INFORMATION SEEKING STRATEGIES FOR MEDICAL PRACTITIONERS : A STUDY OF NORTH-EAST INDIA

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I, Shri Bijoy Bharali, hereby declare that the subject matter of this is the record of work done by me, that the contents of this thesis did not form basis of award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University / Institute.

This is being submitted to the North-Eastern Hill University for the degree of Doctor of Philosophy in Library & Information Science.

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CHAPTER 1

INTRODUCTION

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1.1. DEFINITION

The concept information is as old as mankind itself. It has been vital element of the development of mankind. However, there was no social awareness of its importance till late 17th century. The concept of information changed with the use of printing in mid-15th century and when first abstract journal appeared in 17th century, in the same form as today. This was a new information development, considered as a process through which science, arts, technology and culture became more accessible (*Curras*, 1997). Information has been increasing over the countries. New methods and technologies including computing have been used to process it. During last 2 decades, use of technologies in information processing has reached its peak. The use of computers and telecommunication to acquire, access, retrieve, display and evaluate information has continuously expanded in recent times. At the same time, traditional needs of communication have not ceased to grow. Books and journals proliferated as usual. During the 1990s there was an explosion of materials available on the Internet and of its use. It includes materials derived from such traditional forms of scientific and technical literature, such as journals, patents, data sets, directories, bibliographies, dictionaries and so on. Many publishers are

now moving towards the provision of electronic versions of primary journals in-toto.

Online interaction has provided much easier and speedier physical access to whatever information has been put into machine readable forms. However, intellectual access to materials on the internet are less structured, mainly restricted to some broad classification in directories, in net address and the semantic interaction implicit in hypertext links (*Vickery*, 1999). Therefore, one problem in present scenario is not a shortage of information or its transfer. The problem is in deciding what is useful and what is right. Although the methods to deliver the information services differ from traditional to digital. There is a clear commonality of purpose and mission among all the sectors and types of libraries : "TO ENABLE USERS TO GAIN ACCESS TO THE INFORMATION THAT THEY NEED" (*Brophy*, 2000).

The term information is easy to understand ~~and~~ but difficult to define. The concept information is used differently in specific disciplines and by individuals in different walks of life. Even though a general definition of information encompasses all the disciplines and allows frameworks, theories and results to be transferred across disciplinary boundaries, still independent definition of information seems difficult even though tried by various experts (*Losee*, 1997).

The literature, there seems no consensus to the answer what information is. For each and every field of human activity, information is an unavoidable component. "A single precise definition encompassing

all its aspects can in principle not be formulated because the term 'information' is used in so many contexts (*Belkin*, 1978). We have to agree with *Hayes* when he says "information is slippery concept, amesphous, loaded with connotations and implications and that it has had a variety of meaning and we must have a suitable definition even if it is at the elementary level (*Hayes*, 1969).

The term information has been derived from two Latin words '*formatio*' and '*forma*'. Both the terms convey the same meaning of giving shape to something and of forming a pattern. 'Information' was also Latin synonym for 'news'. Dictionaries define information as an action of telling or fact of been told of something news, intelligence or knowledge. Similar view of considering information and knowledge as synonymous term is expressed by various authorities (*Chandel & Saraf*, 1983).

Many definitions have been attempted. Various service have been also conducted on information definition (*Wellisch*, 1972; *Chandel & Saraf*, 1983; *Curras*, 1988; *Losee*, 1997). The term data and information are often used inter-changeably but they refer to two distinct concepts. Data are language, mathematical and other symbolic surrogates, which are generally agreed upon to represent people, objects, events and concepts. Simply stated data are raw facts. Information is data placed into a context for its recipient. Information generally carries the connotation of evaluated, validated or useful data (*Meadow*, 1992).

Information and knowledge is also often used inter-changeably but

there is a difference. Information when further processed becomes knowledge. "Only when men applies information in doing something, thus it became knowledge. Knowledge like electricity or money is form of energy, that exists while doing work" (*Duken*, 1968).

One of the theories view information as phenomenon and process. Information exists in its own right and produce a reaction that modifies our attitudes and state of knowledge. Information as process is developed consciously from data, documents or events. It is looked for, accepted, apprised and used. All processes produce information (*Curras*, 1997; *Losee*, 1997).

Another theory views information, which help in decision making or reducing uncertainty. The decision making process is only possible when information is received and utilized by the human mind (*Hoshvosky & Masey*, 1968; *Yovit et al.*, 1981; *Meadow*, 1992).

Further, information has 'newness' as a characteristic. Information adds, changes or repeat the representation what is known. Or "we have received we know something new that we did not know before it is always information about something" (*Mackey*, 1969 & *Welsman*, 1972).

Information is also defined in terms of message or signal conveyed or intended to be conveyed. "It is content message which is exchanged when adjusts environment in term is changed by the reaction of organism" (*Bhattacherjee*, 1996 *& Neelaghan*, 1980).

The above discussion of information makes it clear that generic definition of information is not possible. *Losee* has tried to attempt one

by defining information as a value attached to a characteristics or variable returned by a function or produced by a process. He defined "information is produced by all processes and it is the value of characteristics in the processes output that are information". The question remains whatever this definition encompasses all the characteristics, which have been mentioned above.

It is clear from the above description that information is complex in contexts, having more than one attribute and to arrive at agreed definition, encompassing all its attributes seems difficult. So, it may be better, though escapists approached to understand the attributes of information rather than defining it (*Chandel & Saraf*, 1983).

Many attributes or qualities associated with the concept of information assist us in identifying and describing specific information requirement. The various attributes from the above definition can be summarized as follows :

1. Data, information and knowledge are not synonymous terms.
2. Information can be data of value in decision making process.
3. Information is raw material from which knowledge is derived.
4. It has transforming effect on what is known or believed to be known by human being.
5. Information brings change in recipient image (rejection, addition to knowledge, filling up a gap in the initial knowledge or change previous knowledge structure).

In simpler terms, the various attributes or qualities, the information should have one as follows :

— Timely : The receipt of information within the time frame it is needed by the recipient.

— Precision : The measurement detail used in providing information.

— Accuracy : The degree of absence of error in information.

— Quantifiable : The ability to state information numerically.

— Verifiable : The degree of consensus arrived at among various users examining the same information.

— Accessible : The ease and speed with which information can be obtained.

— Freedom from bias : The absence of intent to alter or modify information in order to influence recipients.

— Comprehensive : The completeness of the information.

— Appropriateness : How well the information relates to a user's requirement.

— Clarity : The degree to which information is free from ambiguity.

1.2. INFORMATION NEEDS

There is no generally accepted definition in user studies about information needs. Despite, the certainty of the concept, the research efforts to analyze the concepts 'information needs' remains a fussy notion (*Crawford*, 1978).

The concept 'information need' as observed by several researchers have found different words used to describe the concept and identical terms used to mean different things (*Herner and Herner*, 1967); and the difficulty lies in the problem of separating the concept of 'information needs' from 'wants'; 'demands'; 'requirements' etc. (*Line*, 1974; *Robbert*, 1975).

The term 'need' is abstract, therefore difficult to define. The Oxford English Dictionary (1961) defines 'need' is "a state of want or distribution, lack of needs of subsistence or necessary articles, extensive poverty or indigence".

Wilson (1981) expresses that "information needs is 'wants', 'express demands', 'satisfied demands' and so on".

Menzel (1967) defines 'information needs' as "the demand or conscious wants of users". Information needs may be referred to (i) need 'expressed by user'; or (ii) need that 'user cannot express'; (iii) 'press-out' or 'immediate need'; (iv) 'future' or 'differed' or 'potential need'. Thus, these information needs can broadly be classified into three types of user information needs or approaches (*Brittan*, 1970) as followings :

1. Current information need or approach;
2. Immediate information need; and,
3. Exhaustive information need or approach.

Paisley (1968) clearly explains the following factors affecting the information needs : (i) the full array of information sources that are available; (ii) the uses to which information will be put; (iii) the background, motivation, professional orientation and other individual characteristics of the user; (iv) the social, political, economy and other systems that powerfully affect the user and his works; (v) the consequence of information use, e.g. productivity.

Krikelas (1983) relates 'information needs' with uncertainty. So information need is defined as awareness or recognition of not knowing or existence of uncertainty in the personal or work related life of an individual. He categorized needs as immediate or differed on the basis of behaviour. This seems to be essentially the same as *Childers* (1975) 'kinetic' (immediate need) and 'potential' (deferred) categories. He further said that, library oriented studies focus on immediate needs whereas, potential needs remain hidden and unconscious.

1.3. MEDICAL PRACTITIONERS

The Oxford English Dictionary (1961) defines practitioners as "one engaged in the practice of any art, profession or occupation; a practical or professional worker in any thing".

Therefore medical practitioner can be defined as one who is engaged in the profession of medicine.

A medical practitioner is one who practices medicines (Stadman's Medical Dictionary, 1967). Butterworth's Medical Dictionary (1988) defines medical practitioner as one having "regular application of medical knowledge and skill in the diagnosis and treatment of disease".

The medical practitioners can be classified into two groups, viz. clinicians and non-clinicians. The clinicians are those medical practitioners who are directly in contact with the patients whereas non-clinicians are medical practitioners who are not directly in contact with the patients. Broadly clinicians are those who practice on certain special medicines, e.g., Neurology, Dermatology, Psychiatry etc. whereas non-clinicians are those who cannot practice on special medicine. However, these medical practitioners can be general practitioners, e.g., physiology, pharmacology, anatomy etc.

Medical Council of India has clearly demarcated clinicians and non-clinicians as shown in the Table 1.1 :

Table 1.1 : Medical Practitioners (Clinical and Non-Clinical section).

SECTION	SUBJECTS
CLINICAL	General Medicine, Paediatrics, General Surgery, Orthopaedics, Oto-rhinolaryngology, Ophthalmology, Obstetrics and Gynaecology, Radiodiagnosis, Anaesthesiology, Psychiatry, Dermatology, Venerology & Leprosy, Dentistry.
NON-CLINICAL	Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Forensic Medicine, Community Medicine.

Source :- Medical Council of India (1999), Minimum Standard Requirements for the Medical College : For 150 admissions annually Regulations.

Besides this group, there are certain super specialized subjects available in Medical Colleges & Hospitals in the North-East India. These are namely, Cardiology, Neurology, Nephrology, Urology, Plastic Surgery, Paediatric Surgery, Cardiothorasic, Radiotherapy, Physical education and Rehabilition, Gastroenterology, Endocrinology, Hematology, Tuberculosis and Respiratory Diseases. These super specialized subjects are classified under clinicians.

Besides these two groups there are some clinicians who are not affiliated or attached to a college or hospital. These clinicians are doing practice privately by either having their own clinics or attached to private nursing hospitals. These medical practitioners have to have defined as Private Medical Practitioners.

Medical practitioners frequently need the information on medical science research, the diagnosis and treatment of disease and so on, these are known as medical information.

1.4. MEDICAL INFORMATION

The word 'information' is used in the context of user studies research, to denote a physical entity or phenomenon, the channel of communication through which messages are transferred or the factual data empirically determined, presented in a 'document' or transmitted orally (*Wilson*, 1981).

Medical information is the information related to medicines. It will include details of patients, treatment given, research conducted, drug

administered, operation theater schedules, management information used by medical practitioners, health services etc.

The other term used in the literature is 'health information'. The medical information comprises purely information on clinical practices whereas health information includes health management. Difference of interpretation between Europe where medical tends to include the full range of health professionals whereas in the US it usually refers to medical practitioners only (*Macdougal et al.*, 1996). Further, health information is being used to describe the field not specific to medicine but supportive of the full spectrum of health services (*Ball et al.*, 1988). The health care system comprises of the three elements (*Leckie et al.*, 1996) :

(1) Personal health care services available to individuals and families through hospitals, clinics, neighborhood centres, and similar agencies, and in physicians offices and the clients' own homes;

(2) The public health services needed to maintain a healthy environment; and

(3) Teaching and research activities related to the prevention and treatment of disease.

Thus health care includes many different groups of professionals namely – Medical practitioners, Nurses, Administrators, Pharmacists, Dentists, Dieticians, Physiotherapists etc.

For the purpose of this study, the term 'Medical Information' will be used instead of health information as the study is based on medical practitioners only.

The medical information can be classified into following types (*Gorman*, 1985) :

a) Patient Data : It refers to information about specific person. It includes his / her history, observations from physical examination, and results of diagnostic testing, and demographic information. The usual source of information is patient, his / her family and friends and the medical record.

b) Medical Knowledge : It refers to information which is generalized to the care of all patients. It may exist in the form of (i) original research in the medical journal; (ii) classic descriptions of disease including treatment in standard textbooks; (iii) informal experience of practitioners. Most of the information needs of medical practitioners are concerned with either medical knowledge or patient data or both.

c) Population Statistics : It is the information need related to aggregated data about groups or populations of patients. For most medical practitioners, access to formal population statistics has been through published descriptions of disease prevalence in the medical journal literature. However, this may not be applicable in a given situation because of ethnic compositions, life-style differences and other factors. These days vast amount of data about population statistics available on internet and other electronic sources, allows them better adopt medical practitioners to local population.

d) Logistic Information : It refers to local knowledge about how to get the job done. This is important in day-to-day medical practice as

other types of information, such information is most often obtained from local human resources such as office, hospital staff or colleagues. Though it requires much attention and effort on part of clinicians, logistic information has received relatively little attention from developers of medical information system.

e) Social Influence : It refers to knowledge about the expectations and beliefs of others, especially peers such as colleagues and consultants, but also including patients, families and others in the community. Social influences also receive less attention like logistic information. Even though evidence suggest that this type of information is quite important in determining what practitioner actually do.

Medical practitioners information needs mostly related to care and treatment of the patients, medical knowledge, patient data, drug information, physiological and psychological aspects of diseases (*Covell et al.*, 1985; *McClure*, 1982; *Wood*, 1991).

The information needs of medical practitioners pertain to :

(i) Quick reliable answer to questions relating to specific patient's health promotion;

(ii) Updating information on the technical aspects of his practice;

(iii) Continuing education, a stimulant to think, to read and enquire (*Wolfe*, 1995).

1.5. INFORMATION SEEKING BEHAVIOUR

Information seeking behaviour means the consequence of a need perceived by an information user. Because, user makes demand upon formal or informal sources or services in order to satisfy their needs, which results in success or failure to find relevant information. *Wilson* (1999) expresses that, information seeking behaviour arises as a consequence of a need perceived by an information user, who in order to satisfy that need, makes demands upon formal or informal information sources or services, which results in success or failure to find relevant information. If successful, the individual then makes use of the information found and may either fully or partially satisfy the perceived need – or indeed, fail to satisfy the need and have to reiterate the search process. In his model, he shows that part of the information seeking behaviour may involve other people through information exchange and that information perceived as useful may be passed to other people, as well as being used (or instead of being used) by the person himself or herself.

Wilson (1981) defines that, "information seeking behaviour as an alternative to the then common information needs." According to the author, information seeking behaviour results from the recognition of some need, perceived by the user who as a consequence makes demands on the formal systems such as libraries, information centres on-line service or some other persons in order to satisfy the perceived need.

Again, *Wilson* (1994) defines the user behaviour and considers the starting point of 'user studies' to be the individual user, who, in response to some perceived 'need' engages in information seeking behaviour 'identifies those aspects of information related activity that appear to be identifiable, observable and researchable'.

Others view of information seeking behaviour as path of communication". The paths pursued by individuals in the attempt to resolve an information need" (*Chen*,1982).

Behaviourable approach of *Ellis* (1989) shows the information seeking behaviour consulting set of strategies, viz., starting, chaining, browsing, differentiating, monitoring, extracting, verifying and ending.

Therefore, we can conclude that, information seeking behaviour is meant for those activities where a person may engage in identifying his or her own needs for information searching, for such information in anyway using or transferring that information.

While literature on potential needs and uses of information by science and technology continues to grow, yet there is lack of need for a conceptual, framework within which the enormous amount of data cumulated can be meaningfully integrated. *Paisley* (1968) identified five factors to be considered for proper conceptualization of user behaviour :

a) The fully array of information sources that are available;
b) The users to which information will be put;
c) The background, motivation, professional orientation and other individual characteristics of the users;

d) The social, political, economic and other systems that powerfully affect the user and his work; and

e) The consequences of information use, e.g., productivity.

It is difficult to take al these five factors in to consideration in one study. There is strong evidence from the literature that information used by the scientists and technologists is conditioned by factors such as nature of work, availability of information and other organizational and personal variables.

1.6. INFORMATION SEEKING STRATEGY

Information seeking behaviour gives rise to information seeking strategy. The word 'strategy' became popular in the literature of warfare and statecraft of the 20th century. It means the art of employing all the resources of a nation or coalition of nations to achieve the object of war and peace (Encyclopaedia Britannica). Even the dictionary defines the concept in relation to war.

The Oxford English Dictionary (1961) defines strategy "the art of a commander in- chief; art of projecting and directing the larger military movement and operation of a campaign". The Universal Dictionary of the English Languages (1961) defines that, "the art of conducting a military campaign; specify the art of preparing, moving and using armed forces in a war or so as to secure the initiatives and ultimately win war".

Therefore, Information seeking Strategy can be defined as the art of preparing, and using information resources so as to secure the initiative and ultimately satisfy the information needs.

Belkin et al., (1995) used the concept while saying "any ISS (Information Seeking Strategy) can be described according to its location along these four dimensions". The four dimensions are :

(i) activity or interaction(an information search);

(ii) goal of interaction (learning-selecting);

(iii) mode of retrieval (recognition-specification); and

(iv) resource considered (information-meta information).

In other words information seeking strategy consists of one or more cycles, with each cycle consist of one or more interactive feedback occurrences (user input, information retrieval system, output, user interpretation and judgment, user input) (*Spink*, 1997).

For the present analysis, information seeking strategy will include information needs, information sources, information channels and information barriers together.

1.7. CONCLUSION

Information is complex, having more than one attribute and not a single definition exist encompassing all its attributes. Information is data placed into a context for its recipient and has many attributes or

qualities, viz., timely, precision, accuracy, quantifiable, variable, accessible, freedom from bias, comprehensive, appropriateness and clarity. Information needs are again a complex phenomenon, because the term 'need' itself is an abstract concept. Information need for the purpose of this study has been defined as awareness or recognition of not knowing or existence of uncertainty in the personal or work-related life of an individual. Needs are further identified as immediate and potential. Information seeking behaviour means the consequence of a need perceived by an information user. For the purpose of this study, information seeking behaviour is meant those activities or persons may engage in when identifying his or her own needs for information searching for such information in any way and using or transferring that information. Information seeking strategy is defined as the art of preparing, and using information resources so as to secure the initiative and ultimately satisfy the information needs. For the purpose of this study, information seeking strategy will include four dimensions. These are

- Information needs,
- Information sources,
- Information channels, and
- Information barriers.

A medical practitioner is one having 'regular application of medical knowledge and skill in the diagnosis and treatment of disease'. The medical practitioners are classified into Clinicians and Non-Clinicians

group for further analysis. It is observed that medical practitioner will need medical information. Medical information is information on medical science research, the diagnosis and treatment of disease etc. Further, medical information is classified into following types : patient's data, medical knowledge, population statistics, logistic information and social influence.

CHAPTER 2

LITERATURE REVIEW AND DEVELOPMENT

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The Survey of related literature is very important for the purpose of a research project. Because it helps in acquiring and tracing the comprehensive information about the subject. It is also important for the comparison of data, which is useful in the interpretation of results. Medical literature is so vast that it is not possible to review the whole literature. Therefore, an attempt is made to review the core literature on medical science, which is directly relevant for the present study. Literature review has been divided in to following broad categories :

2.1. HISTORICAL BACKGROUND

2.2. REVIEW OF LITERATURE

2.3. RELATED MEDICAL LITERATURE

2.4. LITERATURE IN INDIA

2.1. HISTORICAL BACKGROUND

The history of medical literature can be traced to early 16th century when *Symphorium Champier* compiled a bibliography 'De Medicinae Claris Seriptoribus' which was printed at Lyons in 1506.

One of the earliest books of 19th century to make a lasting impression on the medical literature is Hemy Grey's Anatomy. The first edition was published in 1858.

The invention of the stethoscope not only led to Laennec's De l' Auscultation Mediate in 1819, one of the most influential books of the century, but it also became the first 'give-away' gimmick to accompany the sale of a book. Laennec's book had four French editions, seven English editions (the first in 1821), three German editions and an Italian edition.

Claude Bernard, the founder of experimental medicine, published many of his important research reports in the burgeoning journals, but his introduction a l' Etude dela Medecine Experimentale, first published at Paris in 1865, probably ranks as one of the most stimulating works in the medical literature.

The age of modern medicine was ushered in by Die Cellular pathologic written by *Rudolph Virchow* in 1858. This was reprinted in 1966 and was translated in to English (1860) and French (1861). As a final example of the German medical literature of the 19th century may be the pioneering work of *Wilhelm Conrad Rontgen*. His classic contribution took the form of a 10 page article in rather obscure journal. Reprints of

this article (which first appeared in 1895) are among the most expensive items in the history of the medical literature.

One of the major Russian contributions to the medical literature, Pavlov's lectures on the work of the principal digestive glands, was published (in Russia) at St. Petersburg in 1897. A French translation appeared in 1901 and an English version in the following year. During the 19th century medical literature in the United States was blossoming quickly and in many areas. *Caspar Wistar* wrote the first text in anatomy, the 2 volumes System of Anatomy, which was published in 1811 – 1814, *Robley Dunglison*'s textbook of physiology came out in 1832. *Benjamin Smith Barton*'s Elements of Botany (1812) was the first book on materia medica and therapeutics. The Massachusetts Medical Society produced the first general pharmacopoeia in 1808 and 12 years later also in Boston appeared the first pharmacopoeia of the United States. *Samual Bard* wrote the first textbook in obstetrics, Compendium of the Theory and Practice of Midwifery, in 1807. *William Dewees* is credit for the first United States texts in paediatrics (1825) and gynaecology (1826).

The United States produced several classics in the literature of medicine during this century. In 1812, *Benjamin Rush* wrote his medical inquiries and observations upon the Diseases of Mind which was not only the first American book in that field, but also ranks as a landmark in its subject.

In 1859, was published the first of six editions of *Samual David Gross*

'A system of Surgery', two volumes that did much to raise the level of American surgery both practically and in the eyes of the rest of the world.

The first United States medical journal after the Medical Respiratory was the Philadelphia Medical Museum, founded by *John Redman Coxe*, which ran through 7 volumes between 1804 and 1811. This form of medical publication spread rapidly with the first medical journal appearing in Massachusetts in 1806 (Medical and Agricultural Register), in Maryland in 1808 (Baltimore Medical and Physical Recorder), in Ohio in 1822, Connecticut in 1823, and South Carolina in 1825. As medical journals became more accepted by both readers and authors as a means of transmitting medical information, important articles began to appear and important journals began long runs. *Ephraim McDowell*'s report of his classic ovariotomy was printed in the Electric Repertory and Analytical Review (7, 242-244, 1817).

The early American medical journals contained many articles on meteorological conditions, fevers, and surgical procedures. Later translations of articles (either summarized or complete) from the foreign journals often appeared. The Boston Medical Intelligencer was founded in 1823 by *Jerome F. C. Smith* as this country's first weekly medical journal. In 1828, it was merged with The New England Journal of Medicine and Surgery (which had begun in 1812) to form the Boston Medical and Surgical Journal. This, one of the leading medical journals in the country, changed its little in 1929 to the New England Journal of

Medical, and now occupies one of the highest positions in medical journalism throughout the world.

English periodical medical literature was roused out of its quiet existence in 1823 by the appearance of *Thomas Warkley*'s Lancet. *Warkley* believed in responsibility and progress in medical practice, education and journalism, and the Lancet provided an effective platform for his often outspoken comments and aggressive approaches. He backed his beliefs by court appearances as both a plaintiff and a defendant. He even carried his programs in to Parliament and was able to lead reform movements in several areas. During his controversial career *Warkley* kept the level of contributions in the Lancet high and it became deeply respected not only in Great Britain, but also throughout the world.

In 1857, began the other major weekly medical journal in England, the British Medical Journal (BMJ) the official publications of the British Medical Association, The 'BMJ' has long maintained a worldwide reputation as an outstanding publication.

In 1846, appeared the first issue of the Australian Medical Journal, although it ceased the following year. After several other medical journals entered the field the present Medical Journal of Australia was formed by an amalgamation in 1914.

In France, the Archives de Médicine et de pharmacie militatires had a useful career from 1815 to 1882. The Archives Generale de Médicine ran from 1823 to 1914, making notable contributions under the

editorship of Trousseau. The comptes Rendus of the Academic des Sciences and the Société de Biologie, beginning in 1835 and 1849 respectively, and still being published, have carried many important medical papers.

In addition to the journals founded by *Miller & Virchow*, Germany was the source of many other important titles. *Langenbeck*'s Archiv fiir Klinische Chirurgie in 1861; Wiener Medizinische Wochenschrift in 1851 and some other are still making worthwhile contributions to the literature. Among the early major Russian medical journals were the Moskowkye Medizhinskaja Gazeta 1866 – 1878, the Wojenao Medizinske Journal (Military Medical Journal) 1823 – 1907, and the Wratsch (Physician).

The birth and growth of specially medical journals has been a phenomenon primarily of the 19th and 20th centuries.

2.1.1. The Twentieth Century

The Medical literature of the middle 20th century became essentially a journal literature. Articles in journals are now the standard method of announcing discoveries, new methods, and even new hypothesis. Speedy publications, wide circulation, and lower cost have all emphasized the journal over the book. This trend was evident toward the end of the previous century, and could be demonstrated in this century by such items as *Joseph Goldberger*'s first major publication on pellagra in 1920. This was a 109 page report which most probably

would have been published as a book earlier but which in the 20th century appeared as a journal article.

The book portion of the medical literature showed two major trends in the 20th century. The first was toward the comprehensive and detailed set, of which the German *Handbiicher* are good representatives. The 12 volume Handbiich der speziellen pathologischen anatomie and histologie, edited by *Henke & Lubarsch* and published by Springer at Berlin, 1924 – 1952 was typical. The second was a continuation of the trend toward the highly specialized monograph. A classic of this century, Felix d' Herelle's Le Bacteriophage, published at Paris in 1921, exemplifies this trend.

Reference works of several varieties were frequent additions to the medical literature of the 20th century. These could be works that keep re-appearing, such as *David Bergey*'s Manual of Determinative Bacteriology, first published at Baltimore in 1923 and now in its 8th edition, or a single appearance publication such as the World Health Organization's bibliography of years 1905 - 62, printed at Geneva in 1963. The publication program of WHO has made many worthwhile contributions to the medical literature.

Whether the journal will remain the chief form of the medical literature for the rest of this century and into the next is an unpredictable matter, although some trends at present suggest that it may not. The printing of separate t..ctics of a journal for each separate article has been tried experimentally. Related to this trend is the publication of only an

abstract or a tightly shorthand version of the article with the storage of the full text in a central location to which readers may write for full copies, if they are interested. The medical newspaper is another new phenomenon in the literature.

Medical journals have appeared in microfiche rather than the traditional printed form. So far these have not been too successful, but as a new generation of readers comes along this form of publication may spread.

The audio side of the audio-visual approach has also entered the medical literature. More than a few journals are now available on tape. This is true of the digest type of publication as well as of the full length article variety. The audio method seems to have met with more favorable reader acceptance than the visual.

Books too are changing their format. The programmed learning text with its columns, boxes and variously sized and shaped pages, is a common sight. The next step is already being taken experimentally, the computerized non-printed text. In this case the text of a book (most logically a multi-authored handbook) is stored in a computer and never printed as a whole. When one of the authors wants to bring his section up to date he displays it on the terminal page by page, makes additions, deletions or corrections and send it back to the storage unit. When a reader wants a more permanent copy than the terminal display, he asks for the page(s) he wants to be printed out and sent to him.

