Telemedicine Programme in Rural Health Care System of India

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ABSTRACT *The Indian sub-continent has a diversified landmass and huge population size. There are 70% of people living in rural and tribal areas with minimum health care facilities The health care facilities in rural areas have provided by government and private sectors. The government has provided the facilities based on three tier system i.e. Sub centre, Primary Health Centres and Community Health Centres. The coverage population size of these centers differed to plain and hilly areas. The fastest development and spared of new diseases, population growth, location of the rural and tribal settlements, providing quality treatment to all the people is major challenging task for the government. With the advancement of medical sciences and electronic sciences and computer based internet services, presently the telemedicine programme is one of the great initiatives in the rural health care system. It has good scope in providing medical care to the people living in the rural and tribal areas. The Indian Space Research Organisation has initiated the telemedicine programme. Currently, it is in project mode and run through public and private partnership ventures. Though it is one of the useful initiatives, it has some setbacks from the technology providers as well the community. Therefore this paper discusses the status of the rural health care system in general and role of the telemedicine programme in specific in focus of India.*

Introduction The Indian sub-continent has diversified landmass and huge population. Currently the country has crossed over 1.2 billion population. India is one of the fastest developing countries in Asian region. The development is also included in better quality and standard life style of the people. It has understood through the status of Human Development Index [HDI]. It has indicated from the infant mortality, maternal mortality ratio, life expectancy, birthrate, and malnutrition level etc. In the HDI, India's position is 136th out of 187 countries (2013), it is ranked in medium developing countries. Though there are many reasons for this condition, the disparity and unequal distribution of health care facilities to people is one of the key reasons. This is because the disparity between rural and urban areas, poor and wealthy life condition of the people, government policies and programme on health and welfare of the people, the standard and accessibility of the medical facilities by the people, level of awareness on healthy life style etc.

India's health care activities divided into two major categories i.e. State list and Concurrent list, the public health and hospitals are under the state list and population control, family welfare , medical education, quality control of drugs are under the concurrent list. The Ministry of Health and Family Welfare is the central authority body for health and health care of the people in the country. The rural health care system is based on three tire system i.e. Sub centre, Primary Health Centres (PHCs) and Community Health Centres (CHCs). The coverage population size of these centers differed to plain and hilly/ tribal areas. Both the central and state governments have maintaining the functions of these centers through various health care programmes. The Indian health care system has both challenges and opportunities. Though there are immense developments and innovations are happened in the field of medicine, the affordability and accessibility of specialist treatment are distance dream to major part of the people still, particularly the people living in below poverty line in the rural and tribal landscape. These people have to travel miles together to get the better treat-

ment. At the same time the cost treatment is not afford to them. It is a huge burden to the low income group people. Also due to the geographical location such as terrain mountain regions in the northeast, deserts of the northwest, and the off-shore islands of Andaman and Lakshadweep the in-hospital healthcare is difficult in India. However with the advancement of medical sciences and electronic sciences, the telemedicine programme is one of the landmark initiatives in the health care system and it will be solving many problems in the rural health care system. In India, the Indian Space Research Organisation (ISRO) has initiated the telemedicine programme. Currently it is in project mode and run by many of public and private partnership ventures. It has some setbacks in the technology providers' side as well the end user side. Therefore this paper discusses the status of the rural health care system in general and role of the telemedicine programme in specific in focus of India.

Rural Health Care System in India
The rural health care system is one of the well-structured systems in India. The rural community is practicing both traditional such as Sidda, Unani, Homeopathy and Ayyurveda and modern (Allopathic) way of health care system. Even the government hospitals also have the separate section and separate hospital for these traditional system. The public health system of rural India had been existed since 1946 (Bhore committee) and strengthened after the Alma Ata declaration in 1978 and plays a dominant role in healthcare delivery system. The rural health care system of India has structured by three levels such as Sub centre, primary health centres and community health centres. These centres are focused preventive, curative and rehabilitative method of health care.

Structure of Rural health care System in India
Sub-Centres (SCs)
The Sub-Centre is the first contact point between the primary healthcare centres and the community. Each

Sub-Centre is maintained by one Auxiliary Nurse Mid-wife (ANM) and one Male Health Worker/ MPW(M). One Lady Health Worker (LHV) is assigned to supervise six Sub-Centres. The Sub-centres are assigned tasks relating to interpersonal communication in order to bring about behavioral change and provide services in relation to maternal and child health, family welfare, nutrition, immunization, diarrhea control and control of communicable diseases. Also the Sub-Centres are provided with basic drugs for minor ailments needed for taking care of essential health needs of the rural people. The Ministry of Health & Family Welfare is providing 100% Central assistance to all the Sub-Centres in the country, since April 2002 in the form of salary of ANMs and LHVs, rent at the rate of Rs. 3000/- per annum and contingency at the rate of Rs. 3200/- per annum, in addition to drugs and equipment kits. There are 148366 Sub Centres functioning in the country as on March 2012.

Primary Health Centres (PHCs)
The PHCs are the first contact spots between village community and the Medical Officer. The PHCs are provided curative and preventive health care and Family Welfare Services to the rural population. The PHCs are established and maintained by the State Governments under the Minimum Needs Programme (MNP)/ Basic Minimum Services Programme (BMS). Currently a PHC is managed by a Medical Officer supported by 14 para-medical and other staff. It acts as a referral unit for 6 Sub Centres. It has 4 - 6 beds for patients. There are 24049 PHCs are functioning as on March 2012 in the country.

Community Health Centres (CHCs)
The CHCs are being set-up and maintained by the State Government under MNP/BMS programme. It is operated by four medical specialists i.e. Surgeon, Physician, Gynecologist and Pediatrician and supported by 21 para-medical and other staff. It has 30 in-door beds with one OT, X-ray unit, Labour Room and Laboratory facilities. It serves as a referral centre for 4 PHCs and also provides facilities for obstetric care and specialist consultations. As on March, 2012, there are 4833 CHCs functioning in the country.

Challenges in Providing Health care Facilities
India is a geographically divided and diversified populated country. Therefore to provide equal and better medical care to every citizen of India is a major challenging task. However the government have succeeded in controlling and eradicated some of the major diseases like Polio, Leprosy, small box, etc., Nevertheless, these are not an indicators for the success level of the health care facilities in India. The majority population of the country are facing many of the challenges and struggles such as infrastructure facilities including the manpower in the hospitals, approach road and transportation facilities, the people's own cultural and traditional way of medical practices, economic imbalance of the people, not affordable treatment cost of poor people and lack of awareness on diseases and treatment and absenteeism of medical practitioners and supportive staff in the hospitals. In India there is only one doctor per 1,700 citizens. India has 387 medical colleges (181 in government and 206 in private) and it has produced 30,000 doctors, 18,000 specialists, 30,000 AYUSH graduates, 54,000 nurses, 15,000 ANMs and 36,000 pharmacists per year. But this strength of medical personnel is not enough to provide better treatment for the huge population. While the Union Health Ministry figures claim that there are about 6-6.5 lakh doctors available, India would need about 4 lakhs doctors more by 2020 to 50,000 doctors for PHCs; 0.8 lakh for community health centres (CHC); 1.1 lakh for 5,642 sub-centres and another 0.5 lakh for medical college hospitals. According to Medical Council of India survey the 75% of doctors' practise in urban areas and 23% in semi-urban areas. The government takes efforts to place the Doctors in the rural areas but it has not fully implemented and the doctors are refused to work in the rural areas. But India is one of the rural area based countries, its majority of the population living rural areas.

Telemedicine Programme in India
The term telemedicine coined in the 1970s, which literally means "healing at a distance". The telemedicine method of treatment system has introduced in the mid to late 19th century, but its modern form was started in the 1960s in the military and space technology sectors, as well as a few individuals using with available commercial equipment. The major focused areas of telemedicine services are on diagnosis and clinical management. It has offered in the industrialized countries such as the United Kingdom of Great Britain and Northern Ireland, Scandinavia, North America, and Australia. The biometric devices in the telemedicine system have used for measuring and monitoring heart beat rate, blood pressure and blood glucose levels. The telemedicine system has overcame the geographical barriers, and increase access to health care services, particularly for the rural and un-deserved communities in developing countries, those who are traditionally suffering from lack of access to quality health care.

India is one of the vast geographical landscape countries spread over an area of 3 million square kilometres. The population strength is more than 1.2 billion across 29 states and six union territories. Almost 70% of the population resides in rural areas lacking access to medical expertise and infrastructure. The healthcare delivery is difficult in its geographical terrain such as mountain regions in the northeast, deserts of the northwest, and the off-shore islands of Andaman and Lakshadweep. In this background, India is one of the appropriate countries for implementing the telemedicine based healthcare facilities to its rural populations. In this circumstance Government of India such as the Ministry of Information Technology, Science &Technology and Space have been experimented the telemedicine as pilot projects since early 2000, and the successful outcome of these pilot projects, the Ministry of Health and Family Welfare has adopted the telemedicine programme into the National Rural Health Mission an initiative focused on improvement of the rural healthcare delivery system. There are various telemedicine initiatives have been taken up by both government and private sector organizations with central and state funding. The following are some of the examples for such major telemedicine initiatives in rural areas of India: Indian Space Research Organization (ISRO) GRAMSAT, the Apollo Telemedicine Networking Foundation, Village Resource Center (VRC)

Table : 1. Telemedicine Network Implemented in Various States of India

NAME OF THE STATE GOVERNMENT	FUNDING AGENCY	NO. OF TELEMEDICINE NODES	SPECIALTY HOSPITAL
Jammu and Kashmir	ISRO	10 District hospitals	Sher-e-Kashmir Institute of Medical Sciences Hospital, Srinagar
Himachal Pradesh	DIT	14 health centers at district, block, and tehsil headquarters	ASHE Shimla and PGIMER Chandigarh
Punjab	DIT	10 District hospitals	Government medical college and hospital and five polyclinics of the state
Uttaranchal	ISRO	2 District hospitals	SGPGIMS, Lucknow
North Eastern States	DIT	District hospitals were of seven North eastern states	Narayana Hrudayalaya, Bangalore
Jharkhand	ISRO	10 District hospitals	3 Medical colleges & hospitals
West Bengal	ISRO	10 District hospitals	School of Tropical Medicine, NRS Medical College in Hospital, Kolkata, Burdwan Medical College & Hospital, Burdwan
Rajasthan	ISRO	10 District hospitals	4 State medical colleges
Chhattisgarh	ISRO	Two of medical colleges	Government medical colleges at Raipur & Bilaspur that further link to premier hospitals of the country
Tripura	ISRO, C-DAC	4 District Hospitals	1 Medical colleges that further linked with SGPGIMS
Karnataka	ISRO	2K District hospitals	Narayana Hrudayalaya, Bangalore
Tamilnadu	ISRO	6 District hospitals	Government Stanley Hospital, Rajamuthiah Hospital, Adiyar Cancer Center-all at Chennai
Kerala	ISRO, C-DAC	14 District hospitals and two Taluk hospitals	AIIMS, New Delhi, Jammu institute of Medical Sciences (RAIO), Kochi, and Sri Chithira Tirunal Institute of Medical Science and Technology, Thiruvananthapuram

ISRO, Indian Space Research Organization; DIT, Department of Information Technology; PGIMER, Post Graduate Institute of Medical Sciences; SGPGIMS, Sanjay Gbandi Postgraduate Institute of Medical Sciences.

Source : TELEMEDICINE and e-HEALTH, 2009, p 570

The Challenges ahead in the Telemedicine programme
The traditional method of treatment gives an emotional relationship between the patient and the doctors. The patients wanted to touch their body by doctors and speak with them personally during the treatment for their illness. Therefore the implementation of telemedicine in the rural is difficult task for the service providers of the telemedicine programme. In addition it has closely associated with attitude and behavior of the rural people.

The basic literacy and ICT based literacy are other setbacks for the implementation of the telemedicine programme in the rural community.

The legal issues related to problems of the telemedicine is not properly taken care by the government as well as the private service providers. The governments are not implemented the appropriate policies for the telemedicine programmes.

The privacy of the patient and maintaining confidentiality on the diseases are major significant process in the method of treatment, but in the telemedicine programme following two are unable to sustain properly.

Lack of emotional and moral support from the doctors during the process of treatment.

Lack of infrastructural facilities like electric power backup, quality instruments, internet connectivity and location of the places

Lack of availability of the man power such as Doctors and the services providers and the relationship between the local kiosk/ information centers/ common services centers operators and rural people.

Practice of the traditional knowledge in health care by the rural community

A shortage of studies and documentations work on economic benefits and cost-effectiveness of telemedicine applications.

Lack of effective support from government such as policy for implementation of the telemedicine programme.

Suggestions:
The followings are some significant suggestions for the effective implementation and further functions of the tel-

emedicine programme in the rural areas in India

Taping traditional health care practices of the rural community with telemedicine programme.

Create connectivity between the rural kiosks, sub centers, primary health centres, community health centers and district level hospitals. This system should also include with nearby medical college hospitals and eminent doctors in the local areas.

Create better professional and personal relationship between the people, grassroots service providers and technocrats. It will help understand the real ground status.

The public and private stakeholders of the telemedicine programme should be ensure the infrastructural facilities of the telemedicine centers

* To create separate policy for implementing the telemedicine programme. It should give legal support to this programme
* To create awareness on telemedicine programme to the rural people. It will help to reduce the unnecessary emotional and ethical doubts of this programme
* To motivate the scientific and academic community to do the research studies on the telemedicine programme

Conclusion
The invention of technologies and implementation in the community and further obtaining the benefits of technologies by the grassroots beneficiaries are interlinked process in the community development process. This process has to perform appropriately, otherwise there will a major setback in the real and fundamental concept of the technologies. This could be applicable to the telemedicine programme also, this is because it has closely associated with health related sentiment of the people. Therefore before implementation of this kinds of programme in the community the technocrats and the service providers create awareness and solved the technological related doubts to the people. It would be a success formula for people oriented technological programme implementation in the community.

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