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Development and Utilization of Medical Information Resource in China

Zhan Youxiang
zhanyx@mlpla.org.cn
Director

Hao Jiying
tanhjy@hotmail.com
Assistant of Planning and Coordinating Office

Medical Library of the Chinese People's Liberation Army
No. 5 Feng Tai Road, Hai Dian District
Beijing, 100039, P. R. China

Abstract:

Medical information resource development, which is an important basis of medical treatment, teaching and scientific research in the national health system and is also one of the criteria in evaluating the level of the national health science development, has already become a significant integral part to improve the development and innovation of health science. During the past twenty years, in order to ensure the prosperous development of health science, medical libraries and medical information institutes in China have made great achievements in the development and utilization of medical information resource, which have effectively met the basic biomedical information needs of clinicians and biomedical researchers. However, due to shortage of subscribing fee for medical literature in most medical libraries and information institutes in China, the development of medical information resource in this country is lagging behind that of the developed countries. This inequality regarding the access to medical information has been disadvantageous to clinicians and biomedical researchers in China. According to the results of an investigation into Chinese scientists by China Strategic Research Group of Scientific Development, 58.4% of the Chinese scientists questioned thought that it was difficult for them to access the recent medical literature. This article deals with the recent situations regarding the development and utilization of medical information resource in China and the main gaps in comparison with the developed countries, and also put forward some suggestions and solutions.

1 Main Achievements

1.1 Basic fulfillment of the collection of core print foreign biomedical journals

Since 1990, the prices of biomedical journals and the adjustment of exchange rates have kept increasing, but the corresponding fees of all medical libraries and information institutes were not increased, so the development of medical information resource was put in a tight corner. According to the statistics of *Union Catalog of Subscribed Foreign Biomedical Journals in Medical Universities in China*, Most medical libraries and information institutions in China have had to reduce the number of subscribed biomedical journals year by year. In 1999, 125 medical libraries subscribed 2826 foreign biomedical journals, two thirds of which were collected by *Index Medicus*, and some core biomedical journals were not subscribed. Library of Chinese Academy of Medical Science as the medical center of National Scientific Literature Center in 2000 and Medical Library of the Chinese PLA as the medical center in the army in 2001, successively obtained the financial support and were able to strengthen the subscription of biomedical journals. In 2003, these two biggest medical libraries in China subscribed about 2000 and 1200 print foreign biomedical journals respectively. This policy supporting the principal medical libraries has effectively eased the shortage of foreign biomedical literature and basically fulfilled the collection of the core print foreign biomedical journals that could satisfy the basic need of medical information in China.

1.2 Subscription a certain number of databases of biomedical literature in succession

With the rapid increase of electronic publications, more than 20 databases of biomedical literature have been introduced into medical libraries and information institutes in China, which could meet part of information needs of index and abstracts and electronic original literature. Nowadays, index and abstract databases that are introduced into China include: *MEDLINE*, *Life Science*, *BIOSIS Preview*, *EMBASE*, *DerWent Biotechnology Abstracts*, *DerWent Drug File*, *Chemical Abstract* etc. Electronic journal full text databases include: *Science Direct OnSite*, *Springer-Link*, *ProQuest Medical Database*, *ProQuest Digital Dissertations* etc.

1.3 Development of some index and abstract databases of Chinese medical literature

Since *Chinese Pharmacological Abstract Literature Database*, the first Chinese medical subject literature database, was developed by both the Institute of Scientific and Technical Information of China and State Drug Administration in 1982, there have been great progress in the development of databases of Chinese medical literature. By the end of 1999, about 60 index and abstract databases of Chinese biomedical literature had been developed and put into operation, such as *Chinese Biomedical Disc Database* and *Chinese Medical Current Contents* covering 95% of Chinese biomedical journals. In addition, Chinese Biomedical Literature Analytical and Retrieval System (CBLARS) and Chinese Medical Citation Index are being developed.

1.4 Achievements of initial successes in medical literature resource sharing

Since 1980, some organizations and cooperative networks of medical information resource have been established under the direction of national departments concerned. China Association of Medical University Libraries responsible for the coordinating acquisition of foreign biomedical journals was established in 1985. In 1990 the project of National Network of Medical Literature Resource Sharing was initiated, which constitutes national network of medical literature resource composed of three level medical libraries: National Center Library, Local Area Center Libraries and Provincial Resource Libraries. Then *Union Catalogue Database of Foreign Biomedical Journals in China* and *Union Catalogue of Foreign Biomedical Journals in Medical University in China* were compiled. Since then, the coordination of subscriptions of foreign biomedical journals has taken place throughout the whole country. In 1992, the Coordinating Conference of Cooperative Subscription of Foreign Biomedical Journals was held by the Education Department

of the Ministry of Public Health, and then the Coordinating Group of Medical Journal Resource Sharing came into existence responsible for the joint development of foreign journals among the medical university libraries. In 1995, China Medical Information Network (CMINET), which is connected to the Internet started to run and the National Center Medical Library and Local Area Center Medical Libraries began to provide the network retrieval of library collection catalogues and union catalogues. In 1996, China Hospital Information Network (CHINET) was established, which realized the telecommunication and telemedicine in member hospitals and constituted the comprehensive computer network of collecting, storing, analyzing and exchanging hospital information. In 2000, Library of China Academy of Medical Sciences as Medical Center of National Science and Technology Library should take the responsibility for organizing, coordinating and managing of the joint development and sharing of medical information resource in China and set up a systematic service network to provide medical information retrieval and original articles. A great deal of index and abstract information of thousands of biomedical journals has been reported since then. To sum up, the above measures have effectively improved the development of medical literature sharing.

1.5 Organization of valuable Internet medical information resource for readers.

With the rapid development of Internet in the 1990s, medical libraries and information institutes in China set about comprehensively researching the collection, organization, storage and utilization of network information. Nowadays, some medical libraries have selected, evaluated and organized some Internet information as their virtual library collection of linked level in their websites to help readers and users to look for the valuable network information and Internet medical information resource have already become a part of virtual library collection in some medical libraries in China.

2 Main gaps

2.1 A great shortage of medical literature subscription funds

According to the statistical data of the Association of Academic Health Libraries (AAHSL) in 2002, more than 140 academic health science libraries in USA and Canada averagely subscribed 2677 journals (1716 print journals and 961 unique electronic full-text journals). HAM TMC Library, one of the eight local area center libraries, has 340,000 volumes of print collections and in 2000/2001 the library subscribed 5019 journals (2738 print journals and 4090 electronic full-text journals) and more than 100 databases, and its subscription expenditure in 2000/2001 was 2,080,000 US\$ that increased 17.4% compared with the year before's. Based on recent statistics, about 40,000 biomedical journals are published all over the world and the annual increasing rate of new journals is 5-7% and the annual increasing rate of journal price is 10-15%. However, the total number of print foreign biomedical journals subscribed in China is only about 4000. Library of China Academy of Medical Sciences and Medical Library of the Chinese PLA as the biggest medical libraries in China only subscribed 2000 and 1200 foreign print journals in 2002 respectively indicating that there is a considerable gap compared to medium medical libraries in developed countries. In recent years, medical libraries and information institutes in China are greatly challenged in the collection development because of the continuous increase of journal price and shortage of subscription funds. They have to take some measures to reduce the number of foreign journals and books, thus resulting in the shortage of some important core biomedical journals and books in China. The development and utilization of medical information resource in China are going steadily downhill.

2.2 Joint development of medical information resource and their sharing are to be further improved.

In America, National Network of Libraries of Medicine (NNLM) was established, U.S. National Library of Medicine (NLM) as the national resource center obtains the support of the Congress

and related laws and regulations, and is in charge of organization and management of the joint development and sharing of medical literature among the eight local area center medical libraries, more than 140 resource medical libraries and 4700 grass-roots medical libraries. Every member library has the clear rights and obligations and a strong sharing sense. In Germany, a specific coordinating collection plan was brought into effect since 1949. 27 special subjects and 105 subject classes were assigned to the libraries, so that important foreign literatures could be collected. At the same time some union catalogues were compiled and the interlibrary loan service was provided amongst most libraries in Germany. In China, although great progress in medical information sharing has been made in recent years, the results are not satisfactory in comparison with that of developed countries. There are three main problems. The first is the irrational allocation of medical information resource. Most foreign medical literature is collected in Beijing and some coastal provinces, especially in three large medical libraries. Some small medical libraries do not subscribe foreign journals at all. The second is the lack of a balanced and restrictive systems for the mutual benefits in member libraries. Member libraries want to share information but lack the sense of joint development. A library that takes an active part in the joint development seems to have no gains from it while those that don't take part in seem to have no loss. The third is the low efficient interlibrary loan system. Only less than one-third of 130 medical university libraries can provide network retrieval of their library collection. Most interlibrary loan services in medical libraries are not satisfactory except several libraries such as Library of China Academy of Medical Sciences, Medical Library of the Chinese PLA and Medical Library of Beijing University (Medical Center of CALIS). In 2001, the average number of interlibrary lendings among 6 medical university libraries in Shandong Province of China was less than 200 and the least was 72. Some problems such as long responding time and poor duplication also existed. On the contrary, in America, the number of interlibrary lendings among medical university libraries is more than ten thousand, which was increased 64% and the number of interlibrary borrowing was increased 132% during the past ten years. The time in OhioLINK interlibrary loan system is only 2 days and the cost is just 5 US\$.

2.3 Policies and related laws and regulations for the development and utilization of medical information are to be perfected

The importance of information resources decides that the sharing of information resources is a national activity, and also a problem of policy. What information resources can be shared? Where can these information resources be shared? How can they be shared? All of these questions are decided by national information policies that are the principle and legal documents for the management and regulation of information resource sharing and the key factor influencing the effect of joint development and information resource sharing. Some countries such as USA and Germany have attached great importance to the sharing activities of information resources and promulgated some relevant laws such as *Library Law* and *Rules of Interlibrary Loan* in order to ensure information resource sharing. In 1965 the Congress of USA passed *Medical Library Assistance Act*, which grants NLM the authority to directly assist other medical libraries and agrees to set up NNLM in the whole country. In China, during the past 50 years some laws and regulations have been issued such as *National Coordinating Project of Books (1957)*, *Rules of Interlibrary Loan (1957, Ministry of Culture)*, *Library Work Report (1980)*, *National Developing Policies of Scientific Information (1991)*. However, all these documents have not functioned effectively. In 2001, the enactment of *Library law* was initiated in China.

2.4 Library holdings are insufficiently delineated and access methods are inadequate

Most medical libraries in USA have established various navigation guide systems of library holding, which comprehensively described and integrated their print and virtual collections. For example, HAM TMC Library has integrated 3050 electronic full-text biomedical journals published by more than ten publishers such as Cell Press, Blackwell Synergy, ScienceDirect,

HighWire Press, Journals@Ovid, Wiley Interscience, EBSCO Online, Karger, Kluwer, Springer LINK, JSTOR, and provides several retrieval methods such as alphabetical browsing and subject heading searching. In October 2003, *Library Journal* reported that most academic libraries would adopt metasearch in the future eighteen months, which can search the related information from various databases. However, the researches of integrating the information resources are still needed to go deep. In most libraries in China, the print and electronic collections are not systematically integrated and some information of library holding on the Internet has already become outdated. For example, the latest version of *Union Catalogue of National foreign Biomedical Journals in China* provides the data of library holding print journals in 1990-1995. It is unfavourable for users to keep abreast of the highly used current journals in libraries.

2.5 Development of index and abstract medical literature is to be strengthened.

Establishing Databases is an effective way of developing medical information resource. Some famous medical databases such as *MEDLINE*, *CATFILE*, *SERFILE*, *GENE-TOX* have a widespread and far-reaching influence on the development of medical sciences. In China, due to lack of coordinative planning under united leadership, there are some problems regarding the collecting coverage, indexing depth, searching speed and the function of retrieval software in medical databases. For example, indexing using MeSH is not provided in *Chinese Medical Current Contents* and the retrieval effectiveness by subject headings in *Chinese Biomedical Disc Database* is still unsatisfactory. In addition, we are lagged behind in developing databases of medical facts and figures.

3 Suggestions

3.1 To increase the outlay for medical libraries and information institutions

A national action should be taken to strengthen the development of medical information resource in China. Core biomedical journals should be collected in China and the meeting rate for original articles should be increased to 85-90%. Three measures should be taken. The first is to continuously increase the specific funds for the National Scientific Literature Center and the acquisition scope should be expanded to books, scientific reports, dissertations and conference proceedings etc. The second is to bring the library expenditure into the financial budgets of their owners and ensure its increase along with escalating prices of academic literature. The third is to establish specific funds for the development of medical library and information science, which are used to regulate and control the development of medical information resource by a national level medical library authorized by department concerned.

3.2 To work out the policies and related laws for the joint development and sharing of medical information resource

Medical libraries and information institutes in China are different systems under different jurisdictions in their developing progress. Such a partitions system is unfavourable for the development of medical librariansh. However, some policies and laws should be enacted concerning the social position, sources of expenditure, rights and responsibilities of member libraries, operating mechanisms and entire distribution in the joint development and sharing of medical information resource. The national departments or organizations concerned have the rights to coordinate the management of all medical libraries and information institutes and to allocate the information resources according to the principles of unified plan, reasonable allocation, close cooperation, joint development and sharing, thus constructing the supporting system to provide medical information resource in China.

3.3 To establish the National Medical Library in China

The subscription, accumulation and utilization of medical information resource reflect the ability to make medical researches, to keep up with update to hold medical knowledge and medical

information. The establishment of NLM was one of the most important contributions of USA in the nineteenth century. The main reason why medical researches in USA are in world advanced level is that NLM has the most abundant biomedical information resource and rather perfect service abilities and NNLM is a functional network composed of four medical libraries at different levels. The authors think that China also needs a genuine national medical library that will take the responsibility to implement the joint development and sharing of medical information resource and provide the efficient information service for clinicians and medical researchers.

3.4 To strengthen the integration of biomedical information resource

Under the current information environment, library has become the provider and manager of information and knowledge, the activator of having information and knowledge circulation. Nowadays, the focus of work in libraries has evolved from classification and Catalogue to the collection, evaluation and organization of information resources. Medical library should be effective at integrating print and virtual information resources in standardized forms according to the readers' needs and the requirement of library collection development, and establishes the "one station" service system based on OPAC, original article delivering system and interlibrary loan system.

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