

TELEMEDICINE AS AN OPTION FOR HEALTH SERVICE LIMITATIONS IN COVID-19 PANDEMIC ERA

Bernadette Dian Novita ¹⁾, Sianty Dewi ^{1), 2)}, Evelyn Ongkodjojo ¹⁾, Immanuel Michael ²⁾, Agatha Christi Palupi ²⁾, Paul L. Tahalele ¹⁾

ABSTRACT

Coronavirus disease 2019 (COVID-19) pandemic provides a new habit in self-quarantine or physical distancing. The recommendation is to delay visits to health facilities if it is not in emergency condition to slow down the spread of COVID-19 transmission. This study aims to develop a telemedicine system that integrates three main components, namely doctors, patients, and hospital management in Gotong Royong Hospital Surabaya, to minimize the transmission of COVID-19 while still providing comprehensive health services. The development of telemedicine service is divided into three stages. In the first stage, emergency screening was carried out by developing Frequently Asked Questions (FAQs). The second stage was continued with prototype testing, and the last part was improving the system to create a better referral system. Gotong Royong Hospital telemedicine has been active since June 2021; within two months, 45 patients are willing to use telemedicine services. The results showed that patients easily accepted telemedicine in internal medicine clinic services ($p < 0,005$). In addition, there are no differences in acute and chronic diseases conditions as well as COVID and non-COVID, so that telemedicine can be recommended for all aspects of patient care. A significant difference was obtained in the ease of obtaining related to treatment or length of treatment and interpretation of laboratory result ($p = 0,01$). Based on this result, the development of telemedicine services during the COVID-19 pandemic makes it easier for patients to gather information related to health care.

Keywords: *Telemedicine; COVID-19; health services for acute and chronic diseases.*

ABSTRAK

Era pandemi COVID-19 memberikan suatu kebiasaan baru berupa karantina mandiri atau *physical distancing*, yang berkaitan dengan anjuran penundaan

kunjungan ke fasilitas kesehatan bila bukan kasus kegawatan, sehingga risiko penularan COVID-19 dapat ditekan. Penelitian ini bertujuan untuk mengembangkan sistem *telemedicine* yang mengintegrasikan tiga komponen utama, yaitu dokter, pasien dan manajemen rumah sakit/klinik pada sistem aplikasi Rumah Sakit Gotong Royong untuk meminimalkan penularan COVID-19 dengan tetap memberikan pelayanan kesehatan yang komprehensif. Pengembangan *telemedicine* dibedakan menjadi 3 tahapan. Pada tahap pertama dilakukan proses skrining/*triage* kegawatan dengan mengembangkan *Frequently Asked Questions (FAQs)*, tahap kedua dilanjutkan dengan uji coba prototipe, dan pada bagian yang ketiga adalah bagian peningkatan untuk membuat sistem rujukan yang lebih baik. *Telemedicine* Rumah Sakit Gotong Royong Surabaya mulai aktif sejak Juni 2021, yang mana dalam periode 2 bulan terdapat 45 pasien yang bersedia menggunakan layanan *telemedicine*. Pada hasil penelitian didapatkan bahwa *telemedicine* lebih mudah diterima oleh pasien pada layanan poli penyakit dalam ($p < 0,005$). Selain itu, tidak terdapat perbedaan kondisi penyakit akut dan kronis maupun COVID dan non COVID sehingga *telemedicine* dapat direkomendasikan untuk semua aspek pelayanan pasien tersebut. Dalam kemudahan memperoleh informasi terkait terapi atau lama perawatan serta interpretasi hasil laboratorium, didapatkan perbedaan yang signifikan ($p = 0,01$). Berdasarkan hal tersebut, pengembangan layanan *telemedicine* di masa pandemi COVID-19 mempermudah pasien dalam memperoleh informasi terkait perawatan kesehatan.

Kata Kunci : *Telemedicine*; COVID-19; layanan kesehatan penyakit akut dan kronis.

1) Faculty of Medicine, Widya Mandala Surabaya Catholic University 2) Gotong Royong Hospital Surabaya Corresponding: novita@ukwms.ac.id

BACKGROUND

Currently, almost all countries in the world are experiencing the COVID-19 pandemic, which was first declared by the *Public Health Emergency of International Concern*

(PHEIC) – *World Health Organization* (WHO) in mid-March 2020 (1). COVID-19 is a rapidly spread infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

SARS-CoV-2 is transmitted primarily via respiratory droplets. The most common symptoms at the onset of COVID-19 illness are fever and acute respiratory symptoms, which in some cases can lead to acute respiratory failure and death. On the other hand, COVID-19 also has some variations in its clinical appearances. COVID-19 can spread easily, so that it poses an extraordinary challenge to health facilities, health workers, and the government. (2–4). One of the strategies to reduce the spread of COVID-19 is the implementation of social distancing, which allows telemedicine services to support the sustainability of the health system, following CDC recommendation in February 2020 (4,5). The use of telemedicine system in Indonesia refers to the Circular of the Minister of Health of the Republic of Indonesia Number Hk.02.01/Menkes/303/2020 of 2020 concerning the Implementation of Health Services through the Utilization of Information and Communication Technology in the Framework of Preventing the Spread of Corona Virus Disease 2019 (COVID-19). Telemedicine can be carried out by doctors using

information and communication technology to diagnose, treat, prevent and evaluate patients' health conditions under their competence and authority regarding service quality and patient safety (6).

