

Challenges and strategies of implementing clinical librarianship: A case study of hospitals of Tehran metropolis

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ABSTRACT

Rapid changes in most treatment fields and evidence-based medical trends emphasize the role of clinical librarian in providing information services to treatment teams. The new task of librarians in treatment teams has faced barriers and challenges. The current study was conducted to assess the obstacles and offer solutions for the implementation of the role of clinical librarian in Iranian hospitals. This qualitative study was conducted on 15 librarians with experience in work and research related to presenting information services to the treatment team. The librarians were interviewed using purposive, available sampling method. The data collection tool was a semi-structured interview, which continued until data saturation, and data analysis was done using thematic analysis method. A total of 147 initial codes, 122 main codes, and 35 subcategories were extracted from analysis of 15 interviews. After detailed evaluation and integration of the subcategories, ten categories and two main themes were determined. The main barriers are related

to the lack of support from executive organizations, the absence of appropriate training programs, and the shortage of skills to enter the treatment teams. These barriers have prevented the approval of clinical librarian as an independent job position. The mentioned strategies are dependent on the support of executive organizations in two sectors: Ministry of Health and hospitals in creating job titles and feeling the need for information specialists in medical teams, as well as universities in defining official and independent disciplines by developing appropriate educational programs and attracting qualified people.

Keywords: Clinical Librarianship; Medical information services; Evidence-based librarianship; Treatment teams; Iran.

INTRODUCTION

The rapid advancement of information technology has brought about profound transformations in the dissemination, creation, and transmission of information. Moreover, it has significantly influenced the social behaviors of individuals and various institutions alike. In light of the escalating production of scientific information across diverse fields, the specialization of sciences, and the imperative of timely access to accurate scientific data, remain crucial for any dynamic society. Consequently, possessing information literacy skills emerges as an essential requirement to meet these demands (Premji et al., 2020). The main task of librarians and information specialists is to provide quick and convenient access to information, and information needs have created new roles for them. Rapid and diverse changes in most clinical fields and evidence-based medical trends have defined the task of clinical librarian in providing information services to treatment teams (Lyon et al., 2015) and created new opportunities for collaboration with clinical personnel (Scott, 2021).

Clinical librarianship was proposed for the first time by Gertrude Lamb (Lamb et al., 1975) at the annual meeting for the American Association of Medical Librarians – it refers to an expert who can play an effective role in providing the information needs of members of medical and research team (Habibi et al., 2023; Lawton & Burns, 2015).

Various studies have confirmed the advantage of presence of clinical librarians in medical teams. Patients emphasized access to up-to-date information, improved quality of care and education, as well as reduced expenses and hospitalization periods (Zare–Farashbandi et al., 2019; Brettle et al., 2016; Aitken et al., 2011). The medical team focused on the following benefits of clinical librarians: increasing utilization scientific and reliable information sources, facilitating information search, saving time, rising awareness about the importance of available evidence, increasing the speed of clinical decisions, improving the ability to evaluate evidences (Zare–Farashbandi et al., 2019; Brettle et al., 2016; Royal et al., 1993; Perrier et al., 2014) , promoting the quality of care and patient safety (Rudd, Harding, and Journal 2021, Hartfiel et al. 2021) as well as educational and research advantages, providing up-to-date information, patient education through facilitating access to information, information literacy skills training, increasing quality of training courses, reducing costs, and developing clinical studies (Aitken et al., 2011; Perrier et al. 2014, Rudd & Harding, 2021; Zare–Farashbandi et al., 2019). The clinical librarians emphasized awareness about personal strengths and weaknesses, understanding the information needs of the medical team, and creating a suitable situation for learning about the clinical environment (Aitken et al., 2011; Perrier et al., 2014; Tahmasebi et al. 2020, Zare–Farashbandi et al. 2019). Davies has confirmed in his article that clinical librarians based in clinical teams have the highest level of exposure to clinical questions and can have a high impact in terms of providing information to support clinical care (Davies, 2009).

In Barley et al.'s (2009) study, it was shown that doctors preferred to use clinical inquiry services for critical evaluation and summarization of evidence, which is one of the necessary skills for clinical librarians. However, the presence of the clinical librarian in a hospital as a member of the medical team is not warranted, and even he/she can face various obstacles (Barley et al., 2009). Personal and social obstacles are important categories of these barriers. Inability to interact with the medical team, lack of searching skills in databases and information sources, unfamiliarity with basic medical information, low self-confidence to work in a medical environment, inappropriate training based on job needs, unawareness of team members about the position of a clinical librarian, and non-acceptance of the librarian as a member of clinical team are among the personal barriers evaluated in studies (Greco et al., 2009; Lyon et al., 2015).

Social barriers are community-based and lead to problems for the presence of clinical librarians (Zare-Farashbandi & Hashemian, 2019), including lack of approval of clinical and health librarians' abilities and unawareness of the benefits and information services provided by a librarian in different treatment sectors (Habibi et al. 2023). The required technical infrastructure, including computer/tablet or laptop, access to the Internet/ Wi-Fi, and full access to databases are not provided for clinical librarians. Also, hospitals have not accepted the presence of a clinical librarian, especially because of financial aspects (Hashemian et al., 2018; Zare-Farashbandi & Hashemian, 2019). MacKenzie (2021) has also pointed out in his study that the proficiency level of health librarians in connection with evidence-based medicine and systematic reviews is at beginner or intermediate level. These librarians are facing many challenges, including lack of funds and insufficient access to the Internet and electronic information, as well as lack of training (MacKenzie, 2021).

