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Implementation Barriers and Service Outcome of Telehealth Information in the Health Services: A Systematic Review

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Abstract

Background: Digital transformation in the field of health services is increasingly experiencing novelty that can support the services provided to the community. Telehealth technology in the form of telemedicine is an effort to use information technology that can help patients, health workers and health institutions to share information easily, quickly and safely. Research related to telehealth (remote healthcare services) is crucial to optimize the potential of technology in healthcare systems, especially after the COVID-19 pandemic, which has accelerated digital adoption. In addition to the many benefits, telehealth programs must be faced with the readiness of human resources, financing, facilities and infrastructure as well as clear legal aspects.

Aims: The purpose of this literature review is to describe the use of telemedicine in the health profession in improving professional health services.

Methods: The research design uses Literature Review, based on a summary of several studies related to the research topic. Telehealth approach used was a literature review. Articles on the use of Telehealth technology were searched using topics and keywords related to "Telehealth", "Telemedicine", "Health Service" and "effectiveness". Relevant research was searched using the Boolean formula and filtered for articles published between 2019 and 2025, including PUBMED, CINAHL, and Google Scholar. "Telehealth", "Telemedicine", "Health Service" and "effectiveness". Then from the results of the literature search, the journal is open access, full article, accessible, and downloadable. The author obtained 8 articles that fit the inclusion criteria used in this method, namely: articles using English and Indonesian.

Results: Based on the articles collected, the use of Telehealth programs can increase the effectiveness of health services. However, telehealth also has disadvantages, namely the dependence on a stable internet connection and high device capabilities (technological literacy). In addition, health workers cannot perform the direct examinations necessary for an accurate diagnosis.

Conclusion: The use of telehealth needs to be further developed and researched, to determine the frequency and efficiency of its utilization, in order to support health services, especially in the field of palliative care.

Keywords: health services, information technology, search engine, telehealth, telemedicine.

INTRODUCTION

Technological advances in the health sector are one of the factors in fulfilling optimal health, especially in places that provide health services, for example, hospitals, clinics, health centers, and home care. This technological advancement will greatly assist doctors, nurses, or other health teams in providing health services (1). One of the developments in information and communication technology in the health sector is telehealth (2).

Telehealth is a technology that allows patients to have private discussions with doctors, without having to meet face-to-face. The discussion will help patients get information about suspected diagnosis, treatment or first treatment of diseases and injuries, as well as tips to improve body health. Telehealth has a wide scope. This is in accordance with the current conditions, the advancement of the world of information and communication technology which has developed and become an inseparable part of the world of health (3).

Health services that were previously carried out in person can now be carried out remotely, such as telehealth services. Telehealth is a form of communication technology that aims to provide health services and information, especially in areas that have problems accessing health services (geographical conditions, access, social levels, and culture). This service uses an internet connection with a video conference system (zoom meeting or google meet), Short Message System (SMS), e-mail, cellular telephone, or digital communication platform (such as WhatsApp or telegram) as a communication medium between health workers and clients (4).

Telemedicine in the current era has developed more rapidly. The most commonly encountered form of telemedicine today is real time interaction, where patients can contact doctors or health experts using smartphones and the internet, patients can also make voice calls or video calls. This proves that health agencies such as outpatient care at home, these conditions make the development of telemedicine technology in Indonesia have new challenges, namely connectivity and accessibility (5).

The utilization of telehealth to support public healthcare is emerging as an important solution in addressing various challenges in the healthcare system. Technology experts predict

that 90% of adults will have access to smartphones by 2020. This condition greatly allows the application of telehealth technology to support remote communication systems between health workers and patients. Telehealth is a process of providing, managing, and coordinating health care and services through information technology and telecommunications. Forms of telehealth include the use of websites, social media, telephones, cell phones, and interactive videos in providing services to patients (6). The efficiency and effectiveness of services can also be improved through telehealth, as it reduces waiting times and transportation costs for patients, and enables more continuous health monitoring, especially for chronic diseases (7).

