

ICT Applications in Healthcare Sector in Tamil nadu: Implementation and Benefits of PICME and MRMBS

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Abstract

In India, e-governance in healthcare sector has become a compulsion in recent past. At the same time, we have to keep in mind that India has certain obstacles like vast geographical area, high population, transport problems, illiteracy and lack of nutritional awareness. But all these obstacles can be made into wings, if ICT applications in the health sector are taken to higher level of implementation. In our country, certain global IT giants are trying to improve e-governance in health services from the year 2006. It is done in government and private hospitals with enthusiasm and expectation. Medical science is fast developing and data relevant to it are raining all the time. Now, there is better scope for interlinking all types of health centres throughout the country. As the need is very urgent due to the emergence of new diseases forcing a real threat, deliverance of high quality medical service has become one of the biggest expectations of the people. This paper tries to review ICT applications at the national level in our country and also in the state of Tamil nadu. In particular, the experiments carried out in Tamil nadu through the 'Tamil nadu Health Systems Project'(TNHSP) and the expectations remaining are addressed. The most important aspect of this project is to decrease the maternity mortality in the State. The Directorate of Medical and Rural Health Services has strongly advised the use of 'PICME' software to monitor the pregnant women regarding their health status and delivery of the child. 'Dr.Muthulakshmi Reddy Maternity Benefit Scheme'(MRMBS) is linked with this process as an attempt to assist the poor pregnant women. The benefits of them are clearly seen all over the state. The challenges and achievements in connection with this process are also addressed in this paper.

Keywords: e-governance, ICT, healthcare, TNHSP, maternity mortality, PICME, MRMBS.

1. 1 Introduction

Hospitals are the main conventional healthcare centres where patients are treated on their illnesses. E-governance in healthcare gives a powerful alternative to patients in the absence of such centres by providing remote caretakers through tele-healthcare system. The delivery of medical service through ICT applications has been implemented in

some states of the country including Tamil nadu keeping in mind the issues related to it. The values connected to the implementation of it are trust, privacy, confidentiality, ethics, integrity, safety and reliability. The moral pressure adds to the other burdens like accountability and sensitivity of the public and so the healthcare sector should be more and more careful in its ways of functioning. Though the demand is perceivable in the case of e-governance implementation in this sector, public health system (PHS) is functioning towards a historic achievement of total success. In this context, the special healthcare programme, TNHSP, focusing on pregnant mothers and new born babies in Tamil nadu, is worth discussing.

1.2 ICT in Medical services

Internet, Web based libraries, Electronic Medical Record, Electronic Health Record and Computerized Prescriptions are some important components of ICT application in hospitals and telemedicine area. Computerization of hospitals, registration of patients under out-patient and in-patient, laboratory, imaging section and record section are initial steps in the huge process. Administrative sections like store, pharmacy etc., are to be also computerized to reduce expenditure and loss of time. Computer is not an alternative to human brain but can be relied upon for unbiased analysis.¹ Electronic medical records can give the complete history of a particular patient to decide hid particular disease. Further it leads to data mining which further takes it to the level of newer scientific developments. By providing a smart card or CD-ROM, the electronic medical record can be kept in the hands of the patient also. Prescription of medicines when done through computer gives a clear picture of dosage and duration of the medicine in-take. Health-connect is a web based tool for doctor-patient communication which develops confidence in the mind of the patient.

1.3 E-Health – the Need of the Hour

E-health can be defined as the use of the appropriate use of Information and Communication Technologies (ICT) in the support of health and other fields related to it. The potential of the variety of applications of ICT may help very important public health care services, health surveillance, health literature and health education.² If they are applied properly

they can greatly improve the health services even in the villages efficiently thereby helping the patients to trust the medical attention they receive in a new mode. In a city, town or village, information systems like Electronic Health Records (EHRs), mobile phones and laptop computers (generally called m-health) can be of enormous value in providing necessary medical attention. The absence of a doctor at a particular medical centre can be met with such facilities and the assistant at the centre can keep track of patients to be in touch with them for a better and quick treatment. There are many agencies to help in this effort and at the same time the ways to implement EHRs are to be evaluated to ensure that whether they are safe and beneficial to the patients.³ The expectations regarding the impact of e-health on patient welfare are linked to systematic reviews of e-health in primary health care, tele-medicine and the cost effectiveness of it.

E-health is a latest development supported by electronic processes and information technology tools. It deals with medical informatics, public health and delivery of medical services quickly through internet and related technologies. It links all in the process of curation right from patient to the doctor through/via nurse, data processing specialists and the hospital manager. Government hospitals are taking up ICT applications in various parts of the country with the aim to upgrade public healthcare system. Development gateway foundation provides web based information for developing countries bringing together professionals working on e-governance initiatives.

1.4 Status of ICT in the Medical field

The change in the scene in healthcare industry of our country is expected to boom further before 2020. The main reason for it is due to the rise in the population of elder people and growth in the income of individuals. In this context, we can say that this sector is fast becoming like software and pharmaceutical industry. Another factor is that the Indian hospitals are gaining worldwide recognition in providing quality service. Globalization and internet explosion also contribute much to improve the potentiality of the sector. All facilities are both local and global and the margin between them is blurred by the craft of technology.⁴

As far as India is concerned medical attention to all citizens at all times remains unachieved still. The problems in healthcare in our country are generally related to Infant mortality, life saving medicines availability, reduction of the rate of spread of infectious diseases and death of mothers during delivery of a child. To improve our standards of life, we have to improve our healthcare infrastructure even in villages because villages are the backbone of our country. The member of community health centres, laboratories and drug banks are to be increased along with latest implementation of ICT applications. The lack of presence of computers and ICT involved testing methods lead to uncertainty in processes and results which will affect the patients according to the sensitiveness of the illness.

1.5 E-Health in Tamil nadu

In Tamil nadu, one implementation of ICT is worth mentioning here. 'An UK based 'Sim Prints' aims to make patient verification more authentic. It tries to link rural healthcare workers with fingerprints technology and emergency medical services. It is assisted by Ford in the project 'Sustainable Urban mobility with Uncompromised Rural reach.' It verifies medical records and statistics in helping the community health workers (CHW) by using GPS technology and Bluetooth for efficiency.⁵ It aims at eradicating the errors that arise out of common community names and unknown date of birth. Follow up care, tracking the full course of treatment and vaccination timings of children are also the key aspects of this programme. Networking with ambulances for emergencies and detection of vehicle accidents in rural areas are supposed to be the next projects to be taken up by Tamilnadu government.

In another notable attempt of introducing ICT in healthcare sector, Apollo multi-speciality digital hospital on OMR in Chennai, Tamil nadu has launched the facility of 'virtual visit'. With this facility introduced by Apollo hospitals, the relatives of patients can see how their dear ones are doing at the OMR hospital's ICU, from any part of the world. It is done by giving specific passwords and time slots. During that particular time, they can log on to 'iseeu.apollo.net.in' and view the patient. This particular hospital also provides the telemedicine facility apart from 'picture archive communication system.' This helps the doctors away from the hospital to see the clinical images to give their suggestions.⁶

Tata Consultancy Services (TCS) is implementing the Tamil nadu government's uniform health information system project. The project is funded as part of the World Bank's Tamil nadu Health Systems Project (TNHSP). The bank has advanced \$228.53 million. The loan repayment starts in 2015. The project entails linking up all the 272 hospitals, 1600 primary care hospitals and 40 tertiary care centres. The networking of all the hospitals is now expected to be completed by June this year. Already 220 hospitals have been networked.

TNHSP will assist in fulfilling the aims of the health policy through the following interventions:-

1. Increased access of health services for poor, disadvantaged and tribal groups.
2. Developing effective interventions to address key health challenges
3. Improving health outcomes and quality of service by strengthening management of the public sector health systems and by involving the non-governmental sector.
4. Increasing the effectiveness and efficiency of the public sector hospital services at the district and sub-district levels.

The TNHSP is structured in the following themes:

Child health

Indigenous people

Health system Performance

Population and Reproductive health

Injuries and Non-communicable diseases.

1.6 PICME: Software to monitor women during Pregnancy

Pregnancy is both an important and challenging period in a woman's life. As majority of the women in the country, especially in Tamil nadu, are both illiterate and economically backward, it has been very difficult to follow-up the health condition of them during their pregnancy. As the mortality rate during pregnancy is still threatening, the Government of Tamil nadu has taken strong measures to address the problem. As usual, technology comes to rescue the people.

The Directorate of public health has advised the use of the 'Pregnancy Infant COHORT Monitoring Evaluation (PICME) software for all staff in all Primary Health Centres (PHC) all over the state. This software is evaluated to keep tabs on the mother throughout her ante-natal period and the child until he becomes one year old. When it is carried out for a year, there is a better guarantee for the health of both the mother and the child. When it was introduced, the government believed that if the mother gets all the required check-ups monthly during the pregnancy period, safer deliveries and healthy children will be the result of it.

1.7 Drawbacks in Maintaining Health cards

Generally the cultural practice in the state is that pregnant women go to their mother's house for delivery of the child. Sometimes, they have to go to their husband's house for certain reasons. When they move here and there, they go to different PHCs and also there is a possibility of forgetting their health cards to carry with them. Since the card contains all the health information regarding their pregnancy state and treatment, the follow-up becomes difficult when they forget the cards. If the pregnant women are inconsistent in check-up, they go to high risk category and their delivery of the child is also at risk. Not only that, the life of the mother is also under risk.

1.8 Advantages of PICME

It is difficult to retrieve manually maintained health cards in a PHC if there is no computer assistance in it.⁷ Instead of the health card, PICME software is used. It will generate a unique number for every pregnant women/mother that is registered at any PHC that the women wants to go to. Once called up, it will generate all the information about pregnant women/mother like weight, scan results, nutrition details and the medicine date. After the birth of the child, the weight of the child, height and immunization details will also be recorded. When everything is digitally managed, there is no space for missing the date and so the mortality rate is decreasing due to proper treatment and follow-up medicines. In addition to PICME facility, health cards are also issued to them and then duplicate will be kept in all the PHCs.

All PHCs have computers with internet connectivity and if there is any connectivity problem, those centres are advised to get data cards for providing service without any interruption. Since this PICME software is web-based it is advised so. Another benefit is that, it will avoid crowd for bulk registration by patients at PHCs. Previously every PHCs had to maintain many registers for entering names and details of

patients. The nurses had to correlate information of each and every pregnant women or child. Due to PICME, this number has reduced. The phone numbers of the pregnant women are also stored (or close family members) by PICME and generate text messages to inform them about the dates of visit to the PHC, ultra sound scan and immunization details. This has helped the work process to become easy, speedy data flow and comfortable management of the programme or project.

The Tamil nadu government decided to stop the tragic incidents of death among pregnant women and wanted to assure safety to them. To bring down the maternal mobility rate, the government introduced a database for them in both rural and urban areas. PICME is the system in establishing the technological assistance to the pregnant women and the child they deliver. Tata Consultancy Services (TCS) is undertaking to implement the Tamil nadu government's uniform health information system project (TNHSP). World bank has also helped the government by releasing \$228.53 million to complete the project successfully. The progress of electronic database maintenance of hospital records is understood from World Bank sponsored building in Madurai district. The repayment by the government also starts in the year 2015. At present, the project is linking up 272 hospitals, 1600 PHCs and 40 tertiary care centres. June 2015 is fixed as the target to complete the interlinking of all these centres. It is reported by TCS officials working on the site that many of the hospitals are now interlinked, nearly 220 hospitals. The need to implement the project in Madurai district in Tamil nadu is very urgent because from the last year till date, nearly 100 pregnant women have lost their lives so far during their pregnancy and delivery of a child. It is first introduced in government hospitals in the state because about 75 percent of the child deliveries are happening in government hospitals.



(Urban city nurses are given training on using laptops in June 2014)





Using the PICME Id number, the nurses will visit each of the pregnant women five times during their pregnancy. They can approach any government hospitals for this purpose. The health history and status of them are accessible at all government hospitals because their number will serve as an identification code. She is tracked for her haemoglobin, ultra sound, HIV and foetal movements. When the expected date of

delivery comes nearer, the health staff becomes alert and in turn they alert the future mother also.

A nurse from Narimedu Urban Health Post was happy about Madurai Corporation providing laptops to maintain the records of the Patients' health status. Previously this job was a time-consuming and tedious one. Now she says, "Earlier, we had to maintain nearly 15 registers containing the health chart of each pregnant woman in the ward we visit and preserve them over a period of a year or two. With laptops being provided to every nurse, the work will be simplified." She was one among the 85 nurses who received laptops from the Mayor of Madurai City.⁸

1.9 Dr.Muthulakshmi Reddy Maternity Benefit Scheme (MRMBS)

Dr. Muthulakshmi Reddy Maternity Benefit Scheme is an important part of TNHSP programme in Tamil nadu. Under this scheme financial assistance of Rs.12000 is given in 3 instalments to women from poor families in order to compensate the wage loss during pregnancy, to get nutritious food and to avoid low birth weight babies. The software helps to monitor disbursement of each instalment of the scheme and check eligibility criteria with PICME database.

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Dr.Muthulakshmi Reddy Scheme Application Form

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The effectiveness of this scheme in rural Madurai district of Tamil nadu was studied by some researchers in 2012. It showed that this scheme was successful in fulfilling the aim of the government of Tamil nadu. The study proved that most of the mothers were benefited (39%) for their first child. The majority of the benefited mothers (46%) were in the age group of 19-25 years and the mothers who were living as joint family benefited more (46%) than nuclear family mothers (17%). Most of the benefited mothers delivered normal weight babies due to regular ANC visits.⁹

Very recently, a new app by name '*Mobydoctor*' has been developed by Devatech Info Systems Private Limited, a Chennai-based IT company. The app helps the doctors for an easy access to information of patients, prescriptions, lab reports, clinical information, case notes and more through their mobile phones. An automatically generated login pin number helps both the doctor and the patient to view their medical records personally. The app is now available for Android and Windows in a global platform with the facility to

operate in multiple languages.¹⁰ If this app is linked to PICME and MRMBBS implementation for the welfare of pregnant women and their babies, the reach and success of the project TNHSP will be overwhelming and more popular.

2.0 Conclusion

As time passes by, both the government and the people become very conscious about their health and the ways of being informed about their treatment and cure. In addition to the project TNHSP, the government of Tamil nadu continues to introduce maximum use of technology to ensure patients getting technology and healthcare under one roof. The medical history of a patient is now not transparent and at the same time it is electronically managed. Deleting the previous details and adding additional information on the treatment of a patient has become a realized dream. Because of the ICT application in healthcare sector, the expertise of the medical practitioners can attend the people in a better way. Implementation of the two softwares PICME and MRMBBS as part of the project TNHSP to safeguard the pregnant women and their babies stand as an example for such remarkable effort in ICT applications in healthcare sector.

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