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Letter to the Editor

Beyond Collections: The Evolving Role of Medical Librarians in Research Data Management

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Contemporary scientific inquiry is firmly situated in the era of Big Data, characterized by an unprecedented growth in research data volumes. This data ecosystem encompasses a vast spectrum of inputs, ranging from clinical trials and longitudinal cohort studies to high-throughput genomic sequencing, medical imaging, Electronic Health Records (EHRs), and outputs derived from emerging artificial intelligence technologies (1). Yet, amidst this surge, the critical challenge lies not merely in data generation, but in its optimal management.

Research data are increasingly recognized as independent, primary scholarly outputs. When curated effectively, these assets become FAIR (Findable, Accessible, Interoperable, and Reusable), enabling seamless sharing, secondary analysis, and integration into future research endeavors (2-4). Furthermore, the systematic reuse of research data significantly enhances scientific efficiency by reducing redundant data collection, thereby saving time, effort, and financial resources (5, 6). It is precisely these benefits that have propelled Research Data Management (RDM) to the forefront of strategic priorities in recent decades (2, 7).

In essence, RDM is an integral component of the research lifecycle, extending from initial project planning through post-project archival, sharing, and eventual disposition (8, 9). The RDM framework encompasses a holistic set of activities: Data planning, documentation, secure storage, access control, long-term preservation, and the facilitation of data reuse (10-12). Technological advancements have now enabled the collection, storage, and cross-disciplinary analysis of scientific data at a global scale. Consequently, governments, funding agencies, and publishers are increasingly mandating comprehensive Data Management Plans (DMPs) and the implementation of Open Data policies (4).

In this landscape, rigorous RDM is indispensable for ensuring research transparency, data integrity, and the continuous advancement of knowledge. Sound data management practices not only facilitate the verification of research findings—thereby

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accelerating scientific progress—but also ensure that data are accurately documented, organized, and archived for future utility. Ultimately, when implemented effectively, RDM serves as a cornerstone for improving data quality and fostering robust collaboration across institutions, research groups, and individual investigators. By mitigating the risks of data loss and minimizing redundant efforts, high-quality RDM acts as a catalyst for a more efficient and collaborative global research enterprise (13-15).

Libraries and research institutions serve as the fundamental pillars of research support, possessing invaluable expertise in the organization, preservation, control, and curation of information (16). As the prominence of RDM continues to escalate, the field of Library and Information Science (LIS) is witnessing the emergence of transformative professional opportunities (17-21). Consequently, libraries are progressively expanding their service portfolios to meet the rigorous demands of RDM, increasingly viewing this integration as a cornerstone of their future institutional roles (22, 23).

To facilitate this transition, organizations such as the Medical Library Association (MLA) have sought to empower librarians through specialized data services training. These pedagogical initiatives enable librarians to acquire essential competencies in data collection, organization, evaluation, and dissemination, while simultaneously instilling a profound understanding of the ethical dimensions and best practices inherent in RDM (24). Furthermore, an increasing number of libraries have assumed the responsibility of providing critical guidance on data literacy (25).

Despite these global advancements, the specialized role of the "Data Librarian" has yet to be fully institutionalized in several contexts, including Iran. While existing literature has endeavored to delineate the necessary competencies and capabilities required for data librarians to contribute effectively to RDM (18, 19, 26-30), including the development of competency models specifically tailored for biomedical data management (31), there remains a significant gap between theoretical frameworks and professional practice.

Therefore, it is imperative that the findings of such studies be utilized by policymakers, academic planners, and strategic decision-makers to design both short-term and long-term curricular interventions. Such efforts should focus on revising Medical Library and Information Science curricula to specifically cultivate the next generation of data librarians. Moreover, research centers and academic organizations, at both micro and macro levels, should adopt these established competency models as benchmarks to assess the proficiency of their staff and to facilitate the recruitment of qualified data professionals.

Given the burgeoning importance of RDM, we strongly advocate that the human resource frameworks within the Ministry of Health and Medical Education be modernized. By adopting the data librarian competency models (31), the Ministry should not only facilitate the recruitment of PhD holders in Medical Library and Information Science into research-oriented faculty positions but also formally establish dedicated "Data Librarian" job descriptions within medical research centers and health science organizations. Such structural reforms are essential to fortify the research infrastructure and ensure the sustainable management of scientific knowledge.

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