Technology that continues to develop is also faced with several problems that must be resolved. There are problems in health services in Indonesia, namely equitable access to health, people who live in hard-to-reach places still have difficulty receiving health services due to Indonesia's geographical constraints which have a very large area consisting of islands with poor connecting transportation infrastructure and related costs, and medical services in remote areas that lack medical staff, Another problem that is often faced by the community is when they want to consult at a hospital or doctor's office, the community is complicated by queues and complicated booking processes. Incidents such as incorrect practice hours and irregular queues are still found, making people sometimes disappointed with the consultation queue process (5).

Connectivity challenges such as the availability of telecommunication networks are the biggest challenges in the development of telemedicine technology, tele-communication networks are the main supporting tool. In addition, there are accessibility challenges, namely the ease of using telemedicine technology. Accessibility also affects the development of telemedicine technology in Indonesia. Therefore, it needs support and innovation from all parties to be able to continue developing telemedicine technology in Indonesia (8).

The convenience provided by increasingly advanced technology is very helpful in meeting human needs, especially in meeting needs in the health sector. Telehealth is one of the utilization of technology in obtaining easy quality human health services according to their needs.

Telehealth has advantages and disadvantages. An analysis of its use in the medical sector is needed. The purpose of this literature review is to know the implementation barriers and service outcome of telehealth information in the health services.

METHODS

Study Design

This study employed a systematic literature review design to explore and synthesize existing evidence regarding the implementation barriers and service outcomes of telehealth in healthcare settings. A systematic literature review is a structured approach used to identify, evaluate, and integrate findings from relevant scientific studies in a transparent and reproducible manner. This method allows for a comprehensive understanding of the research topic by summarizing evidence from multiple studies and identifying patterns, gaps, and implications for practice and future research.

Sample

The sample in this study consisted of scientific articles identified through electronic database searches. The literature search was conducted using three major databases: PubMed, CINAHL, and Google Scholar. The inclusion criteria were established to ensure the relevance and quality of the selected studies. Articles were included if they were published between 2019 and 2025, written in English or Indonesian, and focused on telehealth or telemedicine in healthcare services. Eligible studies included those using quantitative, qualitative, or case study designs and were available as open-access, full-text, and downloadable articles. Articles that were not directly related to the research topic, as well as editorials or non-research publications, were excluded. From an initial large pool of approximately 158,000 articles, a screening and selection process resulted in a final sample of eight articles that met all inclusion criteria and were considered suitable for analysis.

Instrument

The primary instrument used in this study was a structured data extraction form developed by the researchers. This instrument was designed to systematically capture essential information from each selected article, including the authors, year of publication, research design, sample characteristics, type of telehealth intervention,

and key findings related to implementation barriers and service outcomes. In addition, a literature synthesis matrix was used to organize and compare data across studies, facilitating a structured analysis and enabling the identification of recurring themes and patterns within the reviewed literature.

Data Collection Procedure

Data collection was conducted through a systematic and stepwise process. Initially, relevant articles were identified using predefined keywords such as “telehealth,” “telemedicine,” “health service,” and “effectiveness.” Boolean operators “AND” and “OR” were applied to refine and expand the search strategy. The identified articles were then screened based on their titles and abstracts to assess their relevance to the research objectives. Articles that met the initial screening criteria were further evaluated through full-text review to ensure compliance with the inclusion criteria. Only articles that were accessible, complete, and directly relevant to the study topic were included in the final analysis. This process ensured that the selected literature was both relevant and of sufficient quality to support the objectives of the study.

Data Analysis

Data analysis was conducted using a qualitative descriptive synthesis approach. The extracted data from the selected articles were systematically categorized and analyzed to identify common themes related to telehealth implementation barriers and service outcomes. The analysis focused on summarizing findings across studies, comparing similarities and differences, and interpreting the implications of telehealth use in healthcare services. Due to variations in study designs, methodologies, and outcome measures among the included articles, a meta-analysis was not performed. Instead, a narrative synthesis was used to provide a comprehensive and integrated understanding of the findings.

