CHAPTER: 2
THE MEDICAL EDUCATION IN INDIA
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India is in the pursuit of objective of achieving the goal "Health for All" by the year 2000 with primary health care as the key approach. A short narration of medical and health education in the nation will be helpful to assess the state of the art of the profession.

Before the Europeans occupied India, Ayurvedic and Unani systems of medicine were in practice and they brought their own medical or health care team trained in the western system of medicine to look after their personnel soon after trading was normalized in different parts. Therefore hospitals and dispensaries for this purpose were established. The British physicians trained some Indians to assist them as compounders and paramedics. These physicians were impressed by work of some Indians and took these Indians abroad for higher training. Because extreme importance of good health care system, the British rulers appointed a board to consider providing medical education to selected Indians systematically. The Bengal Medical College was first to be established which gained recognition of the Royal College of Physicians and Surgeons in 1846 and thereafter the establishment of General Medical Council in England in 1858,
and all medical courses taught in India were recognized. There were instances when this recognition was withdrawn off and on due to the lower and poor quality and standards of education which was later restored.

A large number of medical schools were established after independence of the nation and the Bhore Committee was established which recommended remodeling of medical education. The medical profession with its all hazards and limitations is still very lucrative in India [116].

The Medical Council of India [IMC] took the task of remodeling medical education and to ensure high standards in the nation. The government can not afford huge sums diverted to modernization of medical schools; but the private institutions which collect capitation fees for admission to medical schools- to both graduate and postgraduate courses, do invest large sums in upgrading and modernizing their laboratories and hospitals with acquisition of latest equipment and well trained staff. The profession of medicine has thus become commercialized and competitive. The people who can afford expensive and advanced medical care are only elite class people. The benefits of modern medicine and science will thus remain, as illusionary as ever to the common man [66].

According to UNICEF [159] India has the highest infant mortality in the world and a total of 2.963 million infants
die annually. Of the total infant deaths of 7.319 million in the World, India accounts of 40.48%.

It is often stated that physicians, as practitioners must develop skills, clinical judgement and competence to communicate with their patients. It is also stated that the medical schools and teachers play very important role in training these aspects. Feinstein [132] beautifully enumerates:

"A medical student seldom watches his teachers take a history. His teachers also seldom watch him. They often check that he has acquired salient information; they check his ability to reason with the information, but almost never check his competence in the act of getting the primary data at bedside. A few hours of direct supervision and enlightened criticism early in his career as a history-taker could greatly improve a student’s subsequent attitude and abilities as a clinician."

None can deny that the outcome of treatment in hospitals must be immensely improved. It is far from content. In part the problem lies with the failure of health professionals, the government, the Indian Medical Council [IMC] to police the medical education adequately; since the stakes could not be
higher. If a stock broker for example, is incompetent, his/her clients may lose savings; and if a physician is negligent and has not kept up with the recent developments in biomedicine, and has not improved his clinical skills, his/her patients may lose vision, memory, a limb or even life. Therefore continuing medical education [CME] becomes inseparable and absolutely essential in medical and health care. In the medical education, emphasis has shifted from knowledge to performance [343].

The science of clinical epidemiology, which is the basic science for medicine, requires that the information published in journals must be applied to individual patients in treatment setting [329].

The 1988-1989 medical research budget in India was Rs.200 million which is lower than any scientific budget provided by the government [196].

There are 268,712 physicians, 109,493 homeopaths, 273,193 indigenous medicine professionals practicing in India [108]. There were 5,568 primary health care and 51,192 sub-centers as of 1985 in the nation. The doctor-population ratio is 1:4000 another source quotes it at 1:3600 in 1979-80 [107] as compared to 1:5150 in 1968. The ideal ratio for physician to population is believed to be 1:2750 [268]. The WHO ratio is
9.1: 10,000 physician to population; and 14.8: 10,000 nurses and midwives.