MATERIALS AND METHODS

The Gotong Royong Hospital telemedicine system was developed by a team from Widya Mandala Catholic University Faculty of Medicine Surabaya in three stages. (1) The first stage, conducted during January – March 2021, was the development of *Frequently Asked Questions* (FAQs) media for the emergency screening process. Suppose during screening process, there are signs of an emergency, the patient is directed to access Information on the Emergency Unit at Gotong Royong Hospital. while if the patient is not in an emergency condition, then proceed with filling in the identity and informed consent (2). The second stage carried out during the period June – July 2021 is the process of testing the prototype on doctors, medical personnel, patients, and hospital management. The main focus is the second stage is health literacy, so that there is an increase in

public awareness about health and bonds between the community and health service providers occur (7). This ability is needed by individuals and communities to access, understand, evaluate, and use health service information to make effective decisions regarding their health conditions (8,9). (3) (Angka “3” tersebut, apa yang dimaksud?) At the last stage, efforts are made to improve the program so that it has a better referral system.

RESULTS

Website-based Gotong Royong Hospital Surabaya’s Telemedicine was developed by the information technology team of the Faculty of

Medicine, Widya Mandala Catholic University Surabaya, and Gotong Royong Hospital Surabaya, started in June 2021. Promotion and education on telemedicine applications at Gotong Royong Hospital Surabaya are carried out in stages, namely: 1) to doctors and 2) to patients. Promotional and educational media use short films for 2 minutes, with links: shorturl.at/iwI78 and leaflets. During the period June – July 2021, 45 patients used the service. The characteristics of patients willing to use telemedicine services at Gotong Royong Hospital Surabaya can be seen in table 1.

Table 1. Characteristics of Patients Using Telemedicine Services at Gotong Royong Hospital Surabaya

Characteristics	Results
Age (yr)	Min = 17; Max. = 78 $\bar{x} \pm SD = 49,82 \pm 17,79$
Sex (%)	Man = 38%, Woman = 62% Emergency Room = 23%
Type of Services (%)	Internal Medicine Unit = 56% Cardiovascular Unit = 3% Neurology Unit = 15% Psychiatri Unit = 3%
Diagnosis (%)	Acute cases = 59% Chronic cases = 41% COVID = 53% Non COVID = 47%

Satisfaction with telemedicine services at Gotong Royong Hospital Surabaya in 5 aspects, namely: 1)

time management, 2) ease of obtaining information related to diseases, especially during the

COVID-19 pandemic, 3) ease of/ obtaining information related to therapy, 4) ease of knowing the interpretation of laboratory results, and 5) convenience for e-prescription services, above 90%. Even for the convenience of knowing the interpretation of laboratory results and e-prescription services, it reaches 100%.

DISCUSSION

Health systems in most developing countries adhere to a consumer model/face-to-face visit. The global COVID-19 pandemic has indirectly changed health services significantly (10). Telemedicine services at Gotong Royong Hospital Surabaya are useful in terms of time efficiency and provide convenience in interpreting laboratory examination results and treatment services. In line with research conducted in Poland (11), the main reason for using teleconsultation is routine/ control periodic consultation and referral to a specialist. Based on data analysis, Telemedicine at Gotong Royong Hospital Surabaya can be easily accepted for Internal Medicine Units' patients ($p < 0,005$). In addition, there were no differences in the patient's

condition, whether in acute or chronic cases ($p = 0,84$), so that telemedicine can be recommended for acute and chronic complaints. In a study conducted in Germany, telemedicine can complement acute conditions and long-term care, but telemedicine still requires good emergency triage based on the doctor's clinical experience and the patient's performance status (12,13). There were also no differences in COVID or non-COVID patients ($p = 0,39$), so telemedicine can be recommended for the care of COVID and non-COVID patients. There was a significant difference in the ease of obtaining information related to treatment or length of treatment ($p = 0,01$) and interpretation of laboratory results ($p = 0,01$). Telemedicine carried out on cancer patients in Germany show several advantages such as ease of obtaining routine treatment, obtaining information related to examination results, and their analysis and supervision during the treatment process, which can be provided using a checklist/ form that needs to be filled out daily (12) Telemedicine services at Gotong Royong Hospital Surabaya can be recommended,

especially for new patients on the second or subsequent visits, to focus services on providing information.