Ethical Considerations

This study did not involve direct interaction with human participants, as it was based entirely on previously published literature. Therefore, formal ethical approval was not required. However, ethical principles were strictly maintained throughout the research process. All sources of information were appropriately cited to ensure academic integrity and to avoid

plagiarism. Only credible and publicly accessible scientific articles were used, and the findings were reported transparently and accurately. These measures ensured that the study adhered to established ethical standards in research.

RESULT

The articles found based on the search results of the keywords used were 158,000 articles. The

selection of articles in this study did not use any specific technique; they were simply selected as usual. Then the articles were selected again based on the inclusion criteria set, so that the author found 8 articles that match the title of this article. Based on these 8 articles, the use of telehealth is very effective in improving health services, especially for clients with residences far from health service centers.

Table 1. Matrix of Article Synthesis (n=8)

No.	Author	Methods	Results
1	Alessandro Giordano, Gian Pietro Bonometti, Fabio Vanoglio, Mara Paneroni, Palmira Bernocchi, Laura Comini, Amerigo Giordano Year (2019) Feasibility and cost effectiveness of a multidisciplinary home telehealth intervention program to reduce falls among elderly discharged from hospital: study protocol for a randomized controlled trial.(10)	Randomized controlled trial. Patients will be followed for 6 months after hospital discharge. Nurse-tutor telephone support and remote exercises will characterize the intervention program. People in the control group will receive usual care.	The results of an economic evaluation can provide information on the cost-effectiveness of the intervention and the effect on quality of life. In case of demonstrated effectiveness and cost-effectiveness, the program can be implemented into healthcare settings
2	Susan Barnason, Lani Zimmerman, Paula Schulz, Carol Pullen, Sue Schuelke (2019) Weight management telehealth intervention for overweight and obese rural cardiac rehabilitation participants: A randomized trial (11).	A randomized controlled design. Measurements at baseline, 4 and 6 months were used, guided by the CONSORT checklist, see Supporting Information File S1. Adults who had undergone coronary artery bypass surgery (CABS) or percutaneous coronary intervention (PCI) and participated in the rural CR program were recruited. Subjects were randomized into a 12-week telehealth WMI or control group. The primary outcome was weight loss. Secondary outcomes included physical activity, patient activation, perceived self-efficacy and use of weight management behaviors.	Demonstrate the utility and feasibility of using WMI telehealth delivery for cardiac rehabilitation participants in rural communities to improve weight management outcomes
3	Juniarti, N., Hartiah, H., Sari, C. W. M., & Desy, I. Y. (2021). Effectiveness of Telehealth Collaboration between	Prospective cohort. The aim of the study was to assess the effectiveness of telehealth collaboration between	Telehealth is effective as an alternative to reach and educate the public about the importance of self-reporting

- Academic, Health Provider and Community towards People's Participation for COVID-19 Self-reporting. (12)
- 4 Adly, A. S., Adly, M. S., & Adly, A. S. (2021). Telemanagement of home-isolated COVID-19 patients using oxygen therapy with noninvasive positive pressure ventilation and physical therapy techniques: a randomized clinical trial (13)
- 5 Padila, P., Lina, L. F., Febriawati, H., Agustina, B., & Yanuarti, R. (2019). Home Visit Based on Telenursing Management Information System
- 6 Sarik, D. A., Matsuda, Y., Garber, K., Hernandez, M., & Terrell, E. A. (2024). Perspectives on Telehealth Use with the Neonatal Population: Policy, Practice, and Implementation Considerations. (15)
- academics, healthcare providers, and communities on community participation for COVID-19 self-assessment and self-reporting in West Java, Indonesia.
- In this single-blind randomized clinical trial, 60 patients with stage 1 pneumonia caused by SARS-CoV-2 infection were treated. Group A (n=30) received oxygen therapy with bilevel positive airway pressure (BiPAP) ventilation, and Group B (n=30) received osteopathic manipulative breathing techniques and physical therapy. Arterial blood gases PaO₂ and PaCO₂, pH, vital signs (i.e., temperature, respiratory rate, oxygen saturation, heart rate, and blood pressure), chest computed tomography were used for follow-up, for assessment of the course and duration of recovery.
- Modifying the theory of research (R) and development (D). Development of telenursing technology based on BAN (body area network) technology can provide monitoring results in real time and connected to WSN (wireless sensor network) transmission through integration with enduser devices (laptops) which in design and implementation can be used in rural and remote areas.
- Nurse-led telehealth, follow-up nursing care is provided at home for two weeks after discharge. Every infant admitted to the NICU and discharged home in the state of Florida was eligible for services. Encounters included COVID-19 signs and symptoms. Nurses and health professionals at health centers can use Telehealth in addition to face-to-face interactions.
- Results showed significant differences in both groups with Group A showing a shorter recovery period than Group B (mean 14.9, SD 1.7 days, and mean 23.9, SD 2.3 days, respectively.) Significant differences were also observed between baseline and final readings in all outcome measures in both groups. Regarding post-treatment satisfaction with our proposed telemanagement healthcare system, positive responses were given by most patients in both Groups.
- There is a program system design that has the advantage of being able to be used to send patient medical data, main complaints, the Type of disease they feel (mild, moderate Result and severe), data visualization in image, sound and text, even video can be used as a digital-based patient health detector through video mail, and family health history with multimedia medical records techniques connected to the health service center of RSUD. Dr. M. Yunus Bengkulu. The research was directly tested on nurses to obtain nurses' understanding in the use of telenursing.
- In the first 18 months of the program, a total of 378 infants were enrolled, and 74.6% received home follow-up services (n=282). Caregivers reported high satisfaction with the program (100% strongly agreed or

