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Original article

A Comparative Study of MSc Degree in Library and Information Science Curriculum in Selected Countries and Suggesting Up-to-date Courses with Medical Orientation

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Abstract

Introduction: The field of Library and Information Science has undergone many changes in recent years due to the close relationship of specialists in this field with information and communication technologies. Since the training of skilled and efficient staffing is the goal of any education system, this study aimed to review the Master of Science curriculum in LIS in the selected countries and suggest up-to-date courses with medical orientation.

Methods: This applied research is descriptive, reviewing universities' websites using the Delphi technique, conducted in two phases with checklist and questionnaire as data collection tools. In the first phase, the curricula of selected universities were collected. In the second phase, the summarized curricula were sent to faculty members of the Medical Library and Information Sciences departments at the Ministry of Health and Medical Education of Iran in the form of a questionnaire in two rounds of Delphi.

Results: The results indicated that 98% of the professors participating in Delphi agreed to update the curriculum. Moreover, Courses such as advanced scientometrics, familiarity with evidence-based medicine and its databases, clinical librarianship, advanced health research methodology, and familiarity with the basic concepts of source finder, and crucial indicators in evaluating information resources were their recommended majors to be included in the suggested syllabus in addition to those extracted from universities' websites, which were subject to survey by professors in the second round.

Conclusion: This research suggests that the professors' views of Delphi on curricula were primarily aligned with those extracted from universities' websites under study. Finally, the proposed syllabus was designed considering the review results of curricula and faculty members' opinions. The findings of this research can be a guide for curriculum and course planners at the Ministry of Health and Medical Education of Iran.

Introduction

One of the most crucial management resources in the health system is efficient, competent, and robust human resources. The World Health Organization (WHO) in 2006 saw this as an investment for today and the future (1). In today's world, universities are the primary custodians of educational programs for training human resources in scientific and specialized fields. However, the problem is that the pace of change and growth of career innovations is usually faster than the pace of change in educational programs, and the received

training often suffers from gaps such as reducing the level of knowledge of students and not recording the points offered by professors (2).

Research in Medical Library and Information Science (MLIS) has looked at this issue from different perspectives. In an article, Zare- Farashbandi and Daei (2017) have compared the curriculum of the master's degree in MLIS with the curricula of similar sub-disciplines in Iran. Findings indicate that the field under study is more similar to the similar field in the Azad

University than the related field in the Ministry of Science. Changing the topics of this field and creating sub-disciplines such as clinical librarian, hospital librarian, and evidence-based librarianship in master's degree can fill the existing gaps (3). Hosseini Rad et al. (2017), in an article evaluating the master's degree program in MLIS from the perspective of graduates in the field of responsive education, have found that the graduates of this field, the degree of compliance of the curriculum of MLIS with the scientific, personal, social, occupational and information needs of the medical community, was reported to be significantly lower than average. Therefore, the developed curriculum does not fully meet the needs of graduates, and it is necessary to revise the content and topics of the curriculum offered (4). Zarea Gavgani et al. (2011), in an article on the need to re-engineer the content of MLIS training programs, concluded that to meet the training needs of medical information specialists. It should be related to evidence-based medicine, critical thinking, research methods used in medical sciences, e-health, web, information technology, and mobile applications should be added to the existing curriculum to meet the professional needs of specialists in this field (5).

In an article, Pei et al. (2016) found that Information Technology (IT) courses cover a wide range of topics in Library and information Science (LIS). However, there are differences concerning countries/regions, program levels, and course types. The impact and coverage of IT training courses in LIS depend not only on the demands of the trainees but also to a significant extent on the IT development situation in the country/region. This study also showed that LIS education in five continents, with the impact of IT, makes educators, managers, and professionals face better knowledge and challenges in LIS education (6).

Santra Namita (2017), in examining the role of academic medical librarians in Malaysia, showed that the training roles of medical librarians have increasingly become their primary tasks. The activities they need to know in the field knowledge or expertise in seeking specific medical information are entirely diminished. Awareness of emerging skills and teachings was also assessed as destitute. University education was limited to specializing in the medical fields. It is recommended that opportunities be created for librarians to have more educational opportunities in the field of librarianship so that they can provide better professional performance (7).

