



Evaluating Telemedicine Utilization in the National Hospital Using Resource Parameters Based on the Australian Council on Health Care Standards (ACHS)

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ARTICLE INFORMATION

Received: May 8, 2024

Revised: May 16, 2024

Available online: May 2024

KEYWORDS

NH Apps, Telemedicine, Compliance with Service Standards, ACHS

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A B S T R A C T

Digital transformation and disruptive innovation describe a comprehensive reorientation of industry including its business models due to the arrival of the digital technology era in the form of digitization of products, services and processes. Meanwhile, digital health products can be in the form of electronic health. The low utilization of Telemedicine visits is 2.90% of total visits as well as the conformity of NH Apps telemedicine products with ACHS standards. Analyzing the use of Telemedicine from Resource Parameters based on Australian Council on Healthcare Standards (ACHS) Standards at the National Hospital. The method for this research uses system theory (Input, Process and Output) and is descriptive research with a qualitative approach. By gathering information from 33 respondents who carried out analysis and assessment regarding the implementation of telemedicine in accordance with ACHS. Information that all telemedicine implementation in each department is going well except in the pharmacy department which is considered less good. The implementation of Telemedicine is in accordance with and meets the requirements in terms of the Use of Telemedicine Applications from the Australian Council on Healthcare Standards (ACHS) Requirements Aspect. Process Flow for Using Telemedicine in Hospitals. National Hospital Surabaya is running well and is systemized using the NH Apps application, divided into 2, namely the outpatient flow and the emergency treatment flow. National Hospital Surabaya has strong modalities regarding units and doctors are all involved in integrated services and have good assessments in system quality, information quality, service quality, structure and environment.

INTRODUCTION

Digital health is transforming healthcare delivery worldwide to meet the growing challenges of an aging population with multiple chronic conditions (Kichloo et al., 2020). Digital transformation and disruptive innovation describe a comprehensive reorientation of industry including its business models due to the arrival of the digital technology era in the form of digitization of products, services and processes. Digital health products can be in the form of electronic health (eHealth), mobile health (mHealth), health information technology, telehealth or teleconsultation (telehealth/telemedicine) (Kharis, 2021a). If all these digital products cannot be applied now and, in the future, they will cause digital disruption in traditional health services in hospitals (Yusof et al., 2018). Telemedicine or online consultation is defined by *the American Academy of Family Physicians* as the practice of using technology to provide health services remotely carried out by doctors in one place using communication technology to serve patients in other places. According to WHO, telemedicine practices can be divided into two, namely asynchronous and synchronous. The difference between the two lies in sending related data required in online

consultations. With asynchronous telemedicine, patient data can be sent by an application to the doctor, then the doctor studies the data and then delivers a diagnosis (Keptner and Heath, 2023).

Meanwhile, synchronic telemedicine is carried out in a direct interactive manner, for example via video call. So, both doctors and patients can interact directly for consultations. However, patient data can first be sent to a doctor to be used as a basis for a diagnosis that completes the online consultation (Lengkong and Adisasmito, 2022). WHO explains that there are four elements that are closely related to telemedicine in Kharis, (2021) the importance of developing telemedicine, namely (1) Aims at providing clinical support, (2) Useful for overcoming geographical and distance barriers, (3) Involves the use of various types of information technology devices, (4) Aiming at improving public health. To increase people's accessibility to information and health services, National Hospital announced the new face of NH Apps, by developing the latest features. With this new application it is hoped that users can more easily get information and save time without the difficulty of registering or queuing first. In terms of facilitating connectivity between users and professional health workers. At the same time, making National Hospital a national health partner, which continues to innovate to provide comprehensive services that focus on users and develop people.

National Hospital as a health service provider. The features in the application display information on hospital registration services, making online and offline consultation appointments, integrated payments and viewing radiology results. The features in the NH Apps will make it easier for users when seeking treatment at the National Hospital. Because all the features are packaged in one application which can be downloaded on each user's Android/Apple. NH Apps is a facility for providing health services, which is one of the basic services needed by society at large. That's why health service accessibility is very important. The quality of information must be reliable to assist decision-making. Likewise, when an organization develops and implements a particular system or application that is used by all stakeholders, the level of readiness for application utilization becomes critical. The following is the trend of outpatient visits for the period 2021–2023.