2.1.2. BIBLIOGRAPHIC CONTROL

The Bibliographical Control of Medical literature started in 1506 when first bibliography was compiled by *Symphorien Champier* entitled 'De Medicinae Clarise Scriptoribus'. But the first 'giant' in medical bibliography appeared in the 18th century. *Albrecht von Haller* had compiled a 9 volume work, 'Elementa Physiological Corporis Humani', at Lausanne, 1757 – 1782, in which he listed and annotated many of the publications in that broad field. This was, in a sense, a warm up for his four major bibliographies. The first of these, 'Biblio theca Botanica', 2 volumes printed at Zurich in 1771 – 1772, contained much medical material. The botanical volumes were quickly followed by the 'Biblotheca Chirurgica', 2 volumes, Bern, 1774 – 1775; 'The Bibliotheca Anatomica', 2 volumes, Zurich, 1774 – 1777 and 'The Biblotheca Medicainae Practice', 4 volumes, Basel, 1776 – 1788. These were arranged by broad subject, and then chronologically. Many of the items listed had abstracts. There was and author index.

John Show Billings who was not only realized the bibliographic needs of the users of the medical literature, but was able to work out practical publications to meet these needs and workable methods to produce the publications. The first volume of the Index Catalogue of the Library of the Surgeon General's Office appeared in 1880. The series was to have 60 more volumes before it ceased in 1961. *Billing* was able to make a vast amount of material easily accessible. (Encyclopedia of Library & Information Science).

Billing envisioned a frequently appearing series as a current supplement to the foundation of the Index - Catalogue. The first monthly issues of this supplement, which was called the Index Medicus were printed in 1879. These issues covered primarily articles from selected medical journals although some other material was also included. The text was classified, and the only indexes were the annual author and subject listings. *Robert Fletcher* assisted *Billing* with the production of the Index Medicus just as he did with the Index - Catalogue. A carefully worked-out team handled the processing of the materials and information.

The Index - Medicus ran into financial difficulties at the end of the century (Ser. I, Volts. 1-21, 1879 – 1899), and sufficient income was not generated again until the Carnegie Institute helped out and made possible the continuation of this valuable tools. With the third series the Index Medicus became a quarterly and took on a subject arrangement with an annual author index.

The American Medical Association produced a similar index with its quarterly cumulative Index to current Medical Literature (Vols. 1-12, 1916 – 1926). The drain of finances and growing production time led to an amalgamation of this with the Index Medicus to form the quarterly cumulative Index Medicus (Vols. 1-60, 1927 – 1956), which had authors and subjects arranged in an easy-touch dictionary format.

With the demise of the Index - Catalogue and the quarterly cumulative Index Medicus a restructuring of the bibliographic mechanism was

needed. The coverage of books was taken care of by the Army Medical Library (now the National Library of Medicine) with a sequence of annual and uniquennial catalogs leading up to the current catalog which began in 1966. Journals were indexed in the 'New' Index Medicus, which began in 1960. This appears in 12 monthly issues and a bound annual cumulation of several volumes.

The mechanization project at the National Library of Medicine that developed along with the new Index Medicus under the direction of *Frank B. Rogers* led eventually to the computerized MEDLARS (Medical Literature Analysis and Retrieval System) programme, which has speeded up the production of the Index Medicus and made computerized searching of the literature a reality, has also led to the development of MEDLINE (the on-line computerized program that provides access to the National Library of Medicines data banks) and to a variety of related programmes. Some of these services have been made available in England, Sweden and other countries. A greatly enlarged and improved MEDLARS II program has just been put into operation. The library has successfully tried out an experimental program with the use of a satellite for the communication of medical information. The State University of New York has developed a broad computerized program that provides bibliographic control for the access to a vast amount of the medical literature.

Abstract journals have provided another approach to the medical literature. *Karl Christain Schmidt* initiated Schmidt's Jahrbiicher der inund auslandischen gesamten Medicine in 1834. The Jahrbiicher met

such a great need that they continued through 336 volumes until 1922. The Germans developed a network of bibliographic journals based on the Zentralblatter or Berichte in the different subject areas that provided brief abstracts, through their annual compilations (Jahresberichte or Jahrbiicher) to the review journals usually titled Ergebnisse. The major English language abstracting journal in the Excerpta Medica series which began in 1947 and has grown considerably. Indexing or abstracting journals are also found in France, Russia, Japan and many other countries (Encyclopedia of Library & Information Science).

2.2. REVIEW OF LITERATURE

The concept of information need is embedded in the studies of users, use and uses, which form one of the most extensive and amorphous areas of research is library an information science. *Crainformationord* (1978) estimates that 1000 user studies have been published. An online search by *Rodhe* (1986) using terms such as user needs, user satisfaction, and user studies turned up 2000 documents in one database alone. The literature on user studies is fragmented and superficial. The appearance of empirical studies in the literature has with *Lipetz* (1970), *Menzel* (1966) and *Paisley* (1968) but the results of these studies have not accumulated to form a significant body of knowledge. There has been difficulty in applying the findings, which has been attributed most frequently to the lack of a unifying theory,

standardization methodology and common definitions. In spite of this, user studies are the most research areas in library and information science. They form a large body of literature in the discipline. *Siatri* (1999) traces the history and evolution of user studies through 1940's till date. It started with conducting surveys on use of information as to find out what scientists read and what use they made of the information. During 1960's, studies were carried out in social behavioural sciences. This was a break through as previously scientists and technologists had monopolized it. One of the important projects was carried by *Line* (1971) named as INFROSS. Three methodologies, namely questionnaire, interviews and day-to-day observations were followed. The findings of the project indicated that satisfaction in library use among social scientists was low. The 1980's were characterized awareness by an increasing surrounding the conceptual framework and methodological issues of user studies. This decade also saw invasion of information technology in the areas of user studies. More studies were undertaken in order to determine the needs of users in relation to different software and information retrieval systems like OPACS, databases etc.

Belkin (1982) in his anomalous state of knowledge (ASK) theory stated that the need arose from the recognition of an anomaly in the user's state of knowledge, which makes the user unable to express verbally the precise information need.

Kuhlthau (1988) conducted a study to explore the experience of students in the library search process. He tried to test the hypothesis

that 'there is a sequence of stages to an information search and to propose a model of the users stage within the search process'. His findings supported by the initial hypothesis and he identified six stages of the search process namely, initiation, selection, pre-focus exploration, focus exploration, information collection and search closure. 1990's saw the implementation of conceptual theories that flourished during the 1980's. An increasing number of researchers acknowledged the value of these theoretical frameworks and incorporated them into their research design along with more sophisticated qualitative research methods. This decade also saw the tremendous growth and establishment of the Internet as an information provider in the information community. A recent study (*Liebscher et al.*, 1997) examined the factors that influence the use and adoption of electronic networks by science and engineering faculty at small institutions. The study identifies a number of factors that are likely to influence use and adoption of electronic networks. These included perceived accessibility, proximity, workstation availability, experience, case of use, academic discipline, task and perceived utility. *Ellis* employing *Blasser & Straurs*'s grounded the any approach derived six generic characteristics of the information seeking patterns of social scientist (*Ellis*, 1989), which was later extended to physical scientist (*Ellis*, 1993) and engineers and research scientists in an industrial environment (*Ellis*, 1997). These are starting, chaining, browsing, differentiating, monitoring and extracting. He added two more categories namely verifying and ending in later studies (*Ellis*, 1997).

These can be defined as follows :

Starting : Activities characteristics of the initial search for information.

Chaining : Following chains of citations of other forms of referential connection between material.

Browsing : Semi-directed searching in an area of potential interest.

Differentiating : Using differences between sources as filters on the nature and quality of the materials examined.

Monitoring : Maintaining awareness of developments in a field through the monitoring of particular sources.

Extracting : Systematically working through a particular source to locate material of interest.

Verifying : Activities associated with checking the accuracy of information.

Ending : Activities characteristic of information seeking at the end of a topic or project, e.g. during the preparation of papers for publication.

The studies conducted by Ellis showed remarkable degree of homogeneity between the information seeking patterns of the physicists, chemists and the social scientists both in terms of the information seeking activities reported and the researchers perception of those activities. The comments on personal contacts, reviews,

chaining, differentiating and monitoring sources and the perception of the different values of primary sources are virtually inter-changeable between the three different types of scientists. Whereas, there is noticeable difference in the perception of secondary sources by the same scientists. *Leckie et al.* (1996) proposed an information seeking model after synthesizing and interpreting the findings of wide variety of representative studies on engineers, healthcare professionals and lawyers. The basic supposition of the model is that the roles and related takes undertaken by professionals in the course of daily practice prompt particular information needs, which in turn give rise to an information seeking process. However information seeking is greatly influenced by a number of interacting variables, which can ultimately effect the outcome. Furthermore, any of the components of the model can occur simultaneously, thus representing the true complexity of a professional's work life. The variables used in the model are : work roles and associated tasks characteristics of information needs, factors affecting information seeking awareness of information and outcomes. The model is intended to capture the complexity of the information seeking activities of professionals. The model stresses that the conceptualization of why and how a professional seeks information cannot reduced to a simplistic analysis of sources alone but, rather, involves a greater understanding of the various roles a professional performs while the need for information is conceptualized as heavily influenced by the role-task relationship, there are also general factors that characterize the professional's

information need. The resulting information seeking activity is thus viewed as being contingent upon two major interacting factors : Sources and Awareness. These two factors in turn are composed of a constellation of district variables that may or may not come into play, creating the dynamic nature of information seeking activity and outcome. Studies of healthcare professionals such as dentists, nurses and physicians have shown that they spend the majority of their time in the role of direct service provider and that the tasks associated with patent care create their greatest need for information. Dentists, after require information on new techniques in dentistry, products and equipment and on new drugs in providing patent care.

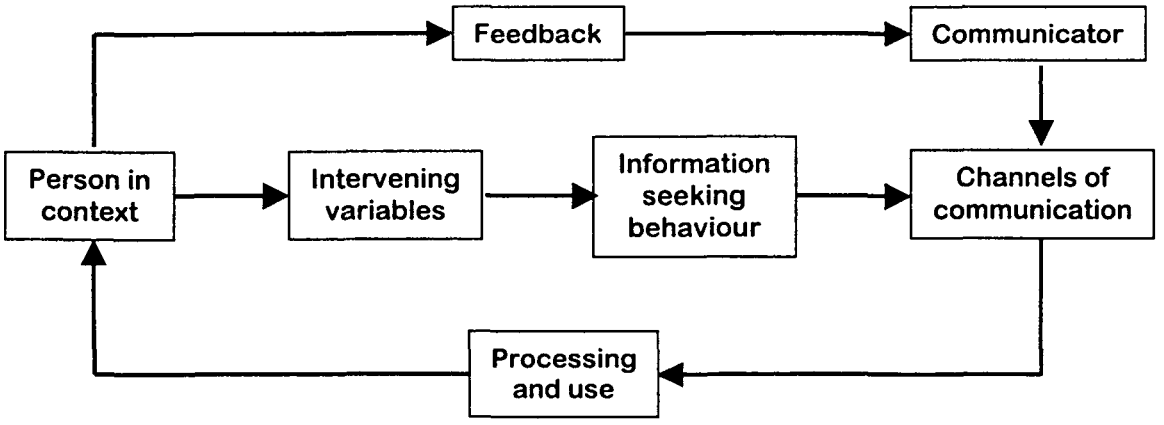
For physicians, tasks associated with patient care create needs for information on differential diagnosis, treatment recommendations, drug information and diagnostic criteria.

Wilson (1999) reviews the status models of information behaviour to discover how they may relate one to another and propose an integration of the model into a more general framework. The situation is now changing. The general adoption qualitative methods has resulted in work that is in the wider tradition of the investigation of human behaviour and which therefore is more likely to find theories and models in the social sciences that can be applied to the study of information behaviour. At the same time, the models and theories proposed by certain researchers, have gained strength as they have been adopted as the basis for further research by other investigations.

Wilson (1981) is bases on two propositions first that information need is not a primary need, but the secondary need that arises out of needs of a more basic kind and second that in the effort to discover information to satisfy a need the enquirer is likely to meet with barriers of different kinds. *Wilson* proposes that basic needs can be defined as physiological, cognitive or affective. He further said that the context of any one of these needs might be the person or the role demands of the person's work or life or the environment. In conclusion, this model by *Wilson* proposes that information need in different work roles will be different or that personal traits by inhibit or assist information seeking. However this is implicit and not made explicit. *Wilson* (1996) made a reversion of his 1981 model. The basic framework of the 1981 model persists here also. The person in context remains the forms of information needs, the barriers are represented by intervening variables and information seeking behaviour is identified. The use of the term 'intervening variables' has been introduced, which can have preventive or supportive impact. Further information seeking behavior is shown to consist of more types than previously. Information processing and use is shown as necessary part of the feedback loop, if information needs are to be satisfied. Three relevant theoretical ideas are presented : Stress / Coping theory and Risk / Reward theory.

Wilson (1999) observed that models of Information behavior do not attempt to describe the same set of phenomena or activities. *Wilson* tried to combine *Ellis* (1993) & *Kuhlthau* (1998) model and create a nested model. Here Information behaviour may be defined as the more

general field of investigation with Information seeking behaviour being seen as a sub-set of the filed. He further extended the nested model by showing that information behaviour is a part of human communication behaviour. *Wilson* (1999) proposes following linking model of Information seeking and communication :



2.3. RELATED MEDICAL LITERATURE

Traditionally medical practitioners have favored past experience, prevailing practice, professional training and peer opinion as guides for day-to-day decisions about patient care. These sources have become less reliable as the volume and complexity of medical information have grown exponentially (*McKibbon et al.*, 1995). According to *Makibbon et al.*, 1995, in the 1970's, medical practitioners and researchers at McMaster University began to address this clinical information overload by developing tools to help medical practitioners to discern the clinically valid, important and applicable details. 'Critical appraisal' of the medical literature was introduced as an approach to

reading that would help practitioners sift clinically relevant and methodologically sound studies from the countless articles appearing in the medical journals. The original critical appraisal series was published in the Canadian Medical Association Journal, then translated into many other languages and disseminated widely.

A recent article in the Chronicle of Higher Educations stated that : 'Publication of scientific journals began in about 1665..... . In 1800, there were about 100 journals; there were 1,000 by 1850, and some 10,000 by 1900. Currently there are close to 1,00,000 journals, and since the 17th century, their member has doubled every 15 years' (*Gifford*, 1992, pp. A 24).

Literature on the studies of information seeking strategies for the medical practitioners in too vast; so it is not possible to covered all the review. Therefore, some latest studies conducted in the abroad which are as following :-

Rath & Werner (1967) made an 'Info-research' – a medical query – an answering service available to 11 major medical research organizations in the Chicago. The service provided several levels of response, from checking a reference to providing a facsimile copy at the users disk. Only 61 request for service were received. Since the information system was planned to be unusually responsive, it revealed that the medical researches viewed the information system not as an essential information source but only as a 'convenient auxiliary activity'. However, the short span of the test scarcely gave medical

researchers time to change their information gathering habits or attitudes. *Nemeth & Szepesi* (1968) at the National Medical Library and Central Documentation Bureau in Budapest, conducted a poll of 18, 162 physicians in 1964 by questioners method. The study resulted in a detailed survey of the literature requirements of the physicians. Data are given on their interests, Journeal Madiang habits and information needs.

Tagliagozzo (1973) conducted a survey of the users of the University of Michigan MEDLARS service using a questionnaire. The objectives of the study were to discover whether, and to what extent, the service was being used by all categories of users for whom it had been designed. The results of the study showed that the bulk of the use appeared to be for research purposes, while only about 15% of use related to professional practice as opposed to academic endeavor. Satisfaction with the service was positively related to the member of relevant references retrieved by a search, and this may have been related in turn to a finding, that 'teachers' are more satisfied than 'learners', the later generally having fever references reviewed. This study was not likely to produce any changes of itself but it might stimulate a more general enquiry in to who actually uses MEDLARS and other systems.

Nosok & Golov (1974) conducted a study on the scientific medical information needs of practitioners at two central district hospitals in the Moscow. Findings are presented on a questionnaire survey of the practitioners. The major findings was that the frequency of various

medical information sources (books, booklets, periodicals, collection of papers etc) is practically independent of a users length of medical service but largely depends on the publication date of the source.

Maquire (1975) conducted a study on the use of information sources by medical researchers and practitioners in Australia. A questionnaire was completed by 77 users of MEDLARS and 37 non-users; in addition 11 MEDLARS users were interviewed. The findings of the study revealed that there appears to be serious under-use and widespread ignorance of medical information sources. MEDLARS users tend to work in a research environment and be literature-oriented. Non-users tend to be in general or special practice, and to be involved in patient care. There choice of information source is apparently determined by accessibility, case of use and familiarity, rather than quality. Some respondents criticized the advertising literature distributed by drug companies. The study also suggested that information gathering skills should be taught as part of medical education and greater publicity should be given to the medical information service.

Strasser (1978) conducted a study on the information needs of practicing physicians in North Eastern New York State using questionnaire method, which had a response of 56%. The study says, the computer aided market analysis indicated that the areas of greatest need for improved information were developments in specialties and government regulations relating to heath care. Sources most frequently used were journal papers, colleagues and books, in that order. Specialty related differences occurred with both specific

information needs and source use. Degree data, geographic location, type of practice and involvement in research or education were also analyzed in relation for information needs and sources.

In a broad preliminary survey on the use of medical literature, *Ford et al.*, (1980) explored the differences in information needs among various healthcare groups, including hospital doctors and general practitioners. Hospital doctors were not asked about the nature of their work details of the type of hospital were obtained, responses were not analyzed in relation to this variable. The survey did not reveal the differences among the user group practitioners, researchers and practitioner-researcher. The survey of the use of medical literature intended as a background for planning research and development.

Fletcher et al., (1981) suggested that, in order for the medical literature to be useful to medical practitioners, it must answer questions that arise in patient care, measure clinically relevant variables and use research designs most likely to yield valid conclusions. In a thirty year review of the medical literature covering 1946 to 1976, the authors note that, despite the rapid growth in publishing, there had not been frequent reports relating to the foremost questions asked by physicians, namely, those dealing with diagnosis, prognosis and treatment. Other frequently asked, but infrequently addressed questions relate the etiology of illness, the differentiation of normal and abnormal human biology. *Fletcher et al.*, (1981) also comment upon the lack of reports of studies that have used research designs that they consider rigorous enough for answering clinical questions. There more

rigorous designs include randomized controlled triads, cohort studies and case control studies. Recurrent themes in studies of medical practitioners use of information sources include the relations on clinical judgment to solve patient problems because of the time pressures of the practice setting and practitioners' preferences for informal information sources such as colleagues. Nevertheless, several studies have found that reading of professional journals in cited as a primary mechanism for continuing medical education and that practicing practitioners spend there to five hours a week reading journals (*Currie*, 1976; *Curry & Putnam*, 1981). Despite this reading for continuing education purposes medical practitioners will report difficulties in applying the medical literature to patient case problems.

A study of medical parishioners in office practice by *Covell et al.*, (1985) showed that physicians formulated an average of six questions related to patient management during an observer's halt day visit or about two questions for every three patients seen. One of the most remarkable findings in the study was that the same practitioners had previously reported on a questionnaire that they needed information related to patient case only once a week.

Of the questions raised by the practitioners during the observation period, only 30 percent of the practitioners information needs were met during the patient visit and most often by another practitioner. A number of barriers to the effective use of print sources were identified in the study, including out of date text-books in the office, poorly organized journal articles and tiles, inadequate indexing of books and

drug information sources and lack of time to find the needed information.

Huth (1989) discussed some of the reasons why practitioners do not use the medical literature more extensively. Although the unmanageable size of the literature presents problems, *Huth* states that the bigger problem is that papers relevant to particular clinical issues are not concentrated in journals with subject boundaries but are scattered more widely. *Huth* also cites the heavy cost in time of searching and retrieving articles and the fact that much of the retrieved literature is not relevant to clinical problems. A great deal of time in required to digest and synthesize the content that is worthwhile, and most medical practitioners do not have specialty training in critical analysis of articles which would allow them to judge the validity of the findings.

Another recent study of knowledge resource preferences of family medical practitioners (*Connelly et al.*, 1990) found that respondents used the commercial drug hand-book Physicians' Desk Reference (PDR) more often than daily and colleagues more frequently than weekly to obtain information on clinical questions. The study found little use of Index Medicus or computerized bibliographic retrieval systems such as MEDLINE. A report on the reading habits of medical students (*Taylor*, 1992) calculated that students would spend over seventy hours a week reading it they were to read all assigned books, handouts and class notes.

Dalrymple (1993) says, nearly two decades after there is many far-reaching changes have occurred in the health sciences. Arguably, most of these changes can be summarized in two words – technology and economics. The increasing number of microcomputers in the early 1980's, followed by growth of facsimile transmission and the advent of Internet, have facilitated the delivery of information and documents not just the library, but to that most convenient of all locations, the requester's workstations. Technological advances in medicine have produced a health care system that improves and prolongs health but whose cost has created serious inequities in distribution and access. In 1990s the economics of health care in North America occupies national attention and the pace of technological innovation continue to accelerate (*P.W. Dalrymple*, 1993). It appears today that too few resources – and too much information will characterize this decade.

Networked information resources for medical librarians : An overview and some case studies in the UK survey by *A Hicks* & *A Tedd* (1995) and examines some of the information resources available to medical librarians via the Internet and describes the use of these by three UK medical libraries : for sending and receiving electronic mail locally, nationally and internationally; for transferring documents, images and sets of records from a remote computer to a local one (file transfer protocol); and for logging on to other computers and online services (tele-netting). Other applications of the Internet for medical librarians described; the use of mailing lists for medical information; announcement of meetings and conferences; job advertisements;

electronic bulletin boards; access to remote database; and electronic periodicals.

The Internet is basically a worldwide network of computers linked by a standard protocol – the TCP / IP (Transmission Control Protocol / Internet Protocol). It is sometimes referred to as highway or super highway along which user can travel to find information. There is a vast amount of information accessible via the Internet, much of it free of charge. The general ways for which the Internet may be used include :

- Sending and receiving electronic mail (E-mail) - locally, nationally and internationally;
- For transferring a document, an image, a set of records and so on from a remote computer to a local one, this is known as file transfer protocol (Fttp); large amount of data are available in this way to the internet user and may be searched for using tool known as 'archie';
- For logging into other computers; this is known as 'tele-netting' and is the method used for accessing online search services such as DIALOG and Data-Star Via the Internet.

Maurice Biriotti (1997) says 'The multimedia tools and other new technologies that collectively make up the 'information revolution' offer health promoters a startling new range of possibilities. Developing new communications technology in the interests of health promotion for the community rather than care for the individuals is a challenge that has yet to be addressed. But, however flawed the progress to date, the

potential offered by new communication technology remains almost limitless. There are surely opportunities for medical practitioners to make use of existing models of human interaction (the face-to-face conversation; the dinner party; the cafe; the support group), and to make technology on integral part of the community life, rather than an alternative to it. *Biriotti* again state that, It is essential that we re-evaluate the dominant individualistic model of technological delivery health promotion is a community issue, and so we must put the community at the heart of its technological developments.

2.4. LITERATURE IN INDIA

The interaction of new knowledge in allied areas of science in perhaps best exemplified by the directions of growth of the biomedical sciences during the post-war period and the new disciplines that have emerged in frontier areas were well established classical fields of study have overlapped (*Sengupta*, 1985). The National Medical Library (NML) was established by the Govt. of India in April 1966 to meet the needs of medical literature by the medical practitioners in India. NML has been designated by the Govt. as a National Focal Point for India of the HELLIS (Health Literature, Library and Information Services) network.

Sengupta (1970) conducted a study on the ranking of periodicals in the field of medical sciences from the Indian scientist's point of view by analyzing of data for 1954-58. The ranking has been attempted on the basis of citations of the periodicals in journals of Indian origin. The

main purpose of the study is to prepare a list of titles of journals, ranked in order to their frequency of citations which will help librarians, documentalists and research workers. To what extent a scientist depends on a particular journal can be revealed from such study. The ranking list comprises 230 periodicals and analysis is made grouping the citations into three sequences. The study revealed that English is the main language among scientific community in India with German and French in second and third respectively. Journals in languages other than English are rarely used. It is also seen that nearly 74% of the total citations are for the period 1941 – 1958; 22% for 1920 – 40 and 4% for the period prior to 1920.

Again in (1978), *Sengupta* has highlighted the growth in research output in Biosciences and correlates its impact that need to keep up-to-date with the wave front of biosciences research in India. Though the giant abstracting and indexing periodicals like Chemical Abstracts, Biological Abstracts, Bioresearch Index, Index Medicus, Current Contents, Life Sciences, etc. are time related tools; indispensable for surveying the literature, these do not by themselves provide a complete answer to the information needs of the Indian Bioresearch Scientists.

Sengupta (1978) discussed the Bioresearch planning and information needs for biomedical scientists in India. Considering the severe impact of 'literature explosion' on biomedical scientists, for assessing the information needs of biomedical scientists in India, he mentioned the necessity to identify different areas where biomedical research may be

planned in India. Further he suggested the main shortcoming in meeting the information needs for bioresearch planning, are presented as :

(i) Absence of any comprehensive list identified research problems.

(ii) Paucity of reliable statistics about production, demand, cost benefits analysis and market potential.

(iii) Non-availability of comprehensive published information at a central place in India-immediately after publication.

(iv) Delay in getting all foreign patent literature in the field.

(v) Cost factors and delay in getting translated text of papers published in other languages than English.

It is suggested that the bioresearch institutions and information centers in this field need to be properly integrated for the timely exchange of information to raise the productivity of biological research.

Ghosh et al., (1980) in study on 'evaluations of periodicals in respect of their significance to present day research activity in the field of neuroscience' highlighted the difficulties for the librarians, information scientists, research scholars attached to the neuroscience research centre to select a list of core journals which will satisfy their major information needs. The difficulty is particularly pronounced because much of the literature is scattered in journals devoted to the individual disciplines involved in neurobiological studies – Biochemistry,

Physiology, Pharmacology and Neurology. Mention is also made about the difficulty in the selection of core journals for organizations having no adequate financial resources to buy many journals in their field and space to stock all the library documents with optimal flexibility for their retrieval at the time of need. To come to the rescue in such cases the study suggested for the application of the bibliometric technique.

Krishan Kumar (1982) conducted a users survey in the 'identification of users and their information needs in health science libraries. He describes the methods to determine the information needs and also mentions the processing, analysis and interpretation of information needs by the medical practitioners. It is suggested that some librarians in India should aim to become experts in users' survey. This is an area and also an exciting one.

Taher & Gupta (1987) carried out a study of the use of some select reference sources by the medical practitioners at the St. John's Medical College Library, Bangalore in 1980. The analysis of the survey has been done from the point of view of the fulfillment of users information needs and to obtain feedback about the usefulness of a select number of reference sources. The survey of the study covers the use of a few international indexing and abstracting journals. The results of the survey showed that the Indian medical professionals borrow heavily from the American professional literature rather than European information source. It is also suggested that the local documentation services in health science should be strengthened.

In 1988, *R P Dixit* conducted a survey on users survey of National Medical Library, New Delhi. In his study a questionnaire was circulated amongst enrolled members. A total of 137 responses were analyzed. On the basic of responses describes use of library, evaluation of library collection, organization of materials, circulation services and reference service. The results of the survey indicate that the existing services of the National Medical Library are not up to the standard. The medical practitioners need improvement in terms of faculty, facilities and services up to a level where they can function as active parts of the network.