Iris Kovar (2017) noted that as technology has infiltrated the design and presentation of the medical school curriculum, health science librarians can embrace emerging opportunities to participate in curriculum design. For example, a new medical librarian in Michigan State University Libraries deployed its database outside of established tasks, learned new skills, and challenged preconceived notions about the role of librarians. In the process, he became a partner in copyright education. These projects helped create a database for a new combined medical education curriculum and introduced new curriculum plans for librarians (8).

Ma et al. (2018), by examining the emerging roles of health information professionals to develop the LIS curriculum, have concluded that recognizing emerging and evolving health information professionals (HIPs) has set a wide range of tasks and expectations. Furthermore, it does not meet the diverse needs of users. On the other hand, it is expected that changing medical approaches to provide evidence-based on the support of the information and scientific research is very different and up to date (9).

The studies indicate that the university libraries of medical sciences provide the necessary services and resources to support educational and research programs of higher education centers, school libraries as curriculum developers, and public libraries to increase public culture and knowledge. Creating, equipping, and managing libraries and information centers and providing better services requires specialized and trained personnel, highlighting the need for training specialists in MLIS. However, students in this field, especially in the master's degree, do not gain a clear understanding of the changes in technology during their studies due to the lack of updating of the curricula. In their professional activities, they face problems due to unfamiliarity with the technologies. Updating master's degree curricula are one of the suggested solutions to avoid this educational gap. Therefore, this study aims to compare the syllabuses of the MSc degree in LIS in selected countries and suggest up-to-date with a medical orientation in Iran.

Methods

This research is applied in terms of purpose and descriptive, which has been done with two methods of reviewing resources and curricula of selected countries and a two-stage Delphi technique for surveying experts.

The data collection tool was a checklist in the first step, which was completed by observing and referring to the websites of the studied universities. Moreover, in the second step, a questionnaire was sent in the first and second rounds to the faculty members of the field of MLIS. Using the Delphi questionnaire and method was to assess various opinions about the extracted topics. The following items were considered in the questionnaire:

1) Which countries?: Based on the questions raised in the present study, the United States, United Kingdom, Australia, India, and Iran have been considered, and three to five universities from each country have been selected according to the availability of courses on their websites.

2) Which universities?: Identifies the study community. In this study, the universities' websites with LIS in the studied countries were examined through search engines. The titles of the universities have been selected according to the available resources. Their course titles were on the websites, reviewed.

3) What is the topic?: Librarianship has been renamed in many universities worldwide (including the universities of the Ministry of Science in Iran, admitting students of LIS), but the content is selected according to the principles of librarianship. Therefore, when collecting the information of the topics, this name change was taken into account, and the course topics were presented in a comprehensive format and according to their dependence on the field of LIS.

The curriculum of LIS in selected domestic and foreign universities was selected according to information and communication technology development and new approaches. In the case of foreign universities, a country was selected from each continent, which according to the research objectives, are leading countries in LIS. Therefore, in this study, the universities of India from Asia, the United Kingdom from Europe, Australia from Eurasia, and the United States of America. The following items were considered in the questionnaire: top

libraries in the field of LIS. Then the titles of universities in those countries were searched. The information obtained from the universities is based on an Internet search and the latest content published on their websites, and their LIS curricula are collected through files (Portable Document Format) published on their information websites. The search method included the keywords "Curriculum," "Library Curriculum, Librarian Course," "Medical Librarian Course", "Health Librarian Course, Medical Librarian Course," "Knowledge Management Course," "Management Course," and "Data Management Course."

After that, the collected curricula were matched with the Iran's Ministry of Health and Medical Education (MOHME) curriculum in MLIS. Then, based on the extracted courses, a preliminary questionnaire was prepared and provided to several experts in LIS to confirm the validity of the content. After applying experts' opinions, the first round of the Delphi questionnaire, including the first part of the general information of professors, and the second part of the list of courses extracted in the first round was prepared, which was classified into three categories: skills, generalities, and practical. These courses

were offered for the Iranian MLIS training program. The scoring method is based on a five-choice Likert scale, including the extent to which professors agree with the suggested topics, including "Very Low: 1", "Low: 2", "Medium: 3", "High: 4", and "Very High: 5". The questionnaire was then sent to professors of MLIS via email for the survey. The number of universities participating in the survey was 11 universities. Delphi lasted two rounds, and the number of professors participating in the first round was 29 and in the second round was 27. Finally, according to the opinions of faculty members on the proposed courses, the suggested courses are announced as the result of the research.

Results

Information on the names of countries and universities, the field of study related to Library and Information Science (public or medical), and the number of course credits are presented in Table 1. This table shows the headings of 5 countries and 21 universities.

Table 1. Number of credits by universities studied in the research

Country name	University name	Name of the field of study	Course credits
India	University of Mysore	Library and Information Science	140
	Pondicherry University	Library and Information Science	75
	Gujarat University	Library and Information Science	96
	University of Madras	Library and Information Science	87
	Goa University	Library and Information Science	40
England	Sheffield University	Librarianship	180
	UCL University	Library and Information Studies	180
	University of Strathclyde	Information and library studies	180
	City University of London	Library Science	180
United States	Florida State University	Master of science in information	37
	The Catholic University of America	Library and Information Science	70
	University of Washington, Information School	Library and Information Science	63
	The University of Arizona	Library and Information Science	37
Iran	Iran Ministry of Health	Medical Library and Information Sciences	
	Iran's Ministry of Sciences	Information Science and Knowledge	
Australia	Charles Sturt University	Information studies (with specializations)	24-64
	University of South Australia	Information Management (Library and Information Management)	130.5
	Curtin University	Information management	400
	Monash University	Business Information Systems	96

In the first step of the research, the titles of the studied courses were classified into three categories, including basics or generalities, skills, and practical, and were then sent to professors in a questionnaire designed for the Delphi survey. These categories are as follows:

Basics or generalities: Concepts of research methods and statistics, medical references and databases, management of medical libraries and marketing of information services, management of medical libraries and marketing of information

services, digital library, theoretical foundations of MLIS, general medical, other items.

Skills: web design skills, e-learning, health information literacy, information resources management, programming and artificial intelligence, communication skills, science policy, information storage and retrieval, information systems, medical resources collection (with emphasis on digital resources), organization medical knowledge (with emphasis on digital resources), and other items.

Practical: Internship in medical libraries and clinical environments, dissertation, other items.

Faculty members participated in Delphi were 52% female and 48% male. Most of the participants were with a degree in librarianship (38%), a university degree of assistant professor (59%), a doctoral degree (22%), and 6-10 years of experience (24%). Most respondents were from Isfahan University of Medical Sciences (21%) and management schools (55%). Also, most members had work experience as a librarian (89%) and agreed to update the curriculum (98%). The results of the two Delphi rounds showed that not all professors believed that the current curricula did not meet the information and practical needs of medical librarians. Also, courses such as advanced scientometrics, familiarity with evidence-based medicine and its databases, clinical librarianship, entrepreneurship, advanced research methods in the field of health, familiarity with the basic concepts of source finder and essential indicators in evaluating information resources in addition to courses extracted from the websites of the studied universities were suggested titles for

inclusion in the proposed courses, which was put to a poll of professors in the second round.

The average responses of the participants in the survey indicate the need to change and update the curriculum in the field of MLIS. Table 2 shows the mean and standard deviation of the scores related to the surveyed topics in the two Delphi rounds. Advanced Statistics, Dissertation, Health Information Literacy, Information Systems, Medical Library Management, Information Services Marketing, Reference and Medical Databases, Information Storage and Retrieval have the highest average.

As shown in Table 3, in the second round of Delphi, most agreed with the proposal. This means that the faculty members' opinion in the survey is based on changing and updating the curriculum. In this table, the proposed syllabuses of the MSc in MLIS in three parts of the main courses, optional and compensatory courses, were identified, and faculty members' opinions about the courses offered are shown. Due to the limited number of courses in the MSc degree, we had to merge and change some syllabuses.

Table 2. The mean and standard deviation of faculty members' scores regarding MLIS courses

Row	Poll topics	Average responses (first round)	Average responses (second round)	Standard deviation (first round)	Standard deviation (second round)
1	Evidence-based medicine and its databases	-	4	-	1.03
2	Essential indicators in evaluating information resources	-	3.72	-	1.06
3	Basic concepts of source finder, blacklist, hijacked	-	3.38	-	1.16
4	Advanced statistics	4.7	4.74	0.51	0.52
5	E-learning	4.2	4.03	1.01	1.21
6	Medical terminology	-	3.81	-	1.03
7	Programming and artificial intelligence	3.8	3.7	1.09	0.91
8	Thesis	4.9	4.48	0.31	1.28
9	Information and research services in the field of health	-	3.34	-	1.19
10	Advanced research methods in the field of health	-	4.07	-	1.09
11	Non-English language	-	2.08	-	1.32
12	Information storage & retrieved data	4.7	4.65	0.53	0.62
13	Organizing medical knowledge (with emphasis on digital resources)	4.1	4.04	1.06	0.78
14	Other practical cases (workshop, ...)	4	-	0.5	-
15	Other basics or generalities	4	-	0.5	-
16	Other skill items	4	-	0.5	-
17	Research Seminar in Medical Library and Information Science	-	4	-	1.07
18	Health information literacy	4.3	4.42	0.95	0.64
19	Science policymaking	3.9	3.70	1.12	1.06
20	Information systems	4.6	4.57	0.67	0.57
21	Advanced scientometrics	-	4.38	-	0.69
22	Internship in medical libraries and clinical environments	4.6	4.14	0.76	1.09

Continue of Table 2. The mean and standard deviation of faculty members' scores regarding MLIS courses

Row	Poll topics	Average responses (first round)	Average responses (second round)	Standard deviation (first round)	Standard deviation (second round)
23	Entrepreneurship	-	3.76	-	1.17
24	Digital library	4.5	4.5	0.67	0.7
25	Clinical librarianship	-	4.11	-	0.99
26	General medicine	4	4	0.92	0.67
27	Theoretical foundations of Medical Library and Information Science	4	3.92	1.15	1.07
28	Collection of medical resources (with emphasis on digital resources)	4.1	3.92	1.11	1.07
29	Management of medical libraries and marketing of information services	4.2	4.46	0.79	0.64
30	Management of information resources (information and knowledge)	4.4	4.4	0.66	0.63
31	Medical references and databases	4.5	4.74	0.81	0.59
32	Concepts of research method	4.7	4.85	0.51	0.45
33	Communication skills	4.1	4	1.13	1.09
34	Web design skills	4	3.92	1.14	1.05
35	Writing an article in English	-	3.92	-	0.97
36	Independent study (teaching article types and article publishing process)	-	3.53	-	0.77
37	Indexing and abstracting with a new approach	-	4.14	-	0.77

Table 3. The final table of the proposed courses of MLIS based on the number of credits approved by the MOHME

Row	Name of Course	Type of lesson suggested	Number of total credits suggested	Number of proposed theory credit	Number of proposed practical credit	No answer	Very low	Low	To some extent	Much	Very much
1	Research Library in Medical Library and Information Science	Main	2	0	1	0	1	1	6	8	11
2	Advanced research methods in the field of health	Main	2	1	0	1	1	1	5	7	12
3	Clinical librarianship	Main	2	1	0	1	0	2	5	7	12
4	Advanced scientometrics	Main	2	1	0	1	0	0	3	10	13
5	Management of information resources (information and knowledge)	Main	2	2	0	0	0	0	2	12	13
6	Internships in medical libraries and clinical environments	Main	2	0	0	0	2	2	2	9	13
7	Management of medical libraries	Main	2	2	0	1	0	0	2	10	14
8	Digital libraries and information systems	Main	2	1	1	1	0	0	3	7	16
9	Information storage & retrieved data	Main	2	1	0	1	0	0	2	5	19
10	Advanced statistics	Main	2	1	1	0	0	0	1	5	21

Continue of Table 3. The final table of the proposed courses of MLIS based on the number of credits approved by the MOHME

Row	Name of Course	Type of lesson suggested	Number of total credits suggested	Number of proposed theory credit	Number of proposed practical credit	No answer	Very low	Low	To some extent	Much	Very much
11	Thesis	Main	6	0	0	0	3	0	0	2	22
12	Medical Databases (with Emphasis on Evidence-Based Medicine)	Main	2	1	1	0	0	3	5	8	11
	Total	**12 main titles**									
13	Familiarity with the basic concepts of source finder, blacklist, hijacked	Optional	2	1	0	1	1	6	6	8	5
14	Entrepreneurship	Optional	2	1	0	1	1	4	3	10	8
15	Web design skills	Optional	2	1	1	1	1	2	3	12	8
16	Independent study (teaching types of articles and the process of publishing an article with emphasis on English)	Optional	2	1	0	1	4	2	4	8	8
17	Science policymaking	Optional	2	2	0	0	1	2	8	9	7
18	E-learning	Optional	2	1	1	1	1	2	6	3	14
19	Health information literacy	Optional	2	2	0	1	0	0	2	11	13
20	Communication skills	Optional	2	2	0	1	1	2	3	10	10
21	Programming and artificial intelligence	Optional	2	1	1	0	1	1	7	14	4
	Total	**9 Optional titles**									
22	Medical terminology	Make-up	2	2	0	1	1	2	5	12	7
23	Theoretical foundations of MLIS	Make-up	2	2	0	0	0	4	4	9	10
24	General medicine	Make-up	2	2	0	0	0	1	3	18	5
25	Collection of medical resources (with emphasis on digital resources)	Make-up	2	1	0	2	1	0	3	14	7
26	Organizing medical knowledge (with emphasis on digital resources)	Make-up	2	1	1	2	0	1	4	13	7
	Total	**5 Make-up titles**									

Discussion

The first round of Delphi surveys of faculty members was conducted through a questionnaire. In addition to demographic questions, a survey was conducted on their experience in librarianship and the need to update course titles. Of all the surveyed forms, 28 out of 29 agreed with the curriculum update, and 26 had experience working as librarians. The results of the first round of the Delphi technique show that the courses of advanced statistics, dissertation, health information literacy, information systems, management of medical libraries and marketing of information services, reference and medical databases, and information storage and retrieval obtained the highest average. According to the information of the first and second rounds of Delphi, all the surveyed courses had a lot of positive opinions. In total, the advanced statistics courses, the concepts of research method, and storage and retrieval of information have obtained the highest average score in both rounds of Delphi.

The findings showed that updating the curriculum of MLIS is positive in the opinion of the vast majority of faculty members and is considered a requirement. According to Mokhtari (10), Torkiantabar (11), BazrAfshan (12), Bigdeli (13), Abotalebi and Biglu (14), Lotfi (15), Hosseini Rad (4), Zare Farashbandi and Daei (3), professors and faculty members of the university on updating the courses of MLIS have emphasized.

Also, considering that MLIS is considered an interdisciplinary field, even the extracted courses, considered make-up courses,

are essential, and surveys were taken from professors also confirm this issue.

Conclusion

The results revealed that the opinions of the members participating in Delphi about the courses were mainly in line with the courses extracted from the websites of the studied universities. Finally, using the results of reviewing the curriculum and the opinions of the faculty members, the proposed courses were designed in three parts: main, optional, and make-up courses. Since the field of MLIS is interdisciplinary, among the extracted courses, even the courses considered make-up courses are considered essential. The opinion of the professors participating in the survey also indicates this issue. According to the present study's results, creating indicators to update the courses is helpful due to the increasing speed of information and communication. In addition, it is necessary to create a database of resources and course references to update the curriculum. Creating an e-learning space for virtual courses in MLIS with the titles of single specialized courses is also beneficial.

The results of this study can be a guide for the use of curriculum designers in the MOHME. In addition, it is suggested to update the curriculum to use information technology, educational and up-to-date tools to improve the literacy level of medical librarians. It is also recommended to hold in-service and retraining courses.

Due to the time constraints for conducting this research, it is suggested that updating in-service training courses in MLIS should be considered to increase the level of literacy and skills of employed librarians in future research. Also, offering master's, short-term and in-service courses in e-learning is considered beneficial.

Declarations

Conflicts of Interests

The authors declare no conflict of interest.

Ethical statement

This study results from a thesis entitled "A Comparative Study of MSc degree in Library and Information Science Curriculum in Selected Countries and Suggesting Up-to-date Courses with Medical Orientation "at Tehran University of Medical Sciences in MSc degree with a code of ethics: IR.TUMS.VCR. REC.1397.147

Authors' contributions

All authors contributed to designing, running, and writing all parts of this study.

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