Table 1. Trend of Outpatient Visits for the Period 2021–2023 at the National Hospital

No	Year	Number of Patients	Telemedicine
1	2020	46,034	820
2	2021	64,543	3,337
3	2022	83,750	3,318
4	2023	89,265	2,577

Table 1 provides information that there is an increase in patient utilization in offline outpatient care. Meanwhile, the use of telemedicine will decrease in 2023. This research is different from several previous studies, because this research will measure the hospital's readiness regarding the accreditation process with ACHS standards by evaluating several system components, but also additional supporting

components which make this model suitable for use in research with the aim of producing appropriate recommendations. Comprehensive for improving and developing Telemedicine applications. In general, the aim of this research is to analyze the use of Telemedicine from Resource Parameters based on the *Australian Council on Healthcare Standards (ACHS)* at the National Hospital.

METHOD

This research is qualitative research with a descriptive approach. And carried out at RSNH Surabaya in November 2023 – March 2024. The instruments used in this research were structured interviews which were conducted based on interview guidelines that had been prepared previously according to the required data, and data analysis using data triangulation, namely: data reduction, data presentation, conclusion drawing or verification”. The research was conducted at the Hospital Outpatient Clinic, National Hospital Surabaya, and the research will be carried out after ethical approval is issued. The research subjects involved Sources of information from this research are from the field of telemedicine users, namely (1) Outpatient, (2) Pharmacy, (3) Radiology, (4) Laboratory, (5) Medical Records, (6) Finance.

RESULT

Telemedicine at the National Hospital is defined as an effort to provide health services which includes the exchange of patient health information, planning and administering therapy, preventing disease and injury, monitoring and evaluating the patient's health condition, as well as other matters deemed relevant between health professionals who have a permit to practice with patients and/or is represented by the patient's family in certain circumstances, which in its implementation uses information and communication technology and is held at the National Hospital health facility. Based on the results of interviews and based on observations in the field, the following are Telemedicine services at the National Hospital. The following is an assessment of each department regarding Telemedicine services. The following is an assessment of each department regarding Telemedicine services.

Table 2. Assessment of Information Sources Related to Telemedicine Services

No	Quality System	Average	Interpretation
<i>Assessment</i>			
1	User Friendly Application	4.24	Good
2	Fast and Responsive Application	4.24	Good
3	Simple not confusing	4.39	Good
4	Easy to Access	4.27	Good
5	Error Easy Application	3.70	Not good
6	Confidentiality	4.36	Good
		<i>Average</i>	<i>4.20</i>
<i>Quality Information</i>			
1	Fast response in disturbances	4.00	Good
2	Results are easy to understand	4.06	Good
3	Accurate results can be relied on	4.18	Good
4	Complete and detailed in easy language	4.12	Good
5	Valid Data	4.30	Good
6	Easy access to information	4.24	Good
		<i>Average</i>	<i>4.15</i>
<i>Service Quality</i>			
1	Problems resolved quickly	4.06	Good
2	Clear information service	4.24	Good
		<i>4.15</i>	<i>Good</i>
<i>Structure</i>			
1	Reliable teamwork	3.94	Not good
2	Improved communication between departments is easier	4.15	Good
3	Support of all departments	4.30	Good
4	Support facilities for telemedicine	4.21	Good
		<i>Average</i>	<i>4.15</i>
<i>Environment</i>			
1	With telemedicine, work is very easy and helpful	4.27	Good
2	Patients feel comfortable in this application	4.33	Good
		<i>Average</i>	<i>4.30</i>

Based on Table 2, it is found that the implementation of Telemedicine based on users is going well except for the implementation related to applications that are easy to error and reliable teamwork.

Meanwhile, based on the Telemedicine assessment department, it is as follows:

Table 3. Telemedicine Assessments Based on Department

No	Units	Quality System	Quality Information	Service Quality	Structure	Environment	Average	Interpretation
1	Medical Records Department	4.25	4.21	4.25	4.25	4.25	4.24	Good
2	Depart. of Pharmacy.	4.03	3.94	3.75	3.75	4.00	3.89	Not good
3	Administration Department.	4.42	4.38	4.50	4.44	4.50	4.45	Good
4	Depart. of Laboratory and Clinical Pathology.	4.15	4.02	4.06	4.09	4.19	4.10	Good
5	Outpatient Department	4.24	4.26	4.27	4.27	4.50	4.31	Good
Grand Total		4.20	4.15	4.15	4.15	4.30	4.19	Good

Table 3 provides information that all telemedicine implementation in each department is going well except for the pharmacy department which is considered less good.

DISCUSSION

Before the start of the telemedicine session, the National Hospital provides education and information to patients and/or the patient's family in writing regarding the differences between telemedicine-based and conventional health services. These matters include discussions about the rights and obligations of hospitals, doctors and patients, the nature of telemedicine meetings, time and duration of services, recording, scheduling, privacy and security, potential risks, and mandatory reporting.

Specifically, the information needs to cover the limitations of confidentiality in electronic communications; emergency protocols, especially for patients who do not have direct access to health services, documentation processes and medical record data storage, potential technical failures, procedures for coordinating care with other health professionals, protocols for repeat visits, legally regulated drug prescribing policies, and conditions under which telemedicine services may be discontinued, and a referral made for in-person hospital care. All this information is contained in the form of a written notification, which must be read and approved by the patient and/or patient's family during the registration process for telemedicine-based health services using a smartphone application. The information provided should be presented in simple language that is easily understood by the patient and/or the patient's family.

In terms of Telemedicine-based Health Service Facilities and Infrastructure, hospitals must determine the minimum acceptable level of privacy, minimize interference and background noise, and other environmental conditions that can affect the quality of meetings, especially when video-based services take place. Hospitals must ensure privacy in doctors' examination rooms, while patients need to ensure privacy in the rooms they use to perform video-based services to prevent unauthorized access and/or leakage of medical information. Seating and lighting should be designed for comfort and professional interaction. Both medical personnel and patients must be visible on the screen and each party's voice can be heard clearly. Patients need to be educated about the importance of reducing background light from windows or light coming from behind them. Hospital and patient-owned cameras or webcams must be placed in a safe and stable position and location to avoid shaking during video conferencing sessions. Wherever possible, hospital and patient cameras or webcams are placed at the same eye level, with the face clearly visible to each party.

The software used to accommodate telemedicine-based health services, both used by medical personnel in hospitals and software used from devices by patients, is evaluated and updated regularly by the Information and Technology Department of the National Hospital. Recording and troubleshooting of complaints from each user is also carried out, including matters related to application malfunctions (app crashes). The hardware used to accommodate telemedicine-based health services is regulated and

evaluated periodically, including minimum hardware specification standards, the functionality of each hardware component, as well as recording and troubleshooting complaints from each user.

History, physical examination, temporary diagnosis and patient management based on telemedicine. Telemedicine-based patient evaluation has a series of limitations when compared with conventional evaluation systems, however, telemedicine-based health service delivery can be optimized to produce outcomes that are comparable and non-inferior to conventional health care systems. A telemedicine-based patient evaluation system needs to be supported by clinical history, access to electronic medical records, diagnostic data (including the results of general and special physical examinations obtained through medical records), as well as the results of laboratory, radiological, electrochemical and other supporting examinations if available.

The entire process of anamnesis, physical examination, temporary diagnosis, and telemedicine-based patient management is structured and regulated. Anamnesis or medical interviews need to be carried out in a directed and structured manner, namely in this case referring to the anamnesis format according to the "sacred seven" and "fundamental four" systems which include (but not limited to): risk factors, current main complaint, location, chronology, quality, quantity/degree of severity, onset, factors that alleviate/aggravate the complaint, accompanying complaints, previous medical history (including allergic history), previous treatment history, family history, and social history. In addition, at the beginning of the teleconsultation session, the doctor should evaluate the patient's general status or condition, including whether the patient appears mild/moderate/severely ill, the patient appears comfortable/uncomfortable, looks tired/fit, good/disturbed concentration, breathing pattern and frequency (e.g. : whether the patient can complete a sentence without difficulty), consciousness and cognitive function (eg: the patient can answer the doctor's questions coherently). Doctors need to assess whether patients require emergency services at the beginning of the teleconsultation session and immediately activate the emergency system for patients who require these facilities.

In a physical examination based on telemedicine services, the doctor can ask the patient for help to collaborate in carrying out general and special physical examinations, that is, the patient is expected to be able to carry out simple examination instructions requested by the doctor and report the results of the examination. General physical examination includes (1) pulse (ask the patient to feel and count the pulse on the neck or wrist for 20 seconds and multiply by 3, regular/not, weak/strong), (2) the doctor counts or estimates the patient's respiratory frequency (N: 8 -12x/minute), 3) the doctor asks the patient to measure body temperature, oxygen saturation, and blood pressure if possible at home (equipment is available, the patient and/or the patient's family can carry out the examination). Meanwhile, special physical examinations are carried out according to the needs and indications determined by the doctor examining

the patient. The examination list here functions as a general reference that can be adapted to the patient's condition and relevance. Special physical examinations that can be carried out include: In planning further management of the patient, the doctor should make and document a plan for supporting examinations (laboratory, radiology, electrodiagnostic, etc. according to indications). Apart from that, doctors are also expected to make and document treatment plans, both medical therapy (in the form of drug prescriptions, medical action plans (surgery, physiotherapy), consultations with other colleagues, return control plans, and transfer of care plans. All results and findings provided obtained from medical interviews and physical examinations, as well as the provisional diagnosis and patient management need to be communicated to the patient and/or the patient's family in simple language that is easy for laypeople to understand. Doctors should also ensure that the patient and/or patient's family have understood the information that has been provided by asking questions and asking the patient and/or patient's family to repeat the information and instructions briefly. Procedures and procedures for anamnesis, examination, physical, diagnosis and management of telemedicine-based patients have been regulated in the SPO for Anamnesis, Physical Examination, Diagnosis and Management of Telemedicine-based Patients.

With the use of *telemedicine*, there is a trend towards documentation and storage record medical Which Better, so that minimize possibility to lose advice from doctors, nursing, pharmacists, and other health workers. At the same time, documentation record medical Which Good Also increase protection law for both sides party. *Telemedicine* Also role in increase safety patient as well as health workers, especially in an outbreak situation like the current one. Ease of access to health facilities and personnel is also reported to help increase patient treatment compliance, including in terms of therapeutic discipline. With the help of increasingly technology develop, various inspection with tool health portable and/or *wearables* (measuring pulse, peripheral oxygen saturation, heart rhythm, blood pressure, blood glucose levels) can also integrated to in ecosystem *telemedicine*, so that help increasing the accuracy of up-to-date medical information to health workers.

Referring to the various positive sides of implementing health-based services *telemedicine*, it is deemed necessary to regulate these services, especially in the scope of services of health in RS National Hospitals, in form guide clinical. With Thus, the implementation of *telemedicine- based health services* can take place effectively, efficiently, comprehensively, safely and measurably, which is always supported by the principles of professionalism and prudence.

CONCLUSION

Process Flow of Using Telemedicine in Hospitals. National Hospital Surabaya is running well and is systemized using the NH Apps application, divided into 2, namely the outpatient flow and the emergency

treatment flow. Resources for Using Telemedicine Applications in Hospitals. National Hospital Surabaya has strong modalities regarding units and doctors are all involved in integrated services and has good assessments in quality systems, quality information, service quality, structure and environment. The implementation of Telemedicine is in accordance with and meets the requirements in terms of the Use of Telemedicine Applications from the Australian Council on Healthcare Standards (ACHS) Requirements Aspect.

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