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Opportunities and Challenges of a Rural-telemedicine Program in Nepal

Bhatta R,[1] Aryal K,[1] Ellingsen G[1]

[1]The Arctic University of Norway, Norway.

ABSTRACT

Background: Telemedicine services are considered essential for improving the accessibility, quality and efficiency of the healthcare services in developing countries. With these expectations, government of Nepal has implemented a rural-telemedicine program in thirty peripheral district hospitals to improve the accessibility of specialist health services. Telemedicine can be appropriate to the nation like Nepal with low physician/patient ratio. However the acceptability of telemedicine can be a delayed process, where the healthcare modalities are not well internalized. Similarly, the peoples who are involved in the program play a key role for making it efficient and effective. Hence, assessing the opportunities and challenges is important to address needs and better implement the program.

Methods: This study has used an interpretive case study approach to explore the opportunities and challenges of the program. Fifteen stakeholders were interviewed from central level and program sites namely Darchula, Sindhupalchowk and from Patan hospital. Discussions at peripheral sites with stakeholders were recorded and intensive notes were taken.

Results: The findings suggested that the rural-telemedicine programme does offer some benefits, however there are still many challenges associated with the implementation of program. These challenges include infrastructure problems, lack of human resources, competence and financing.

Conclusions: Overall attitude of the stakeholders involved in delivering telemedicine services was favorable however several loopholes were reported in the existing system. Hence it shows sufficient potentialities of rural-telemedicine to improve the health care delivery in rural and inaccessible areas.

Keywords: Challenges; local practice; nepal; opportunities and limitation; rural-telemedicine.

INTRODUCTION

Telemedicine is "Medical activities involving distance, and cover diagnosis and clinical management, treatment and education for both health care workers and patients".[1] It is a crucial and innovative means for delivering quality health care services through the rural health care settings in developing countries by utilising medical expertise from specialised and urban centre.[2-4] It is considered clinically useful, feasible, sustainable and replicable in the rural areas and underserved communities.[5]

The government of Nepal has started the rural-telemedicine program in 30 remote district hospitals with the aim of providing access to specialized health care services. Emails for supplies, video conferencing or telephone for medical consultations are used in Nepal. Thus, the purpose of this study was to explore the existing opportunities and challenges of rural-telemedicine programs by taking the perspectives of key stakeholders based on an interpretive field study.

METHODS

The study adopted an interpretative case study approach which supported the researcher to develop deep insight

Correspondence: Ramesh Bhatta, Yeti Health Science Academy, Kantipath, Maharajgunj, Kathmandu, Nepal. Email: rameshcare@yahoo.com, Phone: +9779841387750.

into the research phenomena and to describe and analyze the complex socio-technical aspect of the rural-telemedicine program.[6, 7]

The data collection process started from the 7th of December 2012 to 12th January 2013. Study data were collected from the different respondents (policy makers and program implementers).

Data collection sites	Involved informants
Patan Hospital (Central Coordination Desk)	5
District Health Office, Sindhupalchowk	4
District Health Office , Darchula	4
Ministry of Health and Population (MoHP)	1
Department of Health Service (DoHS)	1

Study was conducted in three rural-telemedicine program implementation sites, namely Sindhupalchowk, Darchula and Patan hospital. Sindhupalchowk is located in the central region, about 100 km away from the capital city. Darchula is located in the far-western region, about 1000 km from the capital. Patan hospital is centrally located which is supporting the rural-telemedicine program in the districts. Study site and respondents were selected purposively.

The data was collected through semi-structured interviews, site observation and discussions. Fifteen informants were interviewed and the interview audios were recorded. Involved respondents were Director General from Department of Health Service, Senior Public Health Administrator working at MoHP under Public Health Administration, Monitoring and Evaluation Division, Health Inspectors and Medical Officers working at Patan hospital under rural-telemedicine program and District Health Officers, Staff Nurse, HA and ANMs working at Sindhupalchowk and Darchula District Health Office. It took about sixty hours to complete the data collection process (i.e. interview, observation and discussions). In addition, relevant articles and governmental policy documents were also reviewed.

Ethical approval was obtained from the Nepal Health Research Council and a permission letter was obtained from the DoHS to visit the study sites. Respondents were informed about the purpose of the study and verbal consent was taken.

RESULTS

The interview with different level health personnel at the two districts hospital showed that the program has been positively perceived by the medical doctors and public health officers. Initially program was perceived as an additional burden of work for the district hospital teams. However, in present scenario they expressed that they are willing to strengthen the capacity of the program and make the services more regular, since it has enabled them to get the necessary technical support.

One of the respondents at the Darchula district hospital said that, rural-telemedicine service has supported patients to get appropriate care and consultations especially to those patients who cannot afford to travel to get the specialist services. He shared one of his remarkable experiences:

"A young girl from a remote village was suffering from dermatological problem (fungal infection) on her body. Due to the distance and financial problem she was not taken to any hospital or specialist doctor. However one day she managed to visit the district hospital where she got chance to participate in a videoconference consultation with a dermatology specialist at Patan hospital. The specialist observed her skin problem on the screen and managed to prescribe medicine. After 6 months the girl was completely recovered"

It shows that by the use of rural-telemedicine service a client from a remote area was able to get specialist service easily at the district hospital level and could save travel time and cost.

A respondent from Sindhupalchowk told that patient flow in the hospital has increased since the program has supported the hospital team to get necessary medical assistance. She said that:

"All the three application of telemedicine program are regularly used at Sindhupalchowk, however videoconferencing is most effective for getting medical support and treating the patient"

She said that the services should be user friendly, so that every health workers can use it easily. However, the respondents at both rural hospitals expressed their dissatisfaction with frequent power cut and interruption in internet with delays in passing emails and necessary supporting documents for the specialist consultation.

Paramedics and nursing staff expressed that, good computer skill, knowledge in medical terminologies and reasonably good English are necessary to use the existing technology for proper communication with specialist.

Regarding the experienced challenges, there is need of regular updating and modernizing the used technology. A respondent at the DoHS mentioned that, the program is facing various challenges that need to be addressed;

"Appropriate infrastructure, relevant technology and trained human resources should be the most focused part of the rural-telemedicine program to make it successful"

Respondent from Patan hospital mentioned that the existing infrastructure and technology should be improved at the district level to make the services more effective:

"The government has replaced the old Internet system which was used through VSAT (Very Small Aperture Technology) application with the ADSL (Asymmetric Digital Subscriber Line) by coordinating with the Nepal Telecom. It is expected that new service will be stable and better to send the emails faster and improve the quality of teleconference."

Respondents at the DoHS and MoHP said that, due to lack of fund and sufficient infrastructure, government is unable to implement the latest telemedicine technologies. While government has recognized the importance of IT in improving the health of the people, however present focus is more on providing basic health care services due to a limited budget situation. So, to address this scenario the government has plan to encourage the International Non-governmental Organizations (INGOs) and private organizations to provide necessary technical as well as financial support for improving the program. They also informed that, due to the geographical difficulty it is hard and expensive to transport the necessary equipments and install the infrastructures in the remote areas.

It is also challenging to comply with the quality and standard of the technology that is internationally used by the telemedicine services. Respondent at the DoHS mentioned that,

"In the international scenario technology is updated and changing day by day, so it is a challenge for the government to adopt the latest technology and purchase new equipment and infrastructure to meet such needs".

He added that in the international scenario, telemedicine services are based on advanced technology and have focused on the medical subspecialties; however the rural-telemedicine program in Nepal has used simple technology that is only used for consultation purposes. In the rural districts the program is affected due to lack of technical expertise, efficient infrastructure and supporting environment. It takes several weeks or even month to maintain the equipment and software if they stop functioning. Respondents at Darchula district hospital said that:

"…due to the irregular supply of electricity and slow internet service, it is difficult to send emails. This is even worse during videoconference consultations due to frequent disconnection, blurry images and unclear sound"

Another challenge was related with lack of competence and training among the personnel involved in the rural-telemedicine program. Government has trained three health personnel in each district hospital for the program; however respondents from Darchula district hospital said that:

"The rural-telemedicine team members at the district hospital are not sufficient, so the government should train more health workers".

Similarly, they also said that the program should also be extended to the peripheral level health facilities since it can be used to improve the maternal and child health, reduce the burden of HIV/AIDS, and support the patient with tuberculosis and other communicable diseases.

Respondents at the Darchula hospital argued that the frequent and unplanned transfer of health workers has hampered the program. Respondent at Patan hospital said that health workers try to avoid their responsibilities due to the lack of confidence, knowledge and skill to use the available technology in the delivery of health services

Managing the feeling of inferiority among the health workers and patients is also seen as challenge to implement the rural-telemedicine program. Respondent at Darchula hospital said that due to illiteracy, lack of confidence and shyness that exist among the rural patients (especially seen among the female and elderly patients) it is difficult to present them in front of the videoconferencing screen. Especially women from the rural communities take the assistance of some other family members to visit the hospital and to express their health problems. He said that:

"Usually patients do not express their health problems on their own; the patient's family members have to express their problems for them so it is difficult and time consuming to use the rural-telemedicine services for such patients"

Financial viability of the program is also seen as a

challenge for the sustainability of the rural-telemedicine program. In developing countries like Nepal, it is really difficult for the government to financially sustain a telemedicine program. Respondents at the MoHP said that government is unable to allocate sufficient funding for the improvement of IT although it is important to improve the health status of the population. He claimed that the government should focus on using cost-effective technology and initiate a policy to coordinate and partner with private and external development partners for technical and financial support. Additionally, he also discussed that government should focus on implementing m-health technology (use of mobile phones) which can be more effective and it needs less skill in the rural districts. Similarly it is cheaper, affordable and also has good network coverage in the rural-communities so it can be helpful to address the health needs. He also focused on regularly monitoring, supervising and continuous researches that are important to adopt the best technology suitable for the rural communities.

Lack of governmental coordination has also affected overall management of the rural-telemedicine program. Due to the unstable political situation and frequent change of government, the policy related with the health care delivery system is fragile. Respondents at Patan hospital discussed that; rural-telemedicine program is started in large scale without proper plans and resources. So it is challenging to function the program. Study finding also showed the controversial opinion among the authorities involved at the central level and the team working at the district hospitals. The district team blamed the central authorities for their poor management and not taking the program activities seriously. However, the district teams were blamed for not showing their active involvement.

Respondent at Patan hospital said that due to the lack of a specific team being responsible for the program, the managerial and decision-making activities related with the program are lengthy and cumbersome. He suggested that the MoHP should form a separate unit with specific team including the experts to manage the program systematically and effectively.

DISCUSSION

The use of telemedicine in low-income countries like Nepal has the potential of being beneficial since it addresses the health problems of rural people who have difficulty in accessing healthcare services. The rural-telemedicine program has shown considerable promise to help the rural population. Similarly the use of relatively simple and cheap technology looks like a sensible strategy as compared to adopt high-tech technology directly from developed countries.[8]

The study showed that the rural-telemedicine program is not able to utilize its full potential and effectiveness. A key factor appears to be that telemedicine generally is considered to be a service that *solves* many challenges related to existing infrastructure, practice, competence and social practices.[2,3,9] This implies that telemedicine is considered to be a facilitating service that helps managers to escape the local conditions and realities. In contrast we argue that rather seeing telemedicine as an easy getaway from the existing hardship, telemedicine needs to be embedded in the existing local practices and realities. In short, large-scale rural-telemedicine programs need to pay attention to the range of factors discussed in the previous sections that currently may influence the program. What is needed is a broad effort where the installed base – i.e. the existing infrastructure and technology, social factors, competence building, incentives and budgeting all need to be considered as a whole in the process.[10-12] Taking the existing local practices as our baseline, we particularly point to three key areas that need to be addressed are discussed below;

First, it is necessary to have a broad local-based information infrastructural approach. Developing countries has huge technological gap between rural and urban areas.[13] No wonder that the use of information technology in developing countries also increases the associated problems related to the lack of accommodated technology, qualified professionals as well as the absence of economic incentives and governmental IT policy.[8] This study illustrates that the program has been affected by a variety of external environmental factors such as irregular electricity supply, slow internet, lack of proper infrastructures and technology, illiteracy among the patients (i.e. user group) and insufficient skilled health personnel. Given such circumstances, we believe that it is also necessary to analyze the technological readiness of the country before implementing telemedicine programs.[14, 12]

Second, it is necessary to have a constantly evolving service. In an information infrastructural perspective, a new technology is not considered a once-and-for all implementation, it is rather seen as an evolving installed base (technologies, services and practices) that continues to grow after a project period is terminated. To some degree this can be seen in the rural-telemedicine program as well. The government has increased the volume of services by carefully expanding the program from 25 to 30 districts. In addition, the government has added the 'Hello-health' service two years after the

startup of the program. It shows that the program is gradually expanding in term of volume and services. Yet, the government fails to support the evolving service with sufficient budgeting, human resources and a coherent policy.

Third, there is a need to domesticate the service. The health personnel involved in the rural-telemedicine program were hesitant to use the new services, which may be due to technophobia, lack of confidence and added workload. In this regard, it would be helpful if the key stakeholders offer regular training on the telemedicine equipment and software, and also enable the users to be more accustomed to its use. The health personnel involved in the program can be motivated by providing extra incentive as well as by avoiding arbitrary way of transfer. Another (perhaps unforeseen) factor was the illiteracy among the rural patients so they felt quite uncomfortable in participating in videoconferences. This illustrates, that it will take some time to ensure that the rural-telemedicine services become socially acceptable in the rural communities.

CONCLUSION

Despite constrains and challenges rural-telemedicine program has supported the health workers in the rural district hospitals and also to the rural patients by providing specialist health care service from their local health facilities and ultimately supported them to save their time and money. However, lack of sufficient knowledge, skill and supporting environment among the health workers have affected the effective use of rural-telemedicine services. Similarly, the existing social and political environment in Nepal has also affected implementation of the program activities and it is still a way to go to realize robust and sustainable telemedicine services in the rural areas.

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