CONCLUSIONS

The development of telemedicine services is needed, especially during the COVID-19 pandemic with the aim that non-COVID-19 patients can continue to receive treatment. Promotion and education about telemedicine need to be carried out to all parties, especially patients and doctors. Telemedicine truly makes it easier for patients to obtain information related to the therapy and the length of time the patient must receive treatment, as well as interpretation of laboratory results. The following are some suggestions that authors can give based on the results of this study: 1) Telemedicine can be promoted for patients with acute and chronic cases, 2) Telemedicine should be focused on control periodic consultation, second and subsequent visits, 3) Further research is needed to assess e-prescribing and teleconsultation related to drug use.

ACKNOWLEDGMENT

This study was granted by the Faculty of Medicine Widya Mandala

Surabaya Catholic University's research funding. We want to thank dr. Mardha and dr. Paulus Supit, management leader of Gotong Royong Hospital Surabaya, to dr. Ari Christy, dr. Tjahaya Purnama, dr. Yudhiakuari Sinchihu, Mr. Bimo, for kindly discussion.

REFERENCES

1. World Health Organization. 2019 Novel Coronavirus (2019-nCoV): Strategic Preparedness and Response Plan. Who. 2020;(February):28.
2. Tay MZ, Poh CM, Rénia L, MacAry PA, Ng LFP. The trinity of COVID-19: immunity, inflammation and intervention. *Nat Rev Immunol.* 2020;20(6):363–74.
3. Rothan H, Byrareddy S. The epidemiology and pathogenesis of coronavirus diseases (COVID-19) outbreak. *J Autoimmun.* 2020;109(102433).
4. Vidal-Alaball J, Acosta-Roja R, PastorHernández N, SanchezLuque U, Morrison D, NarejosPérez S, et al. Telemedicine in the face of the

- COVID-19 pandemic. *Aten Primaria* [Internet]. 2020;52(6):418–22. Available from: <https://doi.org/10.1016/j.aprim.2020.04.003>
5. Koonin LM, Hoots B, Tsang CA, Leroy Z, Farris K, Jolly B, et al. Trends in the Use of Telehealth During the Emergence of the COVID-19 Pandemic — United States, January–March 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(43):1595–9.
 6. Kementerian Kesehatan RI. Surat Edaran Menteri Kesehatan Republik Indonesia Nomor Hk.02.01/Menkes/303/2020 Tahun 2020. Tentang Penyelenggaraan Pelayanan Kesehatan Melalui Pemanfaatan Teknologi Inf(?) dan Komun(?) Dalam Rangka Pencegah (?)Penyebaran Corona Virus Dis (?)2019. 2020;2016:2–5.
 7. Dodson S, Beauchamp A, Batterham R, RH O. Information Sheet 1: What is Health Literacy? In *Ophelia Toolkit: A step-by-step guide for identifying and responding to health literacy needs within local communities*. World Health Organization. 2014.
 8. Theo Raynor DK. Health literacy: Is it time to shift our focus from patient to provider? *BMJ*. 2012;344(7852):1–2.
 9. Bosworth HB, Granger BB, Mendys P, Al E. Medication Adherence: A Call for Action. *Am Heart J* [Internet]. 2011;162(3):412–24. Available from: http://www.tandfonline.com/doi/abs/10.1207/S15327728JMME1502_3%0Ahttps://www.nap.edu/catalog/25021
 10. Shiferaw KB, Mengiste SA, Gullslett MK, Zeleke AA, Tilahun B, Tebeje T, et al. Healthcare providers' acceptance of telemedicine and preference of modalities during COVID-19 pandemics in a low-resource setting: An extended UTAUT model. *PLoS One* [Internet]. 2021;16(4 April 2021):1–15. Available from: <http://dx.doi.org/10.1371/jour>

- nal.pone.0250220
11. Kludacz-Alessandri M, Hawrysz L, Korneta P, Gierszewska G, Pomaranik W, Walczak R. The impact of medical teleconsultations on general practitioner-patient communication during COVID-19: A case study from Poland. *PLoS One*. 2021;16(7 July):4–6.
 12. Reitzle L, Schmidt C, Färber F, Huebl L, Wieler LH, Ziese T, et al. Perceived access to health care services and relevance of telemedicine during the COVID-19 pandemic in Germany. *Int J Environ Res Public Health*. 2021;18(14).
 13. Elkaddoum R, Haddad FG, Eid R, Kourie HR. Telemedicine for cancer patients during COVID-19 pandemic: Between threats and opportunities. *Future Oncol*. 2020;16(18):1225–7.