in the research cycle.

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