CHAPTER - I

I.1 INTRODUCTION

'Those doctors who completed their formal education years ago and who have not subsequently participated in educational activities are a dead load to the profession and a potential menace to the sick'

Sir George Pickering (Cardiologist)

The medical specialist does require up-to-date knowledge not only to sustain himself but also to maintain the quality of his practice. The knowledge explosion in medicine places heavy responsibilities on medical specialists to be aware of the new advances in medicine for improved diagnosis and patient care. The expansion of medical knowledge, the greater awareness, and consciousness towards medical information among health professionals lead to a demand for continuing access to information.

Sir William Osler, the great physician-philosopher said, "if licence to practice meant the completion of his education, how sad it would be for the young practitioner, how distressing for his patients" - therefore, it reveals that every doctor should be a lifelong student of medicine. Collins Cherry (1966) also expressed that, "information in the form of sensory message plays a vital role in the education of

medical doctors and in the medical care profession. During the years of formal schooling, prospective doctors receive millions of messages from external sources. These accumulated and assimilated messages become the base for knowledge for medical care, research and teaching. Accumulation and assimilation of information does not end when a prospective doctor finishes his formal schooling, rather, the process continues throughout his life. The prospective doctor also transmits some messages/information and at the same time he receives information from external sources.

At present an emphasis is laid on the medical specialists' knowing about the sources other than their own knowledge that could provide the information necessary for diagnosis and patient care. For this, they must be able to employ complex and varied systems of information sources and channels. The added dimension of knowing or having access to information sources and channels places the specialist in a dual role in relation to the transmission of information.

Although the prospective doctor accumulated and assimilated a body of information requisite for patient care, dependence on external sources for a portion of the information required to solve problems or to carry out changing work tasks is apparent when one examines current research on human information processing and memory. Seeking or gathering of information by medical specialists in developing countries becomes a difficult task on two grounds i.e., doctors themselves are

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busy in dealing with patients and the concept of 'information' is dynamic and more complex as it is associated with variables such as 'nascent', 'reliable', 'cost', 'value' etc. Moreover, it is an era of information explosion.

It is generally recognised that knowledge in medicine is expanding rapidly and this rate of expansion has been estimated in terms of what is known as the 'doubling period' which is defined as the number of years in which the total amount of knowledge doubles itself. De Solla Price (1963) observes that the pool of scientific information is growing exponentially with a doubling time of 10-15 years. The doubling period in medicine is said to be ten years. This may become less as the rate of growth of knowledge increases. The full impact of this exponential growth rate is not fully realised by medical profession. If we illustrate the problem by quantitative example, the total amount of knowledge in 1980 is 256 times the total amount of knowledge in the year 1900. As this rate of growth of knowledge continues unabated, it is almost impossible for practitioners to keep themselves up-to-date. In the light of this analysis it is obvious that knowledge acquired through medical degrees and diplomas has validity only for a limited number of years and therefore it requires periodical revalidation.

Speaking on the inevitability of specialisations in medicine Thambiah (1985) observes that 'the last two decades has witnessed an enormous amount of advances in every field of medicine along with a large amount of instrumental gadgets for the diagnosis and prognosis of


disease. The human brain can only store a reasonable amount of facts and it has now been well realised that it is not possible for a medical man to be conversant with or master all the advances made in medicine. Time was when a topic like 'Endocrinology' comprised just half a dozen pages in a standard book and the whole of medicine was written up within a moderate compass like Wheeler and Jacks text book of Medicine. We are, if we recall these two facts referred to aware of the enormous advances made and at heart are quite aware that specialisation in the different branches is inescapable and has to be an accepted fact. As specialisation increases, the need for crossfertilisation of ideas also increases; at the same time, the expansion of the volume of information makes this more difficult. It tends to aggravate many of the problems of medical specialists in acquiring reliable information.

The medical specialist cannot often find the information he wants because retrieval is too difficult or too time consuming. The reasons for this are many, but an important one is the haphazard way in which data accumulates. Rapid retrieval of information is difficult because we do not always know in advance how the data is used.

Some of the time required by medical specialists to get information is taken up by delays in publication and bottlenecks in medical information systems. Another major problem occurs when the medical specialist has no difficulty in finding considerable information, often conflicting information, on a certain topic. Here, he must find a way to evaluate it with the help of a critical review of articles and books. But these are often difficult to find. Still another problem arises as a

result of the complex nature of medically useful information. We recognise that different kinds of people use medical information and even medical specialist uses information that is not strictly medical.

