

Health Information Literacy Skills of Medical College Students in Punjab and Chandigarh

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Abstract

Health information literacy (HIL) is essential for health information professionals but studies reveal that many medical students do not have adequate competencies that are essential for searching, evaluating and accessing pertinent information. This study is an attempt to explore the HIL skills of medical students in Punjab and Chandigarh. A structured questionnaire was designed and data were collected from 126 students of 10 medical colleges and institutes in Punjab and Chandigarh. The results of this study reveal that updating knowledge, personal health needs, evidence-based practice and solving patients' health-related issues are major reasons for seeking health information. Majority of the students use the Internet, medical books and handbooks. MedlinePlus, WebMD, eMedicine, Mayo Clinic and PubMed Central are used by students, but majority of them confessed that they don't know enough and want to know more about these databases. Keyword/simple search is mostly preferred by students and the accessibility and availability of the sources are the main sources selection criteria. Key barriers to access health information are lack of time, awareness, infrastructure, poor Internet connectivity, information overload, and lack of library support and trained staff. The study concludes with a few recommendations for improving HIL skills of medical students.

Keywords: Health Information Literacy Skills, Health Information Resources and Services, Medical Students HIL Awareness, Information Search Strategies, Information Evaluation Criteria, Patient Health Information

Introduction

Over the past decades, medical and health information has grown at an explosive rate due to the developments made in medical and health sciences. In addition, with

the advent of ICT, this information is readily available to users. The major users of this information are health professionals and health consumers. But one should know how to access and use this available information. In the medical profession, information skills are taught at various levels as the medical professionals are confronted with information. The budding young health professionals who have just entered the profession, and are getting education in the field of medical science, can easily learn the competencies and skills needed for information evaluation. They are taught about Evidence-Based Medicine, which means that they have to support their clinical decisions with the best available evidence. Health information is needed for patient care, healthcare, teaching/training, research and planning. The required information is accessed through books, mass media, the Internet, health professionals, etc. The people are relying heavily on the Internet for the needed information. But the quality of the information found on the internet is not always reliable. So, how to evaluate the information available via the internet is the real problem now-a-days. This paves the way for Health Information Literacy.

Health Information Literacy

Basically, health information literacy (HIL) as defined by Medical Library Association (2005) is:

the set of abilities needed to: recognize a health information need, identify likely information sources and use them to retrieve relevant information, assess the quality of information and its applicability to a specific situation, and analyze, understand, and use the information to make good health decisions.

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HIL is an essential skill for health information professionals but many students lack important competencies, which are essential for finding and evaluating information (Ivanitskaya, Hanisko, Garrison, Janson, & Vibbert, 2012). So, an attempt is made in this study to explore the HIL skills of medical students of Punjab and Chandigarh.

Review of Literature

Information literacy of undergraduate students in the College of Health Sciences in Niger Delta University was studied by Baro, Endouware and Ubogu (2011) to find the awareness and use of different information resources and assess their ability to evaluate information before using. It was found that students mostly rely on textbooks, medical journals, the Internet, colleagues, and the Nigerian National University Commission's virtual library for information. Electronic resources such as MEDLINE, HINARI, the Cochrane Library, and EbscoHost are used rarely; the major reason may be lack of awareness and skills necessary to search databases. Lack of time, locating citable information, inability to use the medical library effectively, and poor information searching skills are the main problems faced by the students.

Hodgens, Sendall and Evans (2012) examined the self-perceptions of information literacy of postgraduate students before and after completing an online information literacy tutorial and the results showed improvement in information literacy skills. This indicates information literacy skills can be improved by implementing various information literacy programmes designed for the purpose. But after completing the tutorial, some students still had problems in locating quality information, analysis, referencing and plagiarism. Anduallem, Kebede and Kumie (2013) investigated the information needs and information seeking behavior of health professionals and it was found that though majority of them need health information but access to health information resources: internet, journals, library services is limited. Geographical, organizational, personal, economic, education status and time were identified as major barriers to information access. The study suggested conducting trainings and improving infrastructure as essential interventions.

Ma and Latham (2013) explored HIL of undergraduate students of Florida State University, who were seeking and using health information for self-care. The findings

of the study reveal that the Internet, people and print materials are the major sources used by students. Relevance, reliability, accuracy, trustworthiness and credibility were identified as criteria for evaluating health information. The major barriers in seeking health information were insufficient health literacy skills, weak information searching skills and difficulty in determining source authority, accuracy and reliability. The information literacy skills of faculty and students of Post Graduate Institute of Medical Education and Research, Chandigarh and Pt. B.D. Sharma University of Health Sciences Rohtak were studied by Suman and Sharma (2013). It was found that all the respondents under study were able to specify their information needs. Internet search engines, online medical databases, textbooks and journals are the frequently used sources and PubMed, MedlinePlus, MDConsult and UpToDate are mostly used databases. The respondents make use of Boolean operators in searching information and majority of them rate their information evaluation skills as average.

Zhang in 2013 conducted in-depth interviews of twenty undergraduate university students of Texas to study the use of information sources for seeking health- and wellness-related information. The results revealed that search engines, health websites, doctors and parents are the important sources of information. The students employ various source selection criteria significant among these are authoritativeness, accessibility, usability, trustworthiness, familiarity and personal interest. The study also provided implications for designing health websites and conducting health education programs. Sohail and Alvi (2014) investigated the use of web resources by students of Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh and revealed that all the students under study were aware of web resources and mostly make use of them for improving knowledge and finding information quickly. Maximum students find web resources reliable, search engines, especially Google and Yahoo, are preferred by students for searching and accessing web resources. The major barriers in using web resources are slow connectivity, excess of information and time consuming.

HIL of the University of Namibia students was investigated by Nengomasha, Abankwah, Uutoni and Pazvakawambwa in 2015 and it was found that the students are well aware of importance of health information and

able to seek health information. They know about the various sources of health information and prefer the Internet than printed sources. But still, some barriers such as difficulties in assessing the reliability of sources and difficulties in understanding health information hinder the use of health information. The students lack advanced health literacy competencies, which need to be enhanced. Rajender Kumar (2016) studied the usage of e-resources by post- and undergraduate medical students of Maharishi Markandeshwar University, Ambala (Haryana) and it was found that maximum students use search engines and electronic research reports frequently. Main reasons for using e-resources are updating medical knowledge, education, research and communication. Title and subject approaches are employed by most students in accessing e-resources followed by author approach and Boolean operators. Slow downloading, time consuming, expensive nature, lack of subject coverage and lack of training are the main problems in using e-resources.

Mullan et al. (2017) conducted a study of 374 university students enrolled in medical, allied health and nursing degree programs to determine their health literacy levels using the Health Literacy Questionnaire and it was found that health literacy profiles are different across student groups as the medical students had the highest score while the nursing students had the lowest score. The study suggests that for providing excellent patient-centred care, and also for self-care, future health professionals require a high level of health literacy. So, it is recommended that health literacy training modules tailored according to needs of the student groups, should therefore be included in university-based health professional degree programs. Haruna and Hu (2018) conducted a systematic review of literature on international trends in designing electronic HIL for health sciences students and it is found that though the Internet has become an essential source for seeking information for educational projects, academic activities, clinical practice and research, but HIL skills of these students are inadequate. Majority of students have limited skills for locating information from the Internet, evaluating and effectively using health information. The review concludes to develop and improve health information skill set of health sciences students through full-fledged programmes, which needs to be integrated in their health sciences education curricula for the effective location, critical evaluation and efficient use of online health information.

On the basis of review of these select studies, an attempt is made to study the HIL skills of medical students of Punjab and Chandigarh.

Objectives of the Study

The purpose of present study is to explore HIL skills of medical students of Punjab and Chandigarh. The specific objectives of the study are to:

- understand the students' ability to recognize health information need;
- know about their awareness and use of health information resources;
- know about the search strategies and evaluation criteria used by medical students;
- identify problems faced by these students in accessing health information; and
- ascertain the students' willingness to get training for improving HIL skills.

Scope and Limitations of the Study

The study is limited to 10 Medical Colleges/Institutes of Punjab and Chandigarh. The selected medical colleges/institutes are as follows:

1. Adesh Institute of Medical Sciences and Research, Barnala Road, Bathinda
2. Christian Medical College and Hospital, Brown Road, Ludhiana
3. Dayanand Medical College and Hospital, Civil Lines, Ludhiana
4. Gian Sagar Medical College, Banur, Patiala
5. Government Medical College and Hospital, Sector-32, Chandigarh
6. Government Medical College, Circular Road, Amritsar
7. Government Medical College, Patiala
8. Guru Gobind Singh Medical College and Hospital, Faridkot
9. Postgraduate Institute of Medical Education and Research, Sector-12, Chandigarh
10. Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar

Research Method Used

This study is based on survey method of research and a structured questionnaire was designed and used to collect data. The population covered in this study includes 118 MBBS students from 10 medical colleges and institutes of Punjab and Chandigarh, and eight MD students from PGIMER, Chandigarh. The questionnaire was distributed to 130 students; 126 students returned the duly filled in questionnaires. The response rate was 96.92%.

Data Analysis and Findings

The collected data are analyzed, tabulated and discussed in the following sections.

Demographic Profile of Students

The introductory section of questionnaire focused on general information about the medical students, which covered items on category, gender and age. This demographic information is tabulated below:

Table 1: Demographic Profile of Students

Category of students		%
MBBS	118	93.7
MD	08	06.3
Total	126	100
Gender Wise Distribution		
Male	73	58
Female	53	42
Total	126	100
Age Wise Distribution		
Less than 20 Years	09	07.1
20-22 Years	70	55.6
23-25 Years	37	29.3
26 Years and Above	10	08.0
Total	126	100

Table 1 shows the category of students covered under study. Majority of respondents (93.7%) are the students belonging to MBBS Degree and 6.3% are those pursuing MD Degree. The gender-wise distribution shows that 58% of respondents are male and 42% are female. It can also be seen from the above table that majority of respondents (55.6%) fall in the age group of 20–22 years. 29.3% belong to the age group of 23–25 Years, 8% fall under the category of 26 years and above, and remaining 7.1% come in less than 20 years category.

Ability to Recognize Health Information Need

A health information literate person should be able to recognize for what purpose he/she needs health information. There are a number of reasons for which medical students seek health information. This question was an attempt to ascertain the purpose for seeking health information by medical students. The table below presents the multiple responses received:

Table 2: Purpose of Health Information Seeking

Purpose of Health Information Seeking	%	
Class assignments	46	36.5
Personal health needs	55	43.6
Evidence-based practice	54	42.8
Updating knowledge	93	73.8
Queries from patients	53	42.06
No Response	07	05.6

It is obvious from the above table that majority of respondents (73.8%) seek health information for updating knowledge. About 43.6% seek it for personal health needs, 42.8% for evidence-based practice and 42.06% need health information for solving queries from patients.

Awareness and Use of Health Information Resources

Preferred Sources of Health Information

Information is available from a number of sources today. The use of the Internet is increasing day-by-day, and libraries are redefining their role. A question was asked from respondents to know about the sources preferred by them for searching health information and the figure below shows the results:

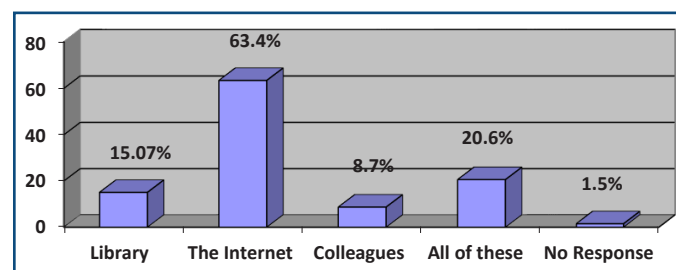


Fig. 1: Preferred Sources for Seeking Health Information

It is evident from Fig. 1 that the Internet, library and colleagues are important sources of information and the Internet is gaining popularity among medical students, and is preferred by 63.4% of students. 20.6% students still prefer to search health information from all the three sources, i.e., library, the Internet and colleagues.