In the study of Hashemian and colleagues, the four main categories of challenges clinical librarians face include performance (educational and clinical), personal characteristics (attitude, psychological, skill, knowledge and time), management, and technological challenges. The correct implementation of clinical information-oriented services and the evaluation of its advantages for improving the quality of services requires the recognition of these challenges and obstacles, and in order to solve them, policy makers in the field of education, employers and managers should help improve the quality of clinical information services (Hashemian et al., 2021a).

Due to the fact that the treatment needs are high in developing countries like Iran and that the treatment staff are faced with a large number of clients with various diseases, it is necessary to use information services and information assistants to improve the treatment processes and speed up the clinical decisions. Cooperation between the information specialist, namely the clinical librarian, with the treatment team can have positive effects such as receiving reliable information about clinical decisions, speeding up decision-making, relying on current knowledge and applying research results in treatment processes. On the other hand, due to the lack of familiarity with the role of clinical librarians in Iranian hospitals along with employment problems and work skills necessary to play the role of clinical librarians, this study aims to examine the viewpoints of medical librarians who have the highest work experience in therapeutic environments of hospitals and medical research centers. By evaluating the obstacles to the implementation of clinical librarian's role from the standpoint of these people and previous studies, it is possible to identify the existing challenges as well as practical and necessary solutions to implement the new job position of librarians as active colleagues in treatment team.

METHODS

Participants

This qualitative study was conducted on librarians working in hospitals and research centers in Tehran who graduated in the field of medical librarianship and information science and had more than 5 years of work experience or had presented at least one research study such as a research project or thesis in the field of medical librarianship. Purposive, snowball and available sampling method was used to select the samples followed by a semi-structured interview. This process continued until data saturation, and 15 interviews were held. Data saturation process means that the researcher did not acquire any new data related to the research topic during the interviews and the data were repeated. The research environment for conducting the interviews was selected based on the suggestions of participants; the interviews were held in the hospitals' libraries, clinical research center, and their own workplace.

Data collection

Semi-structured interview was used for data collection (Appendix 1). An interview guide was first prepared according to the objectives of the research, the research background, and expert opinion. The objectives of this research were to recognize the following: the main challenge to perform the role of a clinical librarian, the obstacles to implementing this role in hospitals, a basic solution to remove the obstacles, factors that can promote the role of clinical librarians in hospitals. In the next step, based on interviews with three people in the pilot phase, decisions were made regarding the number of questions, the timing of interview, and the clarity of questions. The interview process started with an initial inquiry regarding the participants' job conditions and their experiences working in the clinical setting. Subsequently, tailored questions were posed in alignment with the research objectives. Prior to the interviews, the participants were provided with the interview guide via email to facilitate preparation. Interviews were conducted through three modalities: face-to-face, telephone, and online. Each interview session lasted approximately 30 to 45 minutes. Data collection was initiated in October 2020 and concluded in January 2021.

Data analysis

Data analysis was based on thematic analysis method. At the end of each interview, the researcher immediately reviewed the interviews several times, and the interviewees' statements were carefully transcribed. Accordingly, after each interview and at the first opportunity, the researcher listened carefully to the recorded interviews several times to familiarize with the participants' statements, and then the initial codes were implemented and determined. To fully master the interview text, it was manually implemented using Microsoft Word software. The interviews were analyzed during data collection to control the interview process based on the objectives. To control the validity of data, the inter-rater consistency (supervisor, consultant and researcher) was assessed; the first three interviews were simultaneously coded in parallel, and then the codes were discussed to reach an agreement. Participant review and continuous communication of data with researchers determined the validity and reliability of data. In the review by participants, a part of the text along with initial codes were sent to a number of participants to compare and confirm the consistency of ideas extracted from the data with their experiences. After the interviews and preliminary analysis, the researchers reviewed the interview text again and merged similar codes and subcategories. In the last step, the relationship between subcategories was found and categorized into larger classes, and finally the main themes of the study were extracted.

RESULTS

Out of the 15 librarians (coded P1-P15) involved in the study, 10 had prior work experience within medical environments and hospital libraries, while 5 had engaged in research pertaining to clinical librarianship (Table 1). Based on the objectives of the study, 147 initial codes, 122 main codes, 35 subcategories, 10 categories, and 2 main themes were extracted (Table 2). The primary themes revolved around the challenges and obstacles encountered in the implementation of clinical librarianship, along with the corresponding strategies employed to address them. Direct quotations from participants are presented in italics, followed by their assigned code and the corresponding line from the transcripts in brackets.