The IMC, the gate-keeper of medical education in India, do exerts some criteria for medical education, but there is hardly any full adherence by any college, school or the university [350]. The IMC developed a uniform curricula for all medical colleges in the nation, but has yet to accomplish its universal applicability. While there are deteriorating standards of medical education, the fact remains that most of the nation's institutions are hardly equipped to train graduate students. Majority of these institutions will fall far short of changes needed to correct deficiencies [314].

The performance of medical graduates from the Karnataka on American medical standards, which have become to be regarded as the standards of excellence, to evaluate physicians through the ECFMG examinations are going on for years. From 1969 to 1982, a total of 55,112 medical graduates from India took the examination and out of this only 12,345 or 22.4% entered the US Pool of Practicing Physicians [121]. During 1986 only 12.8% medical graduates from India were eligible for ECFMG certification out of a total of 458 who took the examination. From 1979 to 1984 a total of 2250 medical graduates from the state took these examinations of which only 27.55% or 650 passed [120, 289].
A visitor from Malta observes that Written English of most Indian medical graduates was low and recommends an overhaul of the entire selection process and reforms in medical schools [333]. There is a general consciousness that high priority educational needs are not being met [403] [Fig. 4].

The medical education is therefore facing challenges and the demands on it are many—produce more physicians; make education relevant; evolve curricula to accommodate individual learning differences and maintain scientific basis of medicine; adopt curricula to suit the needs of the society [382]. The absence of excellence and poor quality of science in the nation is not entirely due to lack of funds or facilities, but that the senior scientists have not done enough to see that the atmosphere is truly conducive for scientific work [192]. The scientists should therefore marshall forces, link arms, raise banners and insist that science may the only hope of humanity [226].

The society has a very powerful notion of what a physician should be—an idealized image, the one that is deeply ingrained and fervently wished for; but the commercialization of medicine challenges that deal. The physicians' first responsibility is always to the patient; and now a second duty is being imposed—a duty to control cost
which may not be always in the best interest of a patient [81]. The Science Ministers from 24 developing nations of the Organization for Economic Cooperative and Development [OECD] approved a set of three necessary factors for International relations of science and technology [104]:

[a] An equitable contribution from all countries supporting basic research and maintaining up to date research facilities;

[b] An open system of publication of results of fundamental research; and

[c] Equitable contribution of all nations to training of next generation of scientists, etc.

An estimated 10-15% of all hospital admissions have an adverse drug reaction [229, 263, 352]. It therefore warrants that physicians have at their finger tips solutions to several problems arising out of the drug reactions among patients. India has established a National Registry of Drug Reactions with twelve regional centers and all district hospitals and primary health centers are affiliated to it [220]. The drug reactions may also cause due to incorrect dosage. It does happen, however, the dosage schedules are changed frequently in the light of accumulating clinical experience and
continuing laboratory studies. It is wise to check the manufacturer's recommendations for dosage especially if the drug to be administered or prescribed is one that is used only infrequently or has not been used for some time. The libraries play an important role in this regard. Now that CD-ROM databases have become available, within minutes the correct dosage could be found through browsing the appropriate data in this new format. The CD-ROM [Compact Disk-Read Only Memory] was introduced commercially in 1985 [208].

The number of medical schools kept growing and these still continue to grow. There are a total of 471 medical and allied health schools in the nation imparting health education leading to degrees and diplomas in graduate and postgraduate courses of medicine and its allied branches.

The per capita expenditure on medicine worldwide increased from US $10.3 in 1976 to $19.4 in 1987 [206] and in 1987 India spent $2 on health [322].

The medical educators, administrators and government is concerned about the deteriorating standards of medical education in the nation and have proposed ways and means to deal with this important aspect. A National Health Policy is suggested to achieve goals and accepted minimum standards in medical and health education. It is also suggested that there should be health universities established in states which will
regulate stringent medical and health education curricula and standards. An agency on the lines of the University Grants Commission [UGC] will be helpful in the development of nationwide medical and health care institutions and its funding.

The future of medical/health education programs of graduates and other health professionals of India, will largely depend on carefully developed rules and regulation of education and research. It will then become promising if medical or health schools, health care institutions, universities, governments, professional associations and the gate-keeper, the IMC or a similar agency on the lines of UGC, will research problems that have given rise to and come up with practical, applicable and realistic solutions. It is saddening to note that the standards of some medical graduates and their education are not suitable to the nation [308].

India faces a problem of maldistribution of medical and health professionals. Only a few wish to go to rural areas to practice under the primitive conditions and facilities, resulting in a very poor supply of health care professionals in these areas. This has resulted in lack of adequate medical attention in the communities of rural India. India produces over ten thousand graduates from its medical schools and this large number leads to specialization and sub or super-
specialization which assures each graduate a position in the profession and in the society.

In any developing nation, such as India, 90% of diseases are due to malnutrition and poor living conditions, and 95% of the disease can be diagnosed and treated by simple clinical procedures [115]. Thus nutrition education becomes extremely important in biomedical school and imparting patient education becomes of paramount important in the communities of the nation.

Medicine of the next decade will be far more consumer oriented than it is now. The public needs to know more about internal medicine in order to make informed judgements and take decisions for quality of health care. Kamath [201] advocates patient audit system so that only the state of art medicine is practiced. He suggests the audit system must come down heavily on deteriorating standards and institutions and persons shall have to be held responsible if medical education has to be problem oriented and qualitative.

The question will then arise- what can be done? How can the performance of medical and health graduates be raised? How should they be educated? The proper use of current medical and health care literature and development of skills to evaluate the literature will help solve some of the major problems of physicians deficiencies in health care. If the
libraries attached to the health care institutions offer improved information and document delivery systems, proper use of health literature and tremendous improvements in medical and health teachings, and if the health care professionals are persistent in demanding improved and qualitative education and library services, it will contribute immensely to resolve basic questions which will lead to improved educational standards.

The universities are no longer regarded as exclusive citadels of higher learning isolated from mainstream of life as was the case in the past. As powerful instruments of change not only identifying factors that hamper the process of development, but by assisting in finding ways and means of overcoming them through appropriate use of science and technology, these could participate.

In the past the developing world adopted traditional time-honored western models of health education and training. Efforts in medical education were mainly directed towards building the so called "Centers of Excellence" in an effort to produce physicians conforming to the international standards. No conscious effort was made to evolve a system taking into account the health care needs and aspirations of the people, communities and the pace of the development in India. The health systems have failed to improve the health status of
people as anticipated when weighed on the basis of health indicators.

Three different stages of health care are currently imposed in the developing countries - [a] Traditional- which takes place in the communities; [b] White-Coat- which takes place in Hospitals or Health Centers by the health worker, who is knowledgeable, skilled, trained in science and supported by a variety of specialists; and [c] Participatory- which is by participation on people’s terms- People and patients are central [224]. This new emphasis on an actively participating public, presents a challenge and an exciting opportunity for library services, because true participation depends on a full and continuing access to information.

The goals of health education should be consistent with that of the health system. This is perhaps the greatest challenge that the health educators faces today. The health manpower planning, production and utilization are viewed as sub-systems of health system and therefore it becomes an integral part of health planning process. The health educators must join hands with the health care administrators to devise a strategy and utilize it. The health educator has inescapable responsibilities to monitor the performance of those he trains, keeping close functional links with the health
administrator- for e.g. The health educator has his role to play in his trainees' CME programs.

A health information system for health centers would bridge identified gaps and provide a strengthening framework for present health centers’ organizational structure. An effective health information system is a sine-qua-non to health planning and monitoring of care.

The educational goals, training contents, methods, settings, and performance judgement criteria must be redefined. The training is required to be based on competency and must be problem oriented. The health schools must join hands with the health administrators to evolve feasible strategies to fulfill obligations to the community. The health education is a key element in comprehensive health care.

The information explosion as it pertains to biomedical and health sciences has led to suggestions for education reforms in medical and health education utilizing problem solving rather than memory, stressing active rather than passive learning and emphasizing student centered rather than teacher-centered education [302].

02. 1 Medical Education in Karnataka:

The first medical college in the state was established in Mysore city in 1924, and a trend followed in Karnataka. The growth in medical colleges is continuing and will continue in
future [Fig. 5]. There eighty-two institutions imparting education. Eighteen medical; nine dental; one nursing; twenty-five pharmacy; and 23 allied health colleges in the state beside the six postgraduate institutions imparting specialized training in biomedical and health sciences form a strong network of health care mechanisms [Fig. 6]. Two postgraduate institutions are operated and managed by the Central Government; the other four are managed by the State Government. The state government is very much eager to ensure that there are adequate medical and health sciences colleges and schools in the state to produce required if not more graduate in specialities. The government has however not taken into consideration the effects in the increased number of biomedical schools without proper allocation of resources in absence of any mandatory financial or other resources that make up an educational institution namely the Laboratory and a Library in each of the institutions being granted licence to function.

The intake of medical students in the state is over two thousand annually, besides the postgraduate seats in most of the medical colleges. In addition there are colleges that admit students in health education programs such as dental, pharmacy, nursing, and allied health professions such as
Indian systems of medicine, etc. which also accounts for over 1500 seats annually.

The Directorate of Medical Education is at the helm of affairs in the State and is a department under the Ministry of Health of the government.

02. 2 Continuing Medical Education [CME]:

The explosion of information had created a need for CME, which was less keenly felt in the earlier years when new information in any field of medicine was easily accessible through relatively small number of journals, texts or monographs. There is no touchstone through which physicians can assure that the process of their own CME will keep them abreast of advancing knowledge in the field. They must find a way if they are to discharge their responsibilities to their patients. They should take an active role. The passive roles of simply reading or listening or watching is far less effective than active one in which physicians translates what is read, seen or heard into some action of his/her own which might benefit the patients.

CME means accumulating new knowledge and dumping the outdated. It is a part of physicians' duty to keep sufficiently up-to-date in order not to ignore opportunities for effective treatment. The need for CME has been recognized for a long time. Socrates and Plato considered education as a lifelong
process. Sir William Osler recognized importance of CME in the practice of medicine in the early years of the 20th century [286].

The physicians use information to help them decide on appropriate actions for treating their patients. To fulfill this broader objective, physicians must also know "how" to use knowledge they have accumulated. They must develop skills for acquiring information from a variety of sources.

The evidences suggest that the major deficiencies in health services occur not so much because knowledge has not been disseminated, but because it is not used. Therefore it becomes mandatory on parts of physicians to engage themselves in self-education or continuing Medical education.

The CME is [403]:

"The training that an individual physician undertakes, after the end of his basic medical education and where applicable after the end of any additional education for a career as generalist or a specialist, training to improve his competence as a practitioner [not with a view to gaining a new qualifying diploma or licence]." [Fig. 7]

The sole objective of CME is to assist physicians to maintain and extend their professional skills and competence
in whatever area of medical or health care practice. Judgement is the central to the practice of medicine which occurs between making clinical observations and taking clinical decisions.

The problem solution is to attempt to bring the instrument of CME to the physicians in an effective and appropriate form. The true CME should be inculcated in each physician during medical school years and subsequent training [351].

The CME is based on the following eight principles:

[a] Universality: covering all personnel;
[b] Meeting needs of professionals and people;
[c] Consistent: operates on local, regional and national level;
[d] Identifies needs and priorities: draws up plans and is reflected in the aims;
[e] Sets standards and implementation: central setting of standards and decentralized implementation, i.e. CME programs are conducted methodologically with certain standards;
[f] Sequentiality: concept is of a permanent progressive learning process and professionals participates in programs on
a regular and sequential basis;

[g] Supervised systematically; and

[h] Accreditation of participants becomes essential.

The physicians’ major problems in CME are "finding and learning what is new" and "discarding what is outdated". The CME should be a part of medical/health education processes and must become of paramount importance during the periods of accelerated change. The physicians use information to stay informed and those wishing to stay informed with the advances in health and biomedical sciences must develop special skills to deal with biomedical and health literature. Skimming off literature of clinical importance and its use of high specific merit is absolute [172-177].

The promotion of self-directed learning among physicians continues to be the goal of many medical and health educators. Becoming a responsible self-directed learner is a key element in achieving clinical competence [92]. The 27th World Assembly has called on its member states, as far back as 1974, to consider as a matter of urgency, the development of a national system for continuing education for health care professionals.

The rapid increase in biomedical and health information has forced a change in medical or health care practice and education. Many biomedical facts are too quickly out dated to
be of long term value. The performance of physicians will improve drastically after reading clinical articles and they will change their treatment methods to great extent thereby giving benefits to patients for speedy recovery. However, Morgan [274] notes that some physicians change their treatment methods very little after reading the findings of clinical trials in journals and that medical articles are a poor substitute for grand rounds or a clinico-pathological conference.

The highly specialized new knowledge is a result of modern research which makes it difficult to relate to the knowledge used by physicians in their practice. The health care professionals have difficulties in perceiving or applying more than a fraction of new knowledge or even all of the information previously mastered in their graduate education, with the result that the current health care falls far short of its potential. Certainly there are many factors besides the lack of access to the current biomedical information accounting for worsening of the quality of life indicators and which makes academic life of clinicians, students and medical educators difficult and discouraging.

There are cases of physicians who are barred from practicing medicine because their medical knowledge was outdated and had a serious gap in modern medical and surgical
management [225]. Advances which are taking place in biomedical sciences do broaden physicians' ability to combat disease, they also broaden their potential to harm the patients if unaware of these advances. Because of the advances in biomedical sciences, most physicians are likely to fall behind in at least some aspects of clinical knowledge. A majority of physicians favors CE to be mandatory.

It is established that physicians read research results in periodicals to find answers to problems and questions concerning their patients [290, 292]. These reports are in addition to those conventional methods of medical and health education that were taught to them by their peers in schools, conferences and seminars, etc. It is only the wise use of information that can solve the problem of too much to learn. CME alone can not solve all the problems. What it can do is improve the use of available resources and help to ensure that the existing syllabus and procedures are implemented as effectively as possible.

The implications of CME are:

** It should be given appropriate place within the national priorities for providing health care;

** CME requirements should be included in health manpower plans;
When CME identifies differences in initial education, training institutions should be informed, so that their curricula can be revised appropriately;

** Training institutions should ideally be involved not only in the provision of CME but also in assessing work performance and in the supervision of their graduates, so that initial educational programs remain relevant to the needs of the health care system;

** CME should be linked to other aspects of health manpower management such as career development, promotion, job satisfaction, incentive schemes, supervision and performance appraisal;

** The competence stressed in CME should be those that are considered relevant to the effective delivery of health care; and

** Supervision in the health care system should be used as one of the most effective methods of CME. Virtually every study and publication on Continuing Medical Education [CME] has warned of the
avalanche of new medical information and the difficulty the practitioners have in keeping up with it [386].

There is increasing recognition of the need for health professionals to continue their education throughout their careers, if they are to improve their skills, knowledge and keep up with the rapid developments taking place in biomedical and health field. For CME to be useful and relevant, it must be carried out as a part of a coordinated program or system adapted to the needs, not only of the health professionals themselves, but also the communities they serve. There is no touchstone through which physicians can assure that the process of their CME will keep them abreast of advancing knowledge in the field, but they must find ways if they are to discharge their responsibilities to their patients.

The WHO conference held in Manila [405] affirms that the responsibilities of providing biomedical information to the health care professionals rests with the medical college libraries in the developing nations and the researcher for providing information to the professionals is none but the professional qualified librarian.

The responsibilities of professional librarians are to provide front line physicians, researchers, students, medical educators and health care administrators all information of
value pertaining to the care of the sick which will in any way effect delivery of health care and alter quality of life in the communities of Karnataka.

The health sciences libraries in the state will fall far short of the potentials and of the required minimum qualities to be of some standards in the fulfillment of their responsibilities. These have suffered and will continue to suffer due to lack of resources—finances, reading materials and qualified staff so essential to the very existence of these institutions. There are various groups other than physicians and nurses, who make valuable contribution to the theory of medical practice such as pharmacists, para-medics, and health care administrators, etc.

It is inconceivable that education and CME programs are carried without access to information and a collection of basic books and periodicals, the source of which is but a professionally organized and managed health sciences library.

CME is an area of current concern to the health sciences librarians. By assessing the clinical problems of practicing physicians; and the degree of correlations between literature searches—manual or computerized—confirm that the analysis of library information requests may be one approach to determine the CME topics. The core of medical education is that part for which the medical schools and their teaching hospitals are
responsible. The CME efforts need to be well-construed, prepared with careful attention to content, format and mode of presentation.

02. 3 Physiomorphology of Karnataka:

Karnataka is the eighth largest state [population and area-wise] in India. Its name is derived from "Karunadu" literally meaning "Lofty Land". It is situated on the western edge of the Deccan plateau and is surrounded by Maharastra, Goa on the north, Andhra Pradesh on east, Tamil Nadu and Kerala on South with opening to Arabian Sea on the West..

It occupies an area of 32,263 square miles with sex ratio of females to male being 963:1000. The literate population accounts for 38.46% as against 36.6% nationally [202]. Its 49% state income comes from the 71% working force engaged in agricultural and allied activities generating 49% of state income. The state is the home of a large number of minerals and economic importance and contributes all gold and silver produced in the nation. It is also dominated by the engineering industry.

There are 2141 health care institutions with total bed capacity of 39,885 in its hospitals and health centers in the State. The 286 government hospitals account for 33, 833 beds in the state. The breakdown of the health care institutions is: 176 Hospitals; 24 Specialized Hospitals; 545 Primary
Health Centers; 1125 Primary Health Units; and several dispensaries all managed by state government.

The health care of the state is backed by a strong network of medical and allied health institutions. Besides, there are ten hospitals and 407 dispensaries of Indian systems of medicine which are engaged in providing professional training for the manpower development from its 23 colleges in the areas of Unani, Ayurveda and Homeopathy systems of medicine.

The ninety-eight institutions admit 2800 students for courses in allied health sciences of duration ranging from three weeks to 4 years plus 130 students in each batch of ten days to three months.

The per capita expenditure on health in the state was Rs.22 in year 1981/82 and Rs.24 in 1983/84 as against $11.54 in 1981/82 and $11.50 in year 1983/84 by the developed world. The bed to population ratio is 1:1089; doctor to population 1:8144; and nurse to bed ratio of 1:7 as of 1987.

The infant, neonatal and prenatal mortality rate per thousand in Karnataka is 71; 43.5; and 36.5 against national figure of 104.9; 67.2 and 53.6 respectively.

As of May 1989, the state had 60,121 professionals working in the health care industry including physicians, dentists, pharmacists, nurses and midwives, etc.
The Directorate of Health and Family Planning [DHFS] and the Directorate of Medical Education [DME] are the sole gatekeepers of health care and medical education in the State. The earlier manages the network of health care institutions and the latter governs and provides guidelines for institutions in training and education to professionals who will make a difference the way people live in the healthy communities of Karnataka.

The funding for medical education by the government is impressive, and the budget on medical education has been increasing year after year—from Rs.1,322.25 lakh in 1979/80 to Rs.5,277.06 lakh in 1989/90. A glance at the graph is enough to show the high jump in the government spending [Fig. 8]. The government is a strong believer in ensuring that the state has adequate medical colleges to train the graduates. As a result of this liberal policy of the government, the growth of medical colleges is 2.9% as against 2.7% in the developing nations.
STATE BUDGET FOR MEDICAL EDUCATION

DIRECTORATE OF MEDICAL EDUCATION, BANGALORE

Lakhs [In Thousands]

Budget Years

Fig. 8