- assessment, anticipatory guidance, connection with community resources, and general support. Caregiver satisfaction, unplanned use of emergency care, and Readmission were assessed for 30 days.
- aged). There was a 46% reduction in 30-day hospitalizations from baseline levels, and a substantial reduction in the use of emergency care services within one month of discharge compared to infants discharged during the same time period who did not receive services (30.9% vs. 0.13.8%).
- 7 Susanti, I., Khasanah, I. N., & Triyanto, A. (2023). Implementation of Telehealth in Improving Palliative Care in Cancer Patients in Era 4.0: Scoping Review. (16)
- This research was conducted through searching the results of scientific publications, using the PRISMA flow diagram. The article selection process is done by identification and screening.
- The majority of telehealth is done through the mobile application and web-based consultations. Telepalliative utilization shows positive effects on increasing patient self-efficacy, a sense of security, patient involvement in care, effectiveness of symptom management, supporting remote care, and facilitating access to health professionals. In emergency situations, when conditions worsen that require in-person consultation and treatment, it is still necessary to conduct in-person examination and/or treatment.
- 8 Efendi, J. R. (2024). Effectiveness of telehealth use in improving the psychological health and quality of life on elderly at home: Effectiveness of telehealth use in improving the psychological health and quality of life in elderly at home (17).
- The method used was a literature review with the keywords elderly, telehealth, telemedicine, ehealth and mobile health from several databases, namely: ClinicalKey Nursing, EBSCO, Proquest & Scopus and published in 2018 to 2023.
- The results of the review of 10 journal articles concluded that Telehealth can be considered as an important tool to improve the psychological health and quality of life of the elderly, potentially reducing access to health services, hospitalization and costs. Thus, nurses must improve their skills in technology and nursing information systems. Further studies are needed on the use of telehealth in improving the quality of life of the elderly that can be applied in Indonesia.

Based on the results of the literature search, there are 8 articles included in the inclusion criteria which show that the application of telehealth interventions can improve health services both in hospital settings, nursing, pharmaceutical and community services.

DISCUSSION

The author conducts a process of searching for journals that are relevant to the implementation of telehealth in health services. Based on the review of journals, information was obtained that telehealth can assist patients in carrying out self-

care, diet management, and monitoring of treatment programs while at home. Based on 8 articles, varied results were obtained regarding the implementation of telehealth.

Through telehealth nurses can provide holistic and sustainable nursing care after treatment which will improve the quality of life of patients. The ease of providing information and overcoming distance limitations is an advantage of telehealth services, so it is necessary to have legal aspects, financing and supporting infrastructure so that this remote technology can benefit patients with chronic kidney failure (18).