Mohan (1988) conducted a study on library and information services to the private medical practitioners in the twin cities of Hyderabad and Secunderabad. The survey was conducted through a questionnaire, which was distributed to 100 medical practitioners. Out of these 100, only 20 responded of which 10 were general practitioners with MBBS and 10 were with specializations. Mentioning the urgent need to establish a new library and information system for private medical practitioners, the study revealed that the library and information profession has its own responsibility to promote a noble cause with a noble objective.

In 1993, *K Kaliyaperumal* & *K Thandavamoorthy* conducted a study on 'A Survey of modern technological developments in health care librarian in Madras'. They found out the usage of modern technologies in the health care libraries in Madras; e.g. Online services, CD-ROM, Photocopier, microfilming, audio-visuals, library automation such as

machine readable catalogue, automated circulation control, serial control, acquisition control etc. Also they identify the problems in adopting the modern technologies. In order to find out the above aspects, survey was carried out in the form of questionnaire and personal visit also made in number of libraries. They suggest that, minimum standard should be formulated in respect of stock, staff strength, salary, space and service, allotment fund; an efficient medical library and information system should be set up urgently, and it should formulate a long range plan forwards the modernization of health care libraries in India; and the training and awareness programme which are given by the National Informatics Centre, New Delhi, should also cover the Healthcare Libraries even in the remote places of this Country.

Gaur et al., (1993) conducted a survey on 'The use of desk top publishing for in house publishing & printing' in some libraries of New Delhi. According to them, Desk Top Publishing (DTP) – a technology of computerized typesetting, imaging and printing promises to save money and time of the publishers, printers and organizations and opens new door for the in-house publishing and printing. Invention of printing technology is responsible for 'Information Revolution' and invention of DTP brings 'Information explosion' and discusses available techniques for DTP and also others a guide to minimum hardware and software requirements. They identified the need for applications of DTP in Indian libraries and information centers to explore the possibilities of the production of in house publications by using DTP system.

Newton & Jebakumar (1993) conducted a study on 'Need for professional training for Health science libraries in India'. They say, in all professions there will be deviation between theoretical studies and practice. Library profession also has not been exempted from this, especially Health Science Library profession. The status of health science library is based on many factors. The up-to-date knowledge in the advancement of the profession in one of the most important factors. Therefore, special refresher courses and trainings for working library professionals are being conducted from time to time. To fulfill the requirements of out medical practitioners, the staff working in the health science libraries should be fully equipped with the advancement of the profession i.e. ways and means for quick retrieval of information by using CD-ROM technology, by automating the library system and the national and international net working systems for sharing resources. Therefore, Health science library and information services cannot provided effective information service unless the manpower of the systems has been trained properly in the Information Technology.

Singh & Garg (1995) discusses the role of Multimedia / Hyper media (MM / HM) in Biomedical information services in India with basic concepts of multimedia. They discussed the need, importance, advantages and disadvantage in information storage and retrieval with particular reference to biomedical services. The hardware and software and requirements for MM Work station have been suggested. The existing MM product companies and the use of MM and its products in the field of biomedicine viz., cardiology, diabetics, oncology,

pediatric neurosurgery etc. over highlighted. Some recent studies show that this new IT has direct impact on biomedical library and information centers, as users of bio-medical information system have responded positively.

In 1996, *Kapila* discusses 'Factual database in Biomedical'. The author stated that, advances in biomedical research and computer and communication technologies have led to the development of a plethora of databases of all types in the area of biomedicine. Factual databases comprise non-bibliographic databases and those full text databases, which are not derived from published literature. Several databases are available in biomedicine, viz., directories, encyclopedias, drug indexes and sequences database. Multimedia databases and expert systems are amongst the latest developments. Factual database in biomedicine constitute a rich source of information for medical practitioners and lay users. The factual databases in biomedicine reveals the latest trends in information dissemination. As user demand for multimedia database grows, information providers are increasingly adding graphics, images, audio and video to the textual content of the databases. Multimedia elements are of indisputable value in the study and practice of medicine. However, the existing collection of factual databases in biomedicine do provide coverage for a large number of essential aspects of biomedicine and health care and constitute an effective support source for purely bibliographic information or full-text reproduced from published literature. They cater to the information needs of medical practitioners.

CHAPTER 3

METHODOLOGY

CHAPTER 3

METHODOLOGY

3.1. DEFINITION

From the literature review, it is clear that, a many studies have been conducted so far to examine the various issues regarding information needs and information seeking behaviour of medical practitioners abroad and also Indian settings. But so far, not a single study has been conducted in information needs, information channel, information sources and information barriers. In order to satisfy information needs, medical practitioners have to use various channels to reach to the sources of information. The 2 main channels of information are formal (e.g. library) and informal (e.g. discussion with colleagues).

The nature of information needs by the medical practitioners in relation between variables is illustrated in Fig. 3.1.

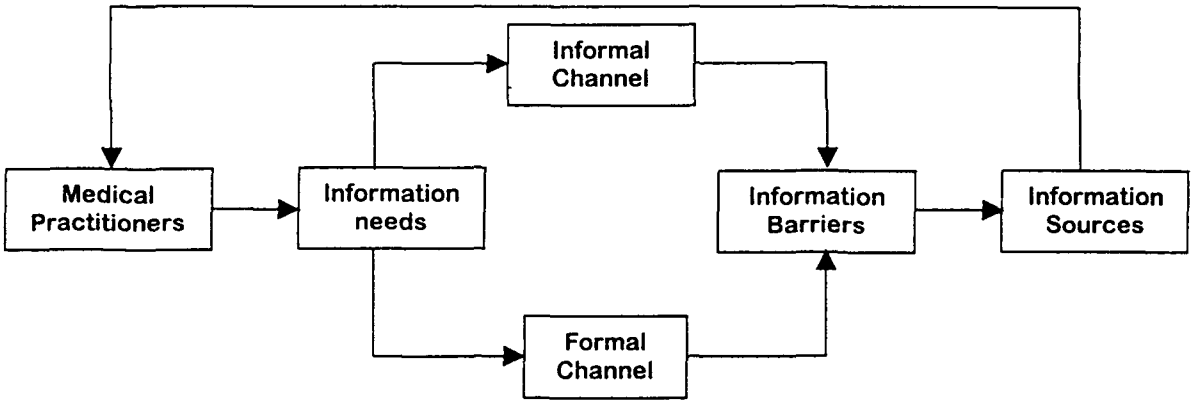


Fig. 3.1. A model to study information seeking strategies of Medical Practitioners.

3.2. OBJECTIVES OF THE STUDY

The objectives of the present study is mainly as follows :

1. To investigate the nature of information needs by the medical practitioners.
2. To examine local institutions in relation to transmission of medical information.
3. To identify the relationships between information needs, information channels, information barriers and information sources.
4. To study any relationships between background variables of medical practitioners and their information needs.
5. To suggest a model for effective transmission of medical information in North East India.

3.3. HYPOTHESIS

For the purpose of this study, the medical practitioners have been classified into 2 group each, Clinicians Versus Non-Clinicians in one group and Institutional Versus Private Medical Practitioners in other group. The underlying assumptions are that information needs and information seeking behaviour of clinicians, non-clinicians and private medical practitioners working in various parts of North East India will not differ. Keeping in view the above assumption main hypothesis to be tested are as follows :-

1. There is no significant difference in information seeking strategy between clinicians and non-clinicians.
2. There is no significant difference in information seeking strategy of medical practitioners based on their background variables.
3. There is no significant difference in information seeking strategy between private medical practitioners and medical practitioners working in institutions.

3.4. THE RESEARCH SITE

The aim of the present study is to study the information needs and seeking strategy of the medical practitioners in North East India. Medical practitioners for the purpose of study have been divided into clinicians, non-clinicians and private medical practitioners. Clinicians and non-clinicians are medical practitioners attached to the institution. Clinicians are medical practitioners who specializes in General Medicine, Paediatrics, General Surgery, Orthopaedics, Oto-rhinolaryngology, Opthalmology, Obstetrics and Gynaecology, Radio-diagnosis, Anasthesiology, Psychiatry, Dermatology, Venerology & Laprosy, Dentistry. Non-clinicians are medical practitioners who specialize in Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Forensic Medicine and Community Medicine. The private medical practitioners are those medical practitioners who are not affiliated to an institution, but have their own clinics for their practice.

This study attempts to identify the relationship among information needs, sources, channels and barriers with background of medical practitioners working in North-East India. The following method has been adopted to conduct the present study.

For the purpose of this study, all Medical Colleges with attached Hospital were identified. In North-East India, there are only four Medical Colleges, which have Hospital attached to them. These are as follows :

1. Gauhati Medical College, Guwahati.
2. Assam Medical College, Dibrugarh.
3. Silchar Medical College, Silchar.
4. Regional Institute of Medical Sciences, Imphal.

The medical practitioners working in the above Institutions are Professor, Associate Professor, Assistant Professor and Registrar / Demonstrator.

3.5. THE SAMPLE

The sample comprised of all medical practitioners working in four Medical College & Hospitals. There are total 605 medical practitioners working in four Medical College and Hospitals. Out of that, 92 medical practitioners were not available for following reasons :

(i) Some of them were on long leave for study out of the institution.

(ii) Some of them were on leave due to transfer.

(iii) Some of them were abroad.

Therefore, questionnaires were distributed to remaining 513 medical practitioners. The questionnaires were distributed and collected personally. The data collection was done through September '98 to May '99. Each medical practitioner was requested 3 times to return the questionnaires. Out of 513 medical practitioners, only 374 medical practitioners responded making in 72.90% response. Further, in order to study the difference between medical practitioners working in Institution and private medical practitioners data was also collected from 23 private medical practitioners based in Guwahati alone. Table 3.1 and Table 3.2 shows details of the sample.

Table : 3.1. Data summary regarding Sample.

SL. NO.	INSTITUTIONS	Total Medical Practitioners	Participated Medical Practitioners	Percen-tage
1	GAUHATI MEDICAL COLLEGE & HOSPITAL, GUWAHATI	207	175	84.54%
2	ASSAM MEDICAL COLLEGE & HOSPITAL, DIBRUGARH	109	73	66.97%
3	SILCHAR MEDICAL COLLEGE & HOSPITAL, SILCHAR	92	61	66.30%
4	REGIONAL INSTITUTE OF MEDICAL SCIENCE, IMPHAL	105	65	61.90%
	Total ::	513	374	72.90%
5	PRIVATE PRACTITIONERS AT GUWAHATI	23*	23	100%
	GRAND TOTAL ::	536	397	74.06%

* : Random sample

Table : 3.2. Details of the Sample.

SL. No.	Name of the Institution	Levels					Total		Sex		
		P	AS	AP	D/R	PP	Number	%	M	F	Total
1	G.M.C.H.	40	33	57	45	-	175	44.08	124	51	175
2	A.M.C.H.	10	09	20	34	-	73	18.38	51	22	73
3	S.M.C.H.	14	09	15	23	-	61	15.36	50	11	61
4	R.I.M.S.	16	12	17	20	-	65	16.37	49	16	65
5	P.P.	-	-	-	-	23	23	5.79	19	04	23
TOTAL ::-		80	63	109	122	23	397		293	104	397
%		20.15	15.86	27.45	30.73	5.79		100	73.80	26.19	100

Note :- GMCH = Gauhati Medical College & Hospital, AMCH = Assam Medical College & Hospital, SMCH = Silchar Medical College & Hospital, RIMS = Regional Institute of Medical Sciences, PP = Private Practitioners, P = Professor, AS = Associate Professor, AP = Assistant Professor, D/R = Demonstrator / Registrar.

As seen from Table 3.2, out of 397 participants, 36.01% represent the top level medical practitioners, viz., Professor and Associate Professor, 27.45% Assistant Professor, whereas 30.73% represent lowest level viz., Demonstrator / Registrar. Majority of the participants were males (73.80%).

3.6. THE SURVEY QUESTIONNAIRE

A questionnaire booklet (Appendix I) based on various studies and scales available in current literature was prepared. There were total of 123 items, which were divided into five sections. A summary of the measures employed, is given in Table 3.3.

Table : 3.3. Survey Questionnaires employed in the Study.

Section	Measures	No. of Items	Scales
I	Information needs	15	5 point likret type
II	Information sources	54	5 point likret type
III	Information channels	25	5 point likret type
IV	Information barriers	17	5 point likret type
V	Background variables	12	**
TOTAL ::		123	

** : Note : Scale varies from single item measures to 8 items.

3.6.1. Information Needs

In this section, there are 15 items, distributed on various information needs. The scale items were averaged on 5 point likret type rating scale ranging from 5 = to a very great extent; 4 = to great extent; 3 = to some extent; 2 = to a small extent; 1 = almost no extent. In the information needs of a medical practitioner, items are in first person, i.e. the "I" format, e.g. :

"I need information to know about the background of the patient".

"I needs information to prepare conference / seminar papers".

"I collect information for understanding research project".

3.6.2. Information Sources

Altogether there are 54 items in this section. The attempt has been made to have comprehensive list of information sources, both printed and non-printed information sources included. The scale items were averaged on 5 point likret type rating scale ranging from 5 = very often;

4 = often; 3 = sometimes; 2 = seldom; 1 = never. Here also items are in first person , i.e. the "I" format, e.g.

Printed information sources :	Non-printed information sources :
"I use news-letters."	"I use radio".
"I use current awareness bulletins".	"I use cinema".
"I use directories".	"I use internet".

3.6.3. Information Channels

In this section, 25 items are included and based on the use of various information channels both formal and informal, are included. The scale items arranges on 5 point likret type rating scale ranging from 5 = very often; 4 = often; 3 = sometimes; 2 = seldom; 1 = never. The items are in first person, i.e. "I" format, e.g.

"I get / acquire information by consulting the Institutional library".

"I get / acquire information by personal connection".

"I get / acquire information by conducting computer based search on my Institute".

3.6.4. Information Barriers

The medical practitioners face various barriers while seeking information. In order to study the information barriers and their impact on information needs there are 17 items on explaining various information barriers were included. These 17 items included personal

as well as environmental barriers. The scale items were averaged on 5 point likret type rating scale ranging from quite 5 = true; 4 = true; 3 = doubtful; 2 = false; 1 = quite false. The items are like :

"There is always shortage of books in my Library".

"Library staff does not assist in using library resources".

"I have communication barriers with my library staffs".

3.6.5. Background Variables

Last section of the questionnaire, consist of 12 items of background variables. The background variables taken into consideration are present age, age at the time of joining in the medical profession, sex, marital status, designation, joining qualification, academic qualification, specialization, number of years working in the profession, number of years working in the present position, number of years working in present organization, number of years working in other organization. Single item measure was named for background variables having scales ranging from 1 – 8.

3.7. THE STATISTICAL ANALYSIS

The following statistical techniques were employed :

a) Factor analysis with varimax rotation,

b) Inter co-relation among the inferred variables,

c) Analysis of variance (ANOVA).

Factor analysis is a data reduction process, but it differs from principle component analysis (PCA). In PCA, variance is the element leading to inclusion of an entity within a component, whereas in factor analysis, co-variance is the critical element. The consequence is that an entity needs not to be included within one factor and partially within one or more others. Factor analysis is frequently used in where there is need to see a relatively large number of measures reduced to fewer, one basic underlying variables. It is used as a means of detecting underlying structure or order among variables. These new composite variables or factor derived there identified from the context of the variables with which they are strongly co-related. These co-relations are called factor loadings.

To reveal the multiple dimensions produced by factor analysis factor loadings are rotated according to various criteria, the most common of which is a varimax rotation. The rotation procedure groups variables that tend to co-relate highly with some factors and considers them together. This allows factors to be defined in terms of the variables with which they are highly co-related.

Factor analysis was initially developed in the context of psychology, but this technique has been used by few studies in library science field also. *McGrath et al.* (1969) applied factor analysis to a formula for determining library collection, allocations of academic departments. Data on 22 variables used for developing an allocation formula was analysed using multiple co-relation and factor analysis. The data were reduced to three groups or factors. *Phillips & Lyons* (1990) choose

factor analysis as a relevant technique to identify relationship among 19 of the questions they asked faculty regarding library policy. The criteria used by SPSS PC package employed selected six factors (Eigen value = 1) out of which only four retained for final analysis. *Saraf* (1995) applied factor analysis for determining leadership styles and their effectiveness in the management of University libraries in India. *Rahman* (1999) applied factor analysis in role of documentation centers in communication and dissemination of scientific and technological ideas in Bangladesh.

Fifteen items of information needs in section I, 54 items of information sources in section II, 25 items of information channels in section III, 17 items of information barriers in section IV were subjected to factor analysis with varimax rotation separately and inferred factors were named appropriately. Analysis of variance (ANOVA) was applied to identify the relationship among the information needs, information sources, information channels, information barriers and background variables.

All statistical techniques were performed using SPSS-PC (ver. 6.0), 1993.

CHAPTER 4

INFORMATION NEEDS, INFORMATION SOURCES, INFORMATION CHANNEL AND INFORMATION BARRIERS

CHAPTER 4

INFORMATION NEEDS, INFORMATION SOURCES, INFORMATION CHANNELS AND INFORMATION BARRIERS

Many studies have been conducted with the information needs, the use of literature or the information seeking behaviour of a particular group of people or scientists. Most of these studies have used the concepts of 'information use' or 'information need', 'information seeking behaviour' and 'strategy' and 'channels of communication'. This system exists in a system of complicated and inter-dependant relation. All these studies gradually contributed, in one way or another in establishing and expanding the field. In an era of continuous technological developments in conjunction with information overload, user studies continue to be a vital tool abling information professionals to improve both their understanding of information use and hence information delivery (*Siatri*, 1999).

In this context, it is felt imperative to study the information seeking strategy of medical practitioners in North-East part of India. The four variables included in the information seeking strategy are information needs, use of information sources, information channels and information barriers. A survey of 397 medical practitioners is conducted and results of which are reported as follows :

4.1 INFORMATION NEEDS : ANALYSIS

The 15 items neatly loaded on 3 factors with a total of 75.2% variance and total eigen value of 11.27. The criteria used for identifying the factors are based on the following criteria :

a) Eigen value of factor is greater than one.

b) Two or more items are loading in each factor.

c) Factor loadings are greater than 0.35.

The factor loadings obtained in the three factors is represented in the following Table – 4.1 (Medical Practitioners – Information Needs : Factor Analysis Results)

Table 4.1 : Medical Practitioners – Information Needs : Factor Analysis Results :

SL. No.	Items	Factors		
		1	2	3
1.	I need information to keep abreast with the latest developments in my area of specialization.	.340	.303	.768
2.	I need information to keep abreast with the latest developments in the areas which are related to my field of specialization	.239	.157	.879
3.	I need information for solving day-to-day problems I face in my profession.	.194	.685	.276
4.	I need information to gain knowledge about the new drugs.	.198	.859	.081
5.	I need information to gain knowledge about new clinical methods.	.222	.873	.042
6.	I need information to gain about the new treatments	.189	.858	.120
7.	I need information to know about the background of the patients	.165	.839	.101
8.	I need statistical information regarding various diseases / epidemics to treat patients suffering from similar symptoms.	.212	.749	.166
9.	I need information for preparing lectures for the students or audiences.	.796	.334	.019
10.	I need information for preparing conference / seminar papers	.864	.239	.168
11.	I need information to write an article or review an article	.846	.194	.199
12.	I collect in formation for understanding research project	.835	.201	.161
13.	I need information to attend national conference / seminar / workshop	.844	.265	.144
14.	I need information to attend the international conference / seminar / workshop	.762	.164	.137
15.	I need information for preparing research projects in my area of specialization	.789	.056	.298
	Eigenvalue	7.737	2.464	1.086
	Percentage of variance	51.6	16.4	7.2

Note : (n = 397) Factor 1 = Conference / Seminars. Factor 2 = Medical Information.
Factor 3 = Uptodateness.

The factors are named as follows :

FACTOR 1 : CONFERENCE / SEMINARS

Seven items loaded on this factor having highest Eigen value of 7.7 with 51.6% of variance. Loadings range from 0.864 to 0.762. This factor emphasis that medical practitioners need information for:

a) Preparing to attend seminar and conferences at national and international levels.

b) Submitting research proposal in their areas of specialization.

c) For writing or reviewing articles.

d) For preparing lectures for the students / audiences.

FACTOR 2 : MEDICAL INFORMATION

This factor seems to be specific to medical practitioners. Six items loaded on the factor with Eigen value of 2.46 and percentage of variance 16.4%. Highest loading of 0.873 is of item 'I need information to gain knowledge about new clinical methods' and item with lowest loading is 'I need information for solving day-to-day problems I face in my profession (0.658)'. This factor emphasis that medical practitioners need information related to their specialization – e.g.,

a) To get information about new drugs.

b) To get information about new clinical methods.

c) To get information about new treatments.

d) To get information about patients background and solve day-to-day problem.

e) Statistical information regarding epidemic disease for treatment.

FACTOR 3 : UPTO DATENESS

Only 2 items loaded on this factor with Eigen value of 1.086 and only 7.2% of variance. Even though this is the last factor, yet this factor is important as it emphasis on keeping oneself informed about latest development in the area of specialization. The two factors which loaded on this factor are :

a) I need information to keep abreast with the latest developments in my area of specialization (0.768) and;

b) I need information to keep abreast with the latest developments in the area, which are related to my field of specialization (0.879).

4.1.1. INTER-CORRELATION AMONG THREE FACTORS OF INFORMATION NEEDS

Inter-correlation among three factors of information needs are represented in Table 4.2 (Inter-correlation and Mean Scores of Information Needs Among Medical Practitioners) as follows :

Table 4.2 : Inter-correlation and Mean Scores of Information Needs Among Medical Practitioners.

Sl. No.	Information Needs	C/S	MI	UD
1.	Conferences / Seminars	X		
2.	Medical Information	.48**	X	
3.	Uptodateness	.52**	.44**	X
	No. of items	7	6	2
	Mean	27.19	23.42	8.84
	SD	6.72	5.39	1.33
	Rank	1	2	3

Note : n = 397 and *P < .01, ** P < .001. C/S = Conferences / Seminars; MI = Medical information; UD = Uptodateness.

From the above table it is clear that inter-correlation among information needs factors conferences / seminars, medical information and uptodateness are inter-correlated. Conferences / seminars is highly inter-correlated with both factors i.e., Medical information and uptodateness with r = 0.48** and r = 0.52** respectively. Further Medical Information is also highly correlated with uptodateness factor (r = 0.44**).

This results herein conformity with already established information needs (*Krikelas*, 1983; *Childers*, 1975; *Brittain*, 1970 & *Saraf et al.*, 1995).

4.2. INFORMATION SOURCES

A rapid expansion of supply and demand regarding information and new techniques, the modern era has seen an increase in number and

variety of information sources available and ever increasing requirement for their use. A total of 54 items naming various information sources were identified for the purpose of this study. This 54 items for better analysis are categorized into following two groups and analyzed separately :

4.2.a). Printed Information Sources (38 items); and

4.2.b). Non-printed Information Sources (16 items).

4.2.a). Printed Information Sources

Responses to the thirty-eight items of section II of the questionnaire related to printed information sources. Out of eight factors only six meaningful and interpretable factors were retained in the final analysis based on following criteria : (i) Eigen value more than 1, (ii) more than 1 item loading on the factor, (iii) factor loadings are more than 0.35. The factor 8 only one item was loaded, namely 'dissertation / thesis' (0562) and on factor 7 two items namely textbooks (.807) and reference book (.831) was loaded. Since they did not fit in the criteria, they were dropped for further analysis. The factor loadings obtained in six factors are reported in the Table 4.3. (Printed Information Sources : Factor Analysis Result)

Table 4.3.: Printed Information Sources : Factor Analysis Result.

SL. No	Items	Factors					
		1	2	3	4	5	6
To satisfy information needs I use -							
1	Journals – Indian	.092	.091	.170	.613	.113	.145
2	International	.251	.001	.069	.653	.178	131
3	Newsletters	.005	.197	.355	.584	.231	.111
4	Current awareness bulletin	.162	.309	.283	.547	.249	.042
5	Government document	.030	.356	.364	.515	.203	.027
6	Research monograph	.011	.156	.270	.750	.024	.040
7	Research reports	.022	.203	.221	.657	.086	.139
8	Conference proceedings	.340	.012	.243	.576	.005	.237
9	Dissertation / Thesis	.190	.299	.267	.252	.081	.148
10	Review of progress	.220	.214	.592	.345	.008	.079
11	Trade literature	.151	.009	.654	.189	.117	.236
12	Treatise	.131	.212	.811	.142	.034	.067
13	Patents	.182	.282	.726	.160	.055	.102
14	Standards	.231	.311	.663	.136	.043	.086
15	Textbooks	-.117	.155	.083	.112	.137	.080
16	Reference books	.137	.128	.186	.134	.139	-.043
17	Published bibliographies	.015	.130	.247	.421	.114	.020
18	Pre-prints or publishers advance notice	.364	.185	.492	.258	.229	.091
19	Dictionaries	.134	.171	.023	.103	.646	.046
20	Encyclopedias	.135	.106	.028	.132	.817	.007
21	Atlas	.096	.077	.084	.127	.786	.003
22	Year books	.148	.102	.332	.083	.463	.189
23	Year book published from WHO	.113	.539	.323	.237	.273	.010
24	Directories	.520	.117	.180	134	.464	.081
25	Unpublished sources	.666	.233	.218	.127	.202	.078
26	In house memoranda	.800	.140	.192	.096	.195	.090
27	Internal meetings	.838	.117	.179	.094	.094	.055
28	Discussion within hospital	.775	.029	.040	.003	.039	.178
29	Discussion with other hospitals	.206	.090	.230	.147	.070	.643
30	Patients record (personal)	.371	.045	.005	.082	.007	.394
31	Patients record (centralized i.e. M.R.D)	.696	.136	.133	.149	.063	.192
32	Pharmaceutical representatives	.089	.056	.106	.093	.006	.859
33	Newspaper / magazines	.239	.298	.146	.006	.209	.620
34	Programme documents published from WHO	.373	.436	.364	.122	.201	.308
35	Statistical quarterly	.176	.747	.283	1.35	.082	.171
36	Public health paper	.148	.859	.185	.173	.008	.074
37	Technical report series	.126	.865	.184	.163	.107	.012
38	Any other	.079	.767	.131	.070	.006	.126
	Eigen value	12.12	3.08	2.28	1.88	1.72	1.54
	Percentage of variance	31.9	8.1	6.0	5.0	4.5	4.1

Note : (n = 397) Factor 1 = Ready References, Factor 2 = Medical sources, Factor 3 = Primary sources (a), Factor 4 = Primary source (b), Factor 5 = Secondary source and Factor 6 = External sources.

FACTOR 1 : READY REFERENCES

Five items loaded in this factor with loading range from 0.838 to 0.520. The eigenvalue of this factor is 12.12 and percentage of variance is 31.9, which is the highest among all the factors. This factor clearly shows that the medical practitioners often need some important information which will be getting easily around them; e.g.:

a) Discussion within hospital;

b) Patients record (Centralized i.e. M.R.D.)

c) Internal meetings;

d) Unpublished sources etc.

FACTOR 2 : MEDICAL SOURCES

Total six items loaded in this factor having the Eigenvalue of 3.08 and percentage of variance is 8.1 The important characteristic of this information source is that, the medical practitioners use information which are published by some specific organization like W.H.O. Some of them are as follows:

a) Year book published from W.H.O.;

b) Public health paper;

c) Technical report services;

d) Statistical quarterly etc.

FACTOR 3 : PRIMARY SOURCES (a)

Primary sources means the basic or original work or studies carried out by the author which is published in the form of like journal article, research report, patients, standards etc. Now a day, for the permanent acquisition by the user the original text or full size or reduced size copy e.g. microfilms, for which a change is usually made like CDROM for the satisfaction of the users needs. However, in this factor six items loaded with the Eigen value of 6.0 and percentage of variance is 2.28. Some of the important factor, which are used by medical practitioners as follows:

a) Review of progress;

b) Trade literature;

c) Treaties;

d) Patients;

e) Standards.

