

**THE INFORMATION NEEDS AND SEEKING BEHAVIOUR OF
THE IMR BIOMEDICAL SCIENTISTS**

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ABSTRACT

Little attention has been focused on the information needs and information-seeking behavior of health science professionals in developing countries, particularly in Malaysia. This study explores the information needs and seeking behavior of biomedical scientists at the Institute for Medical Research (IMR), Malaysia, the oldest and leading medical research center in the country. A total of 84 questionnaires were distributed to the biomedical scientists and 54 filled-in questionnaires were returned with an overall response rate of 64.3 percent. The findings indicated that biomedical scientists use a variety of information sources to satisfy their information needs. Biomedical scientists who were solely involved in research work considered journal articles as the most preferred information source. On the other hand, researcher-cum-lecturers considered books as the most preferred information source in meeting their information needs. Both categories of scientists also considered interaction with colleagues as an important source for satisfying their information needs. The study also revealed that in spite of having access to modern and up-to-date digital information sources, most respondents still preferred using printed materials. Nonetheless, CD-ROM was the most utilized IT-based source. For the Internet-based information sources and applications, e-mail was the most popular while other applications were used infrequently.

Keywords: Information need; Information seeking behaviour; Scientists; Biomedicine; Research libraries; Special libraries; Channels of information.

INTRODUCTION

Information is inevitable to almost all jobs and professions. The need to become informed and knowledgeable individuals leads to the process of "identifying information needs". However, this process alone cannot work without knowing the ways individuals articulate, seek, evaluate, select and

finally use the required information, which is commonly known as “information-seeking behavior”. According to Devadason and Lingam (1997), the understanding of information needs and information-seeking behavior of various professional groups is essential as it helps in the planning, implementation and operation of information system and services in the given work settings. Therefore, the working environment and type of task performed by individuals shape their information needs and the ways they acquire, select and use this information. Several studies have shown a relationship between task complexity and information needs. Leckie, Pettigrew and Sylvain (1996) noted that “work roles and tasks largely determine information needs, while a number of factors ultimately affect which sources and types of information are used in a given situation”.

In the field of science and technology, adequate knowledge of scientists’ information needs is vital for libraries to effectively support their research activities. As stressed by Majid, Anwar and Eisenschitz (1999), a library is considered as the nucleus for any research activity and an essential ingredient for a viable research system, providing an account of previous intellectual endeavors which serves as a breeding ground for new concepts and ideas. Knowledge about the type of materials preferred by scientists is an important factor in determining and satisfying their information needs. Apparently, studies on information needs and seeking behavior of scientists can be traced back to the late 1940s (Renekar, 1993). Since then, a large number of studies have been undertaken on various aspects of information needs and seeking behavior of scientists, medical practitioners, engineers and technologists. Many studies have revealed that several factors such as cost, past success, accuracy, reliability, comprehensiveness, usefulness, currency, response time, accessibility, technical quality, and format contribute to the selection and use of different information sources by scientists (Shanmugan, 1999; Yang, 1998).

Premsmit (1990) reported that academic medical scientists in Thailand needed up-to-date information on various research studies for the identification of their research topics and relevant methodologies. Many studies have shown that journal articles were the most preferred information source by scientists and technologists (Majid, Anwar and Eisenschitz, 2000; Sam, 1996; Folster, 1995; Hart, 1993; Mwila, 1993). In addition non-traditional literature such as unpublished conference and symposia papers, research proposals, policy guidelines, and project reports were equally popular among scholars (Prasad, 1998). Previous studies have also suggested that scientists, besides using formal information communication sources, rely heavily on informal and interpersonal information channels to exchange information with their colleagues (Njongmeta and Ehikhamenor,

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1998; Omekwu, 1998; Reddy and Karisiddappa, 1997; Eager and Oppenheim, 1996). Grefsheim, Franklin and Cunningham (1991) noted that scientific meetings were the most frequent occasions for face-to-face contact between scientists and exchange of valuable scientific information. They also pointed out that personal communications were important as scientists could get useful information far before it was published.

Availability of electronic communication facilities such as e-mail, discussion groups, bulletin boards, electronic conferencing, chat, etc. have opened new channels for communication (Fidzani, 1998; Kuruppu, 1999). Hence, the spectacular advancements in computer and telecommunication technologies have opened new horizons for information creation, duplication, storage, access, distribution, and presentation. As a result, the information technology revolution is expected to bring significant changes in information seeking behavior of users [Kuruppu, 1999; Pelzer, Wiese and Leysen, 1998).

