

An overview of education and training of Medical Informatics in India

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Abstract

Background: Medical Informatics in India is still in the infantile stages. Although the thought processes started in 1993 with the creation of Indian Association for Medical Informatics (IAMI) where in major healthcare delivery institutions were the proponents. Presumably, absence of independent career option in medical informatics in India resulted either in exodus of the required faculty members or the training force for such courses could not evolve. . However, this situation may have been changing in the last few years. But a vast gap exists which needs to be filled up quickly. The purpose of this report is to provide an assessment of the present situation about research and training in medical informatics in India and indicate future prospects with respect to India.

Objectives: To assess the current situation regarding the opportunities research and education in Medical Informatics in India and related issues like availability of career options.

Methods: A survey questionnaire sent by postal mail to well-known Indian institutions engaged in medical informatics training and research. In addition, key stakeholders working towards imparting education and awareness on the principles and practice of medical informatics were contacted to provide information about training and research in medical informatics in India. This was a purposive sampling based on prior knowledge. The responses were thematically analyzed.,

Results: A total of five courses were identified in the survey. These were administered through face to face (F2F), e-learning and other modes of distance learning. . In general, most of the students are graduates in medicine (Allopathic, Homeopathic, Ayurvedic), allied sciences (Nursing, Physiotherapy) and medical administrators or graduates in Engineering or Library and Information Sciences. Most of them are also working. Majority of the courses are part-time and acting as on-job value addition. While some of the courses are mostly face-to-face most of the courses are completely online/distance learning based. Most of the courses however do not directly train for jobs. Therefore, as most of the participants are already working somewhere the question of placement due to the course may not be measurable directly.

Conclusions: Since most of the students from India are already employed, by attending this course they gain further insights into health informatics that they want to pursue as a career.

KEYWORDS: e-learning, Medical Informatics training, India, UHID

Introduction

India is widely recognized as a leader in information and communication technology (ICT). It is believed that in health care, Information and communication technology (ICT) in India, while under-utilized, has the potential to make significant contributions. *Medical informatics (MI)* can be applied to utilize ICT and imparting quality medical education [1-3].

Students' ability to master subject matter is limited in face-to-face (F2F) classes. Additionally, students learn at different paces that cannot be easily considered in the conventional didactic or practical classes. Online course or e-learning provides another learning option [1,6,7].

India has been recognized as one of the leaders in Information technology at least amongst the emerging economies. Medical Informatics has however not kept pace. With increasing corporatization of healthcare on the one hand and demand of telemedicine facilities from the government side a need for trained personnel has only recently been recognized. A need to correct this mismatch between needs and availability is being felt.

The purpose of this paper is to provide an assessment of the existing state of training and research in medical informatics. In the next Section we are going to discuss some of the courses offered formally in India. The subsequent section will discuss on some other relevant developments in India. The final Section will conclude with some future directions.

Study of current Status of MI education and training in India

Methods:

A postal survey (the questionnaire is presented in an appendix to this report) was administered to all known institutions as well as circulated amongst the known EMail groups of those working in Informatics particularly IAMI (iami_gen@googlegroups.com)

Results:

The School of Telemedicine and Biomedical Informatics in Lucknow is one of the largest and most equipped stand alone Telemedicine facility which has come up in India since the last few years wherein a budget of over Rupees 300 million (Nearly US\$ 6.5 Million) have been spent on equipment alone.

The Master's level course at Amrita has been having about 5 students per batch since it started in 2005. It is divided into 4 semesters where the first three semesters have structured lectures and practicals. The fourth semester is intended for a Course work that may be undertaken outside with prior permission.

In general for these courses, most of the students are graduates in Medicine (Allopathic, Homeopathic, Ayurvedic), allied sciences (Nursing, Physiotherapy) and medical administrators or graduates in Engineering or Library and Information Sciences.

Since most of them are also working, a majority of the courses are part-time and acting as on-job value addition. While the courses c and d are mostly face-to-face (with online access to some course materials), the courses a, b and e are completely online / distance learning based.

However, most of the Courses mentioned here do not directly train for jobs. Therefore, as most of the participants are already working somewhere the question of placement due to the course may not be measurable directly.

Most of the students are already employed and attend this course to gain further insights into health informatics that they want to pursue. Some of them are interested in getting HL7 Certified after this.

The overall student feedbacks for all the courses vary from Good to Excellent. For the courses a and b, they are perceived as great new learning experience where the study materials are not didactic and all the assignments are real-life problems.

For direct, low level, job and carrier based training, as well as imparting IT skills to doctors many are running low level short term courses and workshops [8]. These are especially important for Front office workers and Nurses who operate HMIS systems; Telemedicine based clinics as well as do secretarial work in clinics (Table 1)

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Table-1 Courses being offered on medical informatics from India

Sl.	Institute	Course	URL
a	Department of Biomedical Informatics, PSG Institute of Medical Sciences and Research, Peelamedu, Coimbatore 641 004	12-week Certificate Course – entirely online, asynchronous / part-time	http://psgimsr.in/online-hi/
b	Health Level Seven India	14-week Certificate Course – entirely online, asynchronous / part-time	http://122.166.102.206/moodle/
c	Amrita Institute of Medical Sciences, Kochi, Kerala 682 041	Masters program in medical informatics. Duration – One year full time contact session followed by one year project at candidates desired location. Total 2 years	http://aims.amrita.edu/digital-health.html
d	International Institute of Health Management Research, (IIHMR) Plot 3 , Sector 18 A, Dwarka, New Delhi – 110 075	Various 2-12 day Workshops on topics of relevance and some lectures as a part of PG Diploma in Health and Hospital Management Formal 6 months elective training for Management Students from 2010 course starting.	www.iihmr.edu.in
e	eHCF School of Medical Informatics, B-5 A/B, 2nd Floor, Street #-13, Madhu Vihar, I P Extension, Delhi-110092	3-month Certificate Course – Distance Learning mode based on print material and email assignments	http://www.ehcfsmi.edu.in/
f	School of Telemedicine and Biomedical Informatics, S.G.P.G.I.M.S., Lucknow, UP, India	6 months and one year Diploma in Telemedicine and ELearning. It is providing training to delegations from India and abroad on incorporating E Based learning in the curriculum as well as HMIS	www.sgpgi.ac.in

IIHMR is an institution with 5 branches across India. It runs post graduate courses in Healthcare Management In collaboration with IAMI, its New Delhi branch has plans to start from this year a 6 months elective specialization in Healthcare Informatics for their 2 year healthcare management course. The first batch will doing the course in the last semester of 2010. 11 students with previous experience in the following fields have enrolled.- 2 from dental

sciences, 3 from Ayurvedic (traditional Indian) Medical Sciences, 3 from physiotherapy, 1 in Occupational, 1 is Bachelor of Pharmacology, 1 from Computer Science, [1 Radiographer](#)

[Non formal short term courses and training is provided by the following:](#)

[Dr Rajeev Joshi, Pune \(](#)

Discussion

Current Status of relevant developments in India

The Government of India has declared 2010-20 as the “Decade of Innovations” [9]. In line with this theme they have appointed Sam Pitroda as the Prime Minister’s Advisor on “Information, Infrastructure and Innovation” with the rank of a Cabinet Secretary [10,11]. Earlier Mr Pitroda, as the Chairman of the National Knowledge Commission had proposed the development of the Health Information Network for India [12].

In another related development, Nandan Nilekani has also been appointed as Chairman of the Unique Identification Authority of India (UIDAI) with a Cabinet Minister rank and the UIDAI has outlined the role of UID for public health [13]. This has paved the way for creating a nationwide Unique Health ID and a possible National Health Information System [14] which will create a huge demand for Health Informatics Professionals.

All these point towards the possibility of medical informatics gaining a greater significance in the coming years in India.

However, on the flip side, most of the IT programs in India do not give any special stress on Health IT and often a Student Project may be encouraged to explore further. Similarly, a significant majority of hospitals are yet to be digitalized. Moreover, the hi-tech hospitals, being in the corporate sector usually do not view public health as a thrust area unlike Government Institutions. In India, as such there are very few full fledged departments, and most of them are extremely short on human resources. Also, many apparently active research topics in the field of health IT in India, like mHealth, are hardly prospering in an academic setting – Industry is taking lead in that.

Conclusions and Future Directions

India is recognized to be a leader in software skills, and it is rated high also in medical skills being the second only favored country, after Thailand, for Medical Tourism [13]. However the combination of the two *i.e.*, Medical Informatics is still not a recognized career choice. Perhaps after 3-5 years the demand for such courses will increase as the market offers more jobs.

Even newspapers discussing career options are finding “informatics” as a promising area [14]. Therefore, the future of medical informatics training in India is likely to show an upward trend very soon.

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Appendix

Summary of Survey Findings:

Survey Questionnaire for Health Informatics Courses

Name and address of the Institute:

- a. Department of Biomedical Informatics, PSG Institute of Medical Sciences and Research
Peelamedu, Coimbatore 641 004, URL: <http://psgimsr.in/online-hi/>
- b. Health Level Seven India, URL: <http://hl7india.org/news.html> or
<http://122.166.102.206/moodle/>

- c. Amrita Institute of Medical Sciences, Kochi, Kerala 682 041, URL: <http://aims.amrita.edu/digital-health.html>
- d. International Institute of Health Management Research, Plot 3 , Sector 18 A, Dwarka, New Delhi – 110 075, URL: www.iihmr.edu.in
- e. eHCF School of Medical Informatics, B-5 A/B, 2nd Floor, Street #-13, Madhu Vihar, I P Extension, Delhi-110092 URL: <http://www.ehcfsmi.edu.in/>
- f. Dr Rajeev D Joshi <http://www.dataonweb.com/IAMI/workshop/Workshop.htm>
- g. Society For Administration of Telemedicine and Healthcare Informatics (S.A.T.H.I.) 28/31 Old Rajinder Nagar, New Delhi 110060 <http://www.sathi.org>

Courses offered (with duration and full-time/part-time) on Health Informatics in 2009:

- a. 12-week Certificate Course – entirely online, asynchronous / part-time
- b. 14-week Certificate Course – entirely online, asynchronous / part-time
- c. Masters program in medical informatics. Duration – One year full time contact session followed by one year project at candidates desired location. Total 2 years.
- d. Various 2-12 day Workshops on topics of relevance and some lectures as a part of PG Diploma in Health and Hospital Management
- e. 3-month Certificate Course – Distance Learning mode based on print material and email assignments.
- f. Short term workshops for practicing doctors and staff

Background of the students for each course: disciplines and working status

Most of them are either graduates in Medicine (Allopathic, Homeopathic, Ayurvedic), allied sciences (Nursing, Physiotherapy) and medical administrators or graduates in Engineering or in Library and Information Sciences. Most of them are also working.

- a. Information Technology Professionals
- b. Health Professionals (MBBS/ BDS/Physiotherapy/Occupational therapy/Prosthetics /Nursing)
- c. Other Health specialties (Homeopathic/Ayush/_____)
- d. Paramedical Workers (Various ranging from Auxillary Nurse Midwife (ANM) /Accredited Social Health Activist (ASHA)/Radiographer/Registered Medical Practitioner /Other_____)
- e. Front Office staff
- f. Administrators/MHA/Other _____

Mode of training: Face-to-face or online or blended

The courses c and d are mostly face-to-face (with online access to some course materials) while the courses a, b and e are completely online / distance learning based.

Placement of students after the completion of the course:

Most of the Courses mentioned here do not directly train for jobs. However, since most of the participants are already working somewhere the question of placement due to the course may not be measurable directly.

Most of them are already employed and attend this course to gain further insights into health informatics that they want to pursue. Some of them are interested in getting HL7 Certified after this.

Overall feedback of the students of the course:

Good to Excellent for all.

For the courses a and b, they are perceived as great new learning experience where the study materials are not didactic and all the assignments are real-life problems.

Focus of Courses (Please mention only those where IT applications are a major component - Tick all that apply)

- a. Hospital Information Systems**
- b. Telemedicine/eHealth**
- c. Tele Education
- d. Simulation
- e. Telerobotics
- f. Knowledge Management/Library Sciences
- g. Healthcare Management**
- h. Healthcare Administration**
- i. Clinical Informatics
- j. Others: Clinical research informatics
- k. Others: Haptics and health nanosciences

Any other comments:

Since there is not much scope of jobs in industry in India, perhaps after 3-5 years the demand for such courses will increase as the market offers more jobs.