Table 1: Participants' Work Experience in Medical Environments and Clinical Librarianship

Code	Current job position	Work experience
P1	Hospital librarian	Ten years of work experience in a hospital
P2	Hospital librarian	Two years of work as an information assistant - a research project in the field of clinical librarianship
P3	Faculty member-researcher	Thirteen years of work experience - two research projects on clinical librarianship
P4	Professor of medical librarianship	Seventeen years of work experience - four articles and research projects in the field of medical librarianship
P5	University librarian-researcher	Three years of teaching experience to the group - two clinical librarian projects
P6	Clinical research center librarian	Nine years of experience in clinical research center
P7	Hospital librarian	Thirty-two years of work experience - Fourteen years of responsibility in teaching medical information systems in hospitals
P8	Faculty member-researcher	Thirty years of experience in teaching to medical librarianship students - working with the medical department - having two research projects related to clinical librarianship
P9	Hospital librarian	Five years of working experience in a hospital
P10	Hospital librarian	Nine years of working experience in a hospital
P11	Clinical Research Center Librarian	Five years of working experience in the research center and having two articles related to clinical librarianship
P12	Hospital librarian	Ten years of working experience in a hospital
P13	Ph.D. student (medical librarianship) - researcher	Five years of work experience and a research work on clinical librarianship
P14	Clinical Research Center Librarian	Five years of work experience in a hospital and three years of work experience in the medical science research center
P15	Faculty member - Researcher	Twenty years of work experience in hospitals and universities and two research projects related to clinical librarianship

Theme 1: Challenges and barriers to the implementation of clinical librarianship

This theme is formed from five subcategories: lack of organizational support, irrelevance of educational materials to job needs, librarians' unwillingness to provide information services and acquire appropriate communication skills, librarians' lack of adequate knowledge of new technologies and professional expertise.

To distinguish the scope and depth of a problem, we must first identify the nature of obstacles. Despite the wide acceptance of clinical librarians at treatment departments in other parts of the world and considering the importance of correct information provision in decision-making, determining the challenges and obstacles of clinical librarianship in Iran plays a key role in providing a suitable solution and an infrastructural perspective for the implementation and training of clinical librarianship for the managers of education and treatment departments. These problems are considered from two standpoints: the organizational and managerial obstacles and personal difficulties of librarians. From the organizational and managerial perspective, the most important challenge is the lack of support from executive organizations and health policy makers, which arises from the lack of a job title for clinical librarians and relevant associations, absence of support from the policy makers in Ministry of Health, and lack of incentives for the presence of a librarian in treatment team. According to one of the librarians, *"there is no such thing as a clinical librarian in job titles nor a point for motivating librarians to enter the clinic from the library environment and provide these services. If we create financial motivation and privilege for librarians, it acts as a stimulator encouraging them to implement such services"* (P3. Line 84).

Another participant stated that *"elaborating on the position of clinical librarian among medical and clinical teams is incumbent on policy makers. In fact, they can also create job positions for us if they understand the training the clinical librarian has received and capabilities, he/she has to be introduced and supported"* (P6. Line 122).

The mismatch between educational materials and job needs in the clinical environment is another major challenge that most librarians encounter. Most of the university educational materials and short-term training courses are not practical and do not meet the professional needs of librarians for working in a therapeutic environment. A participant stated that *"the course topics are far from real services, or that there is no definition of these services to be applicable in our country"* (P1. Line 98). One of the librarians claimed that *"the first challenge is the absence of such a discipline, so typically no job structure has been considered for it. The shortage of certain course topics for this discipline and the lack of sufficient support from the Ministry and other governmental organs is a big challenge that this profession will encounter if approved"* (P14. Line 60).

Lack of desire and proper communication skills on the part of librarians to work in the treatment team and provide information services is among personal obstacles originating from librarians' lack of motivation to provide services, shortage of self-confidence in their skills and proper communication skills, non-existence of training courses in accordance with the necessary skills in the clinical environment, and lack of motivation to work in the therapeutic environment. One of the librarians who had research experience in the field of clinical librarianship stated that *"the lack of librarians' self-confidence is a major challenge. We could not introduce ourselves well, and this is also a weakness of the educational system that we have not been able to do this so far. A clinical librarian is not defined for many of our physicians, but it is a job position overseas. During the interview we had, the doctors were not even familiar with the term clinical librarian"* (P2. Line 45). Another participant also stated that *"our internships are not practical; however, if they are implemented in the right centers and under supervision of the right professors, they can create self-confidence in the students"* (P8. Line 55).

Also, the deficiency of knowledge and skills required by librarians to participate in the clinical team is a function of insufficient professional expertise. The lack of up-to-date

knowledge and proficiency in librarians to work in new environments is another obstacle to implementation and acceptance of the clinical librarian. A participant stated that *“education is an essential issue for clinical librarians. We have not acquired the skills we need in our theory-based curricula to become clinical librarians in our bachelor's, master's, and even doctorate courses. Our internships have nothing to do with clinical librarianship because from the beginning, the goal was not having clinical librarianship but medical libraries; however, if clinical librarianship is desired, the first thing is obviously education”* (P6. Line 117).

The growing development of information technologies in most fields has had a tremendous impact on the ease and quality of services. Important causes of not implementing the clinical librarianship are the shortage of sufficient knowledge of new information technologies that can be used in the treatment environment as well as lack of awareness of how to use websites, databases, and up-to-date knowledge to provide information services. One of the participants believed that *“the course units during their studies had no application after graduation, and when these students graduated from university, they had no expertise. They neither learned search nor interactive work, nor were they fully familiar with information technologies. The most important reason is the lack of adaptation to the needs of the society and the course headlines”* (P8. Line 49).

Table 2: The sub-themes and semantic units extracted for the challenges and barriers of implementing clinical librarianship in Iran

Categories	Part of the extracted semantic unit
Librarians' unwillingness to provide information services	The lack of self-confidence of librarians. We could not prove ourselves, which is due to the weakness of the educational system, and we, as librarians, have not done our job properly, and we have not been inclined to do this.
Lack of proper communication skills	It's our training. We didn't learn the required skills in theory-based lessons to become clinical librarians in our bachelor's, master's, or even doctorate courses
Shortage of suitable trainings for job needs	The course units presented to the students during their studies did not have any application after graduation; they learned no searching skill or interactive work and are not familiar with information technologies. The most important reason is the lack of adaptation to the needs of the society and the course headlines
Insufficient organizational support	Lack of sufficient support for the discipline from the ministry and other governmental bodies is a big challenge facing this profession if approved.
Not having enough knowledge of new technologies and professional skills on the part of librarians	They neither learned search nor interactive work, nor are they fully familiar with information technology. The most important reason is the lack of adaptation to the requirements of the society and the course headlines

Theme 2: Implementation strategies for clinical librarianship

The second category includes five subcategories as follows: introducing and informing librarians' abilities, creating an academic discipline, recruiting interdisciplinary students, producing suitable content for improving librarians' skills, and supporting custodian and executive organizations (Table 3).

The solutions and training programs necessary to change the role and job status of medical librarians to clinical librarians depend on the support of executive organizations, educational curriculum of universities, and empowering the associated librarians. Looking for problems and challenges to provide a suitable solution from the standpoint of a group having working experience with the treatment team is considered the most realistic method of problem solving. And from the managerial point of view, the decision to implement solutions is based on full awareness of the scope of challenges. The experience of librarians who have collaborated with the clinical team leads to informed solutions based on real needs. Thus, in certain obstacles, most librarians mentioned the weakness of training and professional skills, and more importantly, the lack of organizational support in creating a job position to define the clinical librarian an official career to be accepted by both managers and treatment staff.

Table 3: The sub-themes and semantic units extracted for the implementation strategies of clinical librarianship in Iran

Categories	Part of the extracted semantic unit
Introducing and informing the abilities of librarians	Internship in hospital departments for students, familiarization with terms and different departments and information needs in hospitals may facilitate the acquaintance of the treatment team with clinical librarianship.
Creating a university discipline	Clinical librarianship should be developed through careful planning, and we should recruit top admitted students of the national entrance exam in this discipline so as to make it known and credible.
Recruiting people in an interdisciplinary way for master's and doctoral degrees	In my opinion, one of the solutions is to admit students from clinical fields or medical departments who are interested in librarianship at the master's and doctoral degrees.
Producing appropriate educational content with professional knowledge	Producing training packages in the form of educational videos and holding supplementary courses for those who want to acquire clinical librarianship skills
Support of custodian and implementation organizations	The ministry must consider an executive policy and performance plan for all hospitals and organizational positions for clinical librarians.

An issue that has been neglected so far is the lack of recognition and evaluation of skills and abilities of librarians in obtaining information. The appropriate solution would be to introduce and inform the skills and capacities of librarians to the clinical team depending on issues such as continuously providing information services to clinical staff through different ways. One of the participants said that *“internship in hospital wards for students, familiarization with different terms and wards, and the information needs in hospitals might contribute to the introduction of librarians to the treatment team, which will acquaint them with the information requirements of patients, nurses, and physicians”* (P6. Line 36).

To gain the trust of the treatment team and to provide high-quality information services, librarians must acquire the necessary professional and communication skills. Acquiring these capabilities depends on the empowering strategy of clinical librarians. This is accomplished in a group revising the educational curriculum of universities in accordance with empowerment and professional knowledge through short-term training courses,

using information technology to provide services and content production, fulfilling an internship course in clinical teams and therapeutic environments under the supervision of an experienced trainer in a therapeutic setting. According to one of the librarians, *“course headlines, especially in undergraduate courses, should train a clinical librarian or a real medical librarian, and the trainee should serve internship under the supervision of a clinical librarian”* (P1. Line 101). Another participant stated that *“holding practical courses for medical librarians to instruct necessary items of clinical work, providing training packages in the form of educational videos, audio and video files, as well as holding complementary courses for people willing to acquire the skills of a clinical librarian are required”* (P14. Line 82).

Information technology has been a contributing factor in recent years, facilitating educational processes and improving the personal skills of people, including librarians. Using these technologies to produce educational content for clinical librarians is considered a suitable solution because in this way, they can keep their knowledge updated without having to go through official and time-consuming paths. Producing educational content about new information services, acquiring job competencies and capabilities, and awareness of new medical technologies are helpful for updating specialized knowledge and skills. According to one of the participants, *“providing educational packages in the form of educational videos, audio and video files, holding training courses for people who want to participate, and bestowing a valid clinical librarian certificate to start this job would be useful”* (P14. Line 82).

Based on the scope of knowledge in various fields, especially medical treatment, creating an interdisciplinary academic discipline of clinical librarianship can highlight it in the field of health. Of course, librarianship is interdisciplinary in nature, so it is necessary to be integrated with medical field disciplines. Creating an official university course of clinical librarianship, recruiting talented people with MSc and PhD degrees from other fields of medical sciences can have positive consequences. Introducing the clinical librarian's services and skills to doctors and treatment teams based on academic education is a suitable solution in relation to the stabilization and promotion of the job position. One participant emphasized the importance of meticulous planning in the realm of clinical librarianship, suggesting recruiting top-performing students admitted through the national entrance exam to enhance the visibility and credibility of this discipline. By selecting talented students, this endeavor can garner substantial recognition, akin to the trajectory witnessed in genetics. Currently, there is a growing interest among students in pursuing this discipline. *“We can even set conditions for recruiting students in this discipline, which publicizes the discipline and increases our self-confidence”* (P6. Line 143). Another librarian believed that *“one of the solutions is to admit MSc students of clinical fields or medical groups that are interested in librarianship and information science”* (P13. Line 33).