Physicians require various kinds of information which they obtain from variety of sources under many different circumstances. The physician often needs to have information to broaden his knowledge and background in a particular aspect of clinical medicine or the basic sciences. For example, he may want to bring himself up-to-date on the problem of iron metabolism so that he can better understand the mechanisms and management of iron deficiency. Or he may wish to visualise the better clinical picture and natural history of a disease. For these types of information he would probably consult formal and informal information sources.

Another situation which calls for information, infrequently for most specialists but frequently for some, is in the designing and interpretation of experiments. For this, it is essential that information be available on the latest theories involved and on all the experimental evidences. Such information can usually be obtained from the research journals, directly from other physicians and basic scientists active in the field of research; at formal meetings, at informal conferences; or through other personal communication.

While most specialists have their own personal libraries, they also make extensive use of medical libraries, abstracting services and bibliographic services. The busy specialist medical practitioner may

find little time for any of these and get most of his information from associates and at meetings; and make a concerted effort to keep informed by using all possible channels. The examples cited are not exhaustive and only point out the complexities of information needs for medical specialists. There is no single answer for the handling of even a single type of medical information and there is not even a single medium which is the best for one type of user. We may believe that the electronic computer will soon replace all other media for the storage and dissemination of medical information.

The periodical revalidation of knowledge among doctors and keeping them up-to-date in their field is a problem to be discussed not only by the doctors but also by the information societies. This has direct impact on human beings in the society and any lacuna or handicap leads to eternal loss to the survival of humankind.

When the doctor turns to external sources for information previously encountered but not recallable, or for new information, various information systems are available for his use. Attempts to classify this variety of information systems into a usable model for research purposes have suffered a lot because of the diversity and ambiguity of language used to describe information/communication process. Both 'source' and 'channel' have been defined as the medium for conveying information. 'Formal' has been used to mean all recorded information and to designate one type of information system. 'Informal' has been used to mean all

8. Ibid., p.19.

oral or interpersonal communication as well as a type of information system.

Orr proposed a conceptual framework for the classification of information systems which appeared to be a workable model for research purposes. He categorised input/output channels according to modes (formal and informal: oral and recorded) for the acquisition and transmission of information and by proximal sources (people and records). 10 Although Orr used the words input/output channels, instead of information systems for his classification, the brief definition given is related to one definition of an information system - a complex whole composed of interrelated methods by which information is transmitted or received. 11

A model for classification of information systems, based on Orr's original concept was constructed to illustrate the variety of information systems available to doctors and to serve as base for data gathering and analysis in this study. The formal information system represents all of the institutionalized or organisational arrangements established for transmitting and acquiring information. The informal information system represents all personal arrangements for the same. Modes are the form of information, and channels are the medium used for transmitting or acquiring information. Each of the broad categories of channels can be further sub-divided for special purposes. For example, documents may be classified by format - book, journal article, film


11. ibid., p.148.
strip, letter and report etc. People may be classified as colleagues, administrators, library staff, friends and medical representatives etc.

Within a hospital or private clinic, a doctor can turn to formal or informal systems for seeking information. Figure 1.1 is a model showing the formal and information systems normally used by doctors.

Figure 1.1: A model for classification of information systems used by doctors.
The present approaches or mechanisms in practice in libraries and information centres in understanding users' information needs in all its 'individuating particularities' seems to be not sufficient and effective in providing a more useful effective documentation service. Hence deliberately planned attempts/studies in understanding the users and their information seeking behaviours are warranted. The present study is an attempt in this direction.

1.2 CONCEPTS OF THE PROBLEM AND DEFINITION

(a) Information: Information is taken to mean as a message with a purpose and use, to the receiver as well as to the supplier, communicated orally/personally or through documentary sources.

(b) Information needs: It is defined as information that a specialist (Doctor) lacks and consciously seeks in order to perform his medical care responsibilities. In other words, the term 'need' is used for the meaning of potential demand or unexpressed demand. 'Need' is what an individual ought to have for his work. This definition equates information needs and the conscious demands or wants for information by specialists in medical profession. Conscious demands and 'real' needs for information may be synonymous, but doctors may have an unfelt need (non-awareness that information is lacking) or a felt but unarticulated need (awareness that information is lacking but does not seek for some reason) for information. Information needs as defined in this work are one segment of a continuum of information needs to which information systems respond.
(c) **Seeking behaviour:** Information seeking behaviour means information use behaviour. It is taken to mean that how the doctor goes about in identifying and approaching the different channels of information to meet or fulfill his information requirements arising at different types of medical responsibilities. It is otherwise known as various patterns of information gathering habits of medical specialists to perform their medical responsibilities.

(d) **Specialist:** A specialist is one who acquires higher degrees in particular area of medicine. A person who possesses degrees or post graduate diplomas other than basic medical degree is called as medical specialist. Whenever the term specialist is used it is referred to medical specialist.

1.3 PURPOSE OF THE STUDY

This study was conducted in order to find out:

1. The various types of information needs of medical specialists who are doing their practice, teaching and research in Madras City.

2. The accurate demands of medical information by specialists and their satisfaction as to both quality and quantity of information that is exposed to them.

3. The ways and methods adopted by medical specialists in Madras City for seeking information in order to perform their day-to-day professional responsibilities. That is to say the flow of medical
information through informal and formal channels among medical specialists of Madras City.

4. The various information services offered by national, regional and local medical research centres for supplying information to the medical specialists in Madras City.

5. What information systems and services Madras City Medical Specialists use among all types of systems available.

6. Whether personal variables, such as, (a) level of educational advancement (b) number of years of experience, and (c) level of participation in professional development activities of medical specialists have any relation to their use of information systems.

7. Whether work-setting variables such as (a) use of formal and informal information systems within the free time available, (b) simultaneous employment in different organisations, and (c) the mode of medical practice and the relevance of information, have any relation to the use of information to meet their day-to-day responsibilities by medical specialists of Madras City.

8. Whether the barriers, such as, (a) lack of time, (b) institutional problems (c) sophisticated nature of information system, and (d) factors of economic viability are coming in the way of medical specialist for their access to nascent information.
9. If the design of an optimum information systems for medical specialists in Madras City is warranted.

An exploratory survey designed to answer the aforementioned issues can also yield preliminary untested data on other characteristics of medical specialists with regard to information gathering/seeking behaviours for their day-to-day practice. For this reason, more data was collected to test the hypotheses.

For the purpose of this study, the sample population taken are medical specialists belonging to clinical side and well noted medical disciplines performing their professional responsibilities in Madras City in Tamil Nadu. Specialists in medical field are chosen for this study for the reasons that they always are in need of new information in their specialisation in order to treat complicated diseases of the patients. Further, they have to educate in the new methods of treatment to their junior fellow doctors. The information consciousness and awareness is generally more among specialists rather than average professionals.

No studies are available about medical specialists information seeking or gathering habits particular to Madras city. Although articles were written about the poor picture of medical libraries in India, none of them have focused their attention on the use of other information systems by Madras city specialists. They also did not study the information needs of the medical specialists in the country. Research encompassing the use of both formal and non formal medical information systems and the range of the information needs is required if information
systems in Indian hospitals in general and Madras in particular are to be improved.

1.4 UTILITY OF THE STUDY

It is further felt that a study of this kind has several advantages in medical profession in general and medical specialists of Madras City in particular for the following reasons:

1. The professional responsibilities of medical specialists are varied in nature. For e.g. treatment, diagnosis, consultancy, teaching, research and clinical practice. It is observed that specialists who are part of the teaching hospitals, may have access to the required information from the formal information systems. The adequacy of information supply by formal information system is a matter of concern. Investigations of this study help us in improving the formal information systems that are established to serve the medical specialists attached to teaching hospitals.

2. Most of the practicing specialists in the city may not have access to formal system of information. For them this study provides an insight on developing of non formal information system wherein a specialist can seek the information whenever he is in need.

3. Most of the Government hospitals, private medical establishments in the Madras City exist without a proper information system. Neither the Tamil Nadu State Medical Association nor the All India Institute of Medical Sciences (AIIMS) has ever established any
standards for hospital library services in the Madras city. The present study helps in preparing standards for medical information services to a particular region.

4. This study also helps in finding out the formal and informal way of information gathering behaviour of medical specialists and to improve medical information system if such a system is already in existence.

5. This study will also help in designing optimal information system for medical specialists taking advantage of sophisticated equipment i.e. computer technology available in India.

6. The medical library as an information system in Indian health institutions in general, and health institutions of Madras City in particular need improvement. It is noticed that scant attention was paid to information services in Health institutions until recent years. Medical practitioners as a distinct group of users received little or no mention in ILA (Indian Library Association) standards. The Department of Science and Technology (DST) India has however planned for National Information System for Science and Technology (NISSAT) programme under which an effort was made by ICMR (Indian Council of Medical Science Research) in establishing Bio-informatics division. It is premature to evaluate Bio-informatics in its objectives. This study also helps in designing of Bio-informatics in relation to medical specialists.
7. The study also finds the feasibility factors in designing a computerised medical information system for medical specialists taking into consideration of variables like time, availability of medical data bases and cost of the information retrieval.

8. Medical specialists either attached to teaching hospitals or owning hospitals should have continuing education in their specialisation. Also there is obligation for them to enrich their existing knowledge for their professional survival. It is further helpful in designing and development of medical information system which will be suited to the needs of a specialist.

1.5 HYPOTHESES

1. Male and female medical specialists are equally alert in seeking information.

2. Medical specialists with different lengths of service are equally alert in seeking information through "informal sources".

3. Medical specialists with different lengths of service are equally alert in seeking information through "formal sources".

4. 'Seniors' (i.e., those with longer service in years) in medical profession are less keen to seek 'nascent' information as compared to 'juniors'.

5. Different types of specializations have no effect regarding specialists' awareness of National Medical Information Centres.

6. Medical specialists of various specializations are equally favourable for the provision of computerised medical information services.

7. Different types of specializations have no association in respect of medical specialists' awareness about various medical information sources.

8. The number of years of practice of medical specialists has no association with respect to their number of informative book collections.

9. Different types of specialization have no effect on attendance to conferences/workshops/seminars.

1.6 LIMITATIONS OF THE STUDY

The data collected and findings of the study have to be viewed under the following limitations:

There are several prominent towns and cities in India where medical specialists are found working both in government and private hospitals. Madras is one of the major metropolitan cities in India where medical specialists are found in government and private hospitals. People from South India come in large numbers to Madras for availing themselves of the best treatment from the specialists. The present
research study is confined to Madras City and specialists in Madras alone.

Though Madras Metropolitan area covers a large distance consisting of several hospitals/clinics the investigator has confined his study to certain prominent hospitals numbering twenty three.

Of the several types of specialists available in the medical field, only those specialists who are directly involved in treatment and diagnosis of patients are taken into account for the study.

Further, all specialists of all medical fields were not explored but only 10 popular branches of specialisations viz., Cardiology, Dermatology, ENT, General Medicine, Gynaecology, Neurology, Ophthalmology, Orthopedics, Paediatrics, Surgery were covered in this study.

The study is mainly concerned for the purpose of identifying the felt need for nascent information by specialists and their information seeking behaviour/patterns. It is not intended to investigate the effectiveness of anyone or more information centres available in Madras City.

Based on the investigation and analysis of questionnaire response, the need for computerized information services for medical specialists of the Madras City has been discussed elaborately however, this study is not giving the actuals of cost involved in view of the fact that the hardware and software required for the purpose and other overhead costs vary from time to time. Further, the country is in a computer boom and any estimate of the cost involved for the hardware and software may not be fair and reliable.
1.7 PLAN OF THE STUDY

Keeping the objectives in view, the entire work is divided into the following Nine chapters.

The First chapter is an introduction. It contains the purpose and utility of the study, hypotheses and limitations. The concepts of the problem and definitions have also been provided.

The Second chapter deals with a survey of literature. For this, the investigator has taken the help of DIALOG data base search through computer. The search was conducted in four data bases viz., Dissertations Abstracts International, LISA, MEDLINE and Information Science Abstracts. Nearly 70 references were scanned for review of the literature.

The Third chapter provides information on sample collection and data processing techniques. The techniques used are popularly known methods. A brief account of collection of data and method of analysis of data were discussed.

The Fourth chapter is devoted to geographical description of Madras city and its medical environment.

The Fifth chapter elucidates the basic concepts of information seeking behaviour and patterns and a review has been provided on the concepts of information, information needs, information needs of individuals, information seeking behaviours and information gathering patterns.

The Sixth chapter deals with the analysis of the data obtained through questionnaires. This chapter is outlined according to the design of the questionnaire. More critical account is given to information needs of the medical specialists, awareness of the medical information
sources/services, use of the medical information systems and information seeking behaviours through formal and informal channels by medical specialists in Madras city.

The Seventh chapter examines the need for provision of information infrastructure for doctors in Madras city. A plan for medical information system for the Madras city has been discussed. An attempt has been made to discuss the plans for medical information system for Madras city which include systems approach to planning, establishment of central information facility, collection development and medical information services and man power.

The Eighth chapter examines the possibility and feasibility of providing computerised medical information system for medical professionals of the Madras city. It includes a detailed discussion on information technology and its applications to medical health care and libraries.

The Ninth chapter is summary and conclusions. It includes findings and recommendations followed by a select bibliography and appendices.