The importance of information to biomedical scientists is irrefutable. Obviously, health science is a continuously advancing discipline, involved in the development of various medicines, break-through in the control of various diseases and general improvement in human health. These advances are due to research activities undertaken by biomedical scientists, which in turn lead to the proliferation of medical information. Access to information is vital in responding quickly and effectively to the challenges and complexities of the health research environment. Consequently, information has become an integrated element to support medical research, teaching and clinical services. Creth (1993) commented, "information professionals must articulate and act upon a vision of making adequate amount of information available to health professionals so that their information needs can be met effectively". Therefore, adequate understanding of the information needs and information-seeking behavior of biomedical scientists is necessary for proper planning and improving collections, services and facilities of medical libraries. Realizing this need, many studies on this topic have been conducted in developed countries which reflects the information-seeking environment there. However, conditions in developing countries are considerably different which make it relatively difficult to befittingly apply data from the developed countries.

Appreciating the situation, this study investigates the information needs and information-seeking behavior of biomedical scientists working in the Institute for Medical Research (IMR), Malaysia. Scientists at the IMR carry out research on different aspects of medical sciences such as disease control

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and prevention as well as other pertinent health related issues and problems in the country (Institute..., 1997).

It is expected that knowledge gained through this study would be useful to the IMR library management for the future library planning and improving its performance and effectiveness. The results of this study may also be useful for other medical, science and technology (S&T) libraries in the country in evaluating and reorienting their collections, services and facilities. Similarly, this paper may help overcome the dearth of such studies in developing countries.

METHODS

The survey method of questionnaire was used for data collection. A total of 84 questionnaires were distributed to all research and medical officers, working as biomedical scientists or/and lecturers in the IMR. Only individuals with a minimum qualification of Bachelor in Science or Bachelor in Medicine were included in the study population, which comprised 59 research officers and 25 medical officers, specializing in different areas of medical research.

The survey instrument consisted of 5 sections with 21 questions. Section "A" dealt with the demographic characteristics of respondents such as affiliation, job position, gender, age group, highest academic qualification and length of research experience. Section "B" gathered data on the information sources used, while section "C" collected data on the methods used by the respondents for acquiring the needed information. Section "D" solicited data on the perceived role of medical librarians, and finally, section "E" was on the adequacy of information resources and physical facilities provided by the IMR library. Most of the questions were close-ended using Likert scales, with open-ended options. The questionnaire was pre-tested by 5 medical officers and a dental officer at the Medical Center of the International Islamic University Malaysia, to ensure clarity and validity. Although they were not medical scientists, it was assumed that they might be familiar with the medical research environment. Results of the pilot study showed that the respondents were able to understand the questions properly and their responses were interpretable.

In an effort to shorten delivery time and to overcome the risk of lost mail, the questionnaires were placed in the pigeonholes of the scientists. Respondents were requested to return the filled-in questionnaire to the Personnel Assistant of the IMR Director from whom these were collected

by the researcher. In total, 54 questionnaires were returned with an overall response rate of 64.3 percent.

RESULTS AND DISCUSSION

Respondents

Out of 54 respondents, 36 were working as researchers. The remaining 18 respondents held the position of researcher-cum-lecturer and in addition to their involvement in research activities, they were teaching diploma courses such as Diploma in Applied Parasitology and Entomology (DAP&E) and Diploma in Medical Laboratory Technology. Thirty of the respondents were female and 24 were male. Out of the 30 female respondents, 21 were researchers while the remaining were researcher-cum-lecturers. Fifteen of the male respondents were researchers and 9 were researcher-cum-lecturers.

Over one half of the respondents belonged to the age group “30-39 years”. Another 19 (35.2%) of them were in the age group “40-49 years”. Of the 53 respondents who provided information about their highest qualification, 10 (19%) held a Ph.D., 31 (58.4%) had a M.Sc. degree and 12 (22.6%) respondents had a B.Sc. degree. All 12 respondents with the basic degree and 2 respondents with a Ph.D. were working as researchers. The rest were researcher-cum-lecturers. For those who possessed a M.Sc. qualification, 67.7% were researchers and 23.3% were researcher-cum-lecturers. One half of the respondents had a work experience of 6-10 years. Sixteen (29.7%) of the respondents had more than 10 years of working experience.

Information Sources for Research Purposes

Table 1 presents data on information sources that respondents prefer to use to meet the information needed to support their research activities.

Forty-nine (90.7%) of the respondents considered journal articles as the “most preferred” information source to keep them abreast with current developments in the health science research. Thirty-three (61.1%) of the respondents valued books as “preferred” or “most preferred” information source. Other sources preferred were indexing and abstracting sources (56.6%) and reference materials (46.3%).

It is interesting to note that respondents considered communication with medical researchers in other local and overseas research institutions and universities as a more preferred source for getting the needed information compared to their IMR colleagues.

Newspapers were viewed less useful as 76% of the respondents regarded them as “less preferred” or the “least preferred” source for getting research related information. It was also revealed that 59.2% of the respondents each considered bibliographies and theses as “less preferred” or the “least preferred” sources for getting the required information.

Table 1: Preference for Information Sources Needed for Research

Source	N	Most Preferred	Preferred	Somewh at Preferred	Less Preferred	Least Preferred
Journal Articles	54	49 (90.7%)	5 (9.3%)	-	-	-
Books	51	9 (16.7%)	24 (44.4%)	16 (29.6%)	2 (3.7%)	-
Indexing & Abstracting Sources	53	14 (26.4%)	16 (30.2%)	16 (30.2%)	5 (9.4%)	2 (3.8%)
Reference Materials	51	10 (18.5%)	15 (27.8%)	20 (37%)	6 (11.1%)	-
Review Articles	53	12 (22.2%)	11 (20.4%)	9 (16.7%)	13 (24.1%)	8 (14.8%)
Communication with Medical Researchers in Local Research Institutions and Universities	54	2 (3.7%)	22 (40.7%)	14 (25.9%)	14 (25.9%)	2 (3.7%)
Communication with Medical Researchers in Overseas Research Institutions and Universities	54	4 (7.4%)	18 (33.3%)	11 (20.4%)	15 (27.8%)	6 (11.1%)
Communication with Colleagues within the IMR	54	1 (1.9%)	18 (33.3%)	24 (44.4%)	8 (14.8%)	3 (5.6%)
Conference/Seminar Paper	54	6 (11.1%)	12 (22.2%)	11 (20.4%)	16 (29.6%)	9 (16.7%)
Bibliographies	51	3 (5.6%)	6 (11.1%)	10 (18.5%)	16 (29.6%)	16 (29.6%)
Theses	53	1 (1.9%)	4 (7.4%)	16 (29.6%)	18 (33.3%)	14 (25.9%)
Newspapers	54	-	-	13 (24.1%)	28 (51.9%)	13 (24.1%)

In response to an open-ended option to find out information sources preferred by the respondents, two participants mentioned the Internet as the preferred information source for getting the required information. One respondent revealed that workshops were one of his preferred sources. Based on the findings, it appeared that information sources such as journal articles, books as well as indexing and abstracting sources were considered the most preferred information sources. Similarly, formal and informal

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communication with local and overseas researchers was also considered as a valuable source for getting the required information.

Information Sources for Teaching Purposes

Respondents involved in teaching were asked to assign their preferences for teaching to the same information sources used for research. Out of the 18 respondents involved in teaching, 17 (94.4%) regarded books as the “most preferred” information source for teaching purposes. Eleven (61.1%) of the respondents named journal articles as the second most preferred information source. Two other information sources “preferred” or “most preferred” by 50% and 40% of the respondents respectively were indexing & abstracting sources and reference materials (Table 2). Five (27.5%) of the respondents also reported their IMR colleagues as “preferred” or “most preferred” source for getting the required information for teaching purpose.

Table 2: Preference for Information Sources Needed for Teaching

Source	N	Most Preferred	Preferred	Somewhat Preferred	Less Preferred	Least Preferred
Books	18	17 (94.4%)	1 (5.6%)	-	-	-
Journal Articles	18	11 (61.1%)	2 (22.2%)	2 (11.1%)	1 (5.6%)	
Indexing & Abstracting Sources	18	3 (16.7%)	6 (33.3%)	6 (33.3%)	2 (11.1%)	1 (5.7%)
Reference Materials	15	1 (6.7%)	5 (33.3%)	9 (60%)	-	-
Review Articles	17	4 (23.5%)	2 (11.8%)	6 (35.3%)	4 (23.5%)	1 (5.9%)
Communication with Colleagues within the IMR	18	1 (5.6%)	4 (22.2%)	8 (44.4%)	4 (22.2%)	1 (5.6%)
Theses	17	1 (5.9%)	1 (5.9%)	8 (47.1%)	6 (35.3%)	1 (5.9%)
Communication with Medical Researchers in Local Research Institutions and Universities	18	-	2 (11.1%)	9 (50%)	6 (33.3%)	1 (5.6%)
Communication with Medical Researchers in Overseas Research Institutions and Universities	18	-	2 (11.1%)	7 (38.9%)	6 (33.3%)	3 (16.7%)
Conference/Seminar Paper	17	-	2 (11.8%)	6 (35.3%)	8 (47.1%)	1 (5.9%)
Bibliographies	17	-	2 (11.8%)	4 (23.5%)	8 (47.1%)	3 (17.6%)
Newspapers	17	-	-	5 (29.4%)	7 (41.2%)	5 (29.4%)

It was noted that newspapers, bibliographies and conference/seminar papers were comparatively less preferred information sources for teaching purposes.

Preferred Information Formats

Respondents were asked to indicate information formats preferred by them for meeting their information needs. It was found that the most preferred information format among the respondents was printed materials (49 or 90.7% respondents), followed by electronic/digital materials (25 or 46.3% respondents). On the other hand, 12 (22.2%) of the respondents regarded audio-visual materials as “less preferred” source for getting the required information (Table 3).

Table 3: Information Formats Preferred by Respondents (Multiple Response)

Channels of Information	N	Most Preferred	Preferred	Less Preferred
Printed Materials	54	49 (90.7 %)	5 (9.3 %)	-
Electronic/Digital Materials	53	25 (46.3 %)	28 (51.9 %)	1 (1.9 %)
Audio-Visual Materials	53	9 (16.7 %)	33 (61.1 %)	12 (22.2 %)

Library Visits

The frequency of respondents’ visits to the IMR library is presented in Table 4. Over 70% of the respondents visited the IMR library at least once or twice a month. Only 5.6% of the respondents visited the IMR library once or twice a year.

Table 4: Visit Frequency to the IMR Library (N=54)

Visit	Number	Percentage
Once or twice a week	21	38.9
Once or twice a month	17	31.5
Several times a year	13	24.1
Once or twice a year	3	5.6

Methods for Getting Information from the Library

Respondents were asked to indicate the methods employed by them to obtain the required information from their library. It was found that all

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respondents visited their library personally, though with varied frequencies. (Table 5).

Table 5: Information-Seeking Methods of Respondents (Multiple Response)

Method	N	Visit Frequency			
		Always	Frequently	Occasionally	Never
Go to Library Yourself	54	27 (50%)	9 (16.7%)	18 (33.3%)	-
Ask Support Staff to Get the Information	53	6 (11.3%)	15 (28.3%)	23 (43.4%)	9 (17%)
Call the Librarian	53	7 (13.2%)	10 (18.9%)	24 (45.3%)	12 (22.6%)
Write to Librarian	53	4 (7.5%)	7 (13.2%)	15 (28.3%)	27 (50.9%)

A popular method for getting information from the library was by asking the support staff to get the required information. Six (11.3%) of the respondents used this method “always”, 15 (28.3%) “frequently” and 23 (43.3%) “occasionally”. Of the 53 respondents, 41 (77.4%) respondents called the librarian and 27 (49.1%) wrote to the librarian to get the required information. It appeared that besides visiting their library personally, respondents used other methods for getting information from the library.

Use of IT-Based Sources and Facilities

Respondents were asked about their use of different IT-based information sources and facilities (Table 6).

Table 6: IT-Based Sources and Facilities Used by Respondents

IT-Based Sources & Facilities	N	Use Frequency			
		Frequently	Sometimes	Rarely	Never
OPAC	51	12 (23.5%)	18 (35.3%)	15 (29.4%)	6 (11.8%)
CD-ROM	50	18 (36%)	22 (44%)	7 (14%)	3 (6%)
Internet:					
e-mail	53	36 (67.9%)	14 (26.4%)	3 (5.7%)	-
Electronic Bulletin Boards & Discussion Groups	52	7 (13.5%)	15 (28.8%)	8 (15.4%)	22 (42.3%)
OPACs of Other Libraries	51	4 (7.8%)	16 (31.4%)	15 (29.4%)	16 (31.4%)
E-Shopping	50	1 (2%)	1 (2%)	9 (18%)	39 (78%)

Table 6 indicates that, of the 51 respondents, only 12 (23.5%) were “frequently” searching the OPAC and 18 (35.3%) respondents were only “sometimes” using it. The number of respondents using the CD-ROM databases “frequently” or “sometimes” were 18 (36%) and 22 (44%) respectively.

Respondents were also asked to indicate their use of various Internet-based sources and applications. All the respondents reported using e-mail - 67.9% “frequently”, 26.4% “sometimes” and 5.7% “rarely”. Electronic bulletin boards and discussion groups were “frequently” used by 7 (13.5%) and “sometimes” by 15 (28.8%) of the respondents. Access to the OPACs of other libraries and e-shopping were done by 35 (68.6%) and 11 (22%) of the respondents respectively. In general, the respondents used the CD-ROM and e-mail facilities more frequently.

Adequacy of Library Collections

Newspapers were regarded as “very adequate” or “adequate” by 16 (32%) of the respondents (Table 7).

Table 7: Adequacy of Library Collections

Library Collection	N	Very Adequate	Adequate	Somewhat Adequate	Inadequate	Very Inadequate
Newspapers	50	1 (2%)	15 (30%)	32 (64%)	1 (2%)	1 (2%)
Journals	53	-	13 (24.5%)	25 (47.2%)	14 (26.4%)	1 (1.9%)
Books	53	-	12 (22.6%)	25 (47.2%)	16 (30.2%)	-
Indexing & Abstracting Sources	51	-	11 (20.4%)	28 (51.9%)	12 (22.2%)	-
Review Articles	39	-	7 (14.3%)	17 (34.7%)	19 (38.8%)	6 (12.2)
Audio-Visual Materials	47	-	6 (12.8%)	23 (48.9%)	17 (36.2%)	1 (2.1%)
Reference Materials	49	-	3 (6.1%)	31 (63.3%)	13 (26.5%)	2 (4.1%)
Bibliographies	48	-	3 (6.3%)	23 (47.9%)	16 (33.3%)	6 (12.5%)
Conference/Seminar Paper	52	-	3 (5.8%)	22 (42.3%)	21 (40.4%)	6 (11.5%)
Theses	49	-	-	12 (24.5%)	15 (30.6%)	22 (44.9%)

Journals and books were considered “adequate” by 24.5% and 22.6% of the respondents respectively. Similarly, 20.4% of the respondents perceived the

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indexing and abstracting sources available at the IMR library as adequate. In contrast, of the 49 respondents, 22 (44.9%) regarded these as “very inadequate” in their library collection. It appeared that journals, books and indexing and abstracting sources were considered relatively adequate by one quarter of the respondents. Other information sources such as conference papers, review articles and bibliographies were considered “inadequate” or “very inadequate” by one half of the respondents.

Adequacy of Library Equipment and Facilities

Respondents were asked to provide their assessment on the adequacy of library equipment and facilities. The findings disclosed that of the listed options, air-conditioning was considered as the most adequate facility by 24 (47%) of the respondents (Table 8). About 44% and 43% of the respondents respectively considered the seating capacity and furniture as “adequate” or “very adequate”. On the contrary, OPAC terminals were considered “inadequate” or “very inadequate” by 50% of the respondents. Similarly, 45.7% of the respondents assigned the same assessment to microform equipment. Generally, respondents considered the physical facilities of their library as adequate whereas a majority of them showed dissatisfaction with various types of library equipment.

Table 8: Adequacy of Library Equipment and Facilities

Library Equipment and Facilities	N	Very Adequate	Adequate	Somewhat Adequate	Inadequate	Very Inadequate
Air-Conditioning	51	4 (7.8%)	20 (39.2%)	23 (45.1%)	3 (5.9%)	1 (2%)
Seating Capacity	50	2 (4%)	20 (40%)	23 (46%)	3 (6%)	2 (4%)
Furniture & Furnishing	51	2 (3.9%)	20 (39.2%)	26 (51%)	3 (5.9%)	-
Library Space	50	2 (3.9%)	17 (33.3%)	25 (51%)	4 (7.8%)	2 (3.9%)
Photocopiers	50	-	14 (28%)	28 (56%)	5 (10%)	3 (6%)
Microform Reading/ Printing Equipment	46	-	4 (8.7%)	21 (45.7%)	16 (34.8%)	5 (10.9%)
OPAC Terminals	44	-	1 (2.3%)	21 (47.7%)	20 (45.5%)	2 (4.5%)

Role of Medical Librarians

Discussing Information Sources with the Librarians

It was revealed that 7 (13%) of the respondents “frequently” and 20 (37%) “sometimes” discussed information sources suitable for meeting their

information needs with their librarians (Table 9). An equal number of respondents (27 or 50%) reported “rarely” or “never” having such discussions.

Table 9: Discussing Information Sources with Librarians

Discussion Frequency	Number (N=54)	Percentage
Frequently	7	13
Sometimes	20	37
Rarely	23	42.6
Never	4	7.4

Consulting Librarians for Research or/and Teaching

As summarized in Table 10, over 70% of the respondents “frequently” or “sometimes” consulted their librarians for getting the required information.

Table 10: Responses towards Consulting Librarians for job Tasks

Consultation Frequency	Number	Percentage
Frequently	10	18.5
Sometimes	29	53.7
Rarely	12	22.2
Never	3	5.6

Performance of IMR Medical Librarians

Respondents were asked their opinions regarding the performance of the IMR librarians in effectively meeting their information needs. It was found that 43 of the respondents perceived the performance of their librarians as “very good”, “excellent”, or “good”. None of the respondents rated the performance of their librarians as “poor”.

Table 11: Performance of the IMR Librarians

Evaluation	Number	Percentage
Excellent	2	3.8
Very Good	5	9.4
Good	36	67.9
Fair	10	18.9
Poor	-	-

Difficulties Encountered by Respondents

The findings revealed that over 70% of the respondents encountered difficulties in getting the needed information from their library. It was

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found that 68.5% of the respondents felt that unavailability of needed materials was the major reason for it. Two other problems indicated by respondents were inadequate equipment (16, 29%) and outdated library collections (4, 25.9%) (Table 12). Another 9 (16.7%) of the respondents felt that problems encountered by them were due to lack of medical subject knowledge among the librarians.

Table 12: Reasons for Problems and Difficulties Encountered
(Multiple Response)

Reasons for Problems and Difficulties	Number	Percentage
Unavailability of Needed Materials	37	68.5
Inadequate Library Equipment	16	29.0
Outdated Collections	14	25.9
Lack of Medical Subject Knowledge among Librarians	9	16.7
Non-Cooperative Library Staff	3	5.6
Librarians not Knowledgeable and Well-Trained	2	3.7
Disorganized Library Materials	-	-

Overall Satisfaction towards the IMR Library

It was found that one half of the respondents were either “very satisfied” or “satisfied” with the performance of their library (Table 13). On the other hand, no respondent was “very dissatisfied” with the IMR library.

Table 13: Evaluation performance of the IMR Library

Evaluation	Number (N=53)	Percentage
Very Satisfied	3	5.7
Satisfied	25	47.2
Partially Satisfied	24	45.3
Dissatisfied	1	1.9
Very Dissatisfied	-	-

CONCLUSIONS

The study led to the general conclusion that respondents used a wide array of information sources for satisfying their information needs. Those biomedical scientists who were solely involved in research work considered journal articles as the most preferred information source. However, researcher-cum-lecturers considered books as the most preferred information source followed by journals. However, it was found that major difficulties faced by respondents in getting the required information were mainly due to unavailability of materials and outdated collections. As suggested by some respondents, the IMR library should expand the availability of relevant materials and seek the opinion of users in the selection of library materials. The involvement of users in the selection process is expected to help develop library collections, which are more relevant to their information needs. Similarly, such involvement may also result in higher user satisfaction.

The findings of this study revealed that in spite of access to modern and up-to-date digital channels of information, most respondents still prefer to use printed materials. One possible reason for this under-utilization might be due to lack of knowledge about their availability and/or unfamiliarity with their capabilities and proper use. Users should be exposed to the usefulness and effectiveness of IT-sources in getting the current and up-to-date information. Furthermore, user education programs may also be beneficial in this regard. Such user education programs may help library users learn the effective use of digital information sources.

Since e-mail was the most used Internet-based information sources and applications, it should be extensively used for announcing and promoting library collections, services and facilities to its patrons. E-mail can also be used for answering day-to-day inquiries from users who may not have enough time to visit the library personally. It may help save their time and efforts in getting the needed information for effectively supporting their teaching and research activities.

It was noted that a considerable number of respondents raised the issue of inadequate medical subject knowledge among the librarians as one of the reasons for facing difficulties in getting the needed information. There is a need for medical libraries to take appropriate measures for enhancing the subject knowledge of their professionals, which may result in better communication with scientists and adequate understanding of their information problems and needs.

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