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Medicine

LEARNING MEDICINE AS PROFESSIONAL EDUCATION

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ABSTRACT India is home to one of the oldest medicinal systems in the world. Medical education and training fluctuate greatly across the world The Portuguese first introduced Western medicine into India In the 16 century, East India Company's first fleet of ships brought medical officers and Western medicine to India. Adhering to the ancient curricula, of more than century ago, which compartmentalizes the medical disciplines rather than giving comprehensive understanding of the subject is the source for the mystery. Medical education seem to be in a perpetual state of unrest. The role of medical teacher is like a "sage on the stage rather than guide by the side." Indian healthcare has progressed over the last three decades. Curricular courses of medical education in India have been introduced in India before independence. In the post-independence period, the whole arena of medical education was streamlined with the establishment of the Medical Council of India. Medical education appears to be in a never ending state of unrest. Medical science in India is different from that of the west. Computer and communications revolutions, rapid improvements in biotechnology, genetic engineering research, remarkably developed the past two decades. Competency-based medical education (CBME) has been introduced through the Graduate Medical Education Regulations (GMER) from the Medical Council of India. Education has always been an inextricable part of medicine. Education is assessment and assessment is education.

INTRODUCTION
The National Medical Commission (NMC) was established in 2020 to overtake the MCI Board of Governors in order to instill more strength and transparency into the country's medical education system (1)

Competency-based medical education (CBME) de-emphasizes time-based training and promises greater accountability, flexibility, and learner-centeredness (2)

India has the highest number of medical colleges in the world and subsequently the higher number of medical teachers (3)

The medical education system in India is the largest in the world consisting of more than five hundred medical colleges with an intake capacity of 81979 students each year (4)

The unprecedented growth of medical institutions in India in the past two decades, almost doubling in strength, has led to a shortage of teachers and created a quality challenge for medical education (5).

Health Systems has created new thrust among the concerned institutions (6).

World Health Organization (WHO) guidelines emphasized that faculty development will help to motivate doctors for the 21st century (7).

As specified by the Medical Council of India (MCI), Faculty Development Programs aim to improve the quality of medical education by training and sensitizing teachers about new concepts in teaching and assessment methods (8).

Medical science has eventually metamorphosed from 'Knowledge based' to 'Skill based' applied social science (9).

In the second half of the last century, entry of private investors in the health care industry and medical education system changed the scenario radically with mushrooming of tertiary level medical care centers and medical colleges (10).

The National Medical Commission is being constituted through an act of parliament, the NMC Act 2019. This new medical education regulator will take over the role of the Medical Council of India which is currently run on adhoc basis through a board of governors (BOG) (11).

India in coordination with State Governments should establish robust post graduate programs in Family Medicine and facilitate introduction of Family Medicine discipline in all medical colleges (12).

History
1. Establishment of the Calcutta Medical College 1835
2. Establishment of Calcutta, Bombay and Madras Universities 1857
3. Establishment of the Indian Medical Services 1896
4. Establishment of the School of Tropical Medicine, Kolkata 1922
5. Establishment of the All India Institute of Hygiene and Public Health, Kolkata 1932
6. Establishment of the Medical Council of India 1934
7. Report of the WHO Expert Committee on Professional and Technical Education of medical and ancillary personnel 1952
8. 1st World Medical Education Conference 1953
9. Medical Education Conference in India 1955
10. Indian Public Health Association 1956
11. The Mudaliar Committee 1959
12. Medical Education Committee 1960
13. 2nd Medical Education Conference 1968
14. Indian Association of Preventive and Social Medicine 1974
15. Report of the group on Medical Education and Support Manpower (Shrivastava Committee Report) 1975
16. Re-orientation of Medical Education Scheme 1977
18. National Institute of Health and Family Welfare 1977
19. The Medical Education Review Committee 1983
20. The Health Manpower Planning, Production and Management 1987
21. Expert Committee on Public Health System 1996
22. Calcutta Declaration 1999
23. Task Force on Medical Education 2005
24. Public Health Foundation of India 2006
25. Initiation of Post Graduate Diploma in Public Health Management 2008

Learning Medicine As Professional Education
A lot has happened to change the scenery of medicine over the past 100

years. Medical education appears to be in an unrest. From the early 1900s to the present, numerous reports from educational bodies, and professionals have criticized medical education to draw attention to scientific knowledge, clinical reasoning, practical skill, and honesty. This article summarize the changes in medical education over the past century and describe the current challenges, to transmit knowledge, to impart skills, and to inculcate the values of the profession.

