

Telehealth - an emerging health technology as a future model in Vietnam during Covid-19 pandemic: practical experience from Phutho General Hospital

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Submitted to: JMIR Formative Research
on: February 15, 2021

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Abstract

Telehealth has been emerging as a model of modern technology for healthcare services in Vietnam during the Covid-19 pandemic. Actively preventing the outbreak of Covid-19 and national digital transformation program, Vietnamese Ministry of Health has launched the project 2628/QĐ-BYT that approved a scheme for remote medical examination and treatment for 2020-2025. The project is aiming to connect 1000 hospitals to strengthen the quality of medical services from central hospitals to rural areas via provincial hospitals. The Phutho General Hospital (PGH) is one of leading provincial hospitals that participating and applying early the telehealth systems in Vietnam. By telehealth systems, PGH can offer a valuable support to the doctor's activity by streamlining and facilitating their work. Telehealth was demonstrated to be feasible, acceptable, and effective in PGH of Vietnam, and allowed for significant improvements in health care outcomes. As the achieved results, the Covid-19 pandemic represents a positive input for the acceleration and enhancement of Telehealth in Vietnam. The success of telehealth here may be a useful reference for other parts of the world.

(JMIR Preprints 15/02/2021:27968)

DOI: <https://doi.org/10.2196/preprints.27968>

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Viewpoint

Telehealth - an emerging health technology as a future model in Vietnam during Covid-19 pandemic: practical experience from Phutho General Hospital

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ABSTRACT

Telehealth has emerged as a model of modern technology for healthcare services in Vietnam during the Covid-19 pandemic. Actively preventing the outbreak of Covid-19 using the national digital transformation program, Vietnamese Ministry of Health has launched the project 2628/QĐ-BYT that approved a scheme for remote medical examination and treatment for 2020-2025. The project aims to connect 1000 hospitals to strengthen the quality of medical services using expertise of central hospitals to support rural areas via provincial hospitals. The Phutho General Hospital (PGH) is one of leading provincial hospitals that participated in and applied the early telehealth systems in Vietnam. Using telehealth systems, PGH can offer a valuable support to the doctor's activity by streamlining and facilitating their work. Telehealth was demonstrated to be feasible, acceptable, and effective in PGH, Vietnam, and it allowed for significant improvements in health care outcomes. The Covid-19 pandemic has facilitated the acceleration and enhancement of Telehealth in Vietnam. The success of telehealth in Phutho may be a useful reference for other parts of the world. However, this telehealth system covers focused on the connectivity between doctors rather than the one between doctors and patients which is another area needing further assessment. Keywords: Telehealth, Telemedicine, Teleconsultation, Covid-19, Vietnam

Introduction

Since the outbreak of coronavirus disease 2019 (Covid-19) originated in Wuhan, China in

2020, the disease has spread widely across the world [1, 2]. The disease has affected 221 countries and the latest data showed the outbreak has affected over 106 million people and caused over 2.3 million deaths [3, 4]. Primary symptoms of COVID-19 include fever, dry cough and breathing difficulty. [5, 6]. Elderly people and those with underlying medical problems such as hypertension, heart diseases problems, and diabetes are more susceptible to develop the disease in its most severe form [7]. The impact of Covid-19 is on both health services and the global economy [8]. The Covid-19 outbreak has diminished prospects of an economic recovery, in which many key sectors have been affected, particularly travel and tourism, retail, and other services sectors [8, 9].

The method to control the transmission of the virus is the social distancing that is made possible by the reduction of person-to-person contact [10, 11]. In this context of an ongoing Covid-19 pandemic, telehealth has emerged as an ideal way to communicate among people and plays a critical role in the support of diagnosis and treatment of diseases in many hospitals [12]. Vietnam is a country that has controlled the pandemic very effectively according to the assessment of the World Health Organization (WHO), thanks to political systems as well as an active application of new and advanced technology [13]. In the war against Covid-19, the Vietnamese Ministry of Health launched the project 2628/QĐ-BYT on June 22nd, 2020 which approved a scheme for remote medical examination and treatment for 2020-2025 [14]. The National Steering Committee has established the Vietnam Telemedicine Center for Covid-19 Outbreak Control in June 2020. The center frequently holds online consultations with the participation of leading professors across the country to give advice on critical cases, discuss optimal treatments, and share experiences in inpatient treatment and care with participating experts and hospitals as if there were no distance between the North and the South, or high and low levels of healthcare. Such online consultations greatly contributed to the treatment of COVID-19 patients; as of June 15th, 2020, there have been no cases. The establishment of the Vietnam Telemedicine Center for COVID-19 Outbreak Control marked the development of the medical examination and treatment system following integration trends and application of scientific-technological advance in treatment, especially for dangerous infectious diseases such as COVID-19.

This study aims to present the results of applying Telehealth in Vietnam via Phutho General

Hospital (PGH) which is the largest provincial hospital in the North-West of Vietnam as well as the advantages and challenges of telehealth in the early stages in Vietnam.

Experience from Phutho General Hospital in developing a model for the application of Telehealth in Vietnam

PGH, the largest public hospital in the Northwest of Vietnam, has over 1500 beds, 20 departments, and 9 centers. Currently, PGH is a satellite hospital of eight national hospitals. Hospital facilities and equipment are being enhanced and many advanced medical technologies and techniques are being applied to medical examination and treatment. Recognizing the importance of advance of technology, the hospital has implemented Telehealth, connecting with national hospitals via information technology systems. PGH has registered and signed agreements with eight national hospitals (Table 1) as the project 1628/QD-BYT for 2020-2025 to launch official Telehealth for medical examination and treatment service including teleconsultation, telesurgery consultation, telemedicine, and video-conference.

Table 1: Application of Telehealth between Phutho General Hospital and National Hospitals

Model	Hospital network	Achievement	Challenges	Launch year
Teleconsultation	Bach Mai Hospital, Viet Duc University Hospital, National Hospital of Tropical Diseases, Vietnam National Cancer Hospital	<ul style="list-style-type: none"> - Many cases on resuscitation, emergency and intensive care, surgery, respiratory diseases, oncology, etc. - Became a useful routine meeting among the hospital network. - The system of information technology is relatively completed. - Improving the knowledge and qualification and ability of physicians - Learning by doing via the real cases - A huge recorded data for training 	<ul style="list-style-type: none"> - IT supporting staff is not always available - Investing the IT systems among hospital networks. - Time difference and daily work among hospital networks. - Unavailable payment insurance - Patient's privacy - Internet speed 	2015
Heart surgical telementoring	Hanoi Heart Hospital	10 heart operations	<ul style="list-style-type: none"> - Only performing simple cases - Patient's privacy - Internet speed 	2020
Telemedicine	Hanoi Medical University Hospital	Daily support for patients needs the service including neurological disease, hypertension, diabetes, etc.	<ul style="list-style-type: none"> Only cooperate with Hanoi Medical University Hospital - unavailable payment insurance 	2020

			- Patient's privacy	
Video conference	Vietnamese Ministry of Health	Monthly meeting for direction and management	Internet speed	2020

Implementing Telehealth to improve knowledge and quality of treatment and education

On June 22nd, 2020, with the complex issues caused by the pandemic of COVID-19, the Vietnamese government reviewed comprehensively its epidemic prevention plan and decided to approve the scheme for “Remote medical examination and treatment for 2020 - 2025”. The scheme has rapidly received strong support from the medical community, doctors, and citizens. After nearly 3 months of preparation, on September 24th, 2020, the Ministry of Health of Vietnam officially launched the remote medical examination and treatment program connecting 1000 hospitals, including 20 central hospitals. The project aims to reduce the burden on central hospitals, to increase the quality of medical examination and treatment in primary healthcare facilities, to save costs and increase patient experience and satisfaction while ensuring safety for medical staff, doctors, and patients during the COVID-19 pandemic. The program receives financial support from the Vietnamese Government, regardless of whether patients have insurance or not, both for inpatients and outpatients, and is provided free of charge. The medical specialties included cardiology, oncology, respiratory and musculoskeletal fields.

As one of the early hospitals participating in the project, PGH launched a Telehealth clinic on November 14th, 2020. Teleconsultation was one of the applications which physicians in PGH used commonly to consult specialists from Bach Mai hospital, Viet Duc Hospital, National Hospital of Tropical Diseases and the Vietnam National Cancer Hospital (Table 1). The teleclinic office is equipped with a 52-inch screen, a 48-inch screen and 2 computers with a high-speed internet connection. Doctors in PGH have to prepare the Powerpoint presentation of patients in advance to present and discuss with the specialists about the cases that need help and expertise. Applying teleconsultation helps PGH improve their medical staff's knowledge, the quality of treatment via treatment plans, ensure appropriate referral or evacuation, improve accuracy of diagnosis, and provide opportunities for education. The significant value of the telehealth network showed a high quality and faster decision making, shortening diagnosis time, faster and better patient management, diminishing the length of hospitalization and intensive care stay, improving the accuracy of triage, anxiety reduction,

educational value, increasing the confidence, and reducing the number of unnecessary procedures.

Another breakthrough of telemedicine in PGH is to successfully operate telemedicine in surgery. For example, on the August 6th, 2020, PGH organized a telemedicine cardiovascular surgery program between Phu Tho Hospital and Hanoi Heart Hospital for the case of a 55-month-old child with a ventricular septal defect hole under 2 aortas (Figure 1). Before operating the, surgeons and technicians had a teleconsultation with cardiologists of Hanoi Heart Hospital for the surgery strategy. During the operation, a camera live streamed the operation. The surgeons received advice and guidance from the cardiologists during the operation. Doctors at Ha Noi Heart Hospital have successfully carried out the first online heart surgeries in Viet Nam for patients at PGH through the Telehealth system developed by Viettel Group (Figure 1). Currently, the hospital has conducted 10 heart operations, including treatment for mitral stenosis, mitral regurgitation, ventricular septal defect, aortic valve stenosis, mucous tumor, atrial fibrillation, and heart failure.



Figure 1. Real-time heart surgery telementoring for a case of a 55-month-old child with ventricular septal defect hole under 2 aortas during the Covid-19 outbreak between PGH and Hanoi Heart Hospital.



Figure 2. Tele-surgery consultation via the online platform

Telehealth has changed the way doctors collaborate between PGH and national hospitals during the Covid-19 pandemic

The Covid-19 outbreak has changed the way people contact and communicate between PGH and national hospitals. Telehealth is a model that uses electronic information and telecommunications technologies to support and promote long-distance clinical health care, patient and professional health-related education, public healthcare facilities, and health administration agencies. Telehealth technology helps doctors connect patients with physicians through video calls, emails, and online patient portals and enable real-time consultations between specialists. A quick online visit can improve diagnosis and treatment efficiency, help patients' experience and reduce complications and the number of hospital admissions. Recently, many researchers indicated that utilizing telehealth for specialty visits connects the primary care physicians, the specialist, and the patients for enhanced coordination of care and a speedy diagnosis [15]. This service is also comfortable and beneficial for patients who need follow-up care without a physical exam to monitor for medication side-effects, or have non-urgent questions after surgery [12].

Additionally, Telemedicine has changed the approach of healthcare services and how they will be delivered. Telemedicine also offers many advantages for doctors and patients in PGH as follows:

Strengthening the quality of healthcare services in primary healthcare centers and remote communities. Doctors and physicians in remote rural areas from Phu Tho province can learn from experienced doctors. This is an opportunity for Phu Tho Hospital to receive professional support remotely and gradually improve the quality of medical services. Often using smartphones to transmit images and videos is much more convenient and than using formal videoconferencing and is often preferred by doctors

Patients can easily receive consultation and prescription from leading physicians in national hospitals without traveling long distances, which saves time and money. On the psychological side, the rural patients in Vietnam always want to be examined and cared for by the central medical staff who are believed to have higher experience, knowledge, and skills than the lower-level medical team. Therefore, telemedicine increases the access to care when it brings extended specialists and physician access. This results in telemedicine improving patient engagement and satisfaction.

Utilizing telemedicine can slow down the spread of infection effectively. Telehealth is an effective option to support the fight against the outbreak of COVID-19 by reducing the risk of contact with infected people [16]. Hospital-acquired infection is a serious problem in Vietnam, a tropical country, which has a high risk of nosocomial infection. Telemedicine has the advantage of digital healthcare solutions in repelling the pandemic nationwide because it helps reduce direct contact with patients and decrease the risk of infection for health staff. Thus, the benefits of telemedicine are obvious when it comes to social distancing and the decrease in the spread of diseases.

Limitations

Telehealth or Telemedicine has emerged as a new model of health technology applied in many hospitals in Vietnam during the Covid-19 outbreak. However, there are some limitations.

First, Telemedicine may not suit every person or situation. Second, medical data maybe at risk of being violated by hackers and other criminals accessing the data, especially if the patient accesses telemedicine on a public network or via an unencrypted channel. Third, the

care may be delayed when a person needs emergency care as accessing telemedicine first may delay treatment, particularly since a doctor cannot provide life-saving care or laboratory tests digitally. Fourth, technological concerns can be challenging. Especially, a weak internet connection can make it difficult to offer quality care. Fifth, not all hospitals are yet equipped for telemedicine particularly the lack of computer terminals within hospitals to be able to implement telemedicine.

Conclusion

Telehealth has emerged as a model of modern technology for healthcare services in Vietnam during the Covid-19 outbreak. This report is of the first and early results of counseling and support activities in a remote examination and treatment activities in Vietnam. It is expected that the remote examination and treatment consultancy activities based on the information technology platform will increasingly promote efficiency and ensure sustainability in Vietnam.

Results experienced by PGH showed the advantages of using Telehealth in remote examination using the treatment system standards of the Ministry of Health. By integrating modern data transmission technology, connecting the internet with high-speed transmission, the system is capable of real-time processing and ensuring accuracy for surgery remotely. Doctors at higher-level hospitals can directly guide surgeons of lower-level hospitals, helping shorten the process of treating patients in emergencies.

Covid-19 has brought unprecedented opportunities for telemedicine to develop. This also requires heightened engagement from the government to make sure that a regulatory foundation is implemented. A synchronized telemedicine system should be built in Vietnam in the future.

Acknowledgments

This work was supported by the Division of Science and International Cooperation, Phutho General Hospital, Vietnam.

The data reported in the article are available from the corresponding authors, upon request from qualified investigators.

Authors' Contributions

All authors were involved in drafting the manuscript and agreed to its publication. All

authors read and approved their sections of the final manuscript. Dr. Ngoc Huy Nguyen and Dr. An Quang Nguyen read and approved all sections of the final manuscript.

Conflicts of Interest

The authors have declared that no competing interest exists.

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Supplementary Files

