

Leveraging Information and Communication Technologies (ICT) for Quality Health Care of a Nation

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Abstract

The paper aims at reviewing the relevance of Information and Communication Technologies (ICT) in saving the lives of people and thereby improving the health scenario of a nation. It will also reveal the intertwining of Socio-Economic factors, ICT and Public Health. Telemedicine, which refers to treatment of patients from a distance by making use of video conferencing and exchange of medical reports via ICT, are proven to be cost effective, time saving and life-saving device for the Quality Health Care of people. Telemedicine is of tremendous importance in a world, where scarcity of health care workers and increasing demands on the health care system persists. Telemedicine project, which has been undertaken by Narayana Hrudayalaya Health City, Bengaluru, Karnataka, and such other super speciality hospitals from India, can be viable models for improving the health scenario of the people. Karnataka Telemedicine Project as being implemented by Super Speciality Hospitals like Narayana Hrudayalaya Health City and Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata which is a branch of Narayana Hrudyalaya are providing quality health care to the people of rural, remote and other areas through telemedicine links with the Government hospitals of rural and remote areas. It is the best model of Public Private Partnership (PPP) in Health Care. Thus, sustainability of Health is possible by leveraging ICT in Health. Quality Health Care for all can be made a reality by making use of ICT in Public Health.

Keywords

ICT, PPP, Sustainability, Video Conferencing, Telemedicine, Remote Areas

I. Introduction

Information Technology (IT) and Information and Communication Technologies (ICT) revolution are the new phenomenon, which is having deep impacts in several fields all over the world. Sociologists in the post-modern era have not yet deeply probed into the Sociological aspects of ICT. In the 21st century, the usage of ICT and its effects have deep social implications. It is pertinent to note that the social factors are inter-twined in the working of ICT and it has deep impacts in Public Health. Thus, ICT can be best utilised in providing quality health care to the people of rural and remote areas, wherein quality health care services are not available.

India is the second most populous country of the world and stands next to China in its population. Various growth oriented policies have been undertaken by the Government, still there are socio economic and regional disparities in India. India also experiences health disparities in the rural and urban areas.

Urban areas have an excellent health care systems and experienced Doctors and Nurses. They are mainly concentrated in urban areas, where 27% of the population live. The majority i.e. 73% of the total population, who live in rural areas are not having access to good health infrastructure and doctors.

India has changing socio-political demographic and morbidity patterns that are drawing global attention in recent years. Despite several growth oriented policies adopted by the Government, widening economic, regional and gender disparities are posing challenges for the health infrastructure, medical man power and other health conditions. The current health scenario in India is a story of deprivation and malnutrition. Many poor people in India cannot get treatment for their various health problems, thus health problem in India cannot be considered as a real health problem, but socio - economic problem and problem of unawareness and ignorance. People are illiterate and unaware of many basic health care tips due to their poverty and illiteracy. According to the report of the Registrar General of India (2003), rural areas reported more deaths due to communicable, maternal, prenatal and nutritional conditions, which accounted to about 41%. The Urban areas have a lower number of deaths from communicable, maternal, prenatal, and nutritional conditions, but a higher proportion from non-communicable diseases (56%). Crude Death Rate is 7.4 (year 2008).

The CIA (Central Intelligence Agency) World Fact book, January 2011 report shows that the life expectancy of India was 69.89 in the year 2009. However, the life expectancy has come down to 66.8 as per 2011. For Males the life expectancy is 65.77 years and for females it is 67.95 years as per 2011.

According to a study conducted by Sustainable Development Goals (SDG) health performance published in Journal Lancet, September 2016, which was released at a special event at the UN General Assembly in New York revealed that India ranked 143rd out of 188. Despite rapid economic growth, India was ranked 143rd below Comoros and Ghana. This is a matter of great concern today. Compared to many developed countries like Japan, USA, the life expectancy of an average Indian is much low as compared to the life expectancy of an individual in the developed countries.

As the health care facilities are less in rural areas than in urban areas, there is a rural urban health divide and also health divide within the urban area among the rich and the poor. Such a kind of rural urban health divide is a matter of great concern today. Health expenditure both in terms of percentage of Gross Domestic Product (GDP) spent on health and per capita health expenditure is much higher in the developed countries. The share of GDP spent on health ranges from as low as 1.6 per cent in Azerbaijan to 13.9 per cent in the U.S. Similarly, there is a very wide variation of per capita health expenditure across countries, which is typically extremely low in developing countries compared with most of the developed countries. The range in 2001 was from \$14 in Ethiopia to \$44877 in the U.S. Although health is wealth, if the working force and the labour are healthy, the work efficiency will improve and wealth can also be multiplied. Similarly if the work force and the labour are unhealthy, the efficiency would deteriorate and a day's work lost is a big loss of income for the individual and also for the nation. Thus the health services in India have to be improved. The Public Health Department has to provide equitable

distribution of health to all and this will enable us to achieve the health for all as proclaimed by WHO, which India has not achieved much even by 2016 .

Presently we are in the Information Age, which is also known as Post Industrial era. Man always felt a need of information. At different levels of civilization man has a need to attain different information. IT revolution has made possible the flow of information from one person to the other person easily, effectively and most efficiently. The IT revolution has enhanced the flow of information and knowledge in the simplest and quickest form. IT revolution has further led to the use of ICTs (Information and Communication Technologies). ICT has also been used in the field of medicine extensively all over the world. Use of ICT has affected the health scenario of people of different countries in a positive way. Medical knowledge when exchanged by the medical staff and Doctors can improve the health care system. ICT in health can be extended to the downtrodden and weaker section Thus it can be mentioned that use of ICT in health leads to equal accessibility of good healthcare for all the people of the nation.

The use of ICT in health is commonly known as “Telemedicine”. The word telemedicine is derived from two words “Tele”- meaning far and “Medicine” meaning cure for the disease. Thus Telemedicine can be defined as treating the patients from distant place. It is an umbrella term for health services delivered at a distance and more specifically over various telemedicine networks.

Telemedicine, which is also commonly known as Tele-Health programmes are a real life boon for human development and quality of life of the people. In a situation, wherein a majority of the Indian population lives in villages in their helplessness, ignorance and poor life conditions, it is very difficult to have more number of good hospitals because of the lack of infrastructure and cost factor. Even if there will be few hospitals, it is very difficult to get good Doctors and Nurses because many will not be ready to accept the jobs in villages. In such a situation it is advisable to make use of telemedicine in rural and remote areas. Telemedicine when used in rural and remote areas of Karnataka, have been very effective and efficient in improving the quality of life of people. They are found to be cost effective, simple to be used and efficient. They also bring the patients of rural areas closer to the doctors of urban hospitals. This kind of health care service provides greater level of satisfaction among the poor, rural patients. This also helps the old people and the children to avoid unnecessary referrals and travels. The patients do not have to waste their time, energy and money in meeting different Doctors to get treatment. Telemedicine are highly useful for the people of rural, remote and hilly regions of India.

Thus telemedicine play a key role in changing the health scenario of the country. The Government can play a leading role of improving the health by working with private hospitals. Such kinds of developmental activities in the field of health can reduce death rate occurring due to various chronic health problems. Telemedicine can provide medical literacy to Doctors and nurses. It can also help the paramedical staff to work together with the medical staff. Thus Karnataka Telemedicine with the practice of PPP and the provision of Health Insurances like Yeshaswini can be the best model of health care in India. It has been observed that Public Health Programme of India could not yield the desired result due to many reasons. But use of ICT in health has good potential. Telemedicine will certainly improve the health scenario of India and create good health for all the people of the nation.

II. Functions of Telemedicine

The research reveal that telemedicine has been proven to be beneficial for the individual, community, society, nation and world at large.

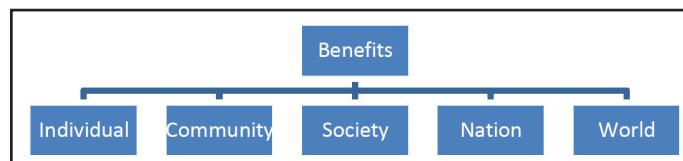


Fig. 1: Functions of Telemedicine

Health is wealth is a commonly known fact. The wealth of the nation depends on the human working force. Human Resource Development refers to the development of the human labour. Healthy labour is more productive. An efficient work depends upon the health of the workers. Earlier research works show that a day lost due to sickness is a big loss for the individual and also a loss to the nation. A nation can grow only if its population is healthy. Thus a healthy worker is an asset to the nation. Telemedicine has been proven to be most beneficial for the individual and also for the nation. Some of its impacts are as follows:

A. Benefits of Telemedicine

Telemedicine helps the patients in tremendous ways. Some of the benefits are-

1. Saves Time

With the help of telemedicine, the patients do not have to waste their time in travelling to reach the super speciality health experts. The patients are admitted in District Government hospitals or the Taluka level hospitals wherever there is a telemedicine facility. The patients, who were admitted in the Government hospitals had chronic health problems. All were cardiac patients. It has been observed that 78 per cent of the patients said that telemedicine saved their time. They also admitted that at the time of emergency they did not have to travel long distance to reach the super speciality hospital. They got the right diagnosis at the right time.

2. Saves Money

Telemedicine certainly helped in saving money. In the case of chronic health problems like cardiac or cancer, a patient who is wealthy can afford a cardiologist or oncologist from super speciality hospitals. But a poor person, who cannot afford even 2 meals a day, cannot afford a cardiac surgery or any other kind of costly cardiac care. A poor patient has to suffer from both the corners, one from his economic helplessness and other is from the health problem. In many cases the poor may not disclose about their health problems to even their family members. Out of their financial insecurity and fear, they may think that death is better for them. It was observed that 81 per cent of patients felt telemedicine is cost effective. It was also observed that many patients belonged to farmer category, who were not well off. Even they said that they got benefits of its cost.

3. Provides Care

Telemedicine consultations provide care. About 65 percent of patients agreed that telemedicine provided care. Observation of telemedicine consultation and the interviews with the patients revealed that patients got admitted in village hospitals due to cardiac arrest, they were in serious condition at the time of hospitalisation, their life was at danger and was put on ventilators.

Next day it was observed that the patient was well stabilised and he could even respond in the interview. The Government hospitals made use of thrombosis, which is an emergency care for the cardiac problem of the patient. It was further observed that patients' lives were saved by providing timely emergency medical care and treatment.

4. Gives Relief from the Disease

Telemedicine has given a relief to the patients from the diseases. While interviewing it was noted that many patients had an old history of cardiac disease. Almost all the patients suffered from cardiac problems from two to three years. About 64.58 per cent of the patients said that telemedicine is a solution for their health problems. It is also understood that many patients used ICT in health to get relief from the health problem. About 61.46 per cent said that they made use of telephone to solve their health problems. About 26 out of 98 patients also made use of computer to solve their health problems. It was interesting to note that even though the computer users formed a very small proportion of research analysis but the size was quite notable as the survey was conducted in five villages of Karnataka namely Chitradurga, Chamarajanagara, Udupi, Davangere and Kundapur. It was also interesting to note that even in villages also some proportion of the total population made use of computers to get relief from their health problems even in the absence of good infrastructure in the villages.

5. Patients feel close to the Doctor

India is dominated by caste consideration. There are many people who have a feeling of inferiority complex and guilt etc. People who belong to low caste and lower economic strata usually have such feelings. Such a kind of fear and stigma is not felt when patients make use of telemedicine for their treatment. In fact telemedicine make them feel that they are not going to be physically examined by the Doctors which in turn gave them a confidence to face the Doctors boldly. This in turn helped them to feel closer to the doctor. The patients also know that the Doctors who are treating are far away and are famous and experienced. When they see the Doctors on monitor they develop a respect for these Doctors. The patients also feel as being considered and recognised by the distant but city's most popular Doctor. This made them feel close to the Doctor. When asked whether they felt close to the tele consultant, majority of them said yes.

The following Table 1 shows the response of patients in connection with their feeling of closeness to the Tele consultant.

Table 1: Feeling of Closeness with the Distant Doctor

Response	Frequency	Percentage
Yes	70	72.9
No	20	20.9
No response	6	6.2
Total	96	100

The above Table show that 72.9 per cent felt close to the Doctor even though they were at distant city. Only 20.90 per cent said that they did not feel close. The patients who felt close said that they had high respect for the Doctors; according to them they were very smart and capable of handling things. The patients who did not feel close were able to communicate with their Doctors through video conferencing only once in a while. Rest of the time

their ECGs and other medical reports were exchanged with the distant Doctors. 6.20 per cent did not respond to this question as they were illiterate and had language problems. However it has been noted that a video conferencing with the city doctors helped in developing a rapport with the patient. The patients expressed that they were interested in seeing the doctor on monitor. Thus video conferencing had given them a special satisfaction and made them feel close to doctor. The level of closeness of the patients with the telemedicine Doctor has also been represented in fig. 2 as given below.

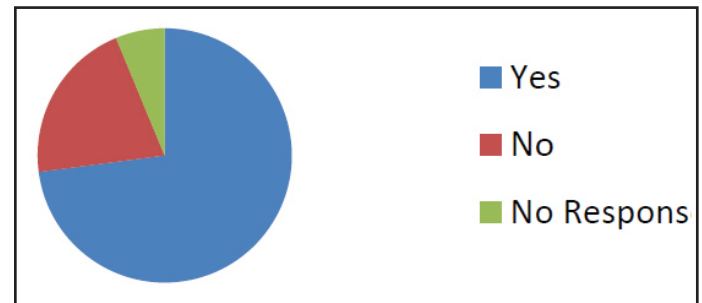


Fig. 2: Feeling of Closeness of Patients with Doctors

Fig. 2 reveals that majority of the patients felt close to the Doctor.

6. Reduces the Social Stigma/Fear

Telemedicine has also been used by low caste. 18.93 per cent of the patients belonged to the low caste. All the patients in the interview mentioned that they were very much satisfied with such a kind of consultation. They never complained of any kind of indifferent treatment by the doctors. This helped them to reduce any kind of fear. This also removed the experiences of social stigma attached with the caste. In telemedicine Doctors do not have to touch and physically examine the patients, it treats the patients through video conferencing or by any other means. The patients do not have to undergo through any sort of fear of physically being examined by the Doctors.

Patients attacked by HIV/AIDS are again under the social stigma. They have a fear that nobody would touch them as the disease is contagious. Thus they may suffer their health problems silently. Various studies reveal that telemedicine has certainly helped such patients. Many telemedicine projects undertaken on the patients of AIDS have been quite successful and beneficial for the patients.

7. The Patients can avoid Unnecessary Referrals

In the absence of telemedicine, in many cases the patients try out various Doctors because the root cause of the problem is not known. He keeps on trying the treatment of different Doctors and goes through various tests. The whole process of medical examination, tests and unnecessary referrals put the patients in trouble. They waste time, money and energy. Telemedicine helps the patient in providing a quick diagnosis of the health problem. This diagnosis is quite reliable and of best quality. Once the patients are given the right diagnosis and at right time, they do not have to go to other Doctors for the referrals.

Almost all the patients said that they got quality advice from the super speciality Doctors. Almost all the Doctors in their interview also said that the patients do not have to try out various Doctors to get a quality treatment. Even all telemedicine technicians expressed the same view.

8. Enables Free Expression of their Health Problems

Video conferencing which is an important technique and has been used in telemedicine certainly helped the patients to express their health problems more freely as they knew very well that their openness will help the Doctor to understand the case thoroughly. As the patients were having regular discussions with the telemedicine Doctors, a rapport was developed which in turn encouraged the patients to express themselves freely. This has made telemedicine a great success. It has been observed that 56.25 per cent of the patients expressed themselves with the Doctor freely to large extent. 31.25 per cent said that they could express themselves to some extent with the telemedicine consultant.

9. Telemedicine Reduced Level of Irritation

The patients preferred this kind of treatment because they said as they were not physically examined again and again by doctor and they were not touched by the nurses they did not have to go through the unnecessary pains. It could be noted that the patients certainly go through some level of discomforts due to the intravenous, injections etc. But in telemedicine the doctors do not have to touch the body of the patients unnecessarily to physically examine. In the old age there is physical deterioration, patients feel weak especially at the time of sickness. Unnecessary medical interventions disturb and cause more irritation. They also put them in an embarrassing situation. There are some people, who are very particular about their body. They do not like anyone to touch them. This has been specially observed during the time of sickness when the patient is physically weak, he does not like to be touched by anybody, he gets irritated and therefore patients have mentioned that Telemedicine is good as they are not troubled by anybody's touch.

10. Help the Patients in the Treatment of Chronic Health Problems

Telemedicine has certainly helped the patients suffering from chronic health problems like cardiac, cancer and AIDS etc. In all these cases quick diagnosis is very essential and telemedicine helps in quick diagnosis at right time. Study show that almost all the patients were serious cardiac patients who were in the age group of 51-90 years. At the age of 71 the patient had undergone a cardiac surgery and he was coming for regular follow ups through telemedicine even at the age of 81. Interview with the patients show that telemedicine has saved their lives.

11. Telemedicine Helps the Patients of Remote and Rural Areas where Medical Experts are not Available

India is characterised by regional disparities. It consists of rural as well as urban areas. Urban areas have quality health care infrastructure whereas rural and the remote areas of India are characterised by low quality of health care. The study was conducted in the rural and remote areas which were approximately 280 kilometres away from cities. In the rural and remote areas there are no clinics or private practitioners. Even if there are a few, they are costly. Telemedicine has certainly encouraged the District hospitals to take up patients suffering from chronic health problems. The Cardiac Care Units (CCUs) of the government hospitals at rural areas saved the lives of many people.

12. Simple in Usage

Telemedicine consultations have been found to be simple. About 70 per cent of the patients considered telemedicine to be simple in its usage. Only 30 per cent of the patients did not respond to this question but almost all the patients were satisfied with this

kind of treatment.

13. Helps in Medical literacy and E - Nursing

The Doctors from the city super specialty hospitals teach the nurses to take care of their patients in rural hospitals or other hospitals through video conferencing. They are also provided with quality trainings through video conferencing. Many times lectures by eminent doctors and professors are conducted. Telemedicine also enables medical literacy and health awareness in rural areas. Heart operations have been conducted at a distance of 2000 kms .

B. Benefit of Telemedicine for Doctors, Telemedicine Technicians, Society, Nation and World Level

New technology requires to be studied in respect to its benefits at different levels. It can be stated that telemedicine is useful for doctors, telemedicine technicians , society and world at large. It has been noted that Doctors who are just MBBs have become bold and confident by treating the patients with the help of medical advice given from super speciality hospitals. Telemedicine enables clearing of doubts and open discussions among many medical and paramedical staff. The telemedicine Technician ained knowledge, expertise and earn more. The hospital devoted sometime in the research and development in IT department, therefore became more competitive and professional. Use of telemedicine has encouraged Public Private Partnership. The research findings show that almost all the Doctors, technicians and directors of health have accepted that telemedicine project can be undertaken as a Public Health care Programme in developing as well as developed countries. It is essential for country and nation's growth and development.

III. Emergence of New Medical Culture and Ethics

Medical ethics and charisma also play a dominant role in health. As the telemedicine consultant had a great level of charisma, dedication and professional ethics, patients were satisfied with the distant city doctor and the junior doctors also responded in the same way. The rural hospital doctors respected the doctors from superspecialty and this mutual trust made them to work in a healthy atmosphere. The doctors from District level Government hospitals started caring for people's health. They serve the underprivileged and become socially committed. Thus new medical culture with a principle of ethics, professionalism and dedication I certainly bring about health development which in turn brings about community and national development.

IV. Conclusion

To conclude, it can be stated that telemedicine consultations can be certainly implemented as " A Public Health Programme". Karnataka telemedicine project can be a best model of a Public Health Programme, wherein ICTs can be best utilised for improving the health of the people of a nation. Telemedicine also have a very wide social implications. Health is a basic human right of all individual. Each citizen has a right to equal access of quality health care. Quality health care should reach every corner of a nation with the help of ICT. ICT in health is a boon and can certainly help in providing quality health care for all.

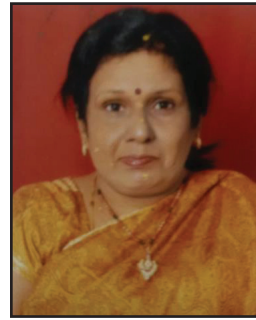
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Dr. Sujata Warriar has been working as Associate Professor in the Department of Sociology and Head of Department of Foundation Course since last 28 years. She has been involved with research activities in the subject of Sociology. Her Doctoral Work on "Social Implications and Functions of ICT in Public Health has been a pioneering work in Telemedicine. She has authored a number of books. She has presented a number of papers in various conferences at national and International level