Types of Health Information Resources Used

A present, information resources exist in various forms. Gone are the days when books were the only carriers of information. To explore the type of resources used and frequency of usage, a question was framed and results are shown below:

The above table shows that medical books and handbooks are still used daily by a large number of students (63), followed by Social Networking Sites which are used by 53 respondents. The mobile applications, colleagues, friends, health professionals and faculty members are also used as sources of information. Online health information sources and reference books are the other useful resources. Three respondents said that they are using other resources that include Google Scholar, Medscape database and Wikipedia.

Table 3: Types of Health Information Resources Used in Study (n=126)

Health Information Resources	Daily	Weekly	Monthly	Occasionally	Never
Medical Books and handbooks	63 (5%)	19 (15.1%)	06 (4.8%)	10 (7.9%)	00 (00%)
Reference books	23 (18.3%)	27 (21.4%)	10 (7.9%)	32 (25.4%)	01 (0.8%)
Medical journals	06 (4.8%)	10 (7.9%)	12 (9.5%)	36 (28.6%)	19 (15.1%)
Electronic journals and books	10 (7.9%)	07 (5.5%)	12 (9.5%)	25 (19.8%)	17 (13.5%)
Online health information sources i.e. health websites, portals, etc.	29 (23.0%)	19 (15.1%)	06 (4.7%)	28 (22.2%)	02 (1.6%)
Websites of medical organizations and associations (Government as well as NGOs)	13 (10.3%)	08 (6.3%)	09 (7.1%)	31 (24.6%)	20 (15.8%)
Healthcare institutions	10 (7.9%)	06 (4.7%)	08 (6.3%)	27 (21.4%)	20 (15.8%)
Government agencies	04 (3.1%)	05 (3.9%)	03 (2.4%)	25 (19.8%)	22 (17.5%)
Health professionals/ Faculty members	32 (25.4%)	17 (13.5%)	03 (2.4%)	26 (20.6%)	05 (3.9%)
Colleagues and Friends	48 (38.1%)	19 (15.1%)	02 (1.6%)	18 (14.3%)	00 (00%)
Mass media i.e. radio, television, newspaper, magazines, etc.	41 (32.5%)	10 (7.9%)	08 (6.3%)	22 (17.4%)	01 (0.8%)
Social Networking Sites (Facebook, Blogs, etc.)	53 (42.1%)	13 (10.3%)	05 (5.5%)	16 (12.6%)	06 (4.7%)

<i>Health Information Resources</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>	<i>Occasionally</i>	<i>Never</i>
Mobile Apps	47(37.3%)	22 (17.4%)	02 (1.6%)	18(14.3%)	02 (1.6%)
Health information search engines like MEDgle, etc.	16(12.7%)	05 (3.9%)	07 (5.5%)	15(11.9%)	16 (12.7%)
Any other	03(2.4%)				
No Response	12(9.5%)				

Use of Health Information Databases

following table helped in ascertaining the use of these databases by medical students:

The libraries are subscribing to a number of databases to provide access to valuable resources for their users. The

Table 4: Use of Health Information Databases (n=126)

<i>Database:</i>	<i>Know and Use This</i>	<i>Know but Don't Use</i>	<i>Don't Know but Wish to Know</i>
MedlinePlus	58 (46.03)	17 (13.5)	28 (22.2)
Mayo Clinic	30 (23.8)	17 (13.5)	30 (23.8)
WebMD	43 (34.1)	11(8.7)	30 (23.8)
Pfizer	09 (7.1)	09(7.1)	46 (36.5)
Science Direct	05 (3.9)	05 (3.9)	53 (42.1)
Scopus	01 (0.8)	07 (5.5)	54 (42.9)
PubMed Central	25 (19.8)	12 (9.5)	34 (27.0)
HINARI	04 (3.1)	04 (3.1)	55 (43.6)
EbscoHost	03 (2.3)	05 (3.9)	54 (42.8)
MD Consult	19 (15.1)	12 (9.5)	27 (21.4)
Clinical Key	11 (8.7)	07 (5.5)	45 (37.5)
Cochrane Database	04 (3.1)	05 (3.9)	51 (40.5)
Karger	04 (3.1)	03 (2.3)	51 (40.5)
Wiley Interscience	06 (4.8)	04 (3.1)	49 (38.9)
Ovid	05 (3.9)	04 (3.1)	51 (40.5)
Thieme	04 (3.1)	04 (3.1)	47 (37.3)
eMedicine	31 (24.6)	08 (6.3)	39 (30.9)
MerkMedicus	03 (2.3)	04 (3.1)	58 (46.0)
NLM Gateway	04 (3.1)	07 (5.5)	46 (36.5)
IndMED	09 (7.1)	06 (4.7)	39 (30.9)
No Response	25 (19.8)		

Table 4 shows that respondents know and use MedlinePlus, WebMD, eMedicine, Mayo Clinic and PubMed Central. It was interesting to find that majority of the respondents confessed that they don't know but want to know more about these databases. It was disappointing to note that 19.8 provided no response, which indicates that these students are not aware of these databases.

Database Search Trainers

When asked about who trained the students in searching databases, following responses were received:

It is clear from the above figure that 56.3 of respondents learned to use databases on their own. Also, 17.4 indicated that the faculty taught them database searching. The library staff contributed for 07.9 respondents and online tutorials were used by 04.7.

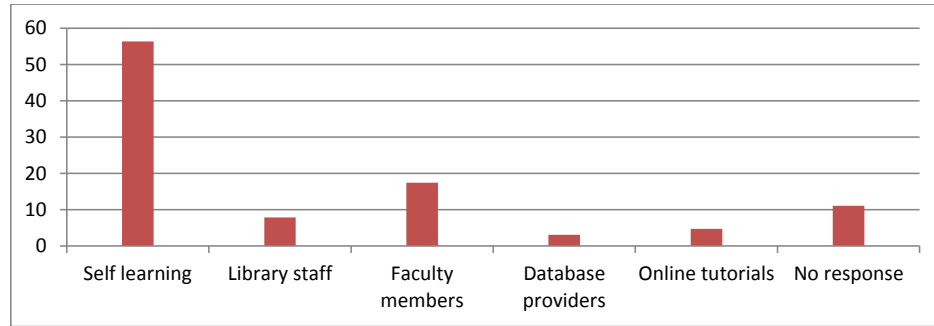


Fig. 2: Database Search Trainers

Search Strategies Employed for Searching Information

The medical students were asked about the search strategies, which they use for searching online databases. Multiple responses were received as they use more than

one strategy, the results are shown below:

Fig. 3 shows that majority of respondents (70.6) use Key word search/simple search, Help references are employed by 16.6 of respondents, closely followed by 15 respondents using advanced search options. Directories/site trees are used only by 5.5 of respondents.

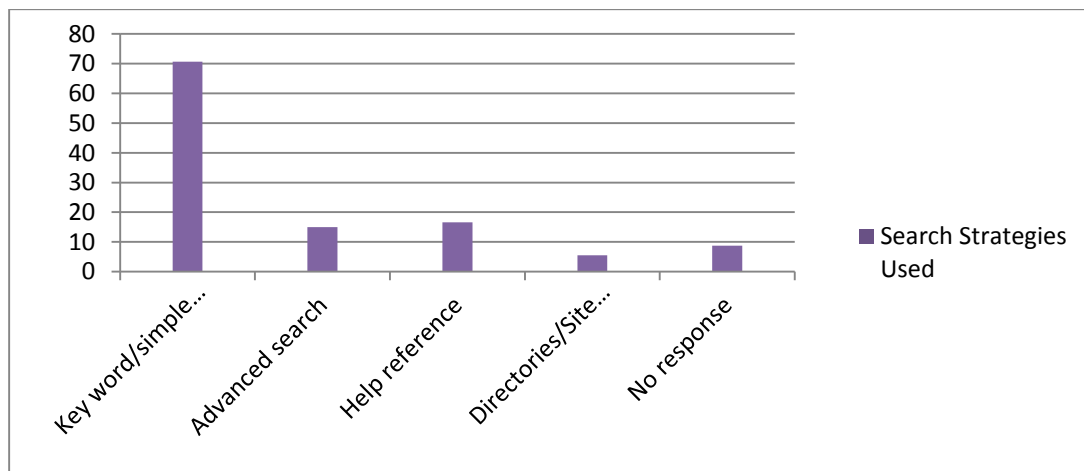


Fig. 3: Search Strategies Used

Evaluation of Health Information by Medical Students

Massive amount of information is now available on the Internet but it needs to be evaluated for quality. This