The last cornerstone as a basic and constructive strategy to find and stabilize the position of clinical librarians by people who work in this field or want to work in the future is to create a job title for librarians in treatment teams with the support of custodian organizations (Ministry of Health, universities), which is a function of organizational support in creating a job position, implementing the presence of a librarian in the treatment team and feeling the need for an information specialist by the treatment groups. This issue can be supported by the Ministry of Health to stabilize the position and create a job title in hospitals for clinical librarians. According to two librarians, the need for librarian's presence and organizational support are important factors. One of the participants stated that *“if doctors presume that they can prescribe information in the*

same way as they prescribe medicine, a burden would be removed from their shoulders, which will affect the treatment of their patients. It means that the doctors' requirements may contribute to the stabilization of these conditions and creation of a job position for the clinical librarian" (P1. Line 102). Another librarian asserted that "the preliminary measures should be taken at the ministry level and implemented with the cooperation of medical sciences universities and hospitals in the form of a pilot study, and then the results should be extracted to develop a comprehensive program" (P9. Line 65). Another participant said that "the ministry should consider an executive policy and performance plan for all hospitals as well as an organizational position for the clinical librarian" (P10. Line 97).

DISCUSSION

Clarifying the obstacles to the implementation of clinical librarianship and providing suitable solutions through the standpoints of experienced librarians who interact in the clinical and research environments can provide beneficial and reliable content for managers to successfully and satisfactorily implement this role and create a job title by eliminating and reducing the obstacles in the new job position of health field librarians and its place in treatment teams. Moreover, educational materials are reviewed more realistically, so that training programs are customized to the job needs of librarians, and talented people are prepared for the new job environment. Previous studies have referred to the following challenges of this field: the lack of educational programs based on requirements of the society, principled and organized planning for clinical librarians training (Hashemian et al., 2018), the absence of a systematic approach to evaluate the impact of librarians on the hospital environment and its feedback (Marshall, 2022), organizational structures, attitudes towards the clinical librarian, poor self-confidence, communication with the treatment team, and the stressful therapeutic environment (Lyon et al., 2015). To solve this challenge and highlight the role of clinical librarians, it is necessary for professional associations representing health librarians to develop their educational policies related to specific qualifications for librarians working in health care. In addition, international cooperation should be solicited to develop educational policies and standards suitable for librarians and health libraries (Lawton & Burns, 2015).

The findings reveal two important issues regarding the implementation of clinical librarianship. First, the obstacles in implementing clinical librarianship in Iran, and second, the solutions to overcome these obstacles from the perspective of experienced people in providing information services to clinical and health groups.

Obstacles to implementation from the participants' standpoint are related to factors such as lack of attention to the importance of library and the role of librarians, deficient support from managers and executive organizations, shortage of sufficient skills of librarians to fulfill their role. Insufficient support from executive organizations and policymakers in the health field and the lack of job title for clinical librarians as well as relevant associations for librarians have complicated this problem. Related research studies have also confirmed this issue. Inadequate skills of librarians, insufficient human resources, lack of organizational support, and the perception and attitude of medical teams towards clinical librarian services are the obstacles to the implementation of clinical librarian role (Zare-Farashbandi et al., 2019; Lawton & Burns, 2015). Moreover, it has been determined that a significant part of the work and expertise of hospital librarians has not been clear to physicians and treatment teams. Many efforts have been made by librarians, including building relationships and interacting with healthcare workers, developing and

demonstrating the professional competencies of librarians, especially the importance given to evidence-based practice in clinical cares (Hanell & Ahlryd, 2021). In the study by Habibi et al. (2023), findings revealed that the majority of doctors were unfamiliar with the term "clinical librarian." Nonetheless, functioning as an information assistant, a clinical librarian fulfills a multifaceted role encompassing activities such as training clinical and research teams, furnishing them with requisite information, and implementing an EBM approach during the morning report. This approach underscores educational aspects and responsiveness to the information needs of the teams (Habibi et al., 2023).

Failure to adapt librarian trainings to job requirements (Bramble et al., 2018), lack of appropriate courses, official position and job title, absence of necessary infrastructure related to the Internet and evidence-based information resources (Hashemian et al., 2018), shortage of up-to-date and related knowledge of job skills for librarians (Lawton & Burns, 2015) are assumed as challenges for the success of clinical librarian role. The results indicated important challenges that should be taken into account such as irrelevance of educational materials to job requirements in the clinical environment, inappropriateness of most university and in-service educational materials, poor professional knowledge and skills' acquisition by the librarians and lack of communication skills for librarians to work in the treatment team. Other significant professional challenges for librarians are insufficient knowledge of modern information technologies and negligence of websites and up-to-date databases to provide information services to the treatment team. Also, the low skill level of health librarians in connection with evidence-based medicine and systematic reviews has led to the lack of trust in them among doctors (MacKenzie 2021).

The basic and constructive solution for defining and stabilizing the position of clinical librarians by experienced individuals is to create a job title for librarians in treatment teams with the support of custodian organizations (Ministry of Health, universities, and hospitals). Also, the librarian should be present in the treatment team, and the treatment groups must feel the need for an information science specialist. In previous studies, the service of responding the clinical questions of doctors based on critical evaluation and summarization of evidence by librarians has been noticed by clinical teams, indicating the ability and positive effect of the information specialist accompanying the treatment team (Barley et al., 2009). Three factors of recognizing those in charge of clinical librarianship and increasing attention to health librarians, proving librarians and their abilities, support and development of librarians' services, and training of librarians (Harrison et al., 2013) are required to improve and maintain the position of health librarians.

Also, the participants proposed suitable solutions to improve the conditions of librarians or reduce existing challenges such as introducing the skills and abilities of librarians to the clinical team, revising the educational programs of universities based on empowerment and professional knowledge required by clinical librarians, creating short-term educational programs, using information technology to provide services and content production, considering internship courses in clinical teams under the supervision of a librarianship expert with work experience in a therapeutic environment. In line with the present findings, previous studies have focused on the creation of new educational paths for librarians and increasing awareness of the need for presence of clinical librarians among other health professions (Tan & Maggio, 2013). Training a clinical librarian in accordance with official university programs, holding short-term training for previous graduates (Zare-Farashbandi & Hashemian, 2019), and acquiring technical and specialized skills in providing evidence-based information as an educational assistant for physicians (Lovasik et al., 2020) are appropriate strategies for the future career of clinical librarians.

Producing suitable educational content to update the professional knowledge of librarians, creating the academic discipline of clinical librarianship, and attracting talented people from other fields of medicine are assumed as proper solutions to stabilize the clinical librarianship job position and to obtain academic education support for the role change from medical librarianship to clinical librarianship. Skills and technology in information management (Wu & Mi, 2013), having up-to-date skills and professional knowledge (Lawton & Burns, 2015), issuing official certificates based on the acquisition of clinical librarianship skills, ensuring minimum knowledge in performing the clinical librarian tasks (Bramble et al., 2018), practical and targeted training, increasing specialized skills and recruiting clinical librarian experts, as well as development of library school training based on librarian job changes (Lawton & Burns, 2015) are appropriate methods for creating job positions and the required knowledge. Besides, the existence of a sponsor is necessary to understand and create a real position for the clinical librarian as an effective member of the clinical team (Santos, 2018). To acquire the necessary skills as a clinical librarian, it is necessary to develop appropriate training programs in the form of educational materials, and the first step is to determine educational needs based on the educational goals to be formulated (Hashemian et al. 2021b).

CONCLUSIONS

The results indicated that the main barriers to the implementation of clinical librarianship are related to organizational obstacles and the lack of support from executive organizations. Other factors such as the absence of appropriate training programs and adequate skills to enter the treatment teams have made the issue more complicated. The so-called concerns have prevented the clinical librarianship from obtaining approval/being approved/accepted as an independent job position in the clinical team, and the librarians who work informally in this field have not been able to possess a suitable and satisfactory job position. The solutions are dependent on the support of executive organizations such as the Ministry of Health, hospitals, and universities. The Ministry of Health and hospitals can contribute to the creation of job titles and inclusion of information specialists in medical teams and universities so that an official and independent academic discipline is created, appropriate educational programs are developed, and capable people who can be directly helpful are attracted. The basic needs of librarians are motivation, respect, and job position. This should be done in two phases. The first is related to universities, the Ministry of Health, and hospitals, which should be assessed and implemented in educational programs, training of librarians, and creation of job positions, appropriate salaries, and relevant associations for librarians. The second phase is related to the librarians who should automatically provide services, acquire communication skills, and constantly update their knowledge and skills. The strengths of this study are related to identifying the existing obstacles regarding the purpose of the study and finding logical solutions to solve them by managers and educational planners as well as making librarians aware of the conditions and skills necessary to create new roles and professions in their job positions. Useful suggestions would be creation of an independent academic discipline or a branch of medical librarianship in the educational departments of medical science universities, generation of information packages to strengthen and update the knowledge of librarians active in clinical environments, holding short-term courses related to effective communication in the work environment, and promotion of teamwork for librarians to participate in the treatment team.

The participants were librarians who have had working experience with a clinical team or a research study related to clinical librarianship and had entered the study voluntarily. The study sample was selected based on access to librarians who were mostly residents in Tehran. Other librarians in other cities of Iran might have had experiences related to the barriers of clinical librarianship implementation. To generalize the offered solutions, physicians and other librarians, officials, and lecturers from other cities may be asked to participate in future studies. In addition, it should be noted that those who have studied librarianship have suitable conditions for employment in the position of hospital or clinical librarian. It is necessary to repeat such a study in future, with its main focus only on those holding a university degree in the field of medical librarianship and information and also provide services in the position of clinical librarian or information assistant.

ACKNOWLEDGEMENT

No grant from any public, commercial, or non-profit funding agency was offered for the conduct of this research.

AUTHOR DECLARATION

The study procedure was approved by the Medical Ethics Committee of Iran University of Medical Sciences [date: 28 Des 2018, ID: IR.IUMS.REC.1397.669]. The current study included only somebody who supplied their informed consent. Before starting the study, the informed consent of all participants was obtained according to the consent form (Appendix 2). All the information was private and nameless. All methods in the study were in accordance with relevant regulations & guidelines (General Ethical Guidance for Medical Research with Human Participants in the Islamic Republic of Iran). The datasets formed and investigated during this study are not publicly available to preserve the participants' privacy but are accessible from the corresponding author on reasonable demand. The authors confirmed that there are no known conflicts of interest associated with this publication.

AUTHORS CONTRIBUTION

Conceptualization: [Z.Dinpajuh, N. Mohaghegh, M.Zarghani], Methodology: [M. Zarghani, M. Khazaei-Pool], Formal analysis and investigation: [Z.Dinpajuh, M. Zarghani, M. Khazaei-Pool, A. Ghamgosar], Writing - original draft preparation: [N. Mohaghegh, A.Ghamgosar, S. Khani]; Writing - review and editing: [all authors]

REFERENCES

- Aitken, E. M., Susan E. P., Renée D. R., & William A. (2011). Involving clinical librarians at the point of care: results of a controlled intervention. *Journal of the Association of American Medical Colleges*, 86 (12), 1508-1512. <https://doi.org/10.1097/ACM.0b013e31823595cd>.
- Barley, E. A Murray J., & Churchill R. (2009). Using research evidence in mental health: user-rating and focus group study of clinicians' preferences for a new clinical

- question-answering service. *Health Information & Libraries Journal*, 26 (4): 298-306. <https://doi.org/10.1111/j.1471-1842.2008.00833.x>
- Bramble, J., Steidinger, S., Hamasu, C., & Austin, M. (2018). Clinical medical librarian licensure: Pros versus cons. *Medical Reference Services Quarterly*, 37(3), 306-311. <https://doi.org/10.1080/02763869.2018.1477719>
- Brettelle, A., Maden, M., & Payne, C. (2016). The impact of clinical librarian services on patients and health care organisations. *Health Information and Libraries Journal*, 33(2), 100-120. <https://doi.org/10.1111/hir.12136>
- Davies, K. (2009). Quantifying the information needs of doctors in the UK using clinical librarians. *Health Information & Libraries Journal*, 26(4), 289-297. <https://doi.org/10.1111/j.1471-1842.2008.00832.x>
- Greco, E., Englesakis, M., Faulkner, A., Trojan, B., Rotstein, R. E., & David, R. (2009). Clinical librarian attendance at general surgery quality of care rounds (morbidity and mortality conference). *Surgical Innovation*, 16(3), 266-269. <https://doi.org/10.1177/1553350609345487>
- Habibi, F., Sheikhsheaei, F., Mohammadpour, M., GhaziMirsaeid, J., & Modiramani, P. (2023). Challenges of the presence and absence of clinical librarians in the use of evidence-based medicine in clinical departments. *Medical Reference Services Quarterly*, 42(2), 108-124. <https://doi.org/10.1080/02763869.2023.2193123>
- Hanell, F., & Ahlryd, S. (2021). Information work of hospital librarians: Making the invisible visible. *Journal of Librarianship and Information Science*, 55(1), 70-83. <https://doi.org/10.1177/09610006211063202>
- Harrison, J., Creaser, C., & Greenwood, H. (2013). The status of health librarianship and libraries in the Republic of Ireland (SHELLI): A mixed methods review to inform future strategy and sustainability. *Health Information and Libraries Journal*, 30(2), 92-109. <https://doi.org/10.1111/hir.12030>
- Hartfiel, N., Girendra, S., Treadway, V., Lawrence, C., & Edwards, R. T. (2021). A clinical librarian in a hospital critical care unit may generate a positive return on investment. *Health Information and Libraries Journal*, 38(2), 97-112. <https://doi.org/10.1111/hir.12332>
- Hashemian, M., Adibi, P., Yamani, N., Rahimi, A., & Zare-Farashbandi, F. (2021a). Clinical informationist services challenges: a qualitative content analysis of the literature. *Journal of Hospital Librarianship*, 21(4), 319-327. <https://doi.org/10.1080/15323269.2021.1982257>
- Hashemian M, Zare-Farashbandi F, Yamani N, Rahimi A, Adibi P. (2021b). A core competency model for clinical informationists. *Journal of the Medical Library Association*, 109(1):33-43. doi: 10.5195/jmla.2021.1065.
- Hashemian, M., Zare-Farashbandi, F., Rahimi, A., Adibi, P., & Yamani, N. (2018). Clinical librarianship challenges in Iran. *Journal of EAHIL*, 14(2), 23-26. <http://ojs.eahil.eu/ojs/index.php/JEAHIL/article/view/232>
- Lamb, G., Jefferson, A., & White, C. (1975). And now, clinical librarians on rounds. *Hartford Hospital Bulletin*, 30(2), 77-86.
- Lawton, A., & Burns, J. (2015). A review of competencies needed for health librarians—A comparison of Irish and international practice. *Health Information & Libraries Journal*, 32(2), 84-94. <https://doi.org/10.1111/hir.12093>
- Lovasik, B. P., Rutledge, H., Lawson, E., Maithel, S. K., & Delman, K. A. (2020). Development of a surgical evidence blog at morbidity and mortality conferences: integrating clinical librarians to enhance resident education. *Journal of Surgical Education*, 77(5), 1069-1075. <https://doi.org/10.1016/j.jsurg.2020.03.024>
- Lyon, J. A., Gretchen M Kuntz, Edwards, M. E., Butson, L. C., and Beth Auten. 2015. The lived experience and training needs of librarians serving at the clinical point-of-care.

- Medical Reference Services Quarterly*, 34(3), 311-333. <https://doi.org/10.1080/02763869.2015.1052693>.
- MacKenzie, K. (2021). Nigerian medical libraries face challenges with high hopes for the future. *Evidence Based Library and Information Practice*, 16(1), 1-3. <https://doi.org/10.18438/eblip29890>
- Marshall, C. (2022). Measuring hospital libraries' impact on patient and hospital outcomes. *Journal of Hospital Librarianship*, 22(3), 171-178. <https://doi.org/10.1080/15323269.2022.2088200>
- Perrier, L., Farrell, A., Ayala, A. P., Lightfoot, D., Kenny, T., Aaronson, E., Allee, N., Brigham, T., Connor, E., Constantinescu, T., & Muellenbach, J. (2014). Effects of librarian-provided services in healthcare settings: A systematic review. *Journal of the American Medical Informatics Association*, 21(6), 1118-1124. <https://doi.org/10.1136/amiajnl-2014-002825>.
- Premji, Z., Fuller, K., & Raworth, R. (2020). A cross-sectional survey on academic librarian involvement in evidence-based medicine instruction within undergraduate medical education programs in Canada. *Journal of the Canadian Health Libraries Association/Journal de l'Association des bibliothèques de la santé du Canada*, 41(3). <https://doi.org/10.29173/jchla29458>.
- Royal, M., Grizzle, W. E., Algermissen, V., & Mowry, R. W. (1993). The success of a clinical librarian program in an academic autopsy pathology service. *American Journal of Clinical Pathology*, 99(5), 576-581. <https://doi.org/10.1093/ajcp/99.5.576>.
- Rudd, S., & Harding, S. (2021). Library and knowledge staff in England share similar perceptions of the roles and personal characteristics of the clinical librarian. *Health Information and Libraries Journal*, 38(4), 268-280. <https://doi.org/10.1111/hir.12365>
- Santos, M. A. A. (2018). Clinical librarian service in the Philippines: Experience in a critical care setting of a tertiary hospital. *Journal of Philippine Librarianship*, 38(1), 18-31.
- Scott, R. J. (2021). A best-fit solution: Transforming an NHS Library and Knowledge Service in readiness for a new hospital building without a traditional library space. *Journal of the Medical Library Association: JMLA*, 109(3), 483-490. <https://doi.org/10.5195/jmla.2021.1167>.
- Tahmasebi, M., Adibi, P., Zare-Farashbandi, F., Papi, A., & Rahimi, A. (2020). The educational role of clinical informationist on improving clinical education among medical students: Based on Kirkpatrick model. *Journal of Education and Health Promotion*, 9(1), 1-7. DOI:10.4103/jehp.jehp_439_19.
- Tan, M. C., & Maggio, L. A. (2013). Expert searcher, teacher, content manager, and patient advocate: An exploratory study of clinical librarian roles. *Journal of the Medical Library Association: JMLA*, 101(1), 63-72. <https://doi.org/10.3163/1536-5050.101.1.010>.
- Wu, L., & Mi, M. (2013). Sustaining librarian vitality: Embedded librarianship model for health sciences libraries. *Medical Reference Services Quarterly*, 32(3), 257-265. <https://doi.org/10.1080/02763869.2013.806860>
- Zare-Farashbandi, F., & Hashemian, M. (2019). The necessity of master's degree in clinical librarianship. *Journal of Health Administration*, 22(1), 9-11. <http://jha.iums.ac.ir/article-1-2851-en.html>.
- Zare-Farashbandi, E., Rahimi, A., Adibi, P., & Zare-Farashbandi, F. (2019). Involving clinical librarians in clinical settings: Skills, roles, advantages and barriers. *Journal of Hospital Librarianship*, 19(2), 144-155. <https://doi.org/10.1080/15323269.2019.1586291>.

APPENDIX 1

Interview Guideline

Research Details

Title: Challenges and Strategies to Implementing Clinical Librarianship in Iran

Ethics code: IR.IUMS.REC.1397.669

Clinical Librarian: A Clinical Librarian is a professional and qualified person responsible for meeting the information needs of medical and research team members and plays a key role in supporting clinical decisions through provision of high-quality information.

Questions

1. Tell me about yourself and give a brief report of your professional and research background? (Education level, job position and research)
2. What is the main challenge in performing the role of a clinical librarian?
3. What are the obstacles to implementing this role in hospitals?
4. In your opinion, what can be a basic solution to remove the obstacles?
5. What factors can promote the role of clinical librarians in hospitals?

APPENDIX 2

Informed consent form

Informed consent for the research on " Challenges and Strategies of Implementing Clinical Librarianship: A Case Study of Iranian Hospitals"

I, (participant's name in full) _____ agree to participate in the mentioned research project between 2020 and 2021 that was approved by the Medical Ethics Committee of Iran University of Medical Sciences [date: 28 Des 2018, ID: IR.IUMS.REC.1397.669].

I understand that the text and recorded verbal or electronic communications with the researcher will be studied and may quote excerpts in a M.S dissertation and in future articles and journal articles that the researcher may write. I understand that my responses will be anonymous and that no identifying (personal) information will be disclosed in any written or verbal context.

I understand that my participation is completely voluntary and that I may withdraw from the study without explanation at any stage if I do not wish to continue.

Name:

Address:

Signature:

Date:

Signature of the researcher:

Date:

Researchers:
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Please keep a copy of this information for yourself and give one copy to the researcher.