CHAPTER 2

LITERATURE REVIEW
AND DEVELOPMENT
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 into the 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 Scriptoribus’ 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 *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 into 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. Samuel 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 militaires 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 für 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 *Handblich 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 tactics 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 Bibliotheca 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 Medicine's 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 Jahrbücher der inund auslandischen gesamten Medicine in 1834. The Jahrbücher 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 Jahrbücher) 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 patient 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 patient 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 based 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 field. 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:

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\[ \text{Person in context} \rightarrow \text{Intervening variables} \rightarrow \text{Information seeking behaviour} \rightarrow \text{Communicator} \rightarrow \text{Feedback} \rightarrow \text{Channels of communication} \rightarrow \text{Processing and use} \]```

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, Journal 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 is 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 half 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 (Ft tp); 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 an 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.