question was an attempt to explore the evaluation criteria, which the medical students use in selecting online health information. The results are tabulated below:

Table 5: Preferred Health Information Search Criteria

Preferred Health Information Search Criteria		
Source is available (Availability)	62	49.2
Source is easy to access(Accessibility)	69	54.7
Source is easy to use(Usability)	56	44.4
Familiarity with the source (Similarity/ Relevance)	38	30.1

<i>Preferred Health Information Search Criteria</i>		
Scope of the source	25	19.8
Source content is truthful or correct (Authoritativeness)	36	28.5
Content is up-to-date (Currency)	45	35.7
Content is specific or general (Specificity)	34	26.9
Easy to understand and use	40	31.7
Source content is not biased (Objectivity)	09	07.1
Recommended by faculty member	14	03.1
No Response	11	08.7

It was appreciating to note that majority of students evaluate information before using. It is obvious from the above table that most preferred criterion for selection of online health information is accessibility. The 54.7 students prefer a source because it is easy to access, 49.2 prefer due to the availability of the source, usability of the source was attributed by 44.4 of respondents. Currency (35.7), easy to understand and use (31.7), and similarity/relevance (30.1) were the other significant criteria preferred by these students.

Satisfaction and Problems in Searching Health Information Resources

Medical libraries provide access to large number of health information resources to the users. An attempt was made to know about the satisfaction level and problems faced by the students in searching web-based resources. Figure 4 presents the results:

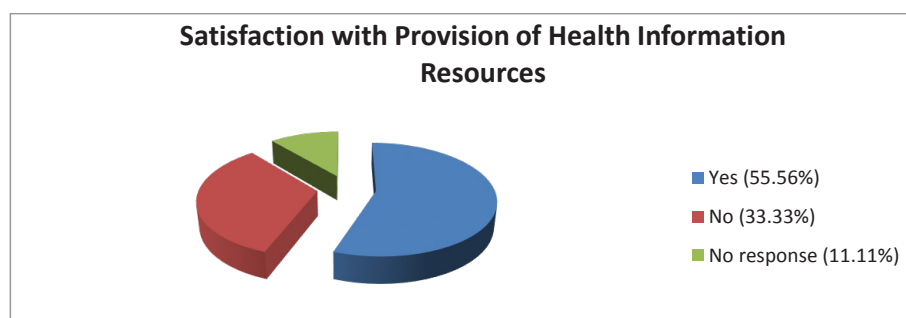


Fig. 4: Satisfaction with Provision of Health Information Resources

It was found that 55.56 students are satisfied with health information resources provided by their libraries and

33.33 are not satisfied; remaining 15.88 did not respond to this query.

Table 6: Problems in Searching Health Information Resources

<i>Problems in Searching Health Information Resources</i>		
Yes	34	26.98
No	72	57.14
No Response	20	15.88
Total	126	100

When questioned about the problems faced in searching web-based health information resources, it was revealed that majority of them (57.14) are encountering problems.

Barriers in Accessing Health Information Resources

A number of challenges hinder access to health information resources and the students under study were asked to list these barriers which are shown below:

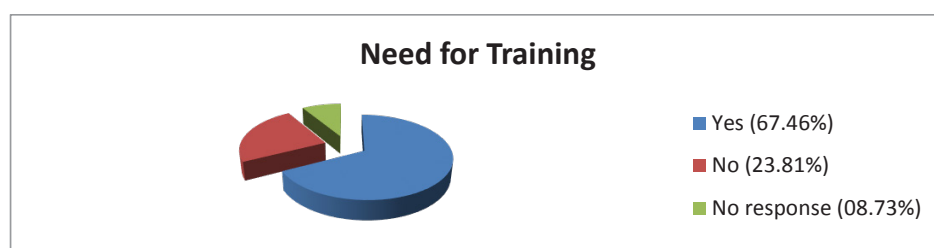
Table 7: Barriers in Accessing Health Information Resources

<i>Barriers in Accessing Health Information Resources</i>		
Lack of awareness	43	34.1
Lack of time	58	46.0
Distance to library	13	10.3
Lack of infrastructure	39	30.9
Inability to access information	18	14.2
Language barrier	10	07.9
Difficulty in understanding	10	07.9
High cost of information	20	15.8
Abundance of resources in subject field i.e. Information overload	26	20.6
Limited resources in your subject field	17	13.4
Lack of support from library/Lack of trained staff	25	19.8
Lack of searching guidelines	23	18.2
Poor Internet connectivity/Slow Internet speed	35	27.7
Poor search skills	14	11.1
Reliability of print v/s web based resources	21	16.6
No Response	20	15.8

The results reveal that lack of time (46) and lack of awareness (34.1) are major obstacles in accessing health information resources. Lack of infrastructure, poor Internet connectivity, information overload, lack of support from library/lack of trained staff, lack of searching guidelines, reliability of print v/s web based resources and high cost of information are other significant barriers being faced by medical students.

Need for Training in Searching Online Health Information Resources

An initiative was taken in this study to ascertain the students' willingness to get training on searching and using online health information resources, and the type of training programme required by them. The figure below represents the responses received:

**Fig. 5: Need for Training in Searching Online Health Information Resources**

It was encouraging to find that majority of respondents (67.46) are interested in getting training on searching online health information resources. When asked about

the type of programmes they wish to attend, the responses received are tabulated in table 8:

Table 8: Type of Training Programmes Needed by Students

<i>Type of Training Programme Needed</i>		
Online Training	26	30.5
Face to Face Training	44	51.7
Both	11	12.9
No Response	04	04.7

Table 8 reveals that majority of these respondents (51.7) require face-to-face training as they found it to be better than online training. 30.5 respondents were interested in online training and 12.9 agreed that both these training programmes can be of great help.

Provision of Health Information to Patients

One of the important segments of HIL is to provide quality information to patients. The medical students were asked if they are taught to search and provide quality health information to patients as part of their medical curriculum. If yes, then who are the trainers for the same? The responses are tabulated below:

Table 9: Provision of Search Training and Trainers for ‘Quality Health Information’

<i>Provision of Search Training to Patients</i>		
Yes	53	42.06
No	66	52.38
No Response (NR)	07	05.56
Total	126	100
<i>Trainers for ‘Quality Health Information’ to Patients</i>		
Library staff	00	00
Faculty Members	22	41.5
Both	20	37.7
On My Own	11	20.8
Total	53	100

From the table above, it was found that 52.38 respondents said that they are not trained to search and provide quality health information to patients. 42.06 respondents said that they are provided such training and majority of students (41.4) said that this training is provided by faculty members.

Conclusions and Suggestions

The findings of the study are consistent with the previous studies. Majority of students possess HIL skills as they can identify the purpose of needed information and seek information from various resources. Students are aware of various health information databases but majority of them confessed that they don't know but want to know more about these databases. The students use various search strategies like advanced search options, 'Help' reference, directories/site trees but Key word searches/simple search are more popular. Majority of students evaluate information before using and uses various evaluation criteria. The major barriers encountered by medical students in accessing health information are lack of time, lack of awareness, lack of infrastructure, poor Internet connectivity, information overload and lack of support from library/lack of trained staff.

In light of aforementioned discussions, it is suggested that librarians should work to develop and improve HIL skills of medical students as HIL skills can help budding health professionals to access health information resources effectively and communicate with patients in a better way. Also, as majority of respondents (67.46) want to get training on searching online health information resources, provision should be made by libraries to provide face to face as well as online training programmes for health professionals. Also, librarians should collaborate with faculty members to design programmes to train students for searching and providing quality health information to patients.

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