



Assessing Research Support Services in Academic Libraries: A Systematic Literature Review

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The study systematically analyzes Research Support Services (RSS) in academic libraries through a comprehensive review of scholarly literature. The objective is to evaluate publication trends, geographical distribution, sample populations, journal coverage, categorization models, core components, implementation challenges, and developmental insights. A systematic review methodology was adopted, utilizing databases Scopus and the Web of Science. The search strategy employed keyword combinations (e.g., “research support services,” “research services and library,” and “academic library”), supplemented by forward and backward citation tracking. This resulted in a final selection of 43 peer-reviewed journal articles published between 1992 and 2024. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines.

The analysis reveals a progressive increase in literature on RSS, with recent focus areas including research data management, bibliometric services, and open access initiatives. Core services identified encompass citation management, data curation, bibliometric analysis, and support for scholarly communication. Key challenges include limited resources, technological barriers, and professional skill gaps. The study emphasizes the need for strategic innovation, including integration of artificial intelligence and collaborative service models. The findings offer significant implications for library administrators, researchers, and policymakers, and represent a pioneering global synthesis of RSS trends and practices in academic libraries.

Keywords: Research Support Services, Academic Libraries, PRISMA, Systematic Literature Review, Reference Services, Electronic Information Resources, Research Data Management, Research Data Services, RSS.

1. Introduction

Libraries are central nodes in the academic ecosystem¹ and have long supported the objectives of their parent organizations through various activities. Fulfilling the knowledge thirst of the patrons by providing facilities such as books, journals, and database access is one of their primary activities. In higher education institutions, in addition to supporting academics, the library is a critical enabler of the institution’s research mission. Traditionally, academic libraries were viewed as repositories of knowledge, and their role in research was limited to “information discovery, collection development, and some elements of information management². However, in recent years, academic libraries worldwide have realized strategies to offer tailored Research Support Services (RSS) that meet the diverse needs of

researchers at various stages of their careers³. This shift reflects the growing recognition of libraries not merely as resource providers but also as partners in the research process⁴ by offering a wide range of advanced services, such as research data management, scholarly communication support, bibliometric and citation analysis, and assistance with open access publishing⁵, collectively called as Research Support Services.^{6,7}

RSS have been defined by various authors, but they all tend to the fact that it is the support of any kind given to a researcher during the research process⁸. Hoffman defined RSS as diverse services that a library provides to assist and support all forms of research & scholarship of its parent institution⁹. Parker on the other hand, characterized it as a collection of resources and services that support the

growth of scholarship and research output¹⁰. However, according to Raju and Schoombie¹¹ research support is the librarian's proactive involvement or collaboration with the researcher during research. RSS plays a pivotal role in fostering academic success and in enhancing research productivity across educational institutions. The increasing complexity of the research landscape, driven by digital advancements and interdisciplinary collaborations, has further heightened the demand for comprehensive and well-structured RSS in academic libraries¹². Despite these advancements, literature has revealed significant variations in the nature, availability, and effectiveness of these services across institutions¹³.

A large body of literature has been found on RSS in academic libraries^{14,15}. However, only a few studies^{16,17,18} have analyzed the existing literature on RSS. The reviews were all non-systematic and provided only a descriptive synthesis of the findings and narrow inclusion criteria. Non-systematic reviews differ methodologically and in the purpose of the systematic reviews. They provide little or no details about the identification, selection, and evaluation of selected studies¹⁹. On the other hand, systematic reviews integrate and aggregate empirical results quantitatively or qualitatively to identify various parameters, such as methodological and quality issues, and to answer the research questions under consideration^{19,20}. Therefore, this systematic literature review was conducted to supplement these studies. By delving deeper into various aspects of RSS systematically, the study consolidates existing knowledge and offers insights into the evolving landscape of RSS across different academic institutions.

The review is structured into ten principal sections. The study begins with an Introduction (Section 1), followed by Research Questions (Section 2) and Methodology (Section 3). The latter is further divided into Source and Search Strategy (3.1) and Selection and Exclusion Criteria (3.2). The Results (Section 4) are then presented. The core of the review, Detailed Analysis of Selected Studies (Section 5), addresses the research questions and is organized into three subsections: RQ1, encompassing Publication Growth Trend (5.1.1), Geographical Distribution (5.1.2), Targeted Population of Selected Studies (5.1.3), and Publication Status (5.1.4); RQ2, focusing on Categorization of RSS (5.2); and RQ3, examining RSS Currently Provided by Academic Libraries (5.3).

The review proceeds to answer RQ4 in the Findings and Discussion (Section 6), followed by the Conclusion (Section 7). The paper concludes with Practical Implications (Section 8) Suggestions (Section 9), and References (Section 10).

2. Research Questions

The study aimed to understand the current state of RSS in academic libraries, highlighting emerging trends, and suggest areas for future development. Through an analysis of forty-three (43) scholarly articles, the study aimed to answer the following research questions:

RQ1: What are the publication growth trends, geographical distributions, sample populations, and publication journals related to these studies?

RQ2: How are RSS categorized by different authors?

RQ3: What are the core components of RSS provided by academic libraries?

RQ4: How does the literature address the challenges encountered by academic libraries in implementing RSS?

By addressing these questions, the study contributes to the broader discourse on the role of academic libraries in supporting research and provides insights that could inform the development of more robust, scalable, and researcher-centered support models.

3. Methodology

The study employed a systematic literature review (SLR) methodology to identify and synthesize research on RSS in academic libraries. While Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines were used to ensure transparent reporting of the selection process^{20,21}, our methodological process involved clearly defining research questions, applying systematic search strategies, screening studies using defined inclusion/exclusion criteria, and extracting and synthesizing data in a structured manner. These steps were informed by best practices in conducting systematic reviews, even though a formal framework such as Arksey & O'Malley, JBI, or Cochrane was not explicitly applied.

3.1 Sources & Search Strategy

The literature search was conducted using two multidisciplinary databases: Scopus and Web of

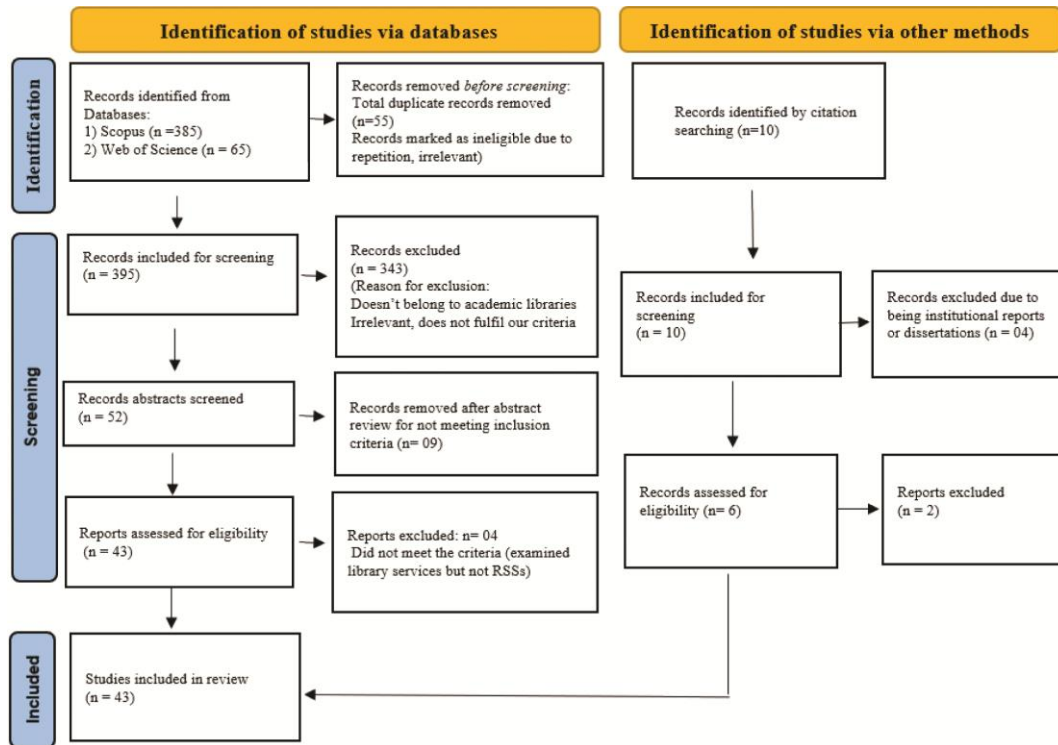


Figure 1 — Search and screening process
Source: Page MJ, et al.: BMJ 2021; 372: n71

Science (WoS). Although subject-specific databases for Library and Information Science, such as LISTA, Library Literature and Information Science, and Library and Information Source, may have offered broader coverage, but due to non-availability of access to these resources, we limited our search to the Web of Science and Scopus, which are well regarded for their comprehensive indexing of high-impact journals. The following search string was formulated and executed in these databases:

TI ("research support services") OR ("research services") OR ("research services and library or libraries") AND TI-ABS-KEY ("Academic library").

The full dataset of the selected articles, such as title, authors, abstracts, keywords, journal names, country of publishing, year of publishing, and DOI's, were exported to Microsoft Excel for analysis. Additionally, to account for historical terminology, we included the phrase "reference services" in the exploratory searches, considering that past literature may have used different terminology for RSS. However, as reference services often include broader

non-research-specific support, we focused on RSS within academic libraries.

3.2 Study Selection and Exclusion Criteria

During the initial search in October 2024, 450 records were retrieved from Scopus (385) and Web of Science (65) by applying the search string TI ("research support services") OR ("research services") OR ("research services and library or libraries"). As the focus of the study was academic libraries, to further confine the results to academic libraries only, the search string TI-ABS-KEY ("Academic library") was applied in both databases, and books were also excluded, and no additional restrictions were imposed, which restricted the results to 52, that is, 36 results from Scopus and 16 from Web of Science. While filtering the studies, the language of the articles was restricted to English. However, no restrictions were imposed on the country or year of publication. Therefore, studies published in any country or year were selected for review. Furthermore, journal articles, conference papers, reports, and book chapters were selected. The PRISMA flow chart in Figure 1 and Table 1 below

TI ("research support services") OR ("research services") OR ("research services and library or libraries") AND TI-ABS-KEY ("Academic library").

shows the entire selection and exclusion process. Four (04) additional articles were selected using forward and backward citation searches of the selected article corpus. The full datasets of the selected 56 articles were exported to Microsoft Excel. The screening process followed a structured, step-by-step approach.

(i) Deduplication: Duplicate records across

#IC	Inclusion Criteria	#EC	Exclusion Criteria
#1IC	Research published on RSS.	#1EC	Research papers other than RSS, Irrelevant, repetitive.
#2IC	Research conducted in context of academic libraries.	#2EC	Research papers doesn't belong to academic libraries.
#3IC	Journals, Book Chapters, Conference papers.	#3EC	Books, institutional reports, dissertations
#4IC	Language: English	#4EC	Studies in other languages

databases were identified and removed using automated deduplication software in Microsoft Excel, followed by manual review.

(ii) Title & Abstract Screening: Articles were independently screened by both authors to ensure their relevance.

(iii) Full-Text Screening: The full texts of 56 potentially relevant articles were assessed against the inclusion and exclusion criteria.

(iv) Final Selection: After the exclusion of ineligible studies, **43 articles** were included in the final review.

A **blind screening process** was applied during the full-text review to minimize selection bias. Both authors independently reviewed each study, and discrepancies were resolved through discussion.

Table 2 — Categorization of Research Support Services

Authors (Year)	Title	Research Support Services
Singh et al. (2024)	<i>Investigation of research support services (RSS) in academic libraries of India</i>	Research Guides, Research Consultancy, Research Impact Measurement, Open Access, Research Tools Recommendation, RDM, Scholarly Publishing, and Archiving and Preservation of Research Output.
Si et al. (2015; 2019)	<i>Investigation and analysis of research support services in academic libraries</i>	RDM, OA, scholarly publishing, research impact measurement, research guides, research consultation and research tools recommendation
Chen and Zhou (2021).	<i>Library research support services in China's universities of traditional medicine: Understanding user requirements</i>	Literature databases, writing and citation management support, novelty search and bibliometrics
Dessa & Dani (2024)	<i>An Investigation of Current Research Support Services in Hungarian Academic Libraries</i>	OA publication, online reputed electronic databases, Bibliometric Support services and RDM services
Ali & Ahmed (2022)	<i>Information Literacy Skills among Library and Information Science Professionals: a forecaster of Research Support Services</i>	IR, article publishing, knowledge of IT tools, collection management, research excellence framework, training, scholarly communication, research data administration, intellectual property rights, copyright, metadata, file formats, licensing, data backups, ethics, structured thinking, trends awareness, bibliometrics, application of social media tools, and research data management
Keller (2015)	<i>Research support in Australian university libraries: an outsider view.</i>	OA, IR, bibliometrics, RDM, and research student support
Awan et al. (2022)	<i>Current status of research support services in university libraries of Pakistan</i>	Basic, more advanced, specialized, and additional research support services
Brown et al., (2018)	<i>The evolution of research support services at an academic library: specialist knowledge linked by core infrastructure</i>	Digitisation and Digital Curation, Research Data Management, Scholarly Publishing, Bibliometrics, and Digital Scholarship.
Zakaria (2021)	<i>Data visualization as a research support service in academic libraries: An investigation of world-class universities</i>	DVS include information, services, training, tools and software, and information resources.
Hussain and Rafiq (2023)	<i>Provision of research support services across the research lifecycle in university libraries</i>	Generation of research ideas and funding, research conduct/ data management, Report writing, publishing and dissemination.
Kennan et al., (2014)	<i>“Making space” in practice and education: Research support services in academic libraries</i>	RDM, Data curation, systematic literature search and digitization of data
Singh & Siwach (2024)	<i>Researchers’ Expectations Towards Library Research Support Services (LRSS): A Case Study of Maharshi Dayanand University, Rohtak</i>	Database Services, RDM, IR, Research Tools Services, Research Impact Measurement Services, Scholarly Communication Services and Infrastructure Facilities.

4. Results

Appendix A and Table 2 present a detailed analysis of the selected studies on RSS, published between 1992 and 2024. **Appendix A** presents the major

characteristics of the selected studies, such as the author, year of publication, country, sampling group, sample size, research method used, and major

<i>Appendix A: Major Characteristics of the selected studies on Research Support Services</i>					
Author	Country	Research Method	Sampling Group	Sample Size	Major Findings
Dessa & Dani (2024)	Hungary	Descriptive Method	Institutions (purposive)	10	Hungarian university libraries are excellent in supporting open access and encouraging the exchange of knowledge. Bibliometrics and research data management services, on the other hand, are still in their infancy, indicating room for expansion in comprehensive research support services.
Singh & Siwach (2024)	India	Cross-sectional study	Faculty & Research Scholars (purposive)	1320	Most anticipated service was 'Database Services', followed by 'Infrastructure Facilities' and 'Institutional Repositories'.
Singh <i>et al.</i> (2024)	India	Descriptive Method.	Institutions (purposive)	212	There are huge gaps in availability and awareness of RSS in Indian libraries. Most of the libraries lack significant adoption of RSS.
Maryati <i>et al.</i> (2024)	Indonesia	Qualitative Method	Library staff (purposive)	4	12 key issues related to the implementation of BPR in research support services, leading to the development of 36 strategies designed to address these challenges.
Sawe <i>et al.</i> (2024)	Kenya	Qualitative Method	Librarians (purposive)	40	Suggested three strategies that university libraries can adopt to enhance RSS: 1. Offline and Online Strategies. 2. Need for Upskilling and Professional Development. 3. Proactive Empowerment
Ali <i>et al.</i> ⁶⁴ (2023)	Pakistan	Quantitative approach	Literature Survey (purposive)	4079	Study found that topic of "information literacy and library" was the most prominent, Journal of Academic Librarianship was the top source of publications, and the University of Illinois was leading in terms of published documents.
Hussain & Rafiq (2023)	Pakistan	Quantitative research design	Library staff (purposive)	190	Found that more than 50% of university libraries in Pakistan were providing most of the basic RSS associated with all stages of the research lifecycle. However, advanced RSS were still at infancy stage.
Shoab <i>et al.</i> (2023)	Pakistan	Quantitative research design	English Teachers (purposive)	318	The study's findings indicate that academic library resources have favourable effects on research support services for English teachers. The analysis revealed significant correlations between various resources.
Ullah <i>et al.</i> (2023)	Pakistan	Quantitative research design.	Library staff (purposive)	141	Almost all libraries provide essential services such as Wi-Fi connectivity, access to the HEC digital library, and access to an e-book collection, & Document delivery service.
Graewingholt <i>et al.</i> (2023)	United States	Qualitative methodology	Peer-assisted learning facilitators (purposive)	9	The study provides compelling evidence that peer-led learning can foster a supportive and effective research environment in academic libraries.
Johnson <i>et al.</i> (2023)	United States	Qualitative methodology	Research Assistants (purposive)	----	The transition to a peer-led collaborative research model was successful in maintaining service continuity during the pandemic. The shared supervision approach allowed for reduced redundancy in training and service hours, enhancing the quality of research support provided to patrons
Miller <i>et al.</i> (2023)	United States	Mixed-methods approach.	Faculty (purposive)	-----	The study provided insights into the scholarly information-seeking habits of faculty, which can inform the development of better support services and research spaces in academic institutions.
Ali & Ahmed (2022)	Pakistan	Purposive sampling method.	Library Professionals (purposive)	253	The findings indicated that Information Literacy Skills (ILS) significantly predict RSS, with a regression model showing that ILSs account for 70% of the variance in RSS.

Awan <i>et al.</i> (2022)	Pakistan	Quantitative Survey Method.	Chief Librarians (Purposive)	175	1. Most university libraries in Pakistan are providing basic RSS. Noticeable lack of support for more advanced and newer RSS. 2. Less than 60% of libraries provide subscriptions to qualitative statistical analysis tools.
<i>(Contd.)</i>					
Chen & Zhou (2021)	China	Inductive qualitative Method	Professors, librarians & students	14	The study found that the current library RSS at TCM universities do not meet the expectations of researchers, leading to a general distrust towards library professionals. It identified 28 specific RSS requirements across five themes and need for libraries to better align their services with user needs.
Zakaria M.S. (2021)	Egypt	Mixed method approach	Institutions (purposive)	100	The study found that most of the top QS ranked academic institutions offered data visualization tools and software's followed by data visualization services through their websites, indicating a strong trend towards supporting research through innovative visualization techniques.
Ueda K. <i>et al.</i> (2021)	Japan	Cross-sectional survey method- Qualitative in nature.	Researchers and professionals	422	Only 28 researchers (22.6%) had experience asking for support from an Academic Research Organisations, while 5 researchers (4.0%) had experience with a contract research organization, and 65 researchers (52.4%) had no experience with either. Overall, the level of supporter satisfaction was low, reported at only 20%, highlighting a need for evaluation and support mechanisms within AROs.
González-Solar & Fernández-Marcial (2021)	United Kingdom	Literature review	Literature Survey (purposive)	----	A significant disconnect between librarians and researchers. The study suggested that academic libraries must evolve and customize their services to align with the changing landscape of research and user expectations, thereby reinforcing their role in the academic community.
Osorio & Droog (2021)	United States	Quantitative research.	Literature Survey (purposive)	----	COVID-19 pandemic has significantly transformed reference and research services in academic libraries, accelerating existing trends and prompting innovative solutions to new challenges. It highlighted the need for libraries to adapt to the changing conditions and improve their services accordingly.
Hwalima & Khanye (2021)	Zimbabwe	Qualitative method (in-depth analysis)	Literature Survey (purposive)	----	The study emphasizes the urgent need for Zimbabwe to establish a national RSS policy and enhance training for librarians to effectively support researchers in achieving educational goals and improving research output.
Fernández-Marcial & González-Solar (2020)	Belgium	Case study approach.	Institutions (purposive)	13	Highlighted the role of Librarians in building a strong relationship with researchers by educating researchers about RSS and providing personalized services in unique situations. Additionally, it highlights the shift in academic libraries towards embracing new technologies and open practices, positioning librarians as key players in the evolving research landscape.
Tang & Zhang ⁶³ (2020)	China	Qualitative approach	Faculty (purposive)	----	The study aims to develop a comprehensive framework for RSS at Peking University Library, focusing on service objects, providers, content, and strategies to enhance academic research support. It further seeks to align library services with the university's "Double First-class" strategy to increase their influence on academic research.
Maryati <i>et al.</i> (2020)	Indonesia	Mixed method approach.	Digital libraries (purposive)	9	Indonesian academic libraries have only implemented seven out of fifteen essential RSS features, indicating significant gaps in service provision. Additionally,

Si <i>et al.</i> (2019)	China	Website investigation method.	Institutions (purposive)	76	obstacles related to technology, organization, and environment were identified as barriers to effective implementation. RSS are crucial in academic libraries, with most of the surveyed libraries offering these services, which include key areas like research data management and open access, among others. However, the services provided vary significantly across institutions, indicating a need for better integration and presentation of these services on library websites. Most of the researchers were satisfied with the library's resource availability and personal assistance, there was significant unawareness regarding specific support services, leading to a gap between researcher needs and library provisions. Additionally, only a small percentage of researchers utilized the library for research-related queries, indicating a need for improved marketing and engagement strategies from the library.
Fazal & Chakravarty (2019)	India	Quantitative method (Empirical based)	Researchers	120	Researchers at the selected institutions moderately utilized the RSS provided by academic libraries, facing various challenges. It indicated a need for improved support from academic libraries and highlighted that unsponsored research projects were the most common type of research activity among participants.
Adeniran & Oyovwevotu (2019)	Nigeria	Survey method	Researchers(purposive)	78	University of Queensland Library's innovative research support model integrates functional teams with traditional liaison roles, thus effectively enhancing service delivery and aligning with the university's strategic goals, despite challenges in communication and resource constraints. It suggested continuous professional development and training as essential for maintaining team effectiveness and adapting to evolving research needs.
Brown <i>et al.</i> (2018)	Australia	Case study approach	Library staff (purposive)	----	There is a diverse range of research data management practices among Victoria University researchers, highlighting a significant need for enhanced training and guidelines to support effective data management. It suggested a collaborative partnership across the university to develop relevant services that align with researchers' needs and institutional goals.
Lang <i>et al.</i> (2018)	New Zealand	Qualitative Method	Researchers (purposive)	----	Spanish academic libraries are increasingly integrating RSS into their strategic plans, however relationship between librarians and academics remains historically weak, leading to limited resources for these services. Additionally, while there is a strong focus on open access and institutional repositories, emerging topics like data management are not yet prioritized by library directors.
Borrego & Anglada (2018)	Spain	Document Analysis & survey method.	Directors of Libraries (Purposive)	76	South African academic libraries have made notable advancements in providing open access services and developing institutional repositories, yet they face significant challenges due to a lack of skills and resistance from researchers regarding data sharing. The study emphasizes the need for improved support systems for researchers
Raju <i>et al.</i> (2016)	South Africa	Case study approach.	Academic libraries	23	Australian libraries offer five key RSS: institutional repositories, open access, bibliometrics, research student support, and research data management. Senior management enhanced these services by
Keller (2015)	Australia	Qualitative method (interviews)	Librarians (purposive)	----	

Si <i>et al.</i> (2015)	China	Mixed method (website investigation & literature review).	Institutions (purposive)	87	rationalizing student services, focusing liaison librarians on research, and creating new research support roles. Out of 87 libraries, 50 offered research data services, categorized into six areas: research data introduction, data curation, management guidelines, reference, resource recommendation, and training. Key challenges included difficulties in data management, researcher reluctance to share datasets, and inadequate infrastructure for data curation.
Kott <i>et al.</i> (2015)	United States	Pilot project where public services librarians provided personalized reference services to university administrators Pragmatic approach- use of a variety of qualitative and quantitative methods.	Librarians (purposive)	5	The study revealed that the administrative RSS successfully connected librarians with university administrators, enhancing library visibility and support, while also highlighting challenges related to time management and communication in service delivery.
Kennan <i>et al.</i> (2014)	Australia	Case Study Method	Institutions (purposive)	219	Most libraries were offering or planning to provide bibliometrics and RDM services but faced challenges due to staff knowledge gaps and resource limitations. There was strong support for specialized education in research support, particularly in bibliometrics and RDM.
Mamtora (2013)	Australia	Case Study Method	Researchers (purposive)	161	To satisfy changing researcher demands, the study found that research librarians must have more responsibilities in data management and digital literacy as well as continuous professional growth. High satisfaction with library support was indicated by surveys, but they also pointed out the need for improved off-campus services and more resources.
Raju & Schoombee (2014)	South Africa	Case Study Method	Library services (purposive)	----	Despite lacking the extensive scope seen in libraries from nations like Australia and the UK, the study concluded that Stellenbosch University Libraries provide useful research support services, such as data management, open access, and bibliometrics. To improve these services, it underlined the necessity for South African institutions to work together and for library leadership to make resource investments.
Corrall <i>et al.</i> (2013)	United States	Library practitioners in Australia, New Zealand, the UK, and Ireland.	Library Professionals (purposive)	----	The study found that library personnel require wider competencies, such as understanding of data curation, policy settings, and research procedures, in addition to technical abilities. To satisfy the changing needs of RSS, it underlined the significance of providing ongoing professional development and revising curriculum.
Snyder <i>et al.</i> ⁶⁵ (2012)	United States	Case Study Method	Researchers(purposive)	----	The RMT model effectively reduced inequalities in research assistance among projects with varying funding levels by offering flexible, economic research data management. Additionally, it enhanced data quality, institutional and legal compliance, and support for research projects.
Du & Evans (2011)	Australia	Qualitative Method	Researchers & Librarians(purposive)	14	The survey found that online databases, interlibrary loans, and document delivery were commonly used by academic users, who viewed libraries as crucial for training in research and resource access. Librarians recognized the diverse range of services that users require across research stages and disciplines, stressing the value of individualized approaches above typical surveys and their role as mediators.
Rasul & Singh (2010)	Malaysia	Survey method	PG Students	437	According to the study, 90.1% of postgraduate students acknowledged the important role academic

Meserve <i>et al.</i> (2009)	United States	Quantitative approach through data collection via Service Point Activity Count forms.	Public service points	-----	libraries play in supporting their research, and 72.5% of them were satisfied with the services they received. However, there is still room for improvement, such as longer library hour. At MLK Library, the Warner model increased question triage and service efficiency by allowing librarians to concentrate on more complicated duties by limiting their involvement in smaller queries.
Harrington (1999)	United States	Qualitative method	multiple groups	-----	According to the survey, online tax services are mostly targeted at professionals, even if they offer notable benefits over paper and CD-ROM versions. Academic libraries encounter difficulties with cost, customisation, and license. Tax publishers and librarians must work together to make sure these services satisfy academic requirements. The study discovered that adding paraprofessionals to library reference services greatly improved customer efficiency and satisfaction while freeing up librarians to work on more complex jobs. Nonetheless, there were difficulties in guaranteeing efficient referrals for complicated inquiries and a high staff turnover rate.
Hammond (1992)	United States	Case study	Library Professionals (purposive)	-----	

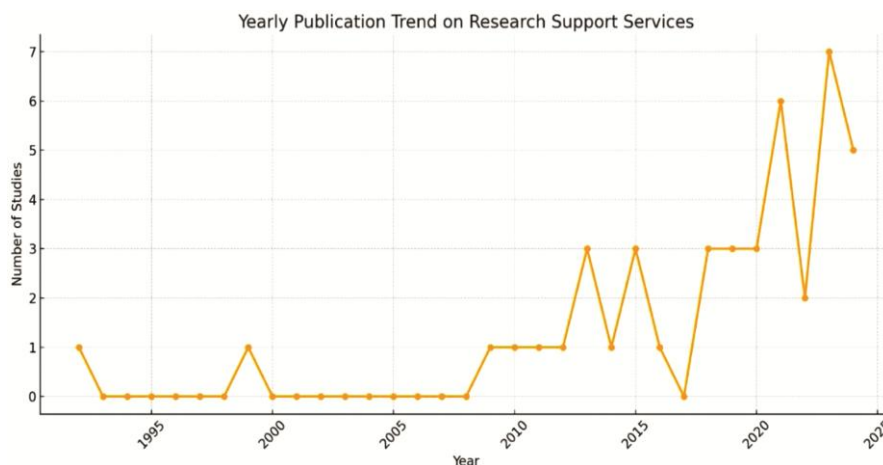


Fig. 2 — Publication growth trend of RSS between 1992 to 2024.

findings. Table 2 lists the categories of RSS performed in the sample studies.

5. Detailed Analysis of the selected studies

To answer RQ1: *What are the publication growth trends, geographical distributions, sample populations, and publication journals*, this section is further divided into four sub- sections:

5.1 Publication growth trend

Figure 2 shows how studies on RSS are distributed and offers an attractive insight into the evolving nature of RSS. Beginning in 1992, only one article (2.32%) was published. The trends of single publications continued in 1999, 2009, 2010, 2011, and 2012. The number of articles has grown to three, that

is, 6.98% each in 2013, 2015, 2018, 2019, and 2020. The number of publications has grown since 2018, peaking in 2023(16.28%) and 2024(11.62%). This upward surge indicates the growing recognition of RSS as critical components of academic library services. Further, studies in the late 1990s and the early 2000s focused on basic topics such as reference services and the role of librarians in supporting research. In contrast, recent studies have shifted towards more advanced services such as data visualization, AI tools, open access, data management, and data analysis tools. The role of librarians has also shifted from traditional caretakers of knowledge to creators of knowledge.

5.2 Geographical distribution

The literature on RSS is diverse, as shown in Figure 3. Nineteen countries have contributed to research on RSS, with 48% of the studies being conducted in the USA, Pakistan, and Australia. The USA leading the list with ten publications (23.25%) indicated its active involvement, robust infrastructure, technological advancements, and substantial federal funding. According to the statistics report by National Science Board²², the US institutions offer comprehensive RSS throughout their research lifecycles. To increase global visibility, projects funded by the federal government are encouraged to publish in open-access modes. Most of their studies discuss advanced RSS and how to improve these services with changing technology.

Pakistan, with six publications (13.96%) in the

second position, showed the active involvement of developing countries in the literature related to RSS. However, it must be noted that most of their studies discuss traditional RSS. Australia ranked third with five publications (11.62%), with most of their studies discussing open access and research data management services, indicating the advancements they have made in this domain. China and India contributed four (9.30%) and three (6.98 %) publications, respectively, indicating a moderate level of research activity on RSS. Indonesia and South Africa contributed two publications (4.66%). Single publication i.e., 2.32% of total publications was contributed each by Belgium, Egypt, Hungary, Kenya, Malaysia, New Zealand, Nigeria, South Africa, Spain, United Kingdom and Zimbabwe.

Geographical Distribution

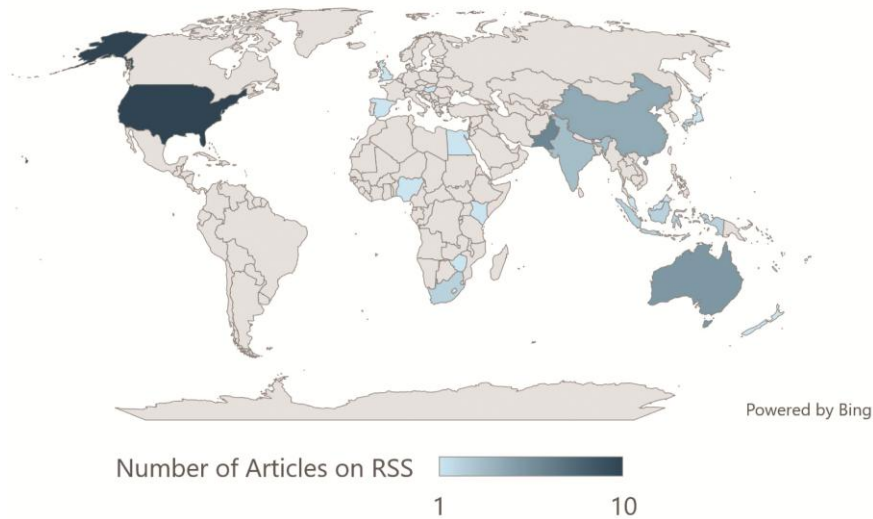


Fig. 3 — Geographical distribution of articles on RSS.

Targeted population of studies

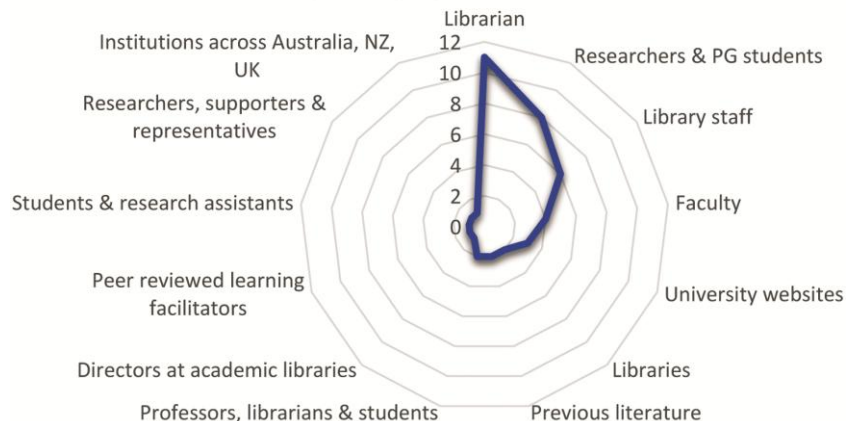


Fig. 4 — Targeted population of Studies

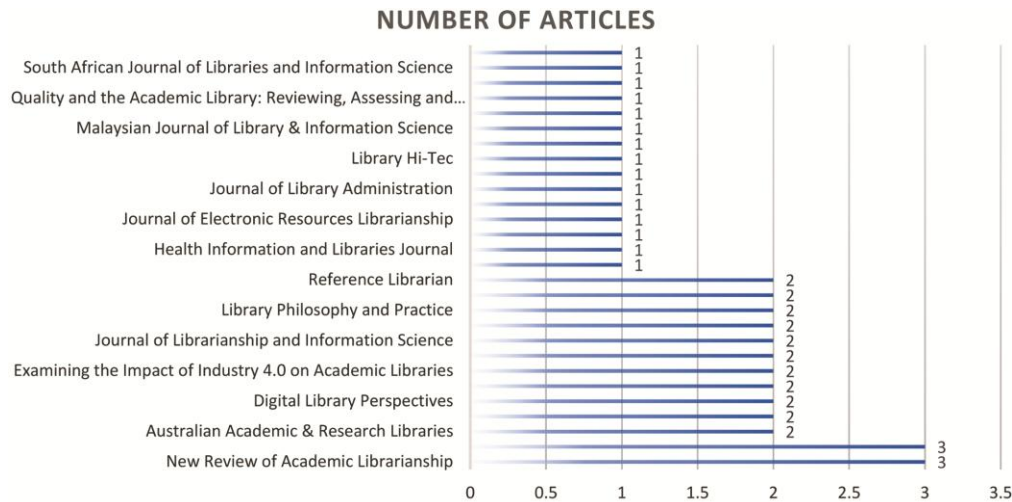


Fig. 5 — Journals

5.3 Targeted population of included studies

In the distribution and composition of targeted population categories in the selected studies, interviews with “librarians were the most prevalent method, with a frequency of 11. The radar chart in Figure 4 indicates that together “Librarians (25.58%), researchers, and PG students (18.60%) constituted 44.18% of the total selected studies. The dominance of “librarians and researchers” is expected in the targeted population of the selected studies, given that librarians are the primary providers of RSS, and researchers are the key beneficiaries of RSS in academic libraries. Although Library Staff (13.96%) and Faculty (9.30%) play a crucial role in shaping academic resources and curricula, they are relatively underexplored in the selected corpus of studies. Other categories included the exploration of the top 100 university websites (6.97%), libraries (4.65%), previous studies (4.65%), and Professors, librarians, and students (4.65%). Given the increasing shift towards digital and remote RSS, more research is needed on technology-driven library services. Directors and peer-reviewed learning facilitators are strategic and policy-level decision makers, but are least targeted in the selected studies with 2.32% each.

5.4 Publication status

Peer reviewed studies in three categories were selected for the review: “Journals”, “Conferences” and “Book Chapters”. “The Journal of New Review of Academic Librarianship” and “Australian Academic and Research Libraries” published three articles, followed by a list of 11 journals that published two articles each. The remaining 15 studies were

published in single journals, conference proceedings, and book chapters worldwide, as shown in Figure 5.

5.5 RQ2: Categorization of RSS

To answer RQ2, a comprehensive analysis of the final corpus revealed twelve (12) articles that systematically classified RSS into distinct categories. Table 2 provides an exhaustive compilation of the RSS, encompassing their corresponding titles and authorship information. Various investigations have approached RSS differently, with some limiting its scope to a specific set of library-provided resources, whereas others have adopted a more comprehensive framework for categorizing RSS. Si et al.²³ and Si et al.²⁴ underscored the critical role of RSS in the e-research domain. Their analysis classified these services into seven comprehensive categories: Research Data Management (RDM), Open Access (OA), Scholarly Publishing, Research Impact Measurement (RIM), Research Guides, Research Consultation, and Research Tool Recommendations. Building on previous research, Singh et al.²⁵ extended the existing framework by incorporating Archiving and Preservation of Research Output, thereby expanding the RSS classification to encompass eight distinct categories. Drawing on their analysis of researchers' expectations, Singh and Siwach²⁶ propose a framework that outlines the RSS into seven distinct dimensions. Ali and Ahmed²⁷ delineate RSS as encompassing a wide spectrum of activities. These services include the development and maintenance of institutional repositories, facilitation of article publication, proficiency in IT tools, and the management of collections. Additionally, they involved support for research excellence frameworks, provision of training,

promotion of scholarly communication, and administration of research data. The authors further note that these services extend to address intellectual property rights, copyright issues, metadata management, file format considerations, licensing procedures, data backup strategies, ethical considerations, structured thinking approaches, awareness of trends, bibliometric analysis, utilization of social media tools, and comprehensive research data management.

Hussain and Rafiq²⁸ categorized 29 RSS into four crucial stages in the research lifecycle. Their study emphasized the significance of RSS throughout each phase of research. During the initial research stage, which involves generating ideas and securing funding, libraries play a vital role by offering RSS, such as providing relevant literature, assisting researchers in using library research tools such as databases and catalogs, enhancing researchers' skills in advanced search techniques, and guiding them through funding database searches. In the second phase, focusing on research conduct and data management, libraries offer RSS including Research Data Management (RDM), Data Visualization Services (DVS), assistance with systematic reviews, and support for the effective use of statistical tools and techniques. The third stage, report writing, encompasses RSS, such as reference and citation management tools, plagiarism detection software, and writing assistance programs. In the final research phase, libraries aided in identifying suitable journals for publication. To increase research visibility, various tools and techniques are employed for electronic preservation of research outputs. Awan et al.²⁹ proposed a four-tier classification system for RSS based on their functional attributes. The first category, termed basic RSS, encompasses conventional library offerings such as research-oriented books, scholarly journals, reference services, current awareness services (CAS), and selective dissemination of information (SDI). The second category includes more sophisticated services, such as information retrieval (IR), clipping services, dedicated research advisory desks, and electronic journal access. The third category, specialized RSS, comprises document delivery services (DDS), interlibrary loans (ILL), anti-plagiarism software (e.g., Turnitin, EVE2, INSIT), reference management tools, statistical analysis software, and archival collections. The final category, additional RSS, incorporates subscription-based qualitative data analysis tools (e.g., NVivo and

Leximancer), online research support tutorials, abstraction and indexing services, and access to online survey platforms, such as Survey Monkey and Gizmo. Chen and Zhou³⁰ identified 28 RSS and divided them into five themes: mastery, planning, project, publication, and electronic preservation. The mastery stage requires an RSS for literature acquisition, research development tracking, and literature processing training. The planning stage requires research collaboration and grant application tutoring. For the project theme, research tools such as SPSS and R, and project management such as RDM, Financial Management support is required. Similarly, the publication theme contained writing and publication support tools and training. After publication, the research was electronically preserved. Therefore, RSS such as RIM, research impact promotion, research data storage and reuse, and data management skill training are required. Brown *et al.*⁶ discussed the “triangle” service model at the University of Queensland and divided the services into digitization and digital curation, RDM, scholarly publishing, bibliometrics, and digital scholarship. Similarly, Keller³¹ identified five key RSS in Australian libraries: Open Access, institutional repositories, bibliometrics, research, RDM, and student support. Data Visualization Services (DVS) were divided by Zakaria³² into five aspects: information, services, training, tools and software, and information resources.

5.6 RQ3: RSS currently provided by academic libraries

RSS are inseparable from the research lifecycle. They improve the quality of research by offering tailored services. From the starting stage of the research lifecycle to the dissemination of research to targeted users, RSS play a critical role. They help researchers in idea generation and assist them at each step of their research cycle by providing them with resources, guidance, and various assisting tools. Even after the research cycle is completed, their role does not stop; they guide a researcher in publishing his research, post-publication preservation facilities, etc. After reviewing the selected corpus of literature, the study found that RSS varied widely among different institutions. This depends on several factors, such as institutional maturity, funding to the library, a skilled workforce, and administrative support to the library. The literature reveals that some libraries offer basic traditional services to support research at their parent

institutions³³ but lack the most advanced services²⁵. Others offered basic and advanced tools and techniques to their patrons. Hungarian Universities, as investigated by Dossa and Dani³⁴, act as benchmark for well-developed RSS. Their libraries provide open access support and access to online reputed electronic databases. All the libraries investigated have a dedicated menu, 'Research Support.' However, there is still scope for improvement in Bibliometric Support and RDM services. Si et al.²³ found that half of the top 100 QS-ranked World-class universities offer Research Data Services (RDS). Zakaria³² investigated DVS and found that all the top 100 QS ranked universities are offering DVS through various tools and software's. Worldclass universities were again investigated for different RSS by Si et al.²⁴, and it was found that their libraries provide a good number of RSS with RDM at the top, followed by OA, scholarly communication, research impact measurement, research guides, research consultation, and research tool recommendations. The Library of Hubei University, China, provides four types of RSS to its users: literature databases, writing and citation management support, novelty search, and bibliometrics, as identified by Chen and Zhou³⁰. The most utilized and familiar services in Australian libraries are online databases, ILL, and DDS³⁵. However, RDM, data curation, systematic literature searches, and digitization of data are important RSS demanded by Australian researchers³⁶. Rasul and Singh³⁷ investigated the satisfaction level of PG students with RSS in Malaysia and found that respondents were mostly satisfied with available resources and services. However, the investigated libraries need improvements in facilities, such as awareness of plagiarism, research publishing, data analysis software, print collections, and opening hours.

In Africa, Raju and Schoombee³⁸ divided the RSS of the Stellenbosch University library in alignment with the stages of the research life cycle and found that the library is well equipped in the preparation, gathering, analysis, and sharing stages. In fact, the Stellenbosch University Library was the pioneer of the Gold Open Access publishing service on the African Continent³⁹. However, the stages of preservation and measurement of research are based on a steep learning curve⁴⁰.

Most academic libraries in Pakistan have offered traditional RSS^{28,29}, such as access to e-books, e-resources, digital libraries, Wi-Fi connections, DDS, dissertations, and database access^{41,42,43}. However,

there is a considerable lack of advanced and newer types of RSS, such as qualitative statistical analysis tools²⁹. RSS in Indian academic libraries are still in their infancy. Most libraries offer basic services and only a few offer RDM services, as investigated by Singh et al.²⁵. Only 13% of the libraries investigated had dedicated RSS portals on their website. Another study by Fazal and Chakravarty⁴⁴ found that researchers were comparatively satisfied with all traditional services and resources; however, they were unaware of newer researcher-specific services, such as bibliometrics and RDM. While investigating the expectations of faculty members and researchers regarding RSS, Singh and Siwach²⁶ found that mostly database services were expected from libraries, followed by well-developed infrastructural facilities, institutional repositories, and RDM tools.

6. Findings and Discussion

To address the challenges encountered by academic libraries in the implementation of RSS, the code of ethics⁴⁵ of the American Library Association lists professional development as one of its eight pillars and states that "We strive for excellence in the profession by maintaining and enhancing our own knowledge and skills, by encouraging the professional development of co-workers, and by fostering the aspirations of potential members of the profession". This demonstrates the importance of professional development in academic libraries in the USA. In this information age, where every field is led by technology, professional expertise must satisfy changing researcher needs. However, many studies found that there is a lack of professional expertise, which acts as the main barrier to RSS³⁶. Considerable emphasis has been placed on staff training. Corral *et al.*⁴⁶, Raju *et al.*⁴⁰, and Sawe *et al.*⁴⁷, while investigating the strategies employed by university libraries to enhance RSS, found that there is an urgent need for the upskilling and professional development of library staff to maintain team effectiveness and in order to satisfy the changing researcher demands, continuous professional development, and training are essential^{6,48}. Enhanced training and guidelines are essential for effective research support services^{17,49}.

Owing to complex and scattered information systems, researchers often find it difficult to locate the relevant resources. This may also be due to their lack of awareness of the RSS provided by their libraries due to various barriers, such as technological, environmental, and organizational barriers³³, thus

underutilizing the services available at their libraries⁵⁰. Meserve et al.⁵¹ had long back suggested the development of a well-structured Warner reference model to enhance efficiency, integrate digital tools, and streamline access to research materials to assist researchers effectively.

A librarian is a key player in a university setup in general and in a library in particular. He acts as a bridge between the RSS and researchers. Therefore, both need to be connected. The study found a significant disconnect between librarians and researchers^{16,52}. This gap must be narrowed to improve the RSS. A librarian needs to build a strong relationship with researchers by providing personalized services and educating them⁵³.

UNESCO has declared Information Literacy as the basic part of the human right to lifelong learning⁵⁴. Both researchers and library staff need information literacy so that the information needs of the researchers can be fulfilled. This can only be done by providing information literacy skills (ILS) to the library staff. The ILSs of library staff not only improve RSS but also influence research productivity²⁷. Thus, information-literate staff can foster a supportive and effective research environment by assisting researchers at every stage⁵⁵.

To measure researchers satisfaction with the services, Ueda et al.⁵⁶ recommended a performance index. This index will help to check the quality of services and their loopholes. This can help to improve the quality of services in the long run. RSS can be tailored to researchers needs by tracking their information-seeking habits⁵⁷. Furthermore, to enhance library visibility and support, librarians must connect with administrators through administrative RSS⁵⁸.

The COVID-19 pandemic necessitated libraries to shift all their services to an online mode and adapt their services accordingly¹⁸. To improve efficiency and reduce redundancy in services, Johnson et al.⁵⁹ recommend a centralized approach to services. An integrated RSS structure with a central hub available through an online portal through which all services can be accessed is the need of the hour. Furthermore, libraries should collaborate with other libraries in their vicinity to improve their services^{30,11}. Collaborations will not only allow them to share expertise and resources but will also be economical.

Academic libraries must rethink and revamp their business operations to improve RSS. Business process re-engineering, as proposed by Maryati et al.⁶⁰, is a bottom-up service innovation that can be

implemented to improve RSS. Furthermore, the creative research assistance model of the University of Queensland Library successfully improved service delivery and aligned with the university's strategic goals by combining functional teams with traditional liaison roles. The model recommends ongoing training and professional development as crucial for sustaining team productivity and adjusting to changing research requirements⁶. Another challenge is the reluctance of researchers to share the datasets^{23,40}. Researchers must be encouraged to share their research data by acknowledging and citing them while using their research data.

While this study has synthesized key trends and practices in RSS based on 43 selected publications, it is evident that a majority of the reviewed studies focused on describing the availability, design, or challenges of RSS, rather than systematically evaluating their outcomes or impact. Only a few studies—such as Mamtora⁴⁸, Shoaib et al.⁴², and Ali & Ahmed²⁷—attempted to measure the influence of RSS on research productivity, researcher satisfaction, or skill development. For instance, Ali & Ahmed²⁷ demonstrated that Information Literacy Skills significantly predict the efficacy of RSS, while Mamtora⁴⁸ highlighted researchers satisfaction with personalized support services. However, the general absence of impact-focused assessments points to a critical research gap. Future studies should incorporate empirical methods, such as user feedback analysis, usage statistics, or citation tracking, to assess the real-world value of RSS. This would not only validate the effectiveness of existing services but also guide evidence-based improvements in academic library support frameworks.

The present review also underscores a recurring concern reported in the literature: although many academic libraries have implemented RSS, their actual usage by researchers remains limited. Several studies in the dataset, including Singh et al.²⁵, Ueda et al.⁵⁶, and Fazal & Chakravarty⁴⁴, reported significant gaps between the provision of services and researcher engagement. For example, Ueda et al.⁵⁶ found that less than a quarter of researchers had accessed institutional RSS, and only 20% expressed satisfaction with them. Similar underutilization was observed by Chen & Zhou³⁰, who highlighted a disconnect between researcher expectations and the RSS offered at Chinese universities. These findings suggest that libraries must go beyond service

availability to focus on strategic promotion, user education, personalized support, and regular needs assessments. Addressing these barriers is essential for enhancing the visibility, relevance, and usage of RSS in academic settings.

7. Conclusion

RSS have become an international issue, and most developed countries are already implementing these services. The systematic review paper comprehensively analyzed 43 academic publications and offers an in-depth understanding of the current state of RSS in academic libraries. The analysis revealed a consistent increase in RSS-related literature with the latest literature focusing on newer types of RSS, such as RDM, bibliometric tools, and open access. The study found contributions from various geographical regions and prominent journals. It was found that developed countries such as the USA and Hungary provide more advanced RSS than their developing counterparts, such as India and Pakistan. The study also revealed that the most prominent method used for data collection was interviews with librarians, indicating that research support is often librarian-led and that the effectiveness of these services depends significantly on their expertise and institutional support. Furthermore, RSS were categorized by the authors using various frameworks that frequently associate them with digital tools, research consultations, and scholarly communication. The core RSS identified include promotion of open access, data management for research, citation management, and bibliometric support services. However, challenges such as limited resources, technological barriers, and skill gaps continue to exist, necessitating strategic intervention. Future studies should explore innovative service models, incorporation of artificial intelligence in RSS, and collaborative strategies to enhance the implementation and efficacy of RSS in academic libraries.

8. Practical Implications

This study has several theoretical and practical implications. First, it addressed the research gap regarding Research Support Services (RSS) provided by academic libraries worldwide. The findings of the study can assist library administrators, researchers, and policymakers in understanding trends, identifying best practices, and addressing challenges in research support services at their institutions. The study is also significantly beneficial for researchers. It provides insight into the various RSS offered by top-

tier universities globally. Librarians can benefit from this study by comparing their services and determining which services should be prioritized. Policymakers can address the challenges addressed in this study to improve RSS and, consequently, enhance research productivity. Furthermore, library administrators, particularly those from developing countries, can enhance their RSS by examining the offerings of world-class libraries. It can be concluded that the results may be valuable for students, researchers, policymakers, professionals, and faculty.

9. Suggestions

In this technology-led era, where Artificial Intelligence (AI) is taking part in every sphere of life, libraries cannot remain stagnant. Libraries need to adopt this technology to keep pace with the changing technology and improve RSS. Librarians play a crucial role in balancing faculty support, research consultations, and technology integration, with obstacles in resource access and AI acceptance. Incorporating on-demand AI-powered research support and implementing a hybrid staffing strategy can improve RSS's accessibility and efficiency of RSS⁶¹. Furthermore, administrators of higher educational institutions should come to the forefront. Considering the limited budget sets of libraries, public-private partnerships can be the best option for incorporating technology into libraries of higher education to improve RSS. Further, a staffing model that utilizes paraprofessionals for front-line information services, as proposed by Hammond⁶², allows librarians to focus on specialized tasks. This model addresses challenges in academic libraries such as adapting to new technologies, balancing multiple priorities, and enhancing the role of librarians.

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