100 -years back,only few medical subjects like Physiology,Pathology and Pharmacology are present.Anatomy and Biochemistry subjects taught in physiology.Bacteriology taught along with Pathology. Afterwards nineteen subjects. Now in medicine more than thirty subjects are included. To avoid repetition,all over the globe,we are using integrated systems.

The duration between 1935-1960 involved continued public health innovation, as well as the first widespread medical-care interventions to treat infectious diseases.sulfa drugs in the late 1930s and penicillin in the mid-1940s. Researchers are estimating the effect of these medical-care interventions on the decline in mortality. Some studies also found an important effect of the introduction of penicillin on mortality.The study of a person's genes (Genomics) and their interactions with other genes , DNA technology,Genetic engineering,is a moderately new approach to understanding complex diseases, from heart disease to cancer, and its application in biomedical research is expected to accelerate over the next century.

Competency-Based Medical Education
"Medicine is going to become commoditized in many ways," says Dr. Jonathan Teich, former Chief Medical Informatics Officer at Elsevier Clinical Solutions

Medical education is scholastic area of educating medical doctors from entry-level, post-graduate, and continuing medical education.

Of late The Government aims to improve the standards of undergraduate (UG) medical education in India. In 2019, the Medical Council of India (MCI) executive members introduced the universally accepted medical curriculum that emphasizes the system of learning and introduces a dedicated module for soft skills such as communication,and attitude.

Widespread adoption of a competency-based approach would mean a paradigm shift in the current approach to medical education. CBME, hence, needs to be reviewed for its usefulness and limitations in the Indian context. This article describes the rationale of CBME and provides an overview of its components, i.e., competency, entrustable professional activity, and milestones (13)

Faculty Expansion Schedule For Medical Teachers In India
Faculty Development Programs help to elevate the standards of medical education by training teachers regarding the update concepts in teaching and assessment methods.Workshops and Seminars,Book Discussions,Individual Consultations. Medical subjects teaching. Clinical Teaching. Periodic educational Publications.

Web based faculty development materials.A systematic advance towards faculty development to magnify element of education to meet health challenges. Health professionals are inadequately planned as teachers , notwithstanding their knowledge and skills may be superior.The advantage of education amendments finally lies with the individual capacity,and collectively to execute some unknown ways in teaching and training of doctors.India is steadily becoming a new universal base of education.

New Reforms To Boost Medical Education In India
Medical field has made very good progress over the last decade.The Covid virus has caused pressure on the health care system around the world.Because of overpopulation,shortage of doctors,technical staff,Government of India has to give top priority and allot good funds in budget. The Task Force on Medical Education was set up in 2005 with the theorising of medical education to the National Rural Health Mission (NRHM).The Public Health Foundation of India was set up in 2006, establishing a strong national research network, Recently, there have been networking of institutions with the initiation of collaborative academic programs (PGDPHM partnership), Indian Public Health Education Institution Network, and the Public Health Education and Research Consortium (14)

Call For Mandatory Representation Of Practicing Family Physicians On The National Medical Commission (NMC)
National Medical Commission (NMC) recently announced new MBBS curriculum.The word "family medicine' has not been even mentioned in the document.

MCI expressed that there is no demand for family medicine in the public and private sectors. Medical Council of India sealed "Family Medicine"from the MCI Act. NMC Act 2019 under section 24 (1) (c), the Under Graduate Medical Education Board is mandated to to develop competency based dynamic curriculum for addressing the needs of primary health services, community medicine and family medicine to ensure healthcare in such areas.

Impact Of Artificial Intelligence In Medical Education-
Technology is going to make possible to regulate and control a lot of their stuff — start picking up their own medications, start deciding on things for themselves because they'll have the tools to do so Artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and animals. Recently AI techniques have sent vast waves across healthcare, even fueling an active discussion of whether AI doctors will eventually replace human physicians in the future. We believe that human physicians will not be replaced by machines in the foreseeable future, but AI can definitely assist physicians to make better clinical decisions or even replace human judgement in certain functional areas of healthcare (eg, radiology).

we can use to make accurate, cost-effective decisions in complex analytical processes. AI is useful in tele health, drug interactions, creation of new drugs, imaging,radiology and other health care conditions.The amount of data collected and managed in (bio)medicine is ever-increasing. Thus, there is a need to rapidly and efficiently collect, analyze, and characterize all this information.

Diagnosis of disease using AI is most curial part of innovative technology. It uses machine learning algorithm to understand onset of disease. In machine learning algorithm Deep Learning algorithms – have recently made huge advances in automatically diagnosing diseases, making diagnostics cheaper and more accessible (15).

More precisely, machine Learning algorithms can learn to see patterns similarly to the way doctors see them. A key difference is that algorithms need a lot of concrete examples many thousands in order to learn. And these examples need to be neatly digitized machines can't read between the lines in textbooks. So Machine Learning is particularly helpful in areas where the diagnostic information a doctor examines is already digitized (16).

The advantage of machine learning algorithm in diagnosis of various disease includes detecting lung cancer or strokes based on CT scans, assessing the risk of sudden cardiac death or other heart diseases based on electrocardiograms and cardiac MRI images, classifying skin lesions in skin images and finding indicators of diabetic retinopathy in eye images. Diagnosis devices and kits often cost a lot and conventional methods are time consuming as well. Here using AI precisely various machine learning algorithms allow a cheaper and robust diagnosis tools. Further, AI based diagnosis protocols are versatile and applicable to large number of populations (17)

Role Of Digital Therapeutics In India
Digital Therapeutics (DTx) is a subdivision of digital health, which represents a collection of technologies, products, and services across healthcare. They are used independently or in concert with medications, devices, or other therapies to optimize patient care and health outcomes (18).

Drug development is considered to be a lengthy, expensive, and high-risk venture in today's world. (19)

Many Indian pharmaceutical companies are now modifying their business models, strategies, product portfolio to enhance their market presence to face the changing market dynamics better. Companies have realized the tremendous value proposition offered by DTx products/services. It is believed that DTx services could reduce the drug manufacturing costs, while adding value for insurers, too, allowing them to customize products based on the patients' needs.

However, DTx is still not prevalent in India, and a few companies are planning to invest and venture into the DTx domain (20)

Telemedicine In India

According to American Telemedicine Association (ATA), *"Telemedicine is the natural evolution of healthcare in the digital world"* (21)

World Health Organization (WHO) has defined telemedicine as, "the delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information,research and evaluation, and for the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities." (22)

The word "telemedicine" literally translates to 'healing at a distance'. It often is used as the umbrella term to encompass health care delivery in addition to other activities such as education, research, health surveillance, and public health promotion (23)

Telemedicine is considered to be the remote diagnosis and treatment of patients by means of telecommunications technology, thereby providing substantial healthcare to low income regions. Telemedicine also helps family physicians by giving them easy access to speciality doctors and helping them in close monitoring of patients (24)

The Integrated Curriculum

The term "integrated curriculum" has fully developed in medical education over the last two decades. The Integrated Curriculum syllabus is popular hypothesis internationally.The aim of integrated curriculum is to breakdown the blockade between the basic and clinical sciences.Integration should promote procurement of skills and progressive development of concepts.An integrated curriculum is described as one that connects different areas of study by cutting across subject-matter lines and emphasizing unifying concepts. The integrated curriculum has so much to offer for students and educators but lacks clarity and unity in the literature. With careful consideration of theory and ideal models underpinning integration and its commonly published forms, a precise definition is necessary to aid in designing, implementing, and reviewing integrated curricula and integrated curricular units. Utilizing the spiral model as the ideal goal, we propose that "integrated curriculum" be defined as: a fully synchronous, trans-disciplinary delivery of information between the foundational sciences and the applied sciences throughout all years of a medical school curriculum.

CONCLUSION

Medical education in India has undergone significant reforms in existing times. As the world's largest medical education system, it is important to understand the status of India's medical education in our interdependent world. As a national strategy, the "Healthy India 2030" blueprint sets a goal of enabling everyone to be involved in health, share health, and be responsible for health. Realizing the goal requires a number of qualified health personnel. Health professional education should be attached greater importance in this long-term national strategic plan.India needs to work out a national medical curriculum which caters to our country's needs.Medical education in post-independent India faces significant challenges.India needs adequately trained public health professionals. Public health education is a tool to create public health professionals. Public health education in India is at cross-roads on several fronts. Traditionally, public health education in India was offered through medical schools and was open for medical graduates only. However, recently the country has witnessed an emergence of institutions offering public health programs to non-medical background graduates. in 100 years everyone will have their own "personal health robot that follows them around and tracks what's happening in their environment and tracks what's happening in their bodies via sensors"

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