World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:13, No:6, 2019

Information Literacy among Faculty and Students of Medical Colleges of Haryana, Punjab and Chandigarh

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Abstract**—**With the availability of diverse printed, electronic literature and web sites on medical and health related information, it is impossible for the medical professional to get the information he seeks in the shortest possible time. For all these problems information literacy is the only solution. Thus, information literacy is recognized as an important aspect of medical education. In the present study, an attempt has been made to know the information literacy skills of the faculty and students at medical colleges of Haryana, Punjab and Chandigarh. The scope of the study was confined to the 12 selected medical colleges of three States (Haryana, Punjab, and Chandigarh). The findings of the study were based on the data collected through 1018 questionnaires filled by the respondents of the medical colleges. It was found that Online Medical Websites (such as WebMD, eMedicine and Mayo Clinic etc.) were frequently used by 63.43% of the respondents of Chandigarh which is slightly more than Haryana (61%) and Punjab (55.65%). As well, 30.86% of the respondents of Chandigarh, 27.41% of Haryana and 27.05% of Punjab were familiar with the controlled vocabulary tool; 25.14% respondents of Chandigarh, 23.80% of Punjab, 23.17% of Haryana were familiar with the Boolean operators; 33.05% of the respondents of Punjab, 28.19% of Haryana and 25.14% of Chandigarh were familiar with the use and importance of the keywords while searching an electronic database; and 51.43% of the respondents of Chandigarh, 44.52% of Punjab and 36.29% of Haryana were able to make effective use of the retrieved information. For accessing information in electronic format, 47.74% of the respondents rated their skills high, while the majority of respondents (76.13%) were unfamiliar with the basic search technique i.e. Boolean operator used for searching information in an online database. On the basis of the findings, it was suggested that a comprehensive training program based on medical professionals information needs should be organized frequently. Furthermore, it was also suggested that information literacy may be included as a subject in the health science curriculum so as to make the medical professionals information literate and independent lifelong learners.

Keywords**—**Information, information literacy, medical colleges, medical professionals.

I. Introduction

INFORMATION Literacy is a skill, ability, expertise, capability and competency of a person that makes him able to find right information from the right source. It is basically to know information about information and the source of information. Information literacy is the competency that empowers one with the required knowledge about information, its nature and available formats; skills to fetch the relevant information by sifting the irrelevant, and attitude for consuming and sharing information, by ethical means and practices [1]. Various definitions have been developed by library professional associations and organizations. According to the American Library Association, information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" [2]. CILIP defines IL as "Information Literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner" [3]. An information literate person must learn to know, to do, to be and to work together. He should be able to make sense, ensure quality, learn independently, think critically, and use information ethically and strategically [4].

Medicine is, among many other sciences, an area in which the expansion of information is enormous and which is critically dependent on up-to-date information [5]. Medical as a profession is one of the most dynamic fields where new medicines and investigations keep coming daily. One needs to keep pace with the changing scenario of the medical profession as an active medical professional [6]. Another major problem with medical professionals is that they have less time for self-study, and therefore need to have information literacy skills. Information literacy is recognized as an important competency in medical education. The Association of American Medical Colleges' Report on Learning Objectives for Medical Education states that physicians must possess the "ability to retrieve (from electronic databases and other resources), manage and utilize biomedical information for solving problems and making decisions that are relevant to the care of individuals and populations [7]". In the field of medical sciences, it can occasionally be disastrous to be uninformed about recent developments and progress. No medical professional whether a general practitioner or a specialist, can adequately treat his patients without being informed of new views, new explanations, new treatment, new theories or new approaches in the various fields of medical sciences. It is said that medical practitioners are crucial life savers. The lack of information can mar a person i.e., the patient. Due to changes in the medical literature day by day, the information goes on increasing, but the medical professionals have less time for self-study as they have to spend most of their time in the treatment of patients and research. It is impossible for the medical practitioner to locate the information in the very less spare of time and to adequately read it. Thus, for all these problems, information literacy is the only solution.

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In their study, Biradar and Swapna found that 87.75% of the students could know the need of information on a topic and consulted library staff for locating the information, while 59.86% of the students could select suitable search terms and construct effective searches such as author search, key word search, title, subject, etc. using Boolean logic and truncation. A majority of respondents i.e., 89.79% could identify the citation elements for books and journals [8]. Ali studied that only 16.30% of the respondents chose the correct Boolean operator OR to get more search results; 81.8% were not aware of the use of a thesaurus in searching for preferred terms for a particular database, while 26.5% were familiar with the usefulness of encyclopedia in providing an overview summary of a topic [9]. Hadimani and Rajgoli studied that all the respondents were able to identify the source of the needed information. The results showed that 91.11% of the respondents were used to evaluating the gathered information by consulting other resources of information and by discussing it with teachers and friends; 47.77% used the copy/paste function; and, 83.33 % were aware of copyright and privacy laws [10]. Baro and Fyneman found that 75% of the students were aware and consult journals as source of information, 56% of the students were using references at the back of consulted books to obtain needed information, while 64% of the students consulted colleagues to obtain needed information. The Internet was used by 75% of the students as the main source of information to retrieve relevant material, and 74% were familiar with different search engines and used them as sources of information [11]. Joshi and Sharma studied that 46.8% of students needed information most frequently for general subjects. More than 95% needed information every week. Students needed assistance for document search (75.5%); document use (79.6%) and Internet use (70.2%). Their self-searching efforts yielded very low success rates for both printed and Internet resources. Of the respondents, 75.3% cited the documents they used for assignment preparation and 77.8% of the respondents were able to use MS-Word [12]. Singh and Joshi (2006) found that 34% of students agreed that the call number reflects the subject of a document, 40% students were aware that a Web page mention its creator, and 34%, 98%, and 96% students were aware that a bibliography is a list of books, a dictionary contains meaning of words, and an atlas contains maps, respectively [13].

II. Study Objectives

The specific objectives of the study were:

- To understand the respondents' purpose of information needs;
- To know the awareness of the respondents about different sources of information;
- To determine the respondents' ability to access and evaluate the traditional printed as well as electronic resources;
- To know how effectively the respondents are able to retrieve the required information from the sources;
- To know how satisfactorily the respondents are able to make use of the retrieved information for satisfying the information need;
- To know the opinion of the respondents regarding the present Information Literacy Program (ILP) of the Institution; and,
- To suggest measures to improve the existing ILP.

III. Research Methodology

The study was based on survey. In the present study, twelve medical colleges were selected for study purpose. Random sampling method was adopted for selecting samples. The total population of the study was 10732. A total of 1200 questionnaires were distributed among the respondents, out of which, 1079 duly filled questionnaires were returned and only 1018 questionnaires were found valid for the analysis.

Research Instrument

A questionnaire was designed to collect data from the population.

Data Analysis

The collected data were analyzed by using simple percentage method.

IV. Findings and Discussion

Out of 1018 respondents, 584 (57.37%) of the respondents belonged to Punjab, 259 (25.44%) to Haryana and 175 (17.19%) belonged to Chandigarh.

TABLE I
Purpose of Information Need

Purposes	Haryana N=259	Punjab N=584	Chandigarh N=175	Total N=1018
Research	110 (42.47)	290 (49.66)	93 (53.14)	493 (48.43)
Teaching	57 (22.01)	104 (17.81)	40 (22.86)	201 (19.74)
Assignment	127 (49.03)	262 (44.86)	60 (34.29)	449 (44.11)
Project Work	55 (21.24)	153 (26.20)	33 (18.86)	241 (23.67)
Subject Knowledge	167 (64.48)	413 (70.72)	115 (65.71)	695 (68.27)
Patient Care	118 (45.56)	284 (48.63)	77 (44)	479 (47.05)
General Awareness	101 (39)	259 (44.35)	82 (46.86)	442 (43.42)

Table I shows that the majority of respondents of Haryana (64.68%), Punjab (70.72%) and Chandigarh (65.71%) required information for updating their subject knowledge in the area of specialization.

Table II highlights that overall Search Engines (72.69%) and Text Books (72.20%) were frequently used information sources by the respondents of Haryana, Punjab and Chandigarh. On the other hand, Health Care Organizations (28.59) and Newsletters (26.92) were the least used information sources by the respondents.

Table III reveals that 25% of the respondents of Punjab, 19.31% of Haryana and 22.28% of Chandigarh were aware of the 'Call Number' which is required to find books on shelves

in the library. Thus, the respondents of Punjab were more familiar with the shelf arrangement than Chandigarh and Haryana.

TABLE II
AWARENESS WITH DIFFERENT SOURCES OF INFORMATION

Information Sources	Haryana N=259	Punjab N=584	Chandigarh N=175	Total N=1018
Text Books	189 (72.97)	422 (72.26)	124 (70.86)	735 (72.20)
Journal	138 (53.28)	338 (57.88)	121 (69.14)	597 (58.64)
Newsletters	69 (26.64)	160 (27.40)	45 (25.71)	274 (26.92)
Conference/Seminar Proceedings	85 (32.82)	197 (33.73)	70 (40)	352 (34.58)
Health Care Organizations	66 (25.48)	168 (28.77)	57 (32.57)	291 (28.59)
Theses/Dissertations	77 (29.73)	182 (31.16)	77 (44)	336 (33.01)
Reference Books	158 (61)	388 (66.44)	97 (55.43)	643 (63.16)
Medical Databases	108 (41.70)	262 (44.86)	129 (73.71)	499 (49.02)
Search Engines (Google, Yahoo etc.)	183 (70.66)	434 (74.32)	123 (70.29)	740 (72.69)
Wikipedia	137 (52.90)	314 (53.77)	117 (66.86)	568 (55.80)
Online Medical Websites (WebMD, eMedicine and Mayo clinic etc.)	158 (61)	325 (55.65)	105 (60)	588 (57.76)

TABLE III
TOOL FOR LOCATING DOCUMENTS ON SHELVES

Options	Haryana	Punjab	Chandigarh	Total
ISBN	31 (11.97)	108 (18.49)	13 (7.43)	152 (14.93)
Call No.	50 (19.30)	146 (25)	39 (22.28)	235 (23.08)
Title	120 (46.33)	225 (38.53)	103 (58.86)	448 (44.01)
Author	58 (22.39)	105 (17.98)	20 (11.43)	183 (17.98)
Total	**259 (100)**	**584 (100)**	**175 (100.00)**	**1018 (100)**

TABLE IV
TOOL FOR IDENTIFYING AVAILABILITY OF DOCUMENTS

Tools	Haryana	Punjab	Chandigarh	Total
OPAC/Web OPAC	170 (65.64)	453 (77.57)	106 (60.57)	729 (71.61)
Bibliography	25 (9.65)	39 (6.68)	15 (8.57)	79 (7.76)
Books in Print	19 (7.33)	41 (7.02)	10 (5.71)	70 (6.88)
Internet	45 (17.37)	51 (8.73)	44 (25.14)	140 (13.75)
Total	**259 (100)**	**584 (100)**	**175 (100)**	**1018 (100)**

Table IV shows that 77.57% of the respondents of Punjab, 65.64% of Haryana and 60.57% of Chandigarh chose the correct option 'OPAC/Web OPAC' which is helpful in identifying the availability of a particular book in the library. It was found that the respondents of Punjab were more familiar with the use of library catalogue than Chandigarh and Haryana.

Table V illustrates that 30.86% of the respondents of Chandigarh, 27.41% of Haryana and 27.05% of Punjab chose the correct option 'Medical Thesaurus' which is used for finding terminology specific to a database. Therefore, respondents of Chandigarh were more familiar with the controlled vocabulary tool than Haryana and Punjab.

TABLE V
USE OF CONTROLLED VOCABULARY TOOL

Options	Haryana	Punjab	Chandigarh	Total
Medical Dictionary	100 (38.61)	232 (39.73)	71 (40.57)	403 (39.59)
Medical Thesaurus	71 (27.41)	158 (27.05)	54 (30.86)	283 (27.80)
Search Engine	65 (25.10)	142 (24.32)	34 (19.43)	241 (23.67)
Do not know	23 (8.88)	52 (8.90)	16 (9.14)	91 (8.94)
Total	**259 (100)**	**584 (100)**	**175 (100)**	**1018 (100)**

TABLE VI
USE OF KEYWORDS

Combination of words	Haryana	Punjab	Chandigarh	Total
Aspirin for heart attack prevention	114 (44.02)	223 (38.18)	61 (34.86)	398 (39.10)
Aspirin heart attack prevention	73 (28.19)	193 (33.05)	44 (25.14)	310 (30.45)
Use of aspirin, heart attack prevention	54 (20.85)	137 (23.46)	47 (26.86)	238 (23.38)
Don't Know	18 (6.95)	31 (5.31)	23 (13.14)	72 (7.07)
Total	**259 (100)**	**584 (100)**	**175 (100)**	**1018 (100)**

Table VI shows that 33.05% of the respondents of Punjab, 28.19% of Haryana and 25.14% of Chandigarh were familiar with the use of keywords. Overall, only 30.45% of the respondents were familiar with the use and importance of the keywords while searching an electronic database.

TABLE VII
USE OF BOOLEAN OPERATORS

Boolean Operators	Haryana	Punjab	Chandigarh	Total
Lung Cancer AND Smoking	141 (54.44)	348 (59.59)	106 (60.57)	595 (58.45)
Lung Cancer OR Smoking	60 (23.17)	139 (23.80)	44 (25.14)	243 (23.87)
Lung Cancer NOT Smoking	25 (9.65)	53 (9.08)	12 (6.86)	90 (8.84)
Don't Know	33 (12.74)	44 (7.53)	13 (7.43)	90 (8.84)
Total	**259 (100)**	**584 (100)**	**175 (100)**	**1018 (100)**

Table VII depicts that only 25.14% respondents of Chandigarh, 23.80% of Punjab, 23.17% of Haryana chose the correct operator i.e. 'OR'. Thus, respondents of Chandigarh were more familiar with the Boolean operators than Punjab and Haryana.

Table VIII shows that 51.43% of the respondents of Chandigarh, 44.52% of Punjab and 36.29% of Haryana were familiar with the use of 'bibliography'; thus, the majority of respondents of Chandigarh were able to make effective use of the retrieved information than the respondents of Punjab and Haryana.

Tables IX and X depict that the majority of the respondents of Haryana, Punjab and Chandigarh rated their skills high for accessing information in print format, while there were more respondents of Chandigarh who rated their skills high for accessing information in electronic format than Punjab and Haryana. For evaluating information in print format, the majority of the respondents of Haryana, Punjab and Chandigarh rated their skills high for evaluating information in electronic format, while most of the respondents of Haryana and Chandigarh rated their skills average.

Table XI reveals that 48.33% of the respondents were satisfied, 31.43% were neutral and 20.24% were dissatisfied. It is clear from the table that majority of the respondents of Chandigarh were more satisfied with the ILP provided by their library than Punjab and Haryana. Almost the same percent of respondents were neutral in the satisfaction level, while the respondents of Haryana were more dissatisfied with ILP of their library than Punjab and Chandigarh.

TABLE VIII
USE OF BIBLIOGRAPHY

Sources	Haryana	Punjab	Chandigarh	Total
Library Catalogue	32 (12.36)	72 (12.33)	21 (12)	125 (12.28)
Bibliography from the article	94 (36.29)	260 (44.52)	90 (51.43)	444 (43.61)
Search the Database	33 (12.74)	134 (22.95)	22 (12.57)	189 (18.57)
Other issues of the Journal	100 (38.61)	118 (20.21)	42 (24)	260 (20.21)
Total	**259 (100)**	**584 (100)**	**175 (100)**	**1018 (100)**

TABLE IX
ABILITY TO ACCESS INFORMATION IN DIFFERENT FORMATS

Formats	Haryana N=259			Punjab N=584			Chandigarh N=175			Total N=1018		
	H	A	L	H	A	L	H	A	L	H	A	L
Print	168 (64.86)	65 (25.10)	26 (10.04)	310 (53.08)	240 (41.10)	34 (5.82)	128 (73.14)	39 (22.29)	8 (4.57)	606 (59.53)	344 (33.79)	68 (6.68)
Electronic	122 (47.10)	97 (37.45)	40 (15.44)	288 (49.32)	233 (39.90)	63 (10.79)	131 (74.86)	32 (18.29)	12 (6.86)	486 (47.74)	516 (50.69)	115 (11.30)

* *H= High, A= Average, L= Low*

TABLE X
ABILITY TO EVALUATE INFORMATION IN DIFFERENT FORMATS

Formats	Haryana N=259			Punjab N=584			Chandigarh N=175			Total N=1018		
	H	A	L	H	A	L	H	A	L	H	A	L
Print	136 (52.51)	94 (36.29)	29 (11.20)	291 (49.83)	234 (40.07)	59 (10.10)	97 (55.43)	57 (32.57)	21 (12)	524 (51.47)	385 (37.82)	109 (10.71)
Electronic	92 (35.52)	122 (47.10)	45 (17.37)	258 (44.18)	239 (40.92)	87 (14.90)	55 (31.43)	89 (50.86)	31 (17.71)	405 (39.78)	450 (44.20)	163 (16.01)

* *H= High, A= Average, L= Low*

TABLE XI
IL PROGRAM & SATISFACTION LEVEL

Satisfaction Level	Haryana	Punjab	Chandigarh	Total
Satisfied	114 (44.01)	289 (49.49)	89 (50.86)	492 (48.33)
Neutral	83 (32.05)	180 (30.82)	57 (32.57)	320 (31.43)
Dissatisfied	62 (23.94)	115 (19.69)	29 (16.57)	206 (20.24)
Total	**259 (100)**	**584 (100)**	**175 (100)**	**1018 (100)**

VII. CONCLUSION AND SUGGESTIONS

Information literacy is a major prerequisite for medical professionals. Keeping in view the various specializations in the area and the needs of the medical professionals, it is necessary for them to be equipped with skills or competencies that can help them to effectively retrieve, evaluate and use required information without wasting much time. Findings of the study indicated that only 23.08% of the respondents were familiar with the tool for locating documents on shelves in the library. For accessing information in electronic format, 47.74% of the respondents rated their skills high, while the majority of respondents (76.13%) were unfamiliar with basic search technique i.e., Boolean Operator, which is used for searching information in an online database. Thus, there is lack of awareness among the respondents regarding information retrieval tools, like, call number, controlled vocabulary tool, use of keywords and Boolean operators. Medical Library Professionals should improve efforts to develop a comprehensive training program or information literacy course, so that the existing gap between the capabilities and skills of the medical professionals can be improved. However, these instruction and training programs now need more refinement due to the growth of electronic and Web-based information resources. These training and instruction programs must be revised and improved in the electronic-era on a regular basis.

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