Healthcare delivery methods changed overnight as a result of the COVID-19 pandemic. Telehealth is becoming a mainstream method of healthcare delivery. All evidence suggests that telehealth is urgently needed and healthcare providers should reflect on best practices for telehealth, and nurse educators should ensure that graduates are prepared to work in the telehealth arena. Formal telehealth nursing education designed to scaffold across the nursing curriculum and practice is still very limited (19).

Telehealth also provides many benefits to clients and families, one of which is to provide remote services and limited costs. The infrastructure is uneven, human resources are not adequately trained and constrained by ethical and legal aspects. Telenursing should apply several principles that must be considered such as protecting the privacy of information provided by clients. Health workers need to equip themselves with competencies, both in the fields of knowledge, technology, personal such as having a positive attitude and having good communication skills and managing emotions (20). Telehealth for example, the Baby Steps program offers the unique benefit of using telehealth as a means to interact and increase engagement with patients and caregivers after discharge from the NICU. Prior to the COVID-19 pandemic, poor telehealth combination by patients, caregivers and providers was a barrier to the implementation and sustainability of virtual care models of care. The dedicated Baby Steps team provides an additional level of support for families in their homes to mitigate connectivity issues, improve digital literacy and mitigate gaps in telehealth. In this way, the program will help with the digital divide from social and health

determinants and improve patient outcomes (15).

For information technology that is used varies, the authors divide it into two large groups, namely telehealth and mHealth. In the telehealth group, most of them use telephone calls or SMS, some also use video conferencing (13) showing positive results on both health service providers and patients as health service users. Some areas of health services are included in this study such as in the area of dental care. An overview of the application of telehealth in the form of tele-dentistry is described in a descriptive study in Japan, where several companies provide telemedicine systems for medical and dental institutions in Japan. Medical and dental institutions started using the system by paying an initial fee and a monthly maintenance fee. Reimbursement costs for dental telemedicine are not as high as in-person consultations in the Japanese insurance system; this is likely to be a factor hindering the growth of the use of dental telemedicine in Japan. Dental telemedicine has clear advantages in preventing the spread of COVID-19 infection in younger people and those with good IT skills. Some dental practitioners in private dental clinics use dental telemedicine as a tool to attract patients to their clinics (21).

In addition, Telehealth has a beneficial impact on improving health both in terms of psychological and in terms of the quality of life of patients. Not only that, telehealth also has a positive impact on health workers. Telehealth can be an important tool for improving psychological, behavioral, nutritional aspects, as well as patient independence and quality of life. Telehealth has the potential to reduce access to inpatient health services and reduce costs. This of course must be a concern for policy makers so that in the future health workers and technology systems can go hand in hand so that they are able to implement telenursing in accordance with appropriate ethics and standards of procedure implementation. This is of course inseparable from government support to advance health services (22). Based on these studies, the use of telehealth gets good support from medical personnel who provide health services and clients who get health services. This proves that health services using telehealth are very effective, especially for clients who live far from health service centers who can use various tools to support telehealth in order to facilitate clients to improve their health status such as,

telephone calls for health services, text messages, and internet-based applications (23).

All of these uses of telehealth, use technology in their use in order to achieve the health needs of clients. This indicates that the use of technology plays an important role in improving the health status of each individual (24). Various studies say that the use of telehealth is very effective in improving health services, especially for clients with residences far from health care centers. But what should concern us is that before implementing a telehealth program, it must be ensured that service providers and recipients of health services can operate the technology used properly, otherwise this program cannot run (1).

A limitation of this study is that the selection of articles was conducted in a simple manner, without using specific techniques. This resulted in a lack of focus on specific telehealth topics within a single subject, leading to a more diverse range of topics.

CONCLUSION

Telehealth can be beneficial for users, especially in medical settings, but there are also several drawbacks to consider. The implementation of telehealth and its limitations include limited physical examinations. Healthcare professionals cannot perform direct examinations such as listening to heartbeats, palpating the abdomen, or checking the throat, which can reduce the accuracy of diagnoses. In addition, there is a higher risk of misunderstanding due to remote communication, which can potentially affect the accