"RETAIL TELECLINICS" - A LOW COST SCALABLE HEALTHCARE DELIVERY MODEL FOR RURAL INDIA

K Vijaya Shekar Reddy MS (Gen), K Lalitha Reddy MBBS, DGO

Nightingale Hospital, Hyderabad, India

Abstract

Rural India has an acute shortage of doctors whereas urban India is over supplied. Many medical graduates are reluctant to serve in rural areas due to poor civic structures. By adopting technology we planned to strike a balance in this disparity. Our project AWISH is a social enterprise. AWISH in Sanskrit means "to reach" which denotes the mission motto-providing medical consultations in rural areas by utilising telemedicine. We have evolved an efficient, cost-effective, sustainable, scalable healthcare delivery model after pilot project, "AWISH retail teleclinics". We have identified, recruited and trained the pharmacy owners in rural areas who provide a 4ftx4ft space in their pharmacy for a teleclinic facility. The Teleclinic is equipped with a computer, LED TV, printer, broadband Internet, pulseoxymeter, glucometer, digital thermometer and BP apparatus. Special videoconferencing software which works on 256KBPS bandwidth is provided. The pharmacist is trained to use the equipment and the approximate cost to the pharmacist for the equipment is around US$1,000. Free consultations are provided for three months and the telemedicine GP runs free medical camps weekly for three months. This familiarises the doctor with the patients, and also increased pharmacy revenue. Medical consultations were provided by our parent institute-Nightingale Multi-specialty Hospital where a dedicated telemedicine wing has been setup. For all patients general consultations are provided. Specialist consultations are provided when required. Currently we are operating 10 Teleclinics and planning to scale up to 100 in a year. All the pharmacy owners have recovered their investment. Present average footfalls are 20 per day in each centre. Our audit results on the project's social and financial impact are promising. For a developing country with poor primary healthcare in rural areas the only resort is dependency on quacks which many a times proves to be problematic to the uneducated population. Our model has proved to be an economical and effective solution.

Keywords: Telemedicine; Telehealth; eHealth

Introduction

Healthcare in India, a developing third world country, has advanced significantly. Tertiary care provided in this country is on par with any developed country. But on the other side rural India is lagging in delivering healthcare to its population.[1] Even primary healthcare is a distant reality for them. The government is trying its best to establish a good primary healthcare network but in vain.[2,3] The reasons for this failure are: poor civic facilities in rural areas which discourage qualified medical professionals from working in these areas; inefficient utilisation of the publicly funded primary healthcare network; and due to poverty, people are not opting for the benefits of modern medicine.

Presently there are few qualified healthcare personnel in rural India. For most of the common ailments like fever or gastroenteritis, people depend on traditional remedies or the quacks who call themselves registered medical practitioners.[4] The medical knowledge of these quacks is very limited. The treatments they provide may push the patients into dangerous situations. Urban India has a surplus of doctors who are sub optimally employed due to their reluctance to move to rural areas. Our aim was to utilise urban doctors to reach the underserved rural patients through telemedicine. We have combined telemedicine with proven retail clinic concept.

The concept of providing medical advice to the underserved areas by telemedicine is picking up all over the world. In India, major players like Apollo Hospitals and Care Hospitals provide telehealth services locally and even trans-continentally.[5] Their

main focus is on tertiary care advice like cardiology, neurology, oncology and tele-radiology. Primary healthcare advice is not on their agenda since it is neither financially viable nor relevant to their facilities. Initially satellite communication technology was used for telemedicine. Presently many rural areas have broadband Internet services provided by public and private telcos.[6] Recent advances in video compression technology allow provision of real time video conferencing at low band width (256 kbs^{-1}).

We have identified the delivery of primary healthcare advice as our primary concern, as this underserved area was on nobody's agenda or seen as a priority.[7] We have decided to make our endeavour a social enterprise. We tried to develop a model which was affordable to the poor rural population and at the same time, sustainable in the long term. As the country is vast, to reach the majority of people we needed to develop a model that was easy to scale up. A pilot project, with an affordable, scalable model was implemented. The project is named "*AAWISH*" which means "*to reach*" in Sanskrit.

AAWISH pilot

A remote rural centre with a population of 5,000 people and a catchment population of another 5,000-6,000 people was selected. This place had one government sub-health centre which was perennially non-functional. Our centre was set up in a space of 500 ft^2, with the following telemedicine equipment, a computer with a camera, scanner-printer, LED TV, headphones, a digital blood pressure apparatus, pulse oxymeter, digital thermometer, ECG machine and clinical lab equipment. A licensed EHR and video software with cloud support, point-to-point dedicated broadband connectivity provided by BSNL is used. The facility has a pharmacy and is staffed by a tele-coordinator, pharmacist, lab-technician, Auxillary Nurse Midwife and cleaning staff. The initial capital expenditure was US$ 11,500 and monthly running costs of US$ 1,200.

The facility consisted of reception, video consultation chamber, pharmacy and a clinical lab. The clinic was open from 10 am to 6 pm. The tele-coordinator received the patient, entered patient details in the EHR and recorded the basic data like pulse rate, SPO$_2$, BP and temperature. The patient was then connected to the tele-hub located at our main hospital-Nightingale Multispeciality Hospital at Hyderabad city. A dedicated tele-consultation centre was opened

at Nightingale Hospital with a GP available during the clinic times. The GP advised the patient regarding treatment. If any basic clinical investigations like Hb concentration, blood sugar, blood urea were required, the lab technician attended to it and provided the reports. Prescribed Medicines were dispensed at the pharmacy. If patient required a speciality consultation, it was arranged with an appropriate specialist. In the first month, as a promotion, free consultations were provided to all patients. The GP visited the clinic weekly on market day and conducted a free medical camp. This was to make the people familiar with the doctor, so that he would be acceptable during a teleconsultation. After six months of promotional support provided to a teleclinic an average attendance of 15 to 20 to people per day, per centre was reached.

Learning from the pilot

After six months a cost and impact audit was conducted of the pilot project and the following points were noted. People needed time to accept the telemedicine concept. The capital expenditure and recurring costs for the project were high and this was not sustainable nor was it scalable. The model needed to be redesigned and the object changed to creating a low cost, efficient, sustainable and scalable healthcare delivery based on the lessons learned from the pilot. Both fixed costs and recurring costs had to be reduced significantly to achieve this.

Revised model

An innovative concept "AAWISH RETAIL CLINICS" evolved based on a 'store in store' concept consisting of a teleclinic within licenced pharmacy.[8] A 4ft by 4ft space is earmarked for this purpose. The telemedicine hardware with LED TV, and printer is installed, with a patient chair in front of the TV monitor. A licensed pharmacy with broadband connectivity is mandatory. The pharmacist is trained to handle the telemedicine hardware and to record basic data like pulse rate, BP, SPO$_2$ and temperature with digital equipment. When the patient walks in, the preliminary details are entered in the EHR which is customised to minimise the data entry process.[9]

The patient is then connected by videoconference with the GP at main centre. Depending on the merits of the case, a prescription, further investigation or specialist consultation is ordered. As many of the patients have primary health problems a simple prescription suffices in majority cases (80% to 90%). In a few cases basic clinical investigation is requi-

sitioned from a lab at a nearby centre. In rare cases tertiary care consultation requirement (1% to 2%), and the patient is advised to visit the main centre.

The cost of the equipment has come down to US$ 1,200. The only monthly recurring cost is US$ 25 for the Internet connection. No additional manpower costs are incurred since the pharmacist doubles as tele-coordinator. When a pharmacy is recruited into the Aawish teleclinic network the pharmacist is given one week's training and as the pharmacist is familiar with common medical knowledge, training them is a simple task. To reduce the initial financial burden on pharmacists a telemedicine demonstration kit is installed by Aawish. An inaugural free medical camp is organised followed by free teleconsultation for one month. The GP visits the centre once a week for three months. After one month the pharmacist has to buy his own telemedicine kit and the demonstration kit is sent to another potential teleclinic. Free medical consultation is provided for three months after which medical consultation is payable on a fee for service basis. A GP consultation costs US$ 0.80 and a specialist consultation US$ 2.20. Over eight months we have established 10 retail clinics and the process is on-going.

Our recent review audit findings are that after initial hesitancy patient acceptance has improved due to a patient friendly approach. On average, 20 patients are seen per centre per day. Transport costs and man hour saving were significant as an average patient needs to travel 10 km to get reasonable medical advice. If needed, an attendant has to accompany the patient at additional cost. In many cases medical advice has been given at an early stage and has potentially avoided the future complications. The costs incurred were within in the reach of poor patients. The pharmacist had an average turnover of US$ 3.00 per patient seen, which increased his profits with a minimal investment. All the pharmacists recovered their investment within three months. As an innovative service provider the pharmacist's relevance in the local community increased. On the whole the revised model has shown very encouraging results.

Discussion

Rural India is medically underserved and primary healthcare provided by the government is not efficient. Our pilot has shown that the rural health delivery model should be cost effective to be successful. The concept of telemedicine has been adopted by bigger players, but it is more of tertiary care advice. Telemedicine in primary healthcare is a novel and useful idea to the rural population. Our revised model "Aawish Retail Teleclinic", store in store model, with minimum investment has proven to be a viable and scalable model with significant social benefit. The scope of the services with the same structure can be augmented by local community participation in preventive health like awareness in hygiene, sanitation, vaccination, and health insurance.

Conclusion

Retail teleclinics for rural people are cost effective in providing primary healthcare. The present model appears to be sustainable as social enterprise. We are trying determine some value additions with which we can move the model into a commercially viable proposition. However this project needs further review after 18 to 24 months to ascertain the long term sustainability.

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Corresponding author:
K.Vijaya shekar Reddy
Mobile no. 9989033686
Land line 040-24530085
E-mail: mailto:docotorkvsreddy@yahoo.com

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