

## **Cost Effective Tele-Ophthalmology with Special Reference to Telemedicine in Rural Areas**

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**Abstract:-** This paper describes an overview of telemedicine applications in ophthalmology and at the same time to provide background information on new tele-ophthalmological applications and the use of tele-Ophthalmology. Few urban areas for their population, no access/ very less access to tertiary eye care. In order to make eye care services accessible to every one, the concept called "Teleophthalmology" has come into existence. Tele-Ophthalmology facility is taken to rural or remote areas by using computers, video conferencing and Internet. Tele ophthalmology enables a doctor from one end to interact with the patients sitting at a remote end in a faraway place through video conferencing, share data through computers and diagnose the patient with the help of local doctor who uses ophthalmic diagnostic equipments to transfer the images. This telemedicine paper also describes about the cost effective telemedicine, how is telemedicine applied in Ophthalmology, goals for using telemedicine, benefits of using telemedicine the goals of telemedicine achieved for diabetes.

**Keywords:-** Clinical trial, diagnosis, Telemedicine, ophthalmology, Vision centers/ community centre,

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### **I. INTRODUCTION**

Telemedicine is the integration of electronic information and medical technology. It delivers information in the form of voice, data, video and imagery. It transfers the medical information's connected by telephone, Internet or other networks and carrying out the necessary outputs, which will be benefited to the rural, and urban area people [3] Telemedicine communication will be transferred from base hospital to the vision centers or community center by connecting one computer to another computer. Vision centers provides comprehensive quality eye care to the rural peoples. The broadcast of telemedicine may be one-on-one, one-on many and many- too many.

Telemedicine can be classified into three main types : Remote monitoring ,Interactive services, Store-and-forward

### **II. APPLICATIONS OF TELEMEDICINE**

#### **2.1 SHARING OF MEDICAL RESOURCES VIA LINKING**

In some areas /countries due to the lack of transportation, medical services and money patients will be suffering from diseases even when they can be easily treated. To tackle these types of problems telemedicine network connections established form base hospital to the particular urban or rural areas where patient is residing. Patient will be benefited. To establish these medical delivery, in some hospitals residents can also be trained efficiently. [5],[6]

#### **2.2 MONITORING, DIAGNOSIS OF DISEASE AND MANAGEMENT**

University of Texas took a pilot study in the department of ophthalmology for glaucoma screening. In this study the digital images were taken through canon camera and transferred to the doctor for better opinion and management of exact diagnosis, ophthalmologist will view from the main hospital. Likewise many pilot studies were carried out and gave best results in ophthalmology for diagnosis, treatment and management. [1] Not only glaucoma but diabetic retinopathy, neuro ophthalmology and cataracts can also be diagnosed and managed through telemedicine in the form of taking digital images and transferred to ophthalmologist via connecting of medical devices.

#### **2.3 RESEARCH AND CLINICAL TRIAL USING TELEMEDICINE**

The research and study may be most of the time multicenteric. In Children and aging patients may not be able to come at exact date to the base hospital. They can be reviewed in the vision centers / community

centers which will be nearby to their houses. With telemedicine medical institutions cost will be less. i.e., no need to base the transportation charges and, reviews for patients will save time also. In these cases both patients and researcher will be benefited. The eyes digital image will be transferred through mail using store and forward telemedicine.

#### **2.4 TELEMEDICINE IN CONTINUING EDUCATION AND DISTANCE LEARNING**

Telemedicine also helps in distance learning and continuing education. [4] Expertise from other state or country can also deliver their talk via telemedicine. It may save time and will be a real time communication transfer. Medical information available in one site can be stored digitally on a computer, and transmitted to another location where may be stored again for review. E- Mail is a store and forward system.

#### **2.5 COST EFFECTIVENESS OF TELEMEDICINE**

In telemedicine, telemedicine equipments computers, installation of hardware and software are difficult. Have to maintain separate system and server for transmitting data. Computers should have the maximum configurations like IBM- compatible or Macintosh any suitable system will be needed. It should have a maximum image resolution and speed of transfer, because while sending large images it should not hang. If you have systems with higher configurations we can easily transfer the data's, images via networks. Telemedicine is an effective solution for providing specialty healthcare in the form of improved access and reduced cost of the rural patients and the reduced professing isolation of the rural doctors, ageing populations need more medical case demanding, it can be provided to everybody at a reasonable cost [7], [8] It will reduce time, travels expenses and confirmation of diagnosis's (ie., second opinion) data security is one of the important constrain. Even we can use inexpensive instruments instead of using very expensive instrument.

### **III. BENEFITS OF TELEMEDICINE**

Reduced stress level in patients. Telemedicine improves support for patients and families. Patients can stay in their local communities and, when hospitalised away from home, can keep in contact with family and friends. Telemedicine technology is used in applications like screening, diagnosis and distance learning etc., Can be performed in real-time using store and forward and technology. Patients those who are not able to spent money, there is no accompany while going to the hospital, aged patients will be benefited through this. [2] When compared the cost effectiveness, screening in Vision centers/ community centre visit is benefited instead of going to base hospitals/. Particularly it is widely used in primary care where are distances to a doctor can be significant obstacle to satisfactory diagnosis and treatment. In India exiting new technology like this will help to rural and urban people in the form of quality medical services.

### **IV. TELEMEDICINE LEVELS OF DELIVERY**

Primary care – screening for common diseases -Rural Internet Kiosks, Secondary -vision centers and Mobile screening Units, Tertiary -Real time consultation

#### **4.1 DIFFICULTIES ASSOCIATED IN TREATMENT WHILE IMPLEMENTING**

In case of failure in connectivity infrastructure, such as high-speed telephone wire, system hardware failure will cause problems. For image transferring the number of colours available to each pixel, size of the screen, quality of a monitoring also followed up frequently.

### **V. TELEMEDICINE IN INDIA**

In India there is no national health insurance policy. There is a great disparity while taking treatment for urban and rural peoples. Most of the people are struggling to get a good healthcare. Telemedicine can be subjected to three tier systems like primary healthcare, Govt hospitals and private hospitals. Even though there are very far from a satisfactory level, due to the lack of medical facilities availing in time. Now days through the telemedicine it is easy to access a doctor with low consulting fees, time consuming and cost effective like no need to spent money for travel purpose. Now days in Govt. Hospitals due to the lack of hardware and software facilities not able to connect the telemedicine technology for the patients those who are staying far like rural and or urban areas.

In India Telemedicine technology is getting familiar with healthcare providers. Some places it is adopted as in project mode. It needs trained people and well-equipped technology to implement the application. Data security needs certain amount of knowledge in it and cryptography. [2] It can support real time surgical telemonitoring to teach complex ophthalmologic procedures. As far as the telemedicine ever covers the entire general healthcare, implementation of the quality control also is one constraining. Several studies have been done to assess these issues. A survey conducted by SGPGIMS (UP) tele-follow up programme for the patients

in Orissa revealed that 99 percent patients were satisfied with using telemedicine technology. So clearly a telemedicine consultation can achieve a high satisfaction level with patients if done well.

**VI. LITERATURE SURVEY**

References are drawn from a variety of sources including published articles, non-referred reports. The telemedicine information exchanges website, Internet documents and also published conference reports.

**VII. CONCLUSION**

Telemedicine consultations where a doctor remotely talks to a patient and advises, is usually done using a videoconference connection. The system works very well. The use of newer technologies like telemedicine with software, rather than just a video conferencing link, can lead to increase in the scientific value of the telemedicine consultation and are serving the purpose of making telemedicine consultation more scientific and data based. A recent study in the United States had patients answer a questionnaire at the end of the telemedicine consultation. Eighty five percent of patients felt satisfied with the consultation.

This review paper describes about the patient safety and satisfaction through the efficient and cost effective delivery of telemedicine in rural areas by the clinicians, in education and in the research areas. If it can be implemented in the rural areas such as primary health centers, community center's, it will reduce the manpower and cost effectiveness and above all the new and innovative technologies would reach and educate people easily and effectively to reduce blindness.

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