FACTOR 4 : PRIMARY SOURCES (b)

Total nine items loaded in this factor, which is the highest loaded factor among all the factors. The Eigenvalue of the factor is 1.88 and the percentage of variance is 5.0. This factor clearly shows that, medical practitioners frequently use these primary sources, which are as follows:

a) Indian journals;

b) International journals;

c) News letters;

d) Current awareness bulletins;

e) Research monographs;

f) Research reports;

g) Conferences, proceedings.

FACTOR 5 : SECONDARY SOURCES

Here, in this sources do not provide the user with the document or information actually needed for users query but refer them to the sources which is called as secondary sources and tell them where to find their requirements. For example, the users utilize the directories, files etc. as sources if necessary specially created for the purpose.

In this factor, total five items loaded with Eigen value of 1.72 and percentage of variance is 4.5. The factor shows that, the medical practitioners give emphasis to use the secondary sources according to their requirements of need. Some of the items of the factor are as follows:

a) Dictionaries;

b) Directories;

c) Atlas;

d) Year books;

e) Encyclopedias.

FACTOR 6 : EXTERNAL SOURCES

In this factor only four items loaded, which is the lowest items loaded factor. The Eigen value of the factor is 1.54 and percentage of variance is 4.1. The importance of the factor shows that, the medical practitioners acquires their important information's from like –

a) Patient's record (personal);

b) Discussions with other hospitals;

c) Pharmaceutical representatives; and

d) Newspapers / magazines.

Form the above factor it is clear that the factor 3 and factor 4 are bearing the similar items, which are known as primary sources. Therefore, for the purpose of further analysis they have been merged together to make one factor named as Primary Sources.

For the further analysis the factors are as follows:

Factor 1 = Ready Reference

Factor 2 = Medical Sources

Factor 3 = Primary Sources

Factor 4 = Secondary Sources

Factor 5 = External Sources

4.2.(a).1. Inter-correlation Among Five Factors Of Printed Information Sources

Inter-correlation among five factors of printed information sources are represented in Table 4.4. (Inter-correlation and Mean Scores of Printed Information Sources Among Medical Practitioners)

Table 4.4. : Inter-correlation and Mean Scores of Printed Information Sources Among Medical Practitioners.

SL. No.	Printed Information Sources	R. R.	M.S.	P.S.	S.S	E.S.
1.	Ready Reference	X				
2.	Medical Sources	.42**	X			
3.	Primary Sources	.48**	.62**	X		
4.	Secondary Sources	.37**	.37**	.50**	X	
5.	External Sources	.43**	.42**	.55**	.31**	X
	No. Of Items	5	6	15	5	4
	Mean	16.23	10.57	43.24	20.88	13.80
	SD	5.23	5.00	10.02	3.22	3.36
	Rank	3	5	1	2	4

Note : n = 397 and *P < .01, **P < .001; RR = Ready reference; MS = Medical sources; PS = Primary sources; SS = Secondary sources; ES = External sources.

Table 4.4. presents the inter-correlation, mean and standard deviation of five factors. From the table it is clear to understand that the printed information sources i.e. ready reference, medical sources, primary sources, secondary sources and external sources are inter-correlated. It is also observed that primary sources have the strongest relation with medical sources (r = 0.62**). All the sources are highly significant relation with each other. The primary sources are having highly significant relation with medical sources (r = 0.62**), external sources (r = 0.55**), secondary sources (r = 0.50**) and ready reference (r = 0.48**).

4.2. b). NON-PRINTED INFORMATION SOURCES

Sixteen items of section II of questionnaire were used to examine the non-printed information sources of medical practitioners. Scores of sixteen meaningful items were submitted to factor analysis with varimax rotation using criteria of –

(i) Factor loading of each item was not less than 0.35,

(ii) Eigen value greater than one.

Out of four factors only three meaningful and interpretable factors were retained in the final analysis and these three factors represented three types of information sources viz.,

(1) Audio-visuals,

(2) Online electronic sources, and

(3) Offline electronic sources.

The fourth factor loaded two items only namely 'any other' (.771 and 0858). Since this was not carrying any meaning, so it was dropped from analysis. The factor loadings obtained in these factors are represented in the table 4.5. (Non-Printed Information Sources : Factor Analysis Results) as follows :

Table 4.5. : Non-Printed Information Sources : Factor Analysis Results.

SL. No.	Items	Factors		
		1	2	3
1.	Radio	.801	.031	.026
2.	Tape recorder	.789	.099	.138
3.	Slide	.038	.105	.675
4.	TV	.790	.039	.061
5.	VCR	.712	.005	.006
6.	LCD Projector	.712	.117	.156
7.	Cinema	.790	.084	.007
8.	CD ROM	.521	.326	.197
9.	Index Medicus	.088	.281	.834
10.	IMSEAR	.072	.461	.728
11.	MEDLARS	.125	.763	.379
12.	Internet	.012	.881	.010
13.	Any other	.232	.245	.080
14.	MEDLINE	.144	.774	.298
15.	Internet	.075	.878	.012
16.	Any other	.091	.136	.078
	Eigen value	6.33	3.14	1.50
	Percentage of variance	35.2	17.5	8.3

Note : (n = 397) Factor 1 = Audio-visuals, Factor 2 = Online Electronic Sources, and Factor 3 = Offline Electronic Sources.

FACTOR 1 : AUDIO-VISUALS

The information dealing with audio-visuals may exist in various types like, still photographs, maps, plans video recordings etc. and also we can say it like 'media centre'. However, in this factor seven items with leading range 0.801 to 0.521. The Eigen value of the factor is 6.33 and percentage of variance is 35.2, which is the highest among the factors.

This factor reveals the strong relationship between medical practitioners and their use of audio-visual sources. Some of the items are as follows:

a) Radio;

b) Tape recorder;

c) TV;

d) VCR;

e) Cinema.

FACTOR 2 : ONLINE ELECTRONIC SOURCES

Total four items loaded in this factor with Eigen value of 3.14 and percentage of variance is 17.5. This factor clearly shows that, the medical practitioners searches online electronic sources for their required important information e.g.:

a) Medline;

b) Internet.

FACTOR 3 : OFFLINE ELECTRONIC SOURCES

Only five items loaded in this factor with Eigen value of 1.50 and percentage of variance is 8.3. This factor stress that, offline electronic sources are also very much useful to the medical practitioners like other sources.

The offline sources includes –

a) Index Medicus;

b) IMSEAR etc.

4.2.(b).2. Inter-correlation Among Three Factors of Non-Printed Information Sources

Inter-correlation among three factors of non-printed information sources are represented in Table 4.6. (Inter-correlation and Mean Scores of Non-Printed Information Sources Among Medical Practitioners).

Table 4.6. : Inter-correlation and Mean Scores of Non-Printed Information Sources Among Medical Practitioners.

SL. No.	Non-printed Information Sources	A.V.	On E.S.	Off E.S.
1.	Audio-visuals	X		
2.	Online Electronic Sources	.67**	X	
3.	Offline Electronic Sources	.70**	.72**	X
	No. of Items	7	4	3
	Mean	29.36	11.24	7.19
	SD	6.02	2.94	2.39
	Rank	1	2	3

Note : n = 397 and *P < .01, **P < .001; AV = Audio-visuals; On ES = Online electronic sources; Off ES = Offline electronic sources.

Table 4.6. presents Inter-correlation, Mean and Standard Deviation of three factors. It is clear from the table that Audio-visuals, Online electronic sources and Offline electronic sources are inter-correlated.

Audio-visual sources are highly significant relation with offline electronic sources (r = 0.70**) and online electronic sources (r = 0.67**). The strongest relation of online electronic sources with offline electronic sources (r = 0.72**).

4.3. INFORMATION CHANNELS

Response to the twenty-five items of section III of the questionnaire (information channels) is used to assess the use of information channels used by medical practitioners. The items loaded on six factors. The criteria for loading is as follows :

(i) The Eigen value is more than 1;

(ii) Factor loading exceeds 0.35.

When one item is having more than 0.35 loading on two factors item is loading on the factor having higher loading. The factor loadings obtained in this factors are represented in Table 4.7. (Information Channels : Factor Analysis Results).

Table 4.7. Information Channels : Factor Analysis Results.

SL. No	Items	Factors					
		1	2	3	4	5	6
1.	Consult with the institutional library	.769	.125	.107	.095	.034	.052
2.	Consult of the public libraries	.090	.259	.290	2.63	.729	.147
3.	Consult of any other libraries	.040	.058	.251	.096	.782	.241
4.	Personal collection	.465	.031	.038	.273	.100	.548
5.	Personal collection from colleagues	.873	.066	.024	.068	.135	.114
6.	Personal visit to a subject specialist	.520	.042	.328	.018	.320	.258
7.	Attending seminar / conference / workshop	.769	.044	.209	.117	.133	.094
8.	Discussion with colleagues / meetings	.869	.052	.169	.049	.040	.015
9.	Accidental discovery of information	.573	.128	.252	.221	.164	.059
10.	Follows up, references and foot-notes	.694	.143	.213	.197	.261	.051
11.	Asking the author for reprint	.435	.261	.524	.182	.254	.108
12.	Writing a letter to a friend in India / abroad	.146	.033	.752	.045	.227	.179
13.	Phone calls to a subject specialist in India / abroad	.079	.024	.739	.076	.241	.293
14.	Sending e-mail to a subject specialist in India / abroad	.197	.286	.711	.281	.119	.076
15.	Sending fax to a subject specialist in India / abroad	.183	.353	.689	.283	.005	.000
16.	Conducting computer based searches in my computer	.090	.113	.335	.750	.121	.037
17.	Conducting computer based searches in my institute	.154	.253	.148	.616	.379	.048
18.	Conducting computer based searches in other institutes of India	.081	.177	.092	.777	.284	.143
19.	Conducting computer based searches while in abroad	.115	.279	.063	.667	.066	.104
20.	MEDLINE	.048	.171	.105	.294	.225	.726
21.	INTERNET	.143	.302	.327	.248	.015	.631
22.	ADONIS	.132	.881	.064	.158	.048	.217
23.	TOXLINE	.128	.843	.140	.119	.031	.209
24.	Medical Bulletin Board Services (MBBS)	.082	.748	.197	.188	.174	.032
25.	Any other	.060	.746	.102	.217	.132	.029
	Eigenvalue	8.21	3.28	1.97	1.50	1.22	1.02
	Percentage of variance	32.9	13.2	7.9	6.0	4.9	4.1

Note : n = 397 Factor 1 = Formal Channel, Factor 2 = Online searches, Factor 3 = Informal Channels, Factor 4 = Electronic Text Searching, Factor 5 = External / Other libraries and Factor 6 = Internet.

FACTOR 1 : FORMAL CHANNEL

It is clear from above table that a total of eight items loaded on this factor having Eigen value of 8.21 and with 32.9% of variance. Formal channel is characterized by use of such sources as:

a) Institutional library;

b) Attending conferences/seminars etc.;

c) Personal visits or discussions with subject specialists / colleagues;

d) Follow up references & footnotes and accidental discovery of information.

FACTOR 2 : ONLINE SEARCHES

Total of four items loaded on this factor having Eigen value of 3.20 and 13.2% of variance. The characteristic of this channel are that the medical practitioners use online searches for their specific information needs, e.g. accessing the online databases like ADONIS, TOXLINE, Medical Bulletin Board Services etc.

FACTOR 3 : INFORMAL CHANNEL

Total of five items loaded on this factor with Eigen value of 1.97 and percentage of variance is 7.9. The characteristic of this channel are that the medical practitioners use informal channel e.g. conversation etc. to satisfy their needs. Some of the items which are loaded in this factor are :

a) Writing a letter to friend in India / abroad;

b) Phone calls to a subject specialist in India / abroad;

c) Sending e-mails to a subject specialist in India / abroad;

d) Sending fax to a subject specialist in India / abroad;

FACTOR 4 : ELECTRONIC TEXT SEARCHING

Total of four items loaded on this factor with Eigen value of 1.50 and percentage of variance is 6.0. This shows that electronic text searching is prevalent among medical practitioners. The use of channels namely :

a) Conducting computer based searches in my computer;

b) Conducting computer based searches on my institute;

c) Conducting computer based searches in other institutes in India;

d) Conducting computer based searches while abroad.

FACTOR 5 : EXTERNAL / OTHER LIBRARIES

Total of two items loaded on this factor with Eigen value of 1.22 and percentage of variance is 4.9. The characteristic of these channels is that the medical practitioners mostly depend on:

a) Public libraries; and

b) Other libraries.

FACTOR 6 : INTERNET

In this factor also only two items loaded Eigen value of 1.02 and percentage of variance is 4.1. The characteristics of this channel are that the medical practitioners use this channel for their latest information needs, e.g.

a) MEDLINE, and

b) Internet.

There is not much difference between factor online searches (factor 2) and internet (factor 6) where search of MEDLINE is also included. These two factors are having similar characteristics. They are sources dependent on the information technology. For the purpose of this study both have grouped together to form one factor named as "INTERNET / ONLINE SEARCHES". Therefore following 5 factors of information channels are retained for further analysis :

Factor 1 = Formal Channel

Factor 2 = Informal Channel

Factor 3 = Electronic Text Searching

Factor 4 = External / Other libraries

Factor 5 = Internet / Online Searches

4.3.1. INTER-CORRELATION AMONG FIVE FACTORS OF INFORMATION CHANNELS

Inter-correlation among five factors of information channels are represented in Table 4.8. (Inter-correlation and Mean Scores of Information Channel Among Medical Practitioners).

Table 4.8 : Inter-correlation and Mean Scores of Information Channel Among Medical Practitioners.

SL. No	Information Channel	Formal Channel	Informal Channel	Electronic Text Searching	External / Other Libraries	Internet / Online Searches
1.	Formal	X				
2.	Informal	.47**	X			
3.	Electronic Text Searching	.28**	.52**	X		
4.	External / Other Libraries	.24**	.54**	.47**	X	
5.	Internet / Online Searches	.25**	.51**	.55**	.39**	X
	No. of items	8	5	4	2	6
	Mean	28.28	8.94	4.85	4.11	8.11
	SD	6.16	3.55	2.65	1.80	3.87
	Rank	1	3	4	5	2

Note: n = 397 and *p < 0.01, ** p < 0.001

Table 4.8. presents inter-correlation, Mean and Standard Deviation of five factors. It is clear from the table that Formal, Informal, Electronic Text Searching, External / Other libraries and Internet / Online searches are inter-correlated. Formal channel is having highly significant relation with informal channel (r = 0.47**) electronic text searching is having highly significant relation with informal channel (r = 0.52**) and formal channel (r = 0.28**). The channel external/other libraries are having highly significant relation with electronic text

searching (r = 0.47**), informal channel (r = 0.54**) and formal channel (r = 0.24**). The Internet / Online searches channel is having highly significant relation with external/other libraries (r = 0.39**), electronic text searching (r = 0.55**), informal channel (r = 0.51**) and formal channel (r = 0.25**) and the strongest relation is with electronic text searching (r = 0.55**). All the channels are highly significant relation with each other.

4.4. INFORMATION BARRIERS

Seventeen items of section IV 'Information Barriers' of questionnaire were used to examine the self reporting of medical practitioners. Seventeen single statement items identified in the scale and these items represented two types of barriers :

(1) Environmental barriers, and

(2) Personal Barriers.

Scores of all seventeen items were submitted to factor analysis with varimax rotation factor matrix for grouping together of highly related items. Two factors were retained for factor analysis based on following principles:

a) Eigen value of each factor is not les than 1;

b) Factor loading of each item is not less than 0.35.

The factor loadings obtained in these two factors is represented in the following Table 4.9. (information Barriers : Factor Analysis Results).

Table 4.9 : Information Barriers : Factor Analysis Results.

SL. No.	Items	Factors	
		1	2
1.	There is always shortage of books in my library	.698	.428
2.	I wish there were more journals available in my library	.621	.471
3.	Indexing and abstracting services are not available in the library	.174	.694
4.	Library staff does not assist in using library resources	.111	.820
5.	I have communication barriers with my library staff	.151	.794
6.	Computerized services are not available to me	.775	.228
7.	I do not have access to online services in my library	.878	.101
8.	I do not have access to online services personally	.868	.132
9.	I do not have access to Internet in the library	.872	.176
10.	I do not have access to Internet personally	.856	.153
11.	I do not have time to visit the library	.078	.698
12.	Latest books and periodicals are not available in the library	.705	.330
13.	My library lacks duplicating facilities	.304	.510
14.	I wish library was opened for more time	.471	.508
15.	Lack of physical facilities viz. AC Room, Seating facilities etc. does not allow library resources to be used maximally	.597	.460
16.	The library staff do not assist / help in using manual bibliographic tools in the library	.393	.576
17.	The library staff do not assist / help in using computerized bibliographic tools in the library	.648	.188
	Eigen value	8.23	48.7
	Percentage of variance	2.05	12.1

Note: (n = 397) Factor 1 = Environmental Barriers, Factor 2 = Personal Barriers.

FACTOR 1: ENVIRONMENTAL BARRIERS

Out of seventeen items ten items loaded in this factor having the loading range from 0.878 to 0.597. Highest loaning items are ' I do not have access to on line services in my library (0.879)' and 'I do not have access to Internet in my library (0.868)'. The Eigen value of the factor is 8.28 and percentage of variance is 2.05. The stress of the factor is on lack of facilities like,

a) There is always shortage of books in my library (0.698);

b) I wish there were more journals available in my library (0.621);

c) Computerized library services are not available to me (0.775);

d) Latest books and periodicals are not available in the library (0.705);

e) Lack of physical facilities viz., AC Room, seating facilities etc. does not allow library resources to be used maximally (0.597)

FACTOR 2 : PERSONAL BARRIERS

Seven items loaded in the factor, Loading range from 0.820 to 0.508. Highest loaded items are 'Library staff does not assist in using library resources' (0.820) and 'I have communication barriers with my library staff' (0.794). Eigenvalue of the factor is 48.7 and percentage of variance is 12.1. Emphasis on this factor is on personal barriers. Some of the important items of the factor are :

a) I do not have time to visit the library (0.698);

b) My library lacks duplicating facilities (0.510);

c) I wish library was open for more time (0.508).

4.4.1. Inter-correlation Among Two Factors of Information Barriers

Inter-correlation among two factors of information barriers are represented in Table 4.10. (Inter-correlation and Mean Scores of Information Barriers Among Medical Practitioners).

Table 4.10. Inter-correlation and Mean Scores of Information Barriers Among Medical Practitioners.

Sl. No	Information Barriers	E. B.	P. B.
1.	Environmental Barriers	X	
2.	Personal Barriers	.61**	X
	No. of items	10	7
	Mean	37.39	15.12
	SD	11.96	5.48
	Rank	1	2

Note : n = 397 and *p < 0.01, ** p < 0.001; EB = Environmental barriers; PB = Personal barriers.

Table 4.10. presents Inter-correlation, Mean and Standard Deviation of two factors. It is clear from the table that Environmental and Personal barriers are inter-correlated. Environmental barriers is having highly significant relation with personal barriers (r = 61**).

4.5. Inter-corelation Among Information Needs, Sources, Channels And Barriers

Inter-correlations among information needs, sources, channels and barriers of Medical Practitioners are presented in the Table 4.11. (Inter-correlations Among Information Needs, Sources, Channels and Barriers of Medical Practitioners).

Table 4.11. Inter-correlations Among Information Needs, Sources, Channels and Barriers of Medical Practitioners.

	IN1	IN2	IN3	IC1	IC2	IC3	IC4	IC5	IS1	IS2	IS3	IS4	IS5	IS6	IS7	IS8	IB1	IB2
IN1	X																	
IN2	48**	X																
IN3	52**	44**	X															
IC1	60**	33**	21**	X														
IC2	42**	22**	28**	47**	X													
IC3	20**	07	09*	28**	52**	X												
IC4	24**	08*	23**	24**	54**	47**	X											
IC5	22**	17**	18**	25**	51**	55**	39**	X										
IS1	45**	41**	10*	67**	34**	21**	18**	29**	X									
IS2	41**	18**	20**	46**	46**	47**	47**	35**	42**	X								
IS3	61**	30**	35**	57**	56**	41**	47**	36**	48**	62**	X							
IS4	42**	27**	23**	45**	30**	15**	26**	17**	37**	37**	50**	X						
IS5	31**	34**	31**	35**	47**	27**	43**	37**	43**	42**	55**	31**	X					
IS6	63**	32**	37**	57**	51**	35**	40**	34**	44**	56**	93**	47**	52**	X				
IS7	54**	16**	26**	53**	46**	41**	46**	30**	41**	59**	84**	52**	43**	67**	X			
IS8	44**	19**	29**	44**	51**	37**	43**	20**	38**	55**	86**	41**	47**	70**	72*	X		
IB1	34**	13**	09*	61**	06	00	07	07	54**	21**	17**	16**	08	16**	21**	12**	X	
IB2	34**	01	01	40**	23**	28**	15**	15**	26**	39**	26**	12**	03	26**	30**	23**	61**	X

Note : *p < 0.01, ** p < 0.001; IN1 = Conference / Seminars, IN2 = Medical Information, IN3 = Uptodateness, IC1 = Formal channel, IC2 = Informal channel, IC3 = Electronic text searching, IC4 = External / other libraries, IC5 = Internet / online searches, IS1 = Ready reference, IS2 = Medical sources, IS3 = Primary sources, IS4 = Secondary sources, IS5 = External sources, IS6 = Audio-visuals, IS7 = Online electronic sources, IS8 = Offline electronic sources, IB1 = Environmental barriers, IB2 = Personal barriers.

From the above table, it is clearly understood that, the formal and informal channels are extensively used by medical practitioners for the all three variables of information needs, i.e. conferences / seminars, medical information and uptodateness. Medical practitioners use formal as well as informal channel for collecting information for conferences / seminars, for medical information and also uptodateness. Electronic text searching channel is used only for information need to attend seminars/conferences. Information regarding new clinical methods, new drugs, new treatments etc. is showing negative correlation with electronic text searching channel. Medical practitioners do not use computerized database either in their institutional library or out side the library. Because it is found, not single library has the computerized database in the library. Regarding external / other libraries channel is used for conferences/seminars and uptodateness except medical information. The channel Internet/online searches is used for collecting information to satisfy their required information needs like latest project report, medical catalogue etc.

It is clear from the above table that all the eight variables (both printed and non-printed) of information sources are having significant relationship with the variables of information needs and information channels. Primary sources and audio-visual sources have the strongest relation with the variables of information needs i.e. conferences/seminars. It means that the medical practitioners needs much more information like journals, patents, standards, research reports etc. for attending the seminars/conferences and information

needs like documentary, cinema, T.V. etc. for preparing the lectures for the audience or students.

Regarding information barriers, it is seen that environmental barriers negatively related with variables of information needs i.e. uptodateness, variables of information channels i.e. external/other libraries and variables of information sources i.e. external sources. So it is understand that for the up to date / latest information medical practitioners do not get from any other libraries or other sources except their own institutional library. It is also found that environmental barriers have no relation with the variables of information channels i.e. electronic text searching and Internet/online searches. It means that all the institutional libraries have no any electronic database, online connection and Internet facilities, which are needed by the medical practitioners. In personal barriers shows the negative relation with the variables of information needs i.e. medical information and uptodateness. The institutional library hampers to get required information like latest text books, reference books, journals etc. by the medical practitioners.

4.6. CONCLUSION

After factor analysis of information needs variables, three variables related to information needs of medical practitioners have been identified. These are (i) conference / seminars, (ii) medical information, (iii) uptodateness. These variable are highly correlated signifying their

importance. Medical practitioners need information conferences / seminars followed by medical information. This reveals that they need information about new drugs, new clinical methods and about new treatments.

Regarding information channels, five variables have been identified and these are viz., formal channel, informal channel, electronic text searching, external/other libraries and Internet/online searches. All these five variables are significantly correlated. The formal channel variable ranks first followed by Internet / online searches variable. This shows that medical practitioners are using besides, libraries Internet and online searches as the channel to satisfy their information needs. The informal channel ranks third.

For the purpose of this study information sources have been divided into two groups : printed information sources and non-printed information sources. Five variables have been identified for printed information sources and these are ready references, medical sources, primary sources, secondary sources and external sources. The analysis shows that the primary source is the most important information source for medical practitioners. This includes journals, newsletters, treatise, patents, research reports and so on. This followed by the secondary source and ready reference respectively and includes sources like discussions within hospital, patients record (Centralized Medical Record Department) internal meetings etc.

For non-printed information sources, three variables have been identified after factor analysis. These are audio-visuals, on-line electronic sources and off-line electronic sources. The three variables are highly correlated indicating their significance. Audio-visual variable ranks first and is followed by on-line electronic sources and off-line electronic sources respectively.

Information barriers are categorized into two variables namely environmental barriers and personal barriers. Between this the environmental barrier is the most important barrier. This indicates that, the medical practitioners do not get good library facilities and it is further restricted by unfavorable attitude of library staffs in their institution. Personal barriers include items like non-availability of time to visit the library etc.

CHAPTER 5

INFORMATION NEEDS, INFORMATION SOURCES, INFORMATION CHANNEL, INFORMATION BARRIERS AND BACKGROUND VARIABLES

CHAPTER 5

INFORMATION NEEDS, INFORMATION SOURCES, INFORMATION CHANNELS, INFORMATION BARRIERS AND BACKGROUND VARIABLES

5.1. BACKGROUND VARIABLES

Socio-economic factors namely age, sex, qualification, tenure in present position, designation etc. will determine the information needs and information seeking strategies of medical practitioners. The background variables of medical practitioners differ in each environment for their information needs and uses. *Stinson & Mueller* (1980) observed that specialty and age of medical practitioners are important factors for using the various information sources in their diagnosis and treatment. Further, in terms of years, practicing as experiences is another important factor for using the information sources. The present study has taken 12 items representing background variables into consideration in order to study the impact of background variables on information seeking strategy.

Twelve variables in Section V 'Personal data' of questionnaire represent background variables. The variables are present age, joining age, sex, marital status, designation, joining qualification, present qualification, working in profession, working in present post, and

working in other organization. All the variables were measured on different scale points depending upon the type of variable. Details of background variables are presented in the following tables :

5.1.1. AGE

Present age group and joining age group of the medical practitioners is *presented in the Table 5.1 (Present Age Group of Respondents (Frequency* count into %) (n=397) and 5.2 (Joining Age Group of Respondents (Frequency count into %) (n=397) respectively.

Table 5.1 : Present Age Group of Respondents (Frequency count into %) (n=397).

SL. No.	Age Groups In Years	Numbers	%	Cumulative
1.	25 – 30 years	53	13.35%	13.35%
2.	30 – 35 years	55	13.85%	24.20%
3.	35 – 40 years	62	15.62%	42.82%
4.	40 – 45 years	83	20.91%	63.73%
5.	45 – 50 years	63	15.86%	79.59%
6.	50 – 55 years	43	10.83%	90.42%
7.	55 < years	38	9.57%	99.99%
	Total	397	99.99%	99.99%

Table 5.2 : Joining Age Group of Respondents (Frequency count into %) (n=397)

SL. No.	Age Groups In Years	Numbers	%	Cumulative
1.	Below 25 years	338	85.13%	85.13%
2.	25 – 30 years	45	11.33%	96.46%
3.	30 – 35 years	6	1.51%	97.97%
4.	35 – 40 years	1	0.25%	98.22%
5.	40 < years	7	1.76%	99.98%
	Total	397	99.98%	99.98%

The above tables indicate that 63.73% of medical practitioners are upto 45 years age group, whereas 85.13% of them were below 25 years of age at the time of joining. Presently only 13.35% of medical practitioners are in the age group of 25 – 30 years. Therefore, it is evident that almost all medical practitioners joined below the age group of 30 years and more than half of them are currently in the age group of below 45 years.

5.1.2. Sex

The sex of medical practitioners are reported in the Table 5.3. (Sex of the Respondents (Frequency count into %) (n=397).

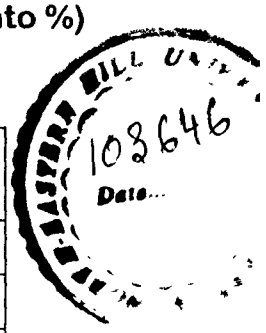
Table 5.3. : Sex of the Respondents (Frequency count into %) (n=397)

SL. No.	Sex	Numbers	%
1.	Male	293	73.80%
2.	Female	104	26.19%
Total		397	99.99%

5.1.3 Marital Status

Marital status of medical practitioners are presented in the Table 5.4. (Marital Status of Respondents (Frequency count into %) (n = 397).

Table 5.4 : Marital Status of Respondents (Frequency count into %) (n = 397)



SL. No.	Marital Status	Number	%
1	Married	347	87.40
2	Unmarried	44	11.08
3	Single	3	0.75
4	Divorced	1	0.25
5	Not known	2	0.50
	Total	397	99.98

The above mentioned two tables show that only 26.19% of medical practitioners are females, and rest (73.80%) of them are male medical practitioners. Further, 87.40% of the respondents are married followed by 11.08% who are unmarried.

5.1.4. DESIGNATION

Designation of the medical practitioners are reported in the Table 5.5. (Designation-wise representation of Respondents. (Frequency count into %) (n=374).

Table 5.5 : Designation-wise representation of Respondents. (Frequency count into %) (n=374)

Sl. No.	Designation	Numbers	%
1.	Professor	80	21.39%
2.	Associate Professor	63	16.84%
3.	Assistant Professor	109	29.14%
4.	Registrar / Demonstrator	122	32.62%
	Total	374	99.99%

Table 5.5. shows that majority 32.62% of them are registrars / demonstrator followed by 21.14% who are assistant professors. Only 21.39% of them are highest position of professors.

6.1.5 QUALIFICATIONS

Qualifications have been identified into following two categories, viz., joining qualifications and present qualifications. These are presented in Table 5.6 (Joining Qualification of Respondents (Frequency count into %) (n=397) and 5.7 (Present Qualification of Respondents (Frequency count into %) (n=397) respectively.

Table 5.6 : Joining Qualification of Respondents (Frequency count into %) (n=397)

Sl. No.	Qualifications	Numbers	%	Cumulative
1.	M.B.B.S	291	73.30%	73.30%
2.	MD / MS	100	25.12%	98.42%
3.	MCH / DM	3	0.75%	99.17%
4.	PhD	3	0.75%	99.92%
5.	Diploma	NIL		
Total		397	99.92%	99.92%

Table 5.7 : Present Qualification of Respondents (Frequency count into %) (n=397)

Sl. No.	Qualifications	Numbers	%	Cumulative
1.	M.B.B.S	91	22.92	22.92%
2.	MD / MS	287	72.30	95.22%
3.	MCH / DM	15	3.77	98.99%
4.	PhD	3	0.75	99.74%
5.	Diploma	1	0.25	99.99%
Total		397	99.99	99.99%

It is interesting to note that 72.30% of the medical practitioners are currently holding M.D. / M.S. qualifications, whereas 73.30% of them were only holding M.B.B.S. degree at the time of joining. This shows that they acquired higher degree after joining their profession. Currently, only 22.92% of them are holding M.B.B.S. degree, however, about 25% of them were having higher qualifications of M.D., M.S. or Ph. D. at the time of joining.

5.1.6. SPECIALIZATION

The various specializations of the medical practitioners are presented and tabulated in the following Table 5.8. : Specialization of Respondents (Frequency count into %) (n = 397)

Table 5.8 : Specialization of Respondents (Frequency count into %) (n = 397)

SL. No.	Specialization	Numbers	%
1	Anatomy	24	6.04
2	Physiology	24	6.04
3	Biochemistry	17	4.30
4	Forensic Science Medicine	14	3.52
5	Community medicine	22	5.54
6	Microbiology	17	4.30
7	Pathology	37	9.32
8	Pharmacology	16	4.03
9	Obstetric & Gynaecology	20	5.04
10	Surgery	25	6.30
11	Ophthalmology	18	4.53
12	Otorhinolaryngology	12	3.02
13	Orthopaedics	10	2.51
14	Dermatology	8	2.01
15	Medicine	31	7.80
16	Anaesthesiology	17	4.30
17	Cardiology	10	2.51
18	Nephrology	5	1.25
19	Pediatrics	24	6.04
20	Plastic surgery	5	1.25
21	Psychiatry	6	1.51
22	Radiology	12	3.02
23	Urology	5	1.25
24	Neurology	7	1.76
25	Radiotherapy	2	0.50
26	Physical education and rehabilitation	3	0.75
27	Others	6	1.51
	Total	397	99.95

A total of 26 specializations are identified. Only 6 respondents answers are not clear and are grouped together as 'other category'. Three hundred ninety one medical practitioners belong to 26 specialization listed in Table 5.8. Out of these, serial no. 1 – 8, represent non-clinical specialization, which total 171 respondents. To these are added 6 medical practitioners under category 'others', under serial no. 27, this making total of 177 non-clinicians. Remaining 220 medical practitioners represent clinicians under 18 specialization shown in Table under serial no. 9 – 26. Clinicians are specialists in Medicine, Surgery, Dermatology, Orthopaedics, Obstetrics & Gynaecology, Ophthalmology, Otorhinolaryngology, Cardiology, Nephrology etc. And non-clinicians are medical practitioners working in Anatomy, Physiology, Biochemistry, Forensic Science Medicine, Community Medicine, Microbiology, Pathology and Pharmacology.

5.1.7. Working In Present Organization

The Table 5.9 : 'Working in Present Organization of Respondents (Frequency count into %) (n = 374)' is presented below.

Table 5.9. : Working in Present Organization of Respondents (Frequency count into %) (n = 374)

Groups (in years)	Total number	Cumulative number	Percentage	Cumulative percentage
1 – 5 yrs	87	87	23.26	23.26
5 – 10 yrs	57	144	15.24	38.50
10 – 15 yrs	58	202	15.50	54.00
15 – 20 yrs	78	280	20.85	74.85
20 – 25 yrs	49	329	13.10	87.95
25 – 30 yrs	37	366	9.89	97.84
30 yrs & above	8	374	2.14	99.98

It is very clear from Table 5.9 that only 8 medical practitioner are working for 30 or more years. Further, more than half of them have only 15 years of working in present organization. Maximum medical practitioner (87) are having only upto 5 years of experience in the present organization.

5.1.8. Working In Profession

The above table indicates only working in experience in the present organization. The total working in profession is presented in Table 5.10 : Working in Profession of Respondents (Frequency count into %) (n = 397).

Table 5.10. : Working in Profession of Respondents (Frequency count into %) (n = 397)

Groups (in years)	Total number	Cumulative number	Percentage	Cumulative percentage
1 – 5 yrs	59	59	14.86	14.86
5 – 10 yrs	56	115	14.10	28.96
10 – 15 yrs	53	168	13.35	42.31
15 – 20 yrs	82	250	20.65	62.95
20 – 25 yrs	17	320	17.63	80.59
25 – 30 yrs	45	365	11.33	91.92
30 yrs & above	32	397	8.06	99.98

The above table, Table 5.10. indicates that maximum 82 number of medical practitioners are working in the profession for 15 – 20 years. More than half (250) are respondents who have worked upto 20 years in profession. Approximately, 80.59% have working experiences of upto 25 years. Only 59 respondents have below 5 years of experience.

5.1.9. Working In Present Position

In order to ascertain as to how many years it takes medical professionals to move to next position, they were asked as to how many years they spent in present position and answers are tabulated and presented below in Table 5.11 : Working in present position of Respondents (Frequency count into %) (n = 374).

Table 5.11. Working in present position of Respondents (Frequency count into %) (n = 374)

Groups (in years)	Total number	Cumulative number	Percentage	Cumulative percentage
1 – 5 yrs	217	217	58.02	58.02
5 – 10 yrs	117	334	31.28	89.30
10 – 15 yrs	30	364	8.02	7.32
15 – 20 yrs	7	371	1.87	99.19
20 – 25 yrs	3	374	0.80	99.99

The above table, Table 5.11 clearly shows that more than half of them spent less than 5 years in the same position and 89.30% of them spent less than 10 years in the same position. This clearly indicates that there is no stagnation and it take medical professional between 5 – 10 yrs. to move to next position.

5.1.10. Working In Other Organization

In order to identify the mobility of medical practitioners from one organization to another, they were asked as to how many other organization they have worked in and results are presented in Table 5.12. : Working in other Organization of Respondents (Frequency count into %) (n = 374).

Table 5.12. : Working in other Organization of Respondents (Frequency count into %) (n = 374)

SL. No.	Working years	Number	Cumulative number	%	Cumulative percentage
1	1	175	175	46.79	46.79
2	2	108	283	28.87	75.66
3	3	34	317	9.09	84.75
4	4	7	324	1.90	86.65
5	5	5	329	1.33	87.98
6	6	2	331	0.53	88.51
7	7	43	374	11.49	100.00

The above table, Table 5.12 shows that 46.79% of them have worked in single organization and 75.66% of them have worked in maximum 2 organizations. Rest have worked upto maximum 7 organizations. This clearly indicates that majority of medical practitioners do not move from one organization to another, therefore indicating that mobility is less.

5.1.11. Inter-correlation Among Background Variables of Medical Practitioners

Inter-correlation among background variables of medical practitioners is presented in the Table 5.13. : Inter-correlation among background variables of medical practitioners as follows :

Table 5.13 : Inter-correlation Among Background Variables of Medical Practitioners

SL. No	Background Variables	1	2	3	4	5	6	7	8	9	10	11	12
1	Present Age	X											
2	Joining Age	-.01	X										
3	Sex	-.13**	.11**	X									
4	Marital Status	-.43**	.08**	.00	X								
5	Designation	-.61**	.03	.12**	.21**	X							
6	Joining Qualification	.09*	.01	-.03	-.09	-.15**	X						
7	Present Qualification	.45**	-.05	-.02	-.39**	.40**	.30**	X					
8	Specialization	.04	.05	-.22**	-.00	.06	.10**	.24**	X				
9	Working in Present Organization	.84**	-.04	-.03	-.38**	-.44**	.03	.38**	.03	X			
10	Working in Profession	.93**	-.04	-.09*	-.45**	.56**	.03	.46**	.06	.86**	X		
11	Working in Present Position	.30**	-.13**	.01	-.23**	.12**	.03	.05	-.03	.42**	.33**	X	
12	Working in Other Organization	.37**	.04	-.08*	-.17**	-.02	.08	.14**	-.06	.20**	.33**	.17**	X

Note : n = 397, *p < 0.01 and **p < 0.001

The above table, Table 5.13 clearly shows that inter-correlation among various background variables are highly significant. The joining age has no significant relation with any background variables, whereas present age shows positive significant relation with working in the profession, present qualifications and working in present organization, whereas designation is negatively significant with present age. Surprisingly, marital status has negative significance with all background variables. Designation with having negatively significant working in profession and working in present organization. Working in present organization and present profession also has positive correlation.

Thus, we can conclude that medical practitioners enter the profession having this qualification. They later on acquire more qualifications or specialization. Their promotional chances seem to be less because it shows negatively significant correlation with designation, thereby indicating their dissatisfaction with promotion. There is stagnation if they are working in same organization.

In order to get promotion, they have to move to other organization. Further, it indicates that medical practitioners at the early stages of profession change the organization. Higher they move in profession, lesser are changes of their changing the organization. Surprisingly sex shows negative significance with specialization.

5.2. BACKGROUND VARIABLES AND INFORMATION NEEDS

In order to identify if any relationship exists between background variables and information needs variable, ANOVA was computed between information needs, variables and background variables, which is presented in Table 5.14. : Medical Practitioners : Background Variables Versus Information Needs (ANOVA) (n = 397) and Table 5.15. : Medical Practitioners : Background Variables Versus Information Needs (ANOVA) (n = 397) respectively.

Table 5.14. : Medical Practitioners : Background Variables Versus Information Needs (ANOVA) (n = 397).

Sl. No.	Medical Practitioners	Information Needs			D.F
		Conferences / Seminars (F1)	Medical Information (F2)	Uptodateness (F3)	
1.	Present Age:	25.40* (F.ratio)	4.09* (F. ratio)	17.38* (F.ratio)	6/390
	Age group in years				
	Below 25	Nil	Nil	Nil	
	25 – 30	19.92	20.98	7.33	
	30 – 35	23.27	21.87	8.74	
	35 – 40	28.08	23.69	9.08	
	40 – 45	29.67	24.74	9.26	
	45 – 50	29.10	24.46	9.20	
	50 – 55	29.39	23.37	8.97	
	55 – 60	30.28 (mean)	24.18 (mean)	9.05 (mean)	
2.	Joining Age :	.99 (F.ratio)	5.55* (F. ratio)	1.41* (F.ratio)	5/391
	Below 25	26.76	24.35	8.83	
	25 – 30	27.88	22.17	8.93	
	30 – 35	30.16	27.00	10.00	
	35 – 40	19.00	14.00	8.00	
	40 +	27.00	19.17	8.14	
	Non – response	27.82 (mean)	21.92 (mean)	8.83 (mean)	
3.	Sex:	.03 (F. ratio)	4.74* (F. ratio)	1.23 (F.ratio)	1/395
	Male	27.22	23.77	8.89	
	Female	27.08 (mean)	22.44 (mean)	8.72 (mean)	
4.	Marital Status	22.05* (F. ratio)	3.23* (F. ratio)	14.30* (F. ratio)	4/392
	Married	28.12	23.66	9.00	
	Unmarried	19.18	21.11	7.52	
	Single	33.66	28.66	10.00	
	Others	33.00	29.00	9.00	
	Non-response	28.00 (mean)	23.00 (mean)	8.50 (mean)	
5.	Designation	63.53* (F.ratio)	5.84* (F. ratio)	13.24* (F.ratio)	3/393
	Professor	30.28	24.27	9.13	
	Associate Professor	29.58	24.15	9.14	
	Assistant Professor	29.66	24.61	9.17	
	Registrar / Demonstrator	24.22 (mean)	21.71 (mean)	8.14 (mean)	
6.	Joining Qualification	.74 (F. ratio)	5.18* (F. ratio)	3.30* (F.ratio)	3/393
	MBBS	27.08	24.05	8.77	
	MD / MS	27.40	21.64	9.07	
	MCH / DM	32.33	23.00	10.00	
	Ph. D	25.00 (mean)	22.33 (mean)	7.33 (mean)	
7.	Present Qualification	19.62* (F. ratio)	4.77* (F. ratio)	21.83* (F.ratio)	4/392
	MBBS	22.21	21.30	7.81	
	MD / MS	28.71	24.05	9.13	
	MCH / DM	29.50	23.50	8.50	
	Ph. D	35.00	22.00	10.00	
	Diploma	(mean)	(mean)	(mean)	

Note: * = Significant at 5% level of significance.

Table 5.15 : Medical Practitioners : Background Variables Versus Information Needs (ANOVA) (n = 397).

Sl. No.	Medical Practitioners	Information Needs			D.F
		Conferences / Seminars (F1)	Medical Information (F2)	Uptodateness (F3)	
8.	Specialization	(F. ratio) .87	(F. ratio) 2.84*	(F. ratio) .89	25/365
9.	Working in present organization	6.92*	2.03*	1.95*	33/363
10.	Working in profession	4.03*	1.64*	3.13*	35/361
11.	Working in present position	7.10*	1.31	1.10	19/377
12.	Working in other organization	13.69*	.97	2.75*	6/390
	No. of organization:				
	Same organization	21.15	22.45	8.45	
	One organization	27.81	23.76	8.73	
	Two organization	29.00	23.84	9.13	
	Three organizations	29.20	23.17	9.23	
	Four organizations	31.00	21.00	9.28	
	Five organizations	28.00	21.80	8.60	
	Six organizations	23.00 (mean)	21.00 (mean)	8.50 (mean)	

Note: *= Significant at 5% level of significance.

The above tables show that present age is related with seminar / conference need, whereas joining age is related with medical information. The designation is also related with seminar / conference, information need followed by uptodateness. Whereas joining qualifications are related with medical information and present

qualifications show relation with uptodateness followed by seminars / conference. Specialization is related with medical information.

Thus we can conclude that when medical practitioners join the profession. They need information mostly on patient's history, new clinical methods and treatments and new drugs, rather than on attending seminars / conferences. The more medical professional moves up in qualifications, experience and designation, his / her information needs change. Now they want information on seminars / conferences and keeping themselves uptodate in the profession. However, they still need medical information for their specializations. This clearly indicates the shift in information need of medical professionals. Younger, less qualified and newly joined medical practitioners will need information on new drugs, patient's history, new clinical methods etc. whereas, older more qualified, experienced and having higher designations need information on how to attend seminars / conferences, write projects, paper and keep themselves uptodate.

5.3. BACKGROUND VARIABLES AND INFORMATION SOURCES

Further, in order to identify if any relationship exist between information sources, they use and background, ANOVA was computed with printed information sources versus background variables and non-printed information sources and background variables and are presented in following tables.

5.3.1. Background Variables And Printed Information Sources

The results of printed information sources and background variables are presented in Table 5.16 : Medical Practitioners : Background Variables Versus Printed Information Sources (ANOVA) (n = 397) and Table 5.17 : Medical Practitioners : Background Variables Versus Printed Information Sources (ANOVA) (n = 397) respectively.

Table 5.16 : Medical Practitioners : Background Variables Versus Printed Information Sources (ANOVA) (n = 397)

Sl. No.	Medical Practitioners	Printed Information Sources					D.F.
		Ready reference (F1)	Medical sources (F2)	Primary sources (F3)	Secondary sources (F4)	External sources (F5)	
1.	Present age	2.79* (F. ratio)	3.45* (F. ratio)	8.53* (F. ratio)	1.64 (F. ratio)	2.21* (F. ratio)	6/390
	Age group (in yrs)						
	Below 25	Nil	Nil	Nil	Nil	Nil	
	25 – 30	15.43	8.84	25.62	20.13	12.56	
	30 – 35	13.96	9.56	27.43	20.20	13.60	
	35 – 40	16.79	11.46	31.98	21.14	14.17	
	40 – 45	16.77	9.83	31.32	21.04	14.13	
	45 – 50	16.73	12.07	31.77	21.42	14.30	
	50 – 55	17.51	11.58	32.09	21.51	14.34	
	55 – 60	16.31 (mean)	10.97 (mean)	30.86 (mean)	20.55 (mean)	13.32 (mean)	
2.	Joining age	2.36* (F. ratio)	3.29* (F. ratio)	0.65 (F. ratio)	3.38* (F. ratio)	0.86 (F. ratio)	5/391
	Age group (in yrs)						
	Below 25	16.87	9.78	30.22	21.00	13.87	
	25 – 30	14.73	12.42	30.44	22.28	14.24	
	30 – 35	14.83	11.16	21.16	20.16	15.16	
	35 – 40	11.00	10.00	32.00	19.00	13.00	
	40 +	13.42	10.71	29.29	19.14	14.57	
	Non-response	15.73 (mean)	11.57 (mean)	30.18 (mean)	20.17 (mean)	13.32 (mean)	
3.	Sex:	4.57* (F. ratio)	.42 (F. ratio)	.56 (F. ratio)	2.29 (F. ratio)	10.86* (F. ratio)	1/395
	Male	16.57	10.67	30.37	20.74	14.13	
	Female	15.29 (mean)	10.29 (mean)	29.84 (mean)	21.29 (mean)	12.88 (mean)	
4.	Marital status	1.78 (F. ratio)	5.71* (F. ratio)	10.26* (F. ratio)	2.25 (F. ratio)	1.95 (F. ratio)	4/392
	Married	16.47	10.95	30.91	21.03	13.96	
	Unmarried	14.47	7.45	24.84	19.84	12.52	
	Single	13.00	14.66	32.66	22.33	15.00	
	Others	18.00	10.00	32.00	20.00	13.00	
	Non-response	17.50 (mean)	7.50 (mean)	26.50 (mean)	17.00 (mean)	13.00 (mean)	
5.	Designation	33.34* (F. ratio)	19.76* (F. ratio)	18.26* (F. ratio)	5.91* (F. ratio)	0.61 (F. ratio)	3/393
	Professor	17.12	11.63	13.67	32.26	21.15	
	Assoc. professor	16.73	11.60	13.90	32.38	21.74	
	Asstt. Professor	16.69	11.14	14.05	31.54	20.76	
	Registrar / demonstrator	16.00 (mean)	10.28 (mean)	12.38 (mean)	27.52 (mean)	20.90 (mean)	
6.	Joining qualifications	5.17* (F. ratio)	1.05 (F. ratio)	2.35* (F. ratio)	0.97 (F. ratio)	3.75* (F. ratio)	3/393
	MBBS	16.76	10.68	29.90	21.03	13.50	
	MD/ MS	14.54	10.09	31.07	20.43	14.56	
	MCH / DM	17.66	14.00	36.66	21.66	17.33	
	Ph. D	19.66 (mean)	13.00 (mean)	28.33 (mean)	21.33 (mean)	15.00 (mean)	
7.	Present qualifications	1.51 (F. ratio)	2.50* (F. ratio)	8.24* (F. ratio)	2.34 (F. ratio)	4.04* (F. ratio)	4/392
	MBBS	15.48	9.63	26.36	20.30	12.79	
	MD / MS	16.48	10.94	31.33	21.14	14.03	
	MCH / DM	15.87	9.00	32.12	19.75	15.06	
	Ph. D	21.50	16.00	35.00	22.00	18.50	
	Diploma	10.00 (mean)	5.00 (mean)	28.00 (mean)	16.00 (mean)	13.00 (mean)	

Note : * = Significant at 5% level of significance.

Table 5.17 : Medical Practitioners : Background Variables Versus Printed Information Sources (ANOVA) (n = 397)

Sl. No.	Medical Practitioners	Printed Information Sources					D.F.
		Ready references (F1)	Medical sources (F2)	Primary sources (F3)	Secondary sources (F4)	External sources (F5)	
8.	Specialization (F. ratio)	2.05*	4.06*	.67	0.75	1.76*	25/365
9.	Working in present organization (F. ratio)	5.99*	3.72*	315*	2.20*	1.25*	33/363
10.	Working in profession (F. ratio)	1.37	1.57*	1.95*	1.14	0.94	35/361
11.	Working in present position (F. ratio)	7.65*	4.79*	2.76*	2.38*	1.11	19/337
12.	Working in other organization (F. ratio)	2.19*	6.90*	4.69*	.96	1.93	6/390
	Number of organizations	(Mean)	(Mean)	(Mean)	(Mean)	(Mean)	
	Same organization	14.63	7.27	10.51	20.24	14.30	
	One organization	16.76	11.43	13.98	21.18	13.81	
	Two organizations	16.63	10.85	12.81	20.86	13.64	
	Three organizations	15.94	11.00	13.17	21.02	13.47	
	Four organizations	13.28	11.42	12.28	19.42	12.28	
	Five organizations	18.20	14.60	16.80	20.80	16.80	
	Six organizations	12.00	9.00	11.00	20.00	9.00	

*Note : * = Significant at 5% level of significance.*

It is clear that information sources, ready references, medical sources, primary sources and external sources are highly used and secondary sources are used very less by all the age group of medical practitioners. Higher the designations, more they depend upon ready references. Further, higher the qualifications, more they depend upon the primary sources. It is further observed that secondary sources and external sources are very less used by the medical practitioners.

5.3.2. Background Variables And Non-Printed Information Sources

The results of non-printed information sources and background variables are presented in Table 5.18 : Medical Practitioners : Background Variables Versus Non-Printed Information Sources

(ANOVA) (n = 397) and 5.19 : Medical Practitioners : Background Variables Versus Non-Printed Information Sources (ANOVA) (n = 397) respectively.

Table 5.18 : Medical Practitioners : Background Variables Versus Non-Printed Information Sources (ANOVA) (n = 397)

Sl. No.	Medical Practitioners	Non-Printed Information Sources			
		Audio-visual (F1)	Online Electronic Sources (F2)	Offline Electronic Sources (F3)	D.F
1.	Present Age	9.09* (F. ratio)	4.81* (F. ratio)	3.89* (F. ratio)	6/390
	Age Group (in years)				
	Below 25 years	Nil	Nil	Nil	
	25 – 30	25.37	9.86	6.20	
	30 – 35	36.72	10.25	6.45	
	35 – 40	30.93	11.69	7.66	
	40 – 45	30.30	11.63	7.62	
	45 – 50	30.82	12.01	7.50	
	50 – 55	31.32	11.93	7.65	
	55 – 60	29.52 (mean)	11.26 (mean)	6.94 (mean)	
2.	Joining Age :	0.36 (F. ratio)	2.13 (F. ratio)	2.74* (F. ratio)	5/391
	Below 25 years	29.10	11.05	7.04	
	25 – 30	29.62	12.31	7.93	
	30 – 35	31.16	13.16	9.83	
	35 – 40	29.00	13.00	8.00	
	40 +	28.42	12.14	7.58	
	Non response	29.84 (mean)	11.13 (mean)	7.03 (mean)	
3.	Sex	0.39 (F. ratio)	1.22 (F. ratio)	0.00 (F. ratio)	1/395
	Male	29.48	11.37	7.20	
	Female	29.04 (mean)	11.00 (mean)	7.18 (mean)	
4.	Marital Status	9.28* (F. ratio)	8.98* (F. ratio)	8.09* (F. ratio)	4/392
	Married	29.97	11.48	7.36	
	Unmarried	24.43	9.20	5.67	
	Single	32.66	16.33	11.66	
	Others	29.00	10.00	7.00	
	Non-response	27.00	13.00	6.00	
5.	Designation	17.25* (F. ratio)	20.09* (F. ratio)	9.89* (F. ratio)	3/393
	Professor	31.20	11.73	7.56	
	Associate Professor	30.95	12.14	7.87	
	Assistant Professor	30.86	11.77	7.50	
	Registrar / Demonstrator	27.15 (mean)	10.85 (mean)	6.75 (mean)	
6.	Joining Qualification	2.21 (F. ratio)	2.36 (F. ratio)	3.17* (F. ratio)	3/393
	MBBS	28.96	11.28	7.13	
	MD / MS	30.40	11.10	7.26	
	MCH / DM	34.66	15.66	11.33	
	Ph. D	29.00 (mean)	11.33 (mean)	7.66 (mean)	
7.	Present Qualification	10.47* (F. ratio)	2.97* (F. ratio)	3.03* (F. ratio)	4/392
	MBBS	26.03	10.40	6.56	
	MD / MS	30.31	11.51	7.37	
	MCH / DM	30.87	11.40	7.25	
	Ph. D	35.50	14.00	10.50	
	Diploma	26.00 (mean)	9.00 (mean)	8.00 (mean)	

Note: * = Significant at 5% level of significance.

Table 5.19 : Medical Practitioners : Background Variables Versus Non-Printed Information Sources (ANOVA) (n = 397)

Sl. No.	Medical Practitioners	Non Printed Information Sources			D.F
		Audio-Visuals (F1)	Online Electronic Sources (F2)	Offline Electronic Sources (F3)	
8.	Specialization (F. ratio)	0.83	0.80	0.64	25/365
9.	Working in present organization (F. ratio)	2.83*	3.06*	2.36*	33/363
10.	Working in profession (F. ratio)	2.17*	1.14	1.26*	35/361
11.	Working in present position (F. ratio)	2.52*	3.82*	2.24*	19/377
12.	Working in other organization (F. ratio)	4.88*	5.08*	3.76*	6/390
	No. of organization:	(Mean)	(Mean)	(Mean)	
	Same organization	26.09	9.53	6.15	
	One organization	30.46	11.69	7.68	
	Two organization	29.41	1.47	7.09	
	Three organizations	29.44	11.76	7.20	
	Four organizations	29.57	11.42	6.42	
	Five organizations	33.20	12.20	8.00	
	Six organizations	27.00	10.50	6.00	

Note: * = Significant at 5% level of significance.

Regarding non-clinical information sources, it is clear from the above tables, Table 5.18 and 5.19 that, present age as well as designation are related with online electronic sources and audio-visual non-printed sources. It is clear that non-printed information sources are important sources and are used by almost all medical practitioners.

5.4. BACKGROUND VARIABLES AND INFORMATION CHANNELS

A total of five information channels have been identified for the purpose of this study. These are formal channel, informal channel, electronic text searching, external / other libraries and internet / online sources. In order to verify relationship background variables and information channels, ANOVA was computed and the result is presented in tables,

Table 5.20 : Medical Practitioners : Background Variables Versus Information Channels (ANOVA) (n =397) and Table 5.21 : Medical Practitioners : Background Variables Versus Information Channels (ANOVA) (n = 397) respectively.

Table 5.20 : Medical Practitioners : Background Variables Versus Information Channels (ANOVA) (n =397)

Sl. No	Medical Practitioners	Information Channels					D.F.
		Formal channel (F1)	Informal channel (F2)	Electronic text searching (F3)	External / other libraries (F4)	Internet / online searches (F5)	
1.	Present age (F ratio)	3.39*	4.19*	2.42*	3.50*	1.14	6/390
	Age group (in years)						
	Below 25	Nil	Nil	Nil	Nil	Nil	
	25 – 30	26.01	7.13	4.49	3.24	7.22	
	30 – 35	26.18	8.09	4.41	4.20	7.83	
	35 – 40	28.69	9.74	5.17	4.53	8.53	
	40 – 45	29.20	9.37	4.71	3.92	7.97	
	45 – 50	29.17	9.31	5.42	4.46	8.77	
	50 – 55	29.76	9.72	5.60	4.41	8.60	
	55 – 60	28.71	9.00	3.97	3.97	7.71	
		(mean)	(mean)	(mean)	(mean)	(mean)	
2.	Joining age (F ratio)	.46	1.29	1.51	1.49	.24	5/391
	Age group (in years)						
	Below 25	28.49	8.79	4.56	3.92	8.19	
	25 – 30	27.97	8.73	5.15	4.48	8.00	
	30 – 35	27.66	11.50	5.50	5.00	9.16	
	35 – 40	31.00	11.00	5.00	4.00	10.00	
	40 +	35.00	7.42	4.71	4.14	7.57	
	Non-response	8.17	9.33	5.37	4.33	7.92	
		(mean)	(mean)	(mean)	(mean)	(mean)	
3.	Sex (F. ratio)	.05	.07	.61	.83	1.51	1/395
	Male	28.24	8.97	4.79	4.16	8.25	
	Female	28.41	8.86	5.02	3.97	7.71	
		(mean)	(mean)	(mean)	(mean)	(mean)	
4.	Marital status (F ratio)	4.28*	5.48*	2.23	3.53*	.73	4/392
	Married	28.75	9.22	5.00	4.20	8.14	
	Unmarried	24.81	6.70	3.77	3.22	7.61	
	Single	25.66	9.33	4.33	5.66	10.33	
	Others	29.00	6.00	4.00	4.00	7.00	
	Non-response	27.00	11.00	4.00	4.50	11.00	
		(mean)	(mean)	(mean)	(mean)	(mean)	
5.	Designation (F ratio)	72.08*	6.06*	4.54*	2.14	2.97*	3/393
	Professor	29.72	9.60	4.85	4.46	8.15	
	Associate professor	29.63	9.56	5.11	4.00	8.28	
	Assistant professor	29.63	9.33	5.08	4.31	8.95	
	Registrar / demonstrator	28.43	8.36	4.87	3.80	7.52	
		(mean)	(mean)	(mean)	(mean)	(mean)	
6.	Joining qualifications	2.53	2.65*	2.11	1.41	2.87*	3/393
	MBBS	28.76	8.80	4.70	4.00	8.02	
	MD/ MS	26.88	9.20	5.16	4.38	8.11	
	MCH / DM	30.66	14.33	6.66	4.66	12.33	
	Ph. D	27.00	9.00	7.33	5.00	13.00	
		(mean)	(mean)	(mean)	(mean)	(mean)	
7.	Present qualifications (F. ratio)	2.45*	6.00*	4.77*	4.73*	7.40*	4/392
	MBBS	26.61	7.58	4.53	3.50	7.16	
	MD / MS	28.81	9.28	4.90	4.27	8.26	
	MCH / DM	28.50	10.12	4.81	4.37	9.25	
	Ph. D	30.00	14.50	12.50	7.00	20.50	
	Diploma	23.00	7.00	4.00	3.00	7.00	
		(mean)	(mean)	(mean)	(mean)	(mean)	

Note: * = Significant at 5% level of significance.

Table 5.21 : Medical Practitioners : Background Variables Versus Information Channels (ANOVA) (n = 397)

Sl. No.	Medical Practitioners	Information Channels					D.F.
		Formal channel (F1)	Informal channel (F2)	Electronic text searching (F3)	External / other libraries (F4)	Internet / online searches (F5)	
8.	Specialization (F. ratio)	0.70	0.79	1.33	1.86*	1.18	25/365
9.	Working in present organization (F. ratio)	10.41*	3.22*	1.51*	.98	1.11	33/363
10.	Working in profes-sion (F. ratio)	1.77*	1.38	1.48*	.96	.82	35/361
11.	Working in present position (F. ratio)	14.20*	1.50	1.77*	.78	.82	19/337
12.	Working in other organization (F. ratio)	6.34*	2.88*	6.69*	1.74	3.51*	6/390
	Number of organizations	(mean)	(mean)	(mean)	(mean)	(mean)	
	Same organization	24.24	7.66	3.86	3.56	7.10	
	One organization	29.35	9.10	4.99	4.28	8.30	
	Two organizations	28.87	9.06	4.99	4.01	7.93	
	Three organizations	29.02	9.50	4.38	4.35	8.38	
	Four organizations	27.42	10.14	6.85	4.28	9.57	
	Five organizations	28.20	12.80	10.40	5.00	14.60	
	Six organizations	28.00	7.50	5.00	5.00	8.50	

Note: * = Significant at 5% level of significance.

From the above two tables, Table 5.20 and 5.21, it is evident that formal channels is having significant relationship with present age, designation, present qualifications. Further, it has also significant relation with working in present position and present organization. It is obvious because formal channels include institutional libraries, attending seminars / conferences and this is possible only when they are working in an organization for a longer duration. Information channel is also having significant relation with present age, designation, present qualifications and working in other organizations. Electronic text searching is also significantly related with present

position, present organization and working in other organization, even though internet / online searches is second largest factor, surprisingly, it does not show any significant relation with any background variable. Medical practitioners tend to use traditional information sources. *Northup* et al., 1983 expressed that the medical practitioners tendency to respond to information problems among known pathways, which are probably established fairly early in medical carrier, partially account for the overwhelming use of colleagues as an information source.

5.5. BACKGROUND VARIABLES AND INFORMATION BARRIERS

Information barriers are closely related with information needs. The information needs of user may of various types and to satisfy these information needs have to meet various types of information barrier. Information need is not a primary need, but a secondary need that arises out of needs of a more basic kind and second that in the effort to discover information to satisfy a need, the enquirer is likely to meet with barriers of different kinds (*Wilson*, 1981).

This study also identified two types of information barriers – medical practitioners face when seeking information these are environmental barrier and personal barriers. Whether any sort of relationship exists between background variables and information barriers and ANOVA was computed between background variables and information barriers and results are presented in the tables, Table 5.22 : Medical Practitioners : Background Variables Versus Information Barriers

(ANOVA) (n=397)and Table 5.23 : Medical Practitioners : Background Variables Versus Information Barriers (ANOVA) (n = 397) respectively.

Table 5.22 : Medical Practitioners : Background Variables Versus Information Barriers (ANOVA) (n=397)

Sl. No.	Medical Practitioner	Information Barriers		DF
		Environmental (F1)	Personal (F2)	
1.	Present Age (F. ratio)	2.26*	2.00	6/390
	Age Group (in years)			
	Below 25	Nil	Nil	
	25 - 30	35.71	13.15	
	30 - 35	33.16	14.40	
	35 - 40	36.66	15.32	
	40 - 45	38.81	15.25	
	45 - 50	38.47	16.12	
	50 - 55	38.58	16.18	
	55 - 60	40.78	15.50	
		(mean)	(mean)	
2.	Joining Age (F. ratio)	0.20	13.72*	5/391
	Age Group (in Years)			
	Below 25	37.19	13.44	
	25 - 30	37.31	18.57	
	30 - 35	33.83	17.16	
	35 - 40	41.00	14.00	
	40 +	38.57	19.28	
	Non-response	38.00	17.18	
		(mean)	(mean)	
3.	Sex (F. ratio)	0.00	0.68	1/395
	Male	37.36	14.99	
	Female	37.47	15.50	
		(mean)	(mean)	
4.	Marital Status (F. ratio)	1.28	4.59*	4/392
	Married	37.87	15.52	
	Unmarried	33.95	11.90	
	Single	31.00	15.66	
	Others	40.00	12.00	
	Non-response	37.50	17.50	
		(mean)	(mean)	
5.	Designation (F. ratio)	155.66*	88.01*	3/393
	Professor	39.65	15.68	
	Associate Professor	39.41	16.22	
	Assistant Professor	40.59	16.13	
	Registrar/Demonstrator	39.30	16.21	
		(mean)	(mean)	
6.	Joining Qualification (F. ratio)	9.83*	1.08	3/393
	MBBS	39.20	14.94	
	MD/MS	31.98	15.45	
	MCH/DM	37.33	19.33	
	Ph. D	42.33	18.00	
		(mean)	(mean)	
7.	Present Qualification (F. ratio)	0.40	1.67	4/392
	MBBS	37.26	14.93	
	MD/MS	37.53	15.21	
	MCH/DM	35.81	13.43	
	Ph. D	40.50	19.00	
	Diploma	47.00	26.00	
		(mean)	(mean)	

Note: * = Significant at 5% level of significance.

Table 5.23 : Medical Practitioners : Background Variables Versus Information Barriers (ANOVA) (n = 397)

Sl. No.	Medical Practitioner	Information Barriers		DF
		Environmental (F1)	Personal (F2)	
8.	Specialization (F. ratio)	1.41	2.75*	25/365
9.	Working in present organization (F. ratio)	19.05*	12.14*	33/363
10.	Working in profession (F. ratio)	1.82*	1.74*	35/361
11.	Working in present position (F. ratio)	30.59*	17.39	19/377
12.	Working in other organization (F. ratio)	12.71*	35.12*	6/390
	Number of organization	(Mean)	(Mean)	
	Same organization	26.78	7.93	
	One organization	40.19	16.79	
	Two organizations	39.37	16.15	
	Three organizations	37.70	16.29	
	Four organizations	37.14	18.00	
	Five organizations	34.40	18.40	
	Six organizations	38.50	13.00	
		(mean)	(mean)	

Note: * = Significant at 5% level of significance.

The above table, Table 5.22 and 5.23 clearly shows that at present, the environmental barriers like, shortage of books and journals in the library, not availability of indexing and abstracting service, not availability of duplicating facilities in the library etc. factors are significantly related with present age, designation, joining qualification whereas personal barriers like, communication barriers with library staff, library staff who do not help in using library resources, not availability of Internet, online searches in the library or accessing personally etc. are significantly related with designation, marital status and specialization. Background variables like working in present organization, working in profession, working in the present post and working in other organizations of medical practitioners are significantly related to both environmental as well as personal barriers.

5.6. TESTING OF HYPOTHESIS

A total of twelve background variables were identified and are listed in the part V of questionnaires named as 'Personal data'. These variables are present age, joining age, sex, marital status, present qualifications, joining qualification, designation, working in present organizations, specialization, working in profession, working in other organizations and working in present positions.

It is clear that majority (96.46%) of medical practitioners joined below the age group of 30 years and approximately more than half of them (63.70%) are below 45 years of age. 72.30% of medical practitioners are currently holding M.D. / M.S. degrees, whereas 73.30% of them were having only M.B.B.S. degree at the time of joining indicating that qualifications were acquired after joining the profession. Only 25% of them are having qualification higher that M. D. / M.S. A total of 26 specializations exist among them. Out of these 8 specializations are non-clinicians and rest are clinicians. Further it is clear that average years of working in the profession is 15 years. Whereas maximum (23.26%) are having upto 5 years of experience in the present organization. Majority of medical professionals are in the profession ranging from 5-20 years. Their promotional avenues seem better. It takes them less than five years to get promoted to higher cadre. However, they do not move from one organization to another quite easily. 46.80% of them have never changed organization and 75.70% of them have worked in only up to two organizations. It is also clear that they only move to other organization in the early stages of profession.

Medical professionals enter the profession having less qualification. They acquire higher qualification / specialization later on. They have lesser chances of being promoted in the same organization and thus move from one organization to another for promotional avenues. Further, it has been observed that this happens in the early stages of their joining profession. Higher they move on the profession, lesser are their chances of changing the institution.

In order to test the Hypothesis II "There is no significant difference in information seeking strategy of Medical Practitioners based n their background variables", ANOVA was computed between information needs, information sources, information channels and information barriers with background variables and results are presented in the Tables 5.14 : Medical Practitioners : Background Variables Versus Information Needs (ANOVA) (n = 397), Table 5.15. : Medical Practitioners : Background Variables Versus Information Needs (ANOVA) (n = 397), Table 5.16 : Medical Practitioners : Background Variables Versus Printed Information Sources (ANOVA) (n = 397), Table 5.17 : Medical Practitioners : Background Variables Versus Printed Information Sources (ANOVA) (n = 397), Table 5.18 : Medical Practitioners : Background Variables Versus Non-Printed Information Sources (ANOVA) (n = 397), 5.19 : Medical Practitioners : Background Variables Versus Non-Printed Information Sources (ANOVA) (n = 397), Table 5.20 : Medical Practitioners : Background Variables Versus Information Channels (ANOVA) (n =397), Table 5.21 : Medical Practitioners : Background Variables Versus Information Channels

(ANOVA) (n = 397), Table 5.22 : Medical Practitioners : Background Variables Versus Information Barriers (ANOVA) (n = 397) and Table 5.23 : Medical Practitioners : Background Variables Versus Information Barriers (ANOVA) (n = 397). For the purpose of this study, information seeking strategy includes information needs, information sources, information channels and information barriers.

Background variables of medical practitioners do influence the information needs. Their information needs change from one variable to another as they move up in the profession. Younger, less qualified and newly joined medical professionals depend on medical information. That is they need information on new drugs, patient's history, new clinical methods and treatment etc. Whereas, older, more qualified, or having specialization, experienced and having higher designations need information on seminars / conferences, and to keep themselves uptodate. This shows that initially they want to know more on treating patients and later on they want information on attending seminars / conferences, writing reviews / articles, writing projects and keeping uptodate with latest developments in the medical information.

Regarding uses of information sources, it is very clear that background variables do influence the use of information sources. This is hardly any use of secondary sources. Use of primary sources depend upon qualifications.

The higher the qualifications, more they depend upon the primary sources and electronic sources. Younger medical practitioners prefer

more electronic sources / internet as compared to older medical practitioners. Non-printed information sources are used by all medical practitioners.

Regarding using different channels, it is very obvious that medical practitioners who are working in various institutions depend on formal channels. Formal channels include institutional libraries, attending seminars / conferences. Even present age as well as designation effects the use of formal channels. The medical professionals who have worked in more than one organization also depend on informal channels like discussion with colleagues etc. it seems that they are more aware of other channels available. Electronic text searching is being frequently used as information channel. However, it is more popular among younger generation of medical practitioners.

The two variables identified as information barriers are personal and environmental barriers. Background variables do influence these barriers. It is also seen that these information barriers i.e. environmental and personal barriers, affect the medical practitioners to get their required information. The medical practitioners in upper age group like Professor, Associate Professor and Assistant Professor having their higher qualifications they are facing more in environmental barriers like non-availability of books, journals in the library, non-availability of duplicating facilities in the library etc. But the medical practitioners at the time of their joining age and to acquire their higher degree in the present organization they are suffering from the personal barriers like communication barriers with the library staffs, non-availability of Internet / online searches etc.

CHAPTER 6

CLINICIANS VERSUS NON-CLINICIANS AND INSTITUTIONAL MEDICAL PRACTITIONERS VERSUS PRIVATE MEDICAL PRACTITIONERS

CHAPTER 6

CLINICIANS VERSUS NON-CLINICIANS AND INSTITUTIONAL MEDICAL PRACTITIONERS VERSUS PRIVATE MEDICAL PRACTITIONERS

6.1. CLINICIANS AND NON-CLINICIANS

In order to test the hypothesis I : "There is no significant difference in information seeking strategy between clinicians and non-clinicians" it becomes essential to group medical practitioners into clinicians and non-clinicians. As already discussed in Chapter I, clinicians are those who have M.S. / M.D. degree and practice on certain special medicine e.g., Neurology, Dermatology, psychiatry etc. whereas non-clinicians are those who are either having M.B.B.S. degree or specialization in non-practicing areas e.g., physiology, pharmacology, anatomy etc. The Medical Council of India has also classified medical practitioners in clinicians and non-clinicians as shown in Table 1.1. : Medical Practitioners (Clinical and Non-Clinical section). Breakup of various specializations and non-clinicians of respondents is already presented in Table 5.8. : Specialization of Respondents (Frequency count *x* %) (n = 397). Three hundred ninety seven medical practitioners are classified into two groups viz. clinicians and non-clinicians as shown in Table 6.1.: Groups of Respondents (Frequency count into %) (*n*=397).

Table 6.1. : Groups of Respondents (Frequency count into %) (n=397)

Sl. No.	Group	Numbers	%
1.	Clinician	220	55.41%
2.	Non Clinician	177	44.58%
Total		397	99.99%

It is evident that 55.41% represent clinicians having specialization as general medicine, general surgery, paediatrics, opthalmalogy, otorhinolaryngology, dermatology, obstetrics & gynaecology etc., whereas rest 44.58% represent non-clinicians. For the purpose of this study, all M.B.B.S. degree holders are taken as non-clinicians. 51.41% of non-clinicians are holding M.B.B.S. degree only (n = 91) Table 5.7. : Present qualification of respondents (Frequency count into %) (n = 397), whereas others have specialization in other non-clinical subjects like anatomy, biochemistry, physiology, forensic science medicine, microbiology, pathology etc.

Information seeking strategy for the present study includes information needs, information sources, information channels and information barriers. Therefore, in order to test hypothesis ANOVA has been computed with clinicians, non-clinicians and information needs, information sources, information channels and information barriers – which are presented in Table 6.2. : Medical Practitioners versus Information Needs (ANOVA) (n=397); Table 6.3. : Medical Practitioners versus Printed Information Sources (ANOVA) (n=397); Table 6.4. : Medical Practitioners versus Non-Printed Information Sources (ANOVA) (n=397); Table 6.5. : Medical Practitioners versus Information

Channels (ANOVA) (n=397) and Table 6.6. : Medical Practitioners versus Information Barriers (ANOVA) (n=397) respectively below (for the purpose of analysis v_1 = clinicians, and v_2 = non-clinicians).

Table 6.2 : Medical Practitioners Versus Information Needs (ANOVA) (n=397)

Medical Practitioners	Information Needs			D.F
	Conferences / Seminars	Medical Information	Uptodateness	
Groups of Medical Practitioners (F. ratio)	1.44	52.98*	2.98	1/395
Clinicians (Mean) (v_1)	27.55	25.09	8.95	
Non-clinicians (Mean) (v_2)	26.74	21.36	8.71	

Note: * = Significant at 5% level of significance.

It is evident from Table 6.2 that clinicians and non-clinicians differ in 'Medical Information' factor (52.98 at 5% level of significance for v_1 = 220 and v_2 = 177 and d.f. 1/395) whereas two other factors of information needs viz., conferences / seminars and uptodateness do not show any difference. The factor 'Medical Information' includes information about history of patients, new clinical treatments and methods etc. Therefore, it is quite obvious that clinicians need this information more than non-clinicians.

Table 6.3. : Medical practitioners Versus Printed Information Sources (ANOVA) (n=397)

Medical Practitioners	Printed Information Sources					D.F.
	Ready Reference	Medical Sources	Primary Sources	Secondary Sources	External Sources	
Groups of Medical Practitioners (F. ratio)	28.36*	15.41*	0.63	0.31	14.53*	1/395
Clinicians (Mean) (v_1)	17.45	9.70	12.79	20.80	14.37	
Non-clinicians (Mean) (v_2)	14.72	11.65	13.28	20.98	13.10	

Note: * = Significant at 5% level of significance.

Table 6.3. indicates that clinicians and non-clinicians differ on to three printed information sources namely, ready references (28.36 at 5% level of significance for v_1 = 220 & v_2 = 177 and d.f. 1/395), medical sources (15.41 at 5% of significance for v_1 = 220 & v_2 = 177 and d.f. 1/395), and external sources (14.53 at 5% of significance for v_1 = 220 & v_2 = 177 and d.f. 1/395). Whereas two printed information sources factors namely primary sources and secondary sources do not show any degree of difference.

Table 6.4. : Medical Practitioners Versus Non-Printed Information Sources (ANOVA) (n=397)

Medical Practitioners	Non-Printed Information Sources			D.F
	Audio-visuals	Online Electronic Sources	Offline Electronic Sources	
Groups of Medical Practitioners (F. ratio)	0.06	2.22	.16	1/395
Clinicians (Mean)(v_1)	29.43	11.07	7.15	
Non-clinicians (Mean)(v_2)	29.28	11.51	7.25	

Note: * = Significant at 5% level of significance.

As seen in Table 6.4., regarding non-printed information sources, it is

very evident that all three factors are non-significant, thereby indicating that clinicians and non-clinicians do not differ on non-printed information sources.

Table 6.5. : Medical Practitioners Versus Information Channels (ANOVA) (n=397)

Medical Practitioners	Information Channels					D.F.
	Formal channel	Informal channel	Electronic Text Searching	External / Other Libraries	Internet/ Online Searches	
Groups of Medical Practitioners (F. ratio)	4.30*	0.06	11.23*	3.28	1.26	1/395
Clinicians (Mean) (v_1)	28.86	8.98	4.45	3.96	8.30	
Non-clinicians (Mean) (v_2)	27.57	8.89	5.34	4.29	7.87	

Note: * = Significant at 5% level of significance.

The Table 6.5 represents analysis of ANOVA between clinicians and non-clinicians versus Information channels. It is very clear that clinicians and non-clinicians differ as far as formal channel (4.30 at 5% of significance for $v_1 = 220$ & $v_2 = 177$ and d.f. 1/395), and electronic text searching (11.23 at 5% of significance for $v_1 = 220$ & $v_2 = 177$ and d.f. 1/395). Informal channel, external / other libraries and Internet / On-line searches factors of information channels do not show any significant difference between clinicians and non-clinicians.

Table 6.6 : Medical Practitioners Versus Information Barriers (ANOVA) (n=397)

Medical Practitioners	Information Barriers		D.F
	Environmental	Personal	
Groups of Medical Practitioners (F. ratio)	2.40	13.61*	1/395
Clinicians (Mean) (v_1)	38.22	14.23	
Non Clinicians (Mean) (v_2)	36.35	16.24	

Note: * = Significant at 5% level of significance.

Table 6.6 shows the results of clinicians and non-clinicians versus information barriers and the result shows that clinicians and non-clinicians differ in personal barrier as compared to environmental barrier. Personal barrier includes items mostly related to libraries. These include items like :

- Non assistance of library staff.
- Non cooperation of library staff.
- No time to visit library
- No duplicating facilities available in the library.

6.2. INSTITUTIONAL MEDICAL PRACTITIONERS VERSUS PRIVATE MEDICAL PRACTITIONERS

In order to test hypothesis III : "There is no significant difference in information seeking strategy between private medical practitioners and medical practitioners working in institutions" – it becomes essential to group medical practitioners into Private Medical

Practitioners and Medical Practitioners working in institutions (institutional). Private medical practitioners are those who are not attached to any formal institutions whereas other group (institutional) is those who are formally working as a full time in an institution like Gauhati Medical College & Hospital, Guwahati, Assam Medical College & Hospital, Dibrugarh, Silchar Medical College & Hospital, Silchar and Regional Institute of Medical Sciences, Imphal. The status is given in Table 6.7. : Status of Respondents (Frequency count into %) (n=397)

Table 6.7. : Status of Respondents (Frequency count into %) (n=397)

Sl. No.	Status	Numbers	%
1.	Institutional	374	94.20%
2.	Private	23	5.79%
Total		397	99.99%

The above Table clearly shows that 94.20% of respondents are working in institutions whereas rest (5.79%) are private medical practitioners. Here I would like to emphasize that in spite of my best efforts its was difficult to collect data from medical practitioners working as private practitioners. Further, data has been collected only from Guwahati. It has been observed that Guwahati is the center of North East and people from other North East States come to Guwahati to seek medical assistance from private medical practitioners.

In order to test the hypotheses, ANOVA has been computed with Institutional Medical Practitioners and Private Medical Practitioners and Information Needs, Information Sources, Information Channels and Information barriers, which are presented in the Table 6.8. : Status of

medical Practitioners versus Information Needs (ANOVA) (n=397); Table 6.9 : Status of Medical practitioners versus Printed Information Sources (ANOVA) (n=397); Table 6.10 : Status of medical practitioners versus Non-printed Information Sources (ANOVA) (n=397); Table 6.11 : Status of Medical Practitioners versus Information Channels (ANOVA) (n=397) and Table 6.12 Status of Medical Practitioners versus Information Barriers (ANOVA) (n=397) respectively (for the purpose of this study v_1 = institutional medical practitioners and v_2 = private medical practitioners).

Table 6.8 : Medical Practitioners Versus Information Needs (ANOVA) (n=397)

Medical Practitioners	Information Needs			D.F
	Conference / Seminars	Medical Information	Uptodateness	
Status (F. ratio)	130.50*	1.92	0.79	1/395
Institutional (Mean) (v_1)	28.02	23.52	8.83	
Private (Mean) (v_2)	13.69	21.91	9.08	

Note: * = Significant at 5% level of significance.

The Table 6.8. clearly shows that the institutional medical practitioners and private medical practitioners differ as far as conferences / seminars information needs is concerned (130.50 at 5% of significance for v_1 = 220 & v_2 = 177 and d.f. 1/395). Medical information and uptodateness show no significant difference as far as Institutional and Private medical practitioners are concerned. It is quite obvious that medical practitioners who are attached to institutions attend more conferences / seminars as compared to those who are having private practices.

Table 6.9. : Medical Practitioners Versus Printed Information Sources (ANOVA) (n=397)

Medical Practitioners	Printed Information Sources					D.F.
	Ready Reference	Medical Sources	Primary Sources	Secondary Sources	External Sources	
Status (F. ratio)	124.74*	72.01*	38.82*	20.50*	0.30	1/395
Institutional (Mean) (v_1)	16.87	11.06	13.43	21.06	13.78	
Private (Mean) (v_2)	5.91	2.65	6.08	18.00	14.21	

Note: * = Significant at 5% level of significance.

It is very evident from Table 6.9 that all printed information sources except external sources show significant difference regarding Institutional medical practitioners and Private medical practitioners. These are ready references (124.74 at 5% level of significance for v_1 = 374 and v_2=23; d.f.1/395), primary sources (32.82 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f.1/395), medical sources (72.01 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395) and secondary sources (20.50 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395)

Table 6.10 : Medical Practitioners Versus Non-Printed Information Sources (ANOVA) (n=397)

Medical Practitioners	Non-Printed Information Sources			D.F
	Audio-visuals	Online Electronic Sources	Offline Electronic Sources	
Status (F. ratio)	30.90*	66.13*	26.74*	1/395
Institutional (Mean) (v_1)	29.77	11.55	7.34	
Private (Mean) (v_2)	22.82	6.78	4.78	

Note: * = Significant. at 5% level of significance.

Table 7.2.3(b) present analysis of ANOVA of Institutional and Private

medical practitioners with non-printed information sources. It is very evident that all three factors namely, Audio-visuals (30.09 at 55 level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395), Online electronic sources (66.13 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f.1/395), Off line electronic sources (26.74 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395) differ in relation to Institutional and Private medical practitioners.

Table 6.11 : Medical Practitioners Versus Information Channels (ANOVA) (n=397)

Medical Practitioners	Information Channels					D.F.
	Formal channel	Informal channel	Electronic Text Searching	External / Other Libraries	Internet/ Online Searches	
Status (F. ratio)	281.58*	15.38*	17.55*	.60	3.92*	1/395
Institutional (Mean) (v_1)	29.27	9.11	4.98	4.12	8.20	
Private (Mean) (v_2)	12.26	6.17	2.65	3.82	6.56	

Note: * = Significant at 5% level of significance.

It is very evident from the Table 6.11 that all the information channels except External/Other libraries channel show significance difference regarding Institutional and Private medical practitioners. These are Formal channel (281.58 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395), Informal channel (15.38 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395) Electronic text searching (17.55 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395) and Internet/Online searches (3.92 at 5% level of significance for v_1 = 374 and v_2 = 23; d.f. 1/395).

Table 6.12 : Medical practitioners Versus Information Barriers (ANOVA) (n=397)

Medical Practitioners	Information Barriers		D.F
	Environmental	Personal	
Status (F. ratio)	599.09*	349.19*	1/395
Institutional (Mean) (V_1)	39.69	16.65	
Private (Mean) (V_2)	00.00	00.00	

Note: * = Significant at 5% level of significance.

It is difficult to identify the relationship between Institutional medical practitioners and Private medical practitioners regarding the information barrier they face. As it is evident from Table 6.12 that the causes to this question were left out by Private medical practitioners and computer could compute only 00.

6.3. CONCLUSION

Information seeking strategy shows marked difference between clinicians and non-clinicians on one side and between Institutional medical practitioners and Private medical practitioners on the other side. They differ in their information need, information sources they use and as well as information channels that are used. It is quite evident that clinicians will emphasis on medical information than non-clinicians. Clinicians are practicing medical practitioners will be like to have information on patient history, new clinical methods, new clinical treatments and new drugs whereas non-clinicians who are not practicing do not emphasis on this information. They do not difference regarding using information sources as far as printed information

sources are concerned. Again, Ready references, Medical sources and External sources are the sources which clinicians will have to depend more for analysis and diagnosis of diseases.

Again, it is the clinicians who are using Electronic Text Searching channel more. They are under pressure to know new methods, treatments and new drugs so that it facilitates diagnosis and treatment. Further, clinicians differ as far as personal barriers are concerned which emphasis mostly uses of various libraries either attached to the institutions or elsewhere.

Information seeking strategies of Institutional medical practitioners and Private medical practitioners also differ. Regarding information needs, it is clear that institutional medical practitioners need more information for attending various conferences / seminars, workshops etc. whereas private medical practitioners do not bother much to attend these formal gathering. However, they do depend on various information sources to gather information regarding new treatment and drugs. It is clear that private medical practitioners use more non-printed information sources like internet, online electronic sources rather than formal sources. It was clear while collecting data that all private medical practitioners have personal computers and internet facilities available. The information channels also show difference regarding institutional medical practitioners and private medical practitioners except one factor namely, external / other libraries. It is clear that private medical practitioners do not visit formal library attached to institution but use other channels.

CHAPTER 7

FINDINGS AND DISCUSSION

CHAPTER 7

FINDINGS AND DISCUSSION

Findings of the study are summarized below :

7.1. INFORMATION NEEDS

After factor analysis of information needs variables three variables related to information needs of medical practitioners have been identified. These are (i) conference/seminars, (ii) medical information, (iii) uptodateness. These variable are highly correlated signifying their importance. Medical practitioners need information conferences / seminars followed by medical information. This reveals that they need information about new drugs, new clinical methods and about new treatments.

7.2. INFORMATION SOURCES

For the purpose of this study information sources have been divided into two groups: printed information sources and non-printed information sources. Five variables have been identified for printed information sources and are ready references, medical sources, primary sources, secondary sources and external sources. The analysis shows that the primary source is the most important information source for medical practitioners. This includes journals,

newsletters, treatise, patents, research reports and so on. This follows by the secondary source and ready reference respectively and includes sources like discussions within hospital, patients record (Centralized Medical Record Department) internal meetings etc.

For non-printed information sources, three variables have been identified after factor analysis. These are audio-visuals, on-line electronic sources and off-line electronic sources. The three variables are highly correlated indicating their significance. Audio-visual variable ranks first and is followed by on-line electronic sources and off-line electronic sources.

7.3. INFORMATION CHANNELS

Regarding information channels, five variables have been identified and these are viz. formal channel, informal channel, electronic text searching, external/other libraries and Internet/online searches. All these five variables are significantly correlated. The formal channel variable ranks first followed by Internet/online searches variable. This shows that medical practitioners are using besides libraries Internet and online searches as the channel to satisfy their information needs. The informal channel ranks third.

7.4. INFORMATION BARRIERS

Information barriers are categorized into two variables namely environmental barriers and personal barriers. Between this the

environmental barrier is the most important barrier. This indicates that, the medical practitioners do not get good library facilities and it is further restricted by unfavorable attitude of library staffs in their institution. Personal barriers include items like non-availability of time to visit the library etc. A summary of the relationships among information needs, information channels and information barriers are presented in Fig. 7.1. : Summary of the relationships among information needs, information channels and information barriers.

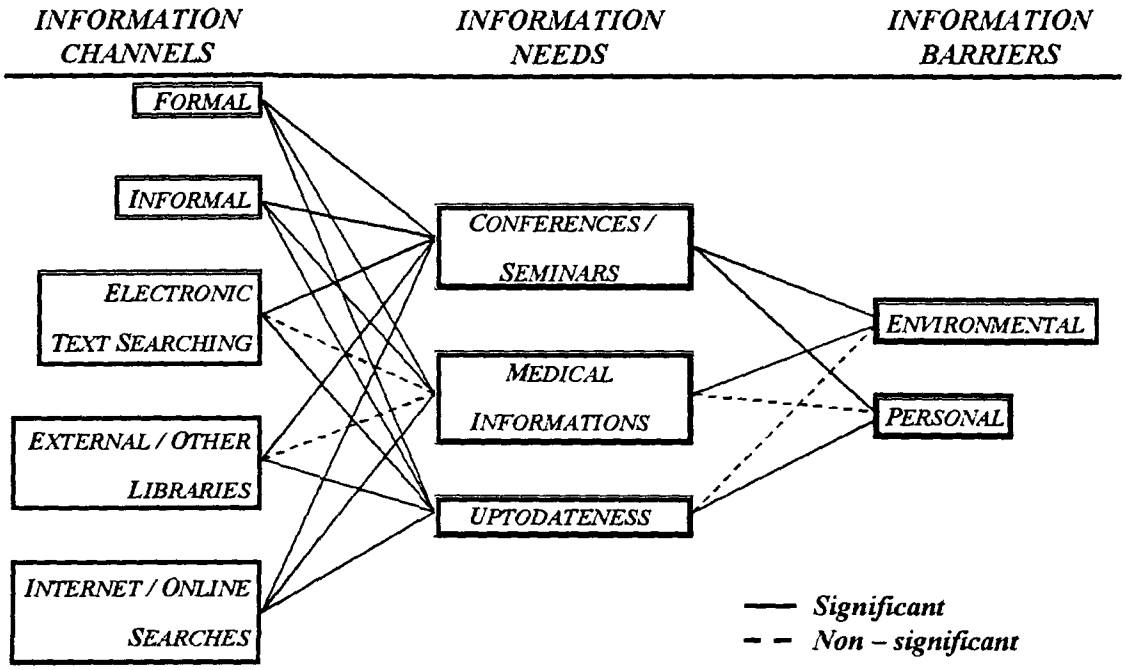


Fig. 7.1 : Summary of the relationship among information needs, information channels and information barriers.

7.5. BACKGROUND VARIABLES

A total of twelve background variables were identified and are listed in Part V of questionnaires named as 'Personal data'. These variables are present age, joining age, sex, marital status, present qualifications, joining qualification, designation, working in present organizations,

specialization, working in profession, working in other organizations and working in present positions.

It is clear that majority (96.46%) of medical practitioners joined below the age group of 30 years and approximately more than half of them (63.70%) are below 45 years of age. 72.30% of medical practitioners are currently holding M.D. / M.S. degrees, whereas 73.30% of them were having only M.B.B.S. degree at the time of joining indicating that qualifications were acquired after joining the profession. Only 25% of them are having qualification higher that M. D. / M.S. A total of 26 specializations exist among them. Out of these 8 specializations are non-clinicians and rest are clinicians. Further it is clear that average years of working in the profession is 15 years. Whereas maximum (23.26%) are having upto 5 years of experience in the present organization. Majority of medical professionals are in the profession ranging from 5-20 years. Their promotional avenues seem better. It takes them less than five years to get promoted to higher cadre. However, they do not move from one organization to another quite easily. 46.80% of them have never changed organization and 75.70% of them have worked in only up to two organizations. It is also clear that they only move to other organization in the early stages of profession. Medical professionals enter the profession having less qualification. They acquire higher qualification / specialization later on. They have lesser chances of being promoted in the same organization and thus move from one organization to another for promotional avenues. Further, it has been observed that this happens in the early stages of

their joining profession. Higher they move on the profession, lesser are their chances of changing the institutions. A summary of the relationships between background variables, information needs and information barriers is presented in Fig. 7.2. : Summary of relationship among information needs, information barriers and background variables.

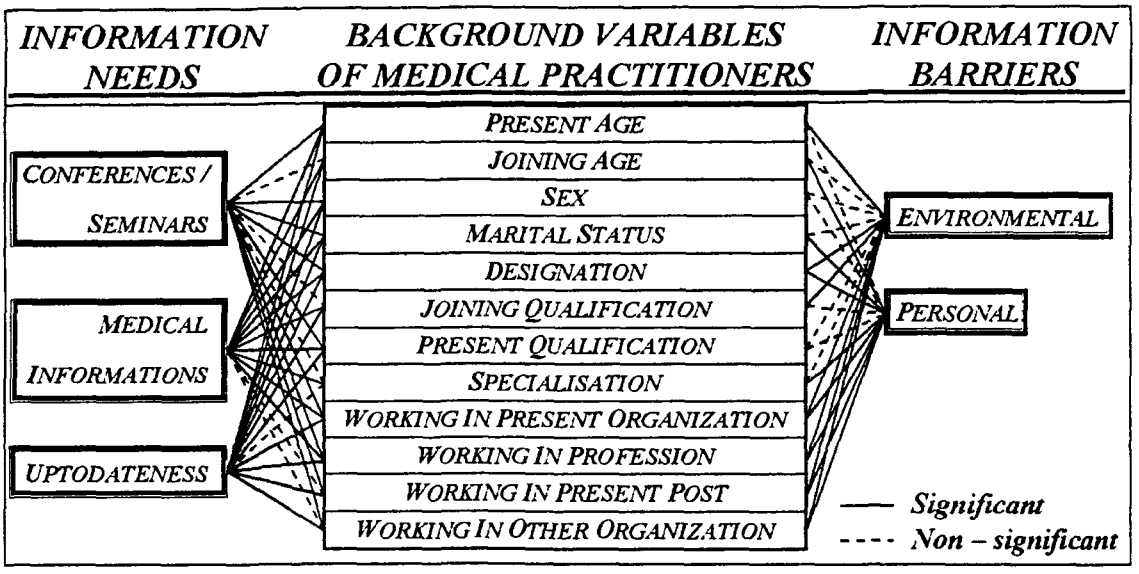


Fig. 7.2 : Summary of the relationship among information needs, information barriers and background variables.

For the purpose of this study, information seeking strategy includes information needs, information sources, information channels and information barriers.

Background variables of medical practitioners do influence the information needs. Their information needs change from one variable to another as they move up in the profession. Younger, less qualified and newly joined medical professionals depend on medical information. That is they need information on new drugs, patient's history, new clinical methods and treatment etc. Whereas, older, more qualified, or

having specialization, experienced and having higher designations need information on seminars / conferences, and to keep themselves uptodate. This shows that initially they want to know more on treating patients and later on they want information on attending seminars / conferences, writing reviews / articles, writing projects and keeping uptodate with latest developments in the medical information.

Regarding uses of information sources, it is very clear that background variables do influence the use of information sources. This is hardly any use of secondary sources. Use of primary sources depend upon qualifications. The higher the qualifications, more they depend upon the primary sources and electronic sources. Younger medical practitioners prefer more electronic sources / internet as compared to older medical practitioners. Non-printed information sources are used by all medical practitioners. A summary of the relationship between information sources and background variables is presented in Fig. 7.3.

: Summary of the relationship between information sources and background variables.

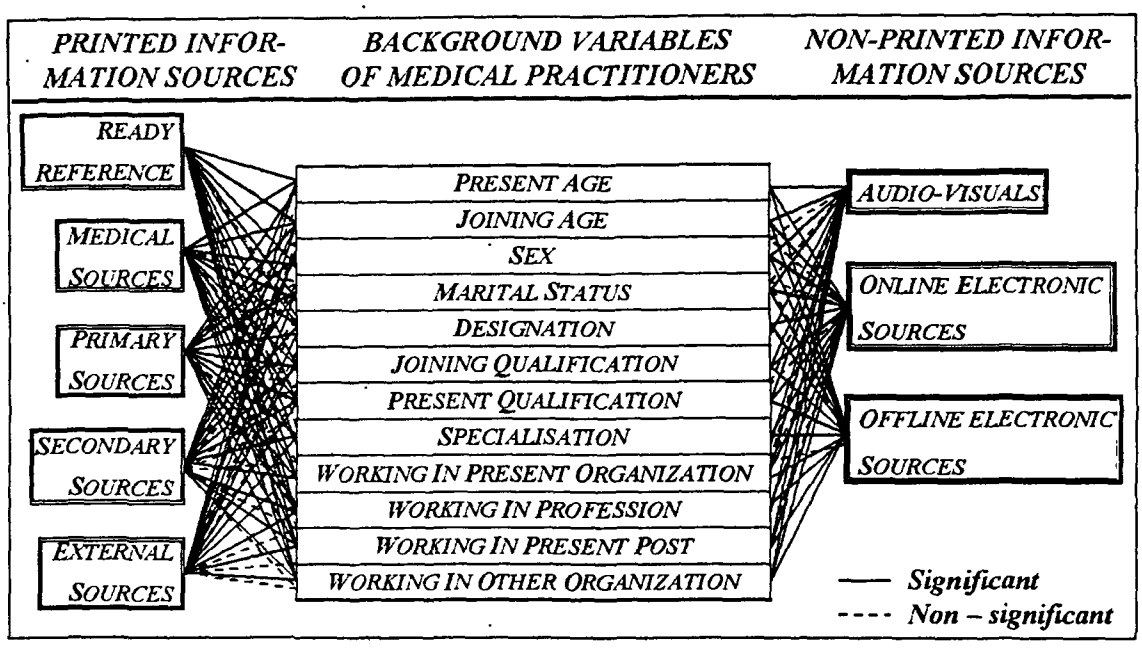


Fig. 7.3 : Summary of the relationship among information sources and background variables.

Regarding using different channels, it is very obvious that medical practitioners who are working in various institutions depend on formal channels. Formal channels include institutional libraries, attending seminars / conferences. Even present age as well as designation effects the use of formal channels. The medical professionals who have worked in more than one organization also depend on informal channels like discussion with colleagues etc. it seems that they are more aware of other channels available. Electronic text searching is being frequently used as information channel. However, it is more popular among younger generation of medical practitioners.

The two variables identified as information barriers are personal and environmental barriers. Background variables do influence these barriers. It is also seen that these information barriers i.e. environmental and personal barriers, affect the medical practitioners

to get their required information. The medical practitioners in upper age group like Professor, Associate Professor and Assistant Professor having their higher qualifications they are facing more in environmental barriers like non-availability of books, journals in the library, non-availability of duplicating facilities in the library etc. But the medical practitioners at the time of their joining age and to acquire their higher degree in the present organization they are suffering from the personal barriers like communication barriers with the library staffs, non-availability of Internet / online searches etc. A summary of the relationship between information channels and background variables is presented in Fig. 7.4. : Summary of the relationship between information channels and background variables.

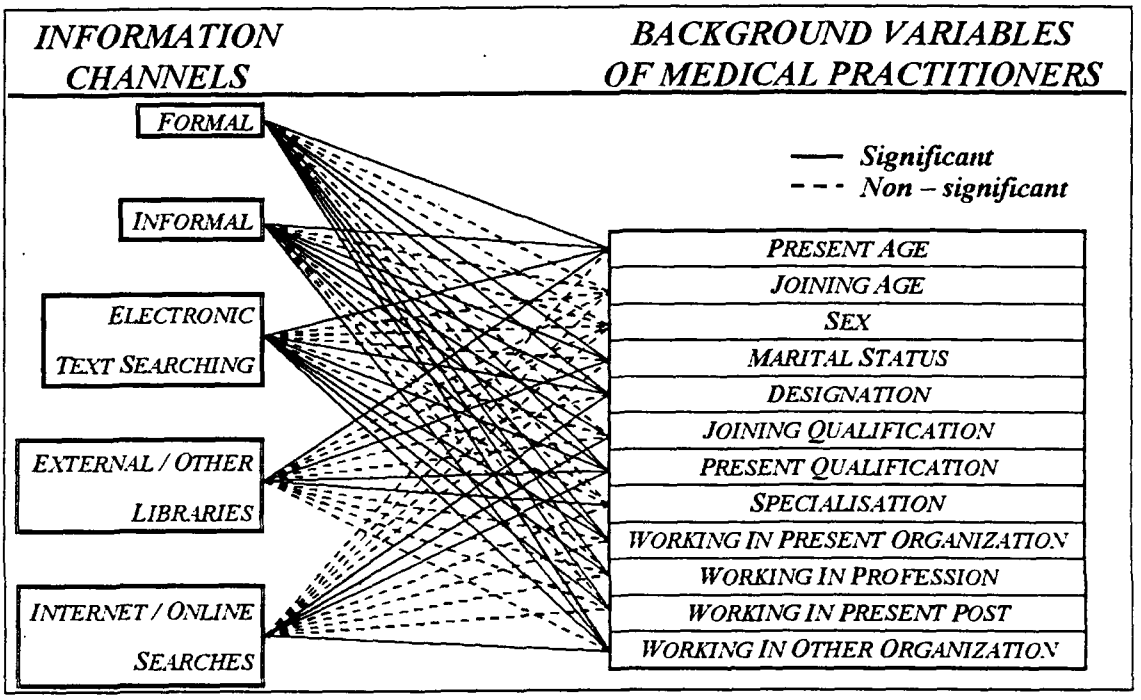


Fig. 7.4 : Summary of the relationship between information channels and background variables.

Information seeking strategy shows marked difference between clinicians and non-clinicians on one side and between Institutional

medical practitioners and Private medical practitioners on the other side. They differ in their information need, information sources they use and as well as information channels that are used. It is quite evident that clinicians will emphasis on medical information than non-clinicians. Clinicians are practicing medical practitioners will be like to have information on patient history, new clinical methods, new clinical treatments and new drugs whereas non-clinicians who are not practicing do not emphasis on this information. They do not difference regarding using information sources as far as printed information sources are concerned. Again, Ready references, Medical sources and External sources are the sources which clinicians will have to depend more for analysis and diagnosis of diseases.

Again, it is the clinicians who are using Electronic Text Searching channel more. They are under pressure to know new methods, treatments and new drugs so that it facilitates diagnosis and treatment.

Further, clinicians differ as far as personal barriers are concerned which emphasizes mostly uses of various libraries either attached to the institutions or elsewhere.

Information seeking strategies of Institutional medical practitioners and Private medical practitioners also differ. Regarding information needs, it is clear that institutional medical practitioners need more information for attending various conferences / seminars, workshops etc. whereas private medical practitioners do not bother much to attend these formal gathering. However, they do depend on various

information sources to gather information regarding new treatment and drugs. It is clear that private medical practitioners use more non-printed information sources like internet, online electronic sources rather than formal sources. It was clear while collecting data that all private medical practitioners have personal computers and internet facilities available. The information channels also show difference regarding institutional medical practitioners and private medical practitioners except one factor namely, external / other libraries. It is clear that private medical practitioners do not visit formal library attached to institution but use other channels. A summary of the relationships among information needs, information barriers, and background variables are presented in Fig. 7.5.

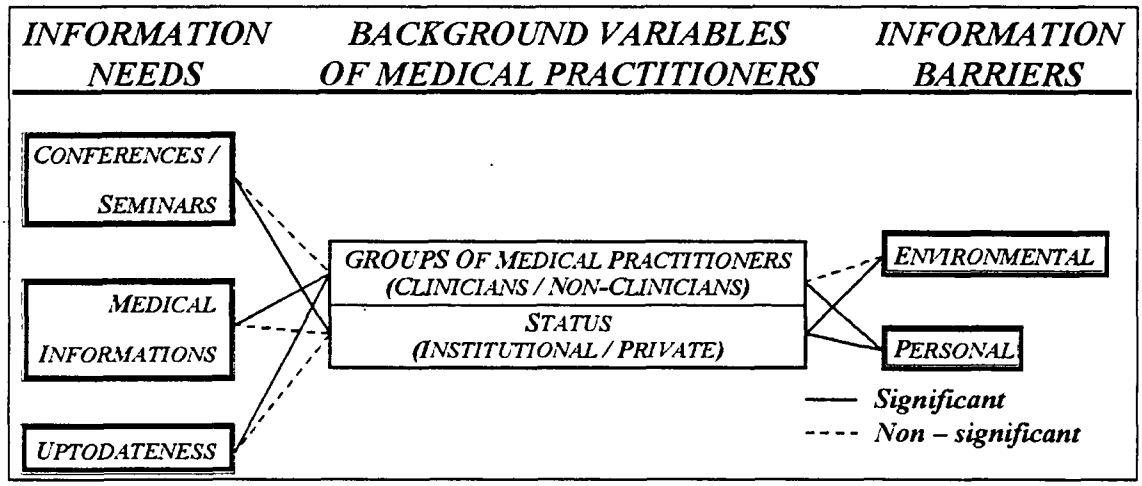


Fig. 7.5. Summary of relationship among information needs, information barriers and background variables.

A summary of the relationships between information sources, and background variables are presented in Fig. 7.6.

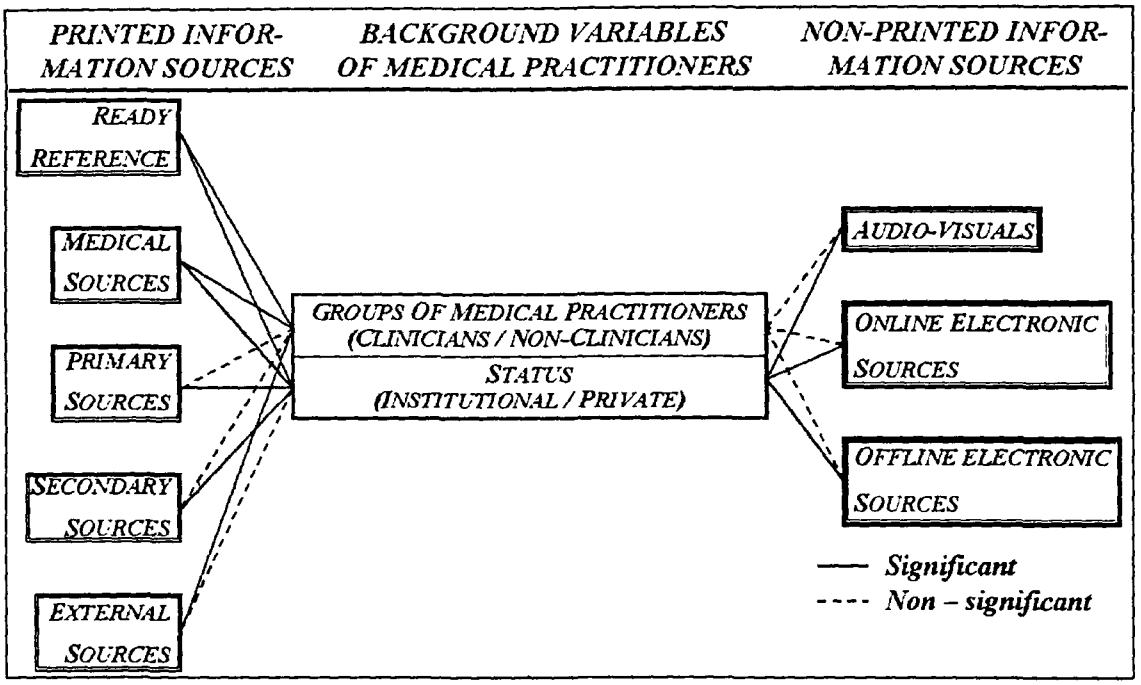


Fig. 7.6. Summary of relationship between information sources and background variables.

From the above discussion, a generic model of information seeking strategy used by medical practitioners in North-East India is graphically presented in Fig. 7.7. : A Model of information seeking strategy for Medical Practitioners.

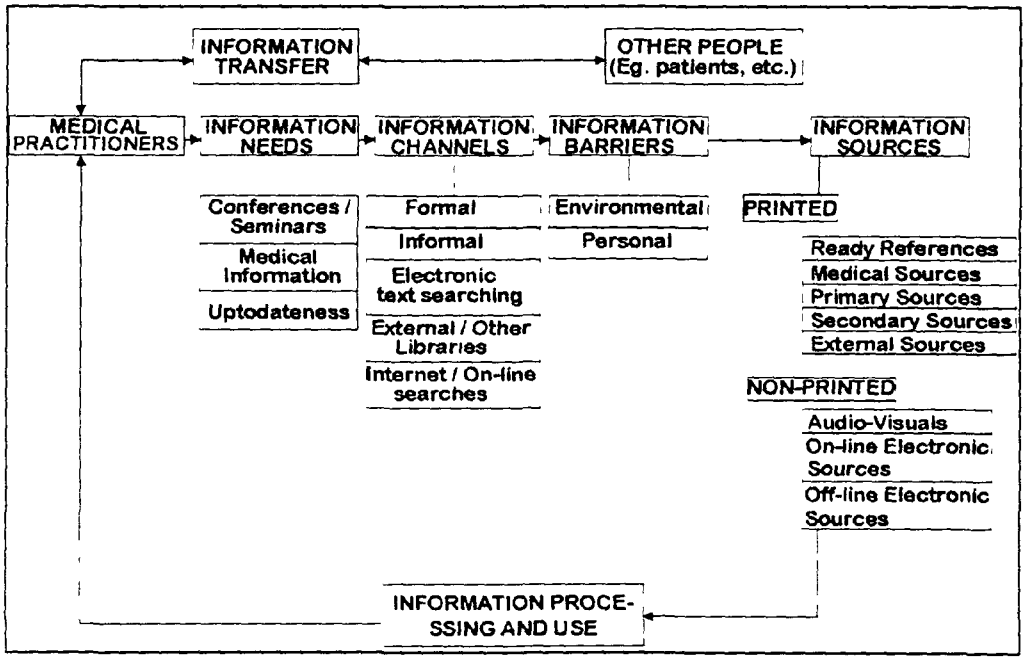


Fig. 7.7 : A Model of information seeking strategy for Medical Practitioners.

CHAPTER 8

SUGGESTIONS AND RECOMMENDATIONS

CHAPTER 8

SUGGESTIONS AND RECOMMENDATIONS

8.1. INTRODUCTION

A total of seventeen variables on information barriers were administered to all participants. Factor Analysis reduced these into two main variables which are named as 'Environmental' and 'Personal'. The environmental factor mainly related to non-availability of latest materials, physical facilities and various services of the library. Personal barriers are to less time to visit library and communication barriers with library staff. Thus it is clear that medical practitioners face environmental as well as personal barriers while seeking information. In order to give suggestions to improve the library services, it is essential to know the existing scenario of the existing libraries. A survey was conducted with the help of structured questionnaire (Appendix II) to examine the available resources, services provided and infrastructure facilities available in all four Medical College libraries. The libraries are as follows :

1 Gauhati Medical College Library, Guwahati.
2 Assam Medical College Library, Dibrugarh.
3 Silchar Medical College Library, Silchar.
4 Regional Institute of Medical Sciences Library, Imphal.

The summary of the findings of the questionnaires are presented in

Table 8.1. : Summary of the Present Status of Library Facilities in North East India.

Table 8.1 : Summary of the Present Status of Library Facilities in North East India

Sl. No	Items	1	2	3	4
1.	Year of Establishment	1961	1947	1969	1972
2.	Collection :				
	2.1. No. of Books	24,017	27,083	13,803	26,208
	2.2. Periodicals				
	No. of bound volumes				
	Indian	17,000	7,655	4	5,039
	International				
3.	Budget :				
	(For last five years)	(Rs. in Lakhs)	(Rs. in Lakhs)	(Rs. in Lakhs)	(Rs. in Lakhs)
	1994 – 1995	2.0	2.0	2.0	14.0
	1995 – 1996	2.5	2.0	1.5	14.0
	1996 – 1997	2.5	2.99	1.5	10.0
	1997 – 1998	2.0	2.0	1.5	5.0
	1998 – 1999	1.0	1.0	1.0	2.0
	Total :	10.0	9.99	7.5	45.0
		(for both books and periodicals)			
4.	Manpower :				
	Designation & Qualification :				
	4.1. Librarian	BLISc.	BLISc.	BA	PhD
	4.2. Addl. Librarian	MLISc.	Nil	Nil	Nil
	4.3. Dy. Librarian	Nil	Nil	Nil	MLISc
	4.4. Asstt. Librarian	Nil	BA	HSLC	Nil
	4.5. Doc. officer	Nil	Nil	Nil	PhD
	4.6. Tech.Asstt.	Nil	Nil	Nil	Nil
	4.7. Library Asstt.	BLISc.	HSLC	Nil	BLISc
	4.8. Lib. Attendant	HSLC	Nil	HSLC	HSLC
	4.9. UDA	Nil	Nil	Nil	Nil
	4.10. LDA	HSLC	Nil	Nil	HSLC
	4.11. Others	Nil	HSLC	HSLC	Nil
	Total				
5.	– No. of user per day	45 – 60	50 – 60	150	NA
	– Books issued per day	50	15 – 30	30	NA
6.	Opening time of the Library	10 AM to 4 PM (College Section) 8 AM to 8 PM (Hospital Section)	8 AM to 8 PM	8 AM to 8 PM	9:30 AM to 7:30 PM
7.	Arrangement :				
	7.1. Classification	DDC	DDC	NA	Colon
	7.2. Cataloguing	AACR II	Nil	NA	AACR
8.	Service provided to the users :				
	8.1. Circulation	Yes	Yes	Yes	Yes
	8.2. Reference	Yes	Yes	Yes	Yes
	8.3. Others	Xerox	No	No	Xerox & Medline Search on CDROM
9.	Availability of Databases				
	9.1. CDROM Databases	Nil	Nil	Nil	MEDLINE
	9.2. Online Databases	Nil	Nil	Nil	Nil
	9.3. In house Databases	Nil	Nil	Nil	Nil
	9.4. Software used	CDS/ISIS	Nil	Nil	DOS

10.	Status of Computerisation Availability 10.1. No. of P.C. 10.2. No. of CDROMS 10.3. Networking	 One Nil Nil	 Nil Nil Nil	 Nil Nil Nil	 One One Nil
11.	Person trained in IT 11.1. Professional 11.2. Semi professional 11.3. Non professional	 1 Nil Nil	 Nil Nil Nil	 Nil Nil Nil	 Five Four Six
12.	Future plan for computeri-sation and others	Yes	Yes	NA	Planning to install a VSAT, e-Mail and Internet

Note : 1. Gauhati Medical College Library, Guwahati, 2. Assam Medical College Library, Dibrugarh,
3. Silchar Medical College Library, Silchar, 4. Regional Institute of Medical Sciences Library, Imphal.

SUMMARY OF THE PROBLEMS / BARRIERS FACED BY MEDICAL PRACTITIONERS FOR SEEKING INFORMATION

1. They do not have proper services available in their institutions.
2. Most of the medical practitioners depend on personal sources rather than the institutional library.
3. Latest periodicals and other important materials are not available in the libraries.
4. All the libraries are facing financial constraints, which does not allow them to grow in the proper direction.
5. All the libraries are not having sufficient professionally qualified staff, which would have helped in providing proper library services.
6. Timings of the library also do not suit most of the medical practitioners.

It is very evident from the above study that environmental factors play a crucial role in the information seeking strategy of medical

practitioners. The only solution / alternative in the present circumstances is the Resource Sharing.

8.2. SUGGESTIONS

It is very evident from the above discussion that medical college libraries are facing many problems. Services provided by them are very poor and access to the latest periodicals and other materials in unthinkable due to paucity of adequate finances. State governments are unconcerned about the status of library staff and on developing infrastructure facilities in the libraries. One of the libraries is manned by only a graduate and almost half of them have no computer available in the library. Keeping this scenario in view, there is a need for resource sharing among all the medical college libraries in the North-East India. Resource sharing means when two or more libraries are sharing their resources for the benefit of all participating libraries. It is the only realistic means of providing full range of resources needed for scholarly research so the sharing of resources among the libraries is increasingly accepted.

Today, the concept of resource sharing does not remain confined to interlibrary loan and document supply. It includes sharing of materials, functions, services and expertise.

8.2.1. NEED FOR RESOURCE SHARING

Further, it is difficult for a single library to acquire all materials. Resource sharing becomes imperative due to :

(i) Exponential growth of information;

(ii) Increasing the cost of library materials like journals, books etc. and reducing the library budget;

(iii) Development and application of information technology in the library makes newer and easier methods of information processing retrieval and dissemination;

(iv) More emphasis on avoidance of unnecessary duplication of information sources.

The pressure for resource sharing due to the devaluation of rupee, rising cost of published materials, increasing in the number of published materials and limited financial aid resulted in switching over automation in libraries.

8.2.2. NEMLIBNET

There is a need for medical library network in the North East India given the paucity of modern, uptodate medical information available to medical practitioners as well as problems involved in providing such services because of poor communication infrastructure. This network provides gateway to the internet, enabling the user to exchange e-mail

with any internet address and access off line information service available over the internet.

UNESCO defines information network as "Information Network is a set of interrelated information systems associated with communication facilities which are cooperating through more or less formal agreements, in order to implement information handling operations, with a view pooling their resources and better serving the users. They generally follow identical or compatible rules and procedures. In modern practice many information systems are in fact based upon Networks and the two terms are often used interchangeably."

Therefore, NEMLIBNET (North Eastern Medical Library Network) is proposed in this study.

8.2.3. VISION

The vision will be to create a network of resources with local service interface forming part of national medical information. This will be utilized by linking existing medical college libraries in North East through network, which will accept the need to explore cooperation and collaboration by consensus as a response to the educational, training and information needs of the country.

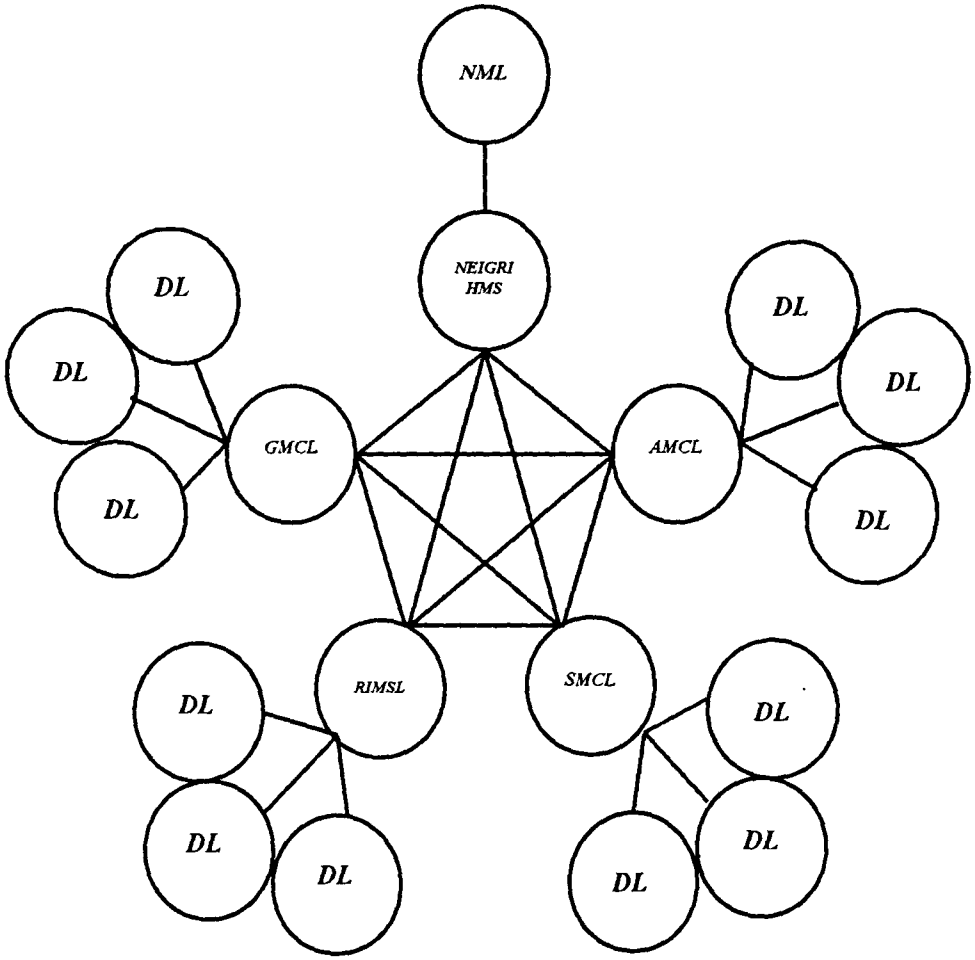
8.2.4. OBJECTIVES

The objectives of the NEMLIBNET are :

1. To promote resource sharing and enhance access to information;
2. To support information needs of medical practitioners in the North East India;
3. To formulate appropriate collection developments and explore ways of saving cost;
4. To facilitate access to information through shared computer systems and networks;
5. To build links with other types of libraries in the region;
6. To explore sources of finance for enhancement of information handling;
7. To generate new services and to improve the efficiency of existing one; and
8. To improve the efficiency of information infrastructure, so as to develop the national infrastructure.

8.2.5. ORGANISATIONAL STRUCTURE

The model of organizational structure of NEMLIBNET is given below :



Note : NML – National Medical Library, New Delhi; NEIGRIHMS – North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences; GMCL – Gauhati Medical Library; AMCL – Assam Medical College Library; SMCL – Silchar Medical College Library; RIMSL – Regional Institute of Medical Sciences Library; DL – Departmental Library.

Fig. 8.1. A model of North Eastern Medical Library Network (NEMLIBNET)

There are four main medical college libraries. These are,

1. Gauhati Medical College Library, Guwahati.
2. Assam Medical College Library, Dibrugarh.
3. Silchar Medical College Library, Silchar.
4. Regional Institute of Medical Science Library, Imphal.

Every library will be networked with its department library. The topology of the network will star and distributed network. Each of the four libraries will be interconnected and all the four will be networked in NEIGRIHAMS (North-Eastern Indira Gandhi Regional Institute of Health and Medical Sciences). The NEIGRIHAMS will act as a regional focal point of the NEMLIBNET. NEIGRIHAMS is an autonomous institute established by Govt. of India in 1987. It has been the first and only post graduate medical institute in the North-Eastern region and the third in the country. NEIGRIHAMS has the objectives like (i) medical education and human resource development – centre of excellence for medical education to generate health manpower in speciality, super-speciality medical departments and paramedics; (ii) user friendly patient care system with state of the are technology; (iii) central research organisation with primary and advanced research facilities; (iv) health consultancy service in regional and central health schemes. The institute shall be coordinating with international health organisations like WHO, UNICEF and World Bank. NEIGRIHAMS will be connected to the National Medical Library (NML), New Delhi and NML will act as a national focal point.

The National Medical Library, as apex body of the network, was made responsible for developing bibliographic control tools, providing leadership to medical libraries, conducting training programmes / courses for professional development of libraries, formulating standards for medical libraries besides coordination of activities of regional focal point and other nodal libraries of the network. The

regional focal point will form an important linkage between NML and nodal libraries and provide information services to all medical practitioners in the region.

8.2.6. Proposed Services And Functions

The establishment of NEMLIBNET would enable the medical students and practitioners to get better and improved services to satisfy their information needs. The proposed services are as below :

8.2.6.1. Bibliographic searches

Searches on MEDLARS / MEDLINE and other databases are to be provided to the users. Currently electronic networks are serving as important focal points for developments associated with electronic document delivery, electronic journals and a variety of web-based facilities which provide access to a wide range of other databases and information resources (*Rowley & Slack*, 1999).

8.2.6.2. Document Delivery

Document delivery is an important aspect of library services. Medical practitioners want the relevant documents in their hands. So, this document delivery service will be provided into following two ways :

(i) Through the interlibrary loan system among the libraries of NEMLIBNET, and

(ii) Photocopy services through electronic transmission.

8.2.6.3. Development of Tools for effective cooperation

In order to make successful resource sharing network, the co-operative effort i.e., means, methods and tools must be available. Such tools include the sources of information on the resources available in the libraries of the network with compatibility with the administrative procedures and regulations of the participating libraries and also in establishing efficient lines of communication among all the libraries of network. The activities of NEMLIBNET should be :

(i) Preparation of computerized database of serials and other holding of all participating libraries

(ii) Pooling of national and international databases on subjects related to medical sciences for common use among participating libraries under the network

(iii) Development of standards procedures for medical libraries of NEMLIBNET for uniform functioning.

(iv) Organization of users surveys to access the information needs of medical profession in the region.

(v) Organization of user education programmes for efficient use of the resources like a booklet entitled 'information through NEMLIBNET and other sources' etc.

8.2.6.4. Improving the network skills of NEMLIBNET Library Professionals

It is very important to improve the skills of the library professionals working in the networking. In the networking, it is very essential to develop curriculum for training programmes for the professional working under the network. The courses and workshops are to be conducted both at the regional and national levels to train the library professionals in new developments.

8.2.6.5. Introduction of Newer communication and computer Technologies

Participating libraries should keep abreast with the latest technology for efficient functioning of the NEMLIBNET should draw its recommendations from time to time to keep trace with new developments and also to see that such recommendations are also implemented.

8.2.7. FUNDING, MAINTENANCE

To implement the NEMLIBNET programme, the authority should approach to North Eastern Council (NEC) or Government of India for adequate funding. On the other hand all the seven states of North East India should also be approached to provide financial assistance for implementation and maintenance of the network. It is true that, most of the networking initiatives are supported by donor agencies and this support is not feasible. However, organizations like national and

international NGOs could be contacted to extend their cooperation in the present network for the purpose.

As we know that, with the every rapid development of medical sciences there have been an explosion of information regarding various aspects of medical diagnosis, treatment and research. For all academic institutions it is vitally essential to have all these information readily available and easily accessible. Therefore, NEMLIBNET if implemented as per suggestions and model would be in a position to meet the information needs of the medical professionals in the region. With the help of this NEMLIBNET, a medical practitioner would be in a position to access the resources from all nodal libraries as well as regional focal point and national focal point for the required information just sitting in his respective departmental library. Today it is evident that, pathology system in the hospital interconnecting with a medical practitioner's computer in the remote location, direct access to medical libraries and full text transmission or journal articles, X-ray images transferred across the country or the transfer of data from one district medical practitioner's lap top computer to a colleague in another region (*Kleeberg*, 1993). This network would active such objectives of remote as well as local information access even at global level.

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APPENDIX I : INFORMATION SEEKING STRATEGIES FOR MEDICAL PRACTITIONERS

: A STUDY OF NORTH EAST INDIA.

QUESTIONNAIRE

Dear Doctor,

In connection with my requirements for Ph.D at N.E.H.U., Shillong, I am conducting a research study in the topic cited above. The main objective of the study is to investigate the nature of information needs, sources, channels used by the medical practitioners for medicine and patient care and also examine the barriers for quality transmission of the health information, so that possible suggestions can be made for effective transmission of health information in North East India. Therefore, I request you to spare a few minutes of your valuable time to fill up this questionnaire.

All the information supplied by you will be kept strictly confidential.

Thanking you.

Sincerely Yours.

(BIJOY BHARALI)

Code =

Section 1 : INFORMATION NEEDS.

Information need is defined as "state of want". It is a basic resource for medical education, research and patient care, thus rendering support to-wards enhancing the quality of life. Medical practitioners need information for keeping abreast with the latest developments in their fields, writing or reviewing articles or preparing research projects.

Listed below are some statements on information needs. Please encircle whichever is appropriate.

5-To a very great extent.
4-To great extent.
3-To some extent.
2-To small extent.
1-Almost no extent.

1.I need information to keep abreast with the latest developments in my area of specialization:	5	4	3	2	1
2.I need information to keep abreast with the latest developments in the area which are related to my field of specialization.	5	4	3	2	1
3.I need information for solving day to day problems I face in my profession.	5	4	3	2	1
4.I need information to gain knowledge about the new drugs.	5	4	3	2	1
5.I need information to gain knowledge about new clinical methods	5	4	3	2	1
6.I need information to gain knowledge about new treatments.	5	4	3	2	1
7.I need information to know about the background of the patients.	5	4	3	2	1
8.I need statistical information regarding various disease/epidemics to treat patients suffering from similar symptoms.	5	4	3	2	1
9.I need information for preparing lectures for the students or audiences.	5	4	3	2	1
10.I need information for preparing conference/seminar papers.	5	4	3	2	1
11.I need information to write an article or review an article.	5	4	3	2	1
12.I collect information for understanding research project	5	4	3	2	1
13.I need information to attend national conference/seminar/workshop	5	4	3	2	1

14.Ineed information to attend the international conference/seminar/workshop.	5	4	3	2	1
15.I need information for preparing research projects in my area of specialization.	5	4	3	2	1

SECTION 2 : INFORMATION SOURCES .

"Information is the key to quality health care". In order to get information, various information sources are used. Below are listed some of the information sources, you may be using for getting information.

Please encircle whichever is appropriate.

5-Very often
4-Often
3-Sometimes
2-Seldom
1-Never

To satisfy information needs, I use,

1.Journals. Indian	5	4	3	2	1
International	5	4	3	2	1
2.News letters	5	4	3	2	1
3.Current Awareness Bulletins	5	4	3	2	1
4.Government Documents	5	4	3	2	1
5.Research monograph	5	4	3	2	1
6.Research report	5	4	3	2	1
7.Conference proceedings	5	4	3	2	1
8.Dissertations/Thesis	5	4	3	2	1
9.Review of progress	5	4	3	2	1
10.Trade literature	5	4	3	2	1
11.Treatise	5	4	3	2	1
12.Patents	5	4	3	2	1
13.Standards	5	4	3	2	1
14.Text books	5	4	3	2	1
15.Reference books	5	4	3	2	1
16. Published bibliographies	5	4	3	2	1

17. Pre-Prints or Publishers advance notice	5 4 3 2 1
18. Dictionaries	5 4 3 2 1
19. Encyclopaedias	5 4 3 2 1
20.Atlas	5 4 3 2 1
21. Year books	5 4 3 2 1
22.Year book published from UNICEF/WHO	5 4 3 2 1
23.Directories	5 4 3 2 1
24. 20.Unpublished sources	5 4 3 2 1
25.In-house memoranda	5 4 3 2 1
26. Internal meetings	5 4 3 2 1
27. Discussion within hospital	5 4 3 2 1
28. Discussion with other hospitals	5 4 3 2 1
29. Patients record (Personal)	5 4 3 2 1
30. Patients record (Centralised i.e. MRD)	5 4 3 2 1
31. Pharmaceutical representatives	5 4 3 2 1
32. News papers/Magazines	5 4 3 2 1
33.Programme Documents	5 4 3 2 1
34.Published from WHO	
Statistical Quarterly	5 4 3 2 1
Public Health Paper	5 4 3 2 1
Technical Report Series	5 4 3 2 1
Any Other	5 4 3 2 1
35.Audio-Visual:	
Radio	5 4 3 2 1
Tape Recorder	5 4 3 2 1
Slide	5 4 3 2 1
T V	5 4 3 2 1
V C R	5 4 3 2 1
LCD Projector	5 4 3 2 1
Cinema	5 4 3 2 1
36.C D Rom	5 4 3 2 1
37.Indexing and Abstracting services	
Index Medicus	5 4 3 2 1
IMSEAR	5 4 3 2 1
Medlars	5 4 3 2 1
Internet	5 4 3 2 1
Any other	5 4 3 2 1

38.On-line databases

Medline	5	4	3	2	1
Internet	5	4	3	2	1
Any other	5	4	3	2	1

SECTION 3 : INFORMATION CHANNELS

Information channels means how you get or acquire information from various sources. Below are the listed some information channels medical practitioners use for satisfying their information needs. Please encircle whichever is appropriate

5-Very often
4-Often
3-Sometimes
2-Seldom
1-Never

I get/acquire information by:-

1.Consult the Institutional library	5	4	3	2	1
2.Consult the public libraries	5	4	3	2	1
3.Consult any other libraries	5	4	3	2	1
4.Personal collection	5	4	3	2	1
5.Personal collection from colleagues	5	4	3	2	1
6.Personal visit to subject specialist	5	4	3	2	1
7.Attending seminars/conferences/workshop	5	4	3	2	1
8.Discussion with colleagues/meetings	5	4	3	2	1
9.Accidental discovery of information	5	4	3	2	1
10.Follows up references and footnotes	5	4	3	2	1
11.Asking the author for reprint.	5	4	3	2	1
12.Writing a letter to friend in India/abroad	5	4	3	2	1
13.Phone calls to a subject specialist in India/abroad	5	4	3	2	1
14.Sending E-mail to a subject specialist in India/abroad	5	4	3	2	1
15.Sending fax to a subject specialist in India/abroad	5	4	3	2	1
16.Conducting computer based searches in my computer	5	4	3	2	1
17.Conducting computer based searches on					

my Institute	5	4	3	2	1
18 Conducting computer based searches in other Institution in India	5	4	3	2	1
19 Conducting computer based searches while abroad	5	4	3	2	1
20 Accessing on-line data bases like MEDLINE	5	4	3	2	1
INTERNET	5	4	3	2	1
ADONIS	5	4	3	2	1
TOXLINE	5	4	3	2	1
Medical Bulletin Board Service (M B B S)	5	4	3	2	1
Any other	5	4	3	2	1

Section 4 : INFORMATION BARRIERS

You might be facing some problems or barriers while acquiring information from various sources Listed below are some problems or barriers which you might have encountered

Please encircle whichever is appropriate

5- Quite true
4- True
3- Doubtful
2- False
1- Quite false

1 There is always shortage of books in my library	5	4	3	2	1
2 I wish there were more Journals available in my library	5	4	3	2	1
3 Indexing and abstracting services are not available in the library	5	4	3	2	1
4 Library staff does not assist in using library resources	5	4	3	2	1
5 I have communication barriers with my library staff	5	4	3	2	1
6 Computerized library services are not available to me	5	4	3	2	1
7 I do not have access to online service in my Library	5	4	3	2	1
8 I do not have access to online service personally	5	4	3	2	1

9. I do not have access to Internet in the library.	5	4	3	2	1
10. I do not have access to Internet personally.	5	4	3	2	1
11.I do not have time to visit library	5	4	3	2	1
12.Latest books and periodicals are not available in the library	5	4	3	2	1
13.My library lacks duplicating facilities.	5	4	3	2	1
14.I wish library was opened for more time.	5	4	3	2	1
15. Lack of physical facilities viz. AC room, Seating facilities etc does not allow library resources to be used maximally.	5	4	3	2	1
16.The library staff do not assist/help in using manual bibliographic tools in the library .	5	4	3	2	1
17.the library staff do not assist/help in using computerised bibliographic tools in the library.	5	4	3	2	1

Section 5: PERSONAL DATA

Please tick (✔) mark whichever is appropriate for you

1. PRESENT AGE (Years);
   1. Below 25
   2. 25-30
   3. 30-35
   4. 35-40
   5. 40-45
   6. 45-50
   7. 50-55
   8. 55-60

2. Age at the time of joining medical profession(Years).
   1 Below 25
   2. 25-30
   3. 30-35
   4. 35-40
   5. 40 +

3. Sex 1. Male 2. Female

4. Marital Status 1. Married 2. Unmarried 3. Single
   4. Divorced 5. Others

5. Designation 1. Professor 2. Asso. Prof. 3. Asst. Prof. 4. Registrar/ Demonstrator
   5. Any other (Please specify)

6. Please Indicate your academic qualification at the time of joining in the profession.

1. M.B.B.S. 2. M.D./M.S. 3. D.M./M.Ch 4. Ph.D.
5. Diploma (Please specify)
6.Any other (Please specify)

7. Please Indicate your present academic qualifications.

1.M.B.B.S. 2 M.D./M.S. 3. D.M./M.Ch 4. Ph.D. 5. Diploma (Please specify)
6.Any other (Please specify)

8. Your area of specialization

9. How long you have worked in this present organization

10.How long you've been in this profession

11.How many years you have been in the present position.

12.How many other organizations you've worked in.

APPENDIX II : INFORMATION SEEKING STRATEGIES FOR MEDICAL PRACTITIONERS

: A STUDY OF NORTH EAST INDIA.

QUESTIONNAIRE

1.Name of the library:

2.Date of establishment:

3.Collection:
No of books:

No of bound volumes: Indian:
International:

4.Budget:

For Last five years:
On books:
On periodicals:

5.Status of Computerisation

Availability:
No. of PC:
No. of CDROMS:
Networking:

6.Availability of Databases

CDROM Databases:
On-line databases:
In-house databases:
Software use in the library:

7.Manpower:

Name	Qualifications
1.Librarian	
2.Dy.Librarian	
3.Asstt.Librarian	
4.Technical Asstt.	
5.Library Asstt.	
6.Library Asstt.	
7.Library Attendent.	
8.UDA	
9.LDA	
10.Others.	

8.Persons trained in IT: Professionals Semi-Prof. Non-Prof.

9.Users:
No. of users (Last five years)

10.Opening time of the library:

11.Services provided to the users
Circulation:
Reference:
Others:

12.Statistical data
No.of user per day
How many books issue per day

13.Arrangement:
Classification:
Cataloguing:

14.Future plan for Computerization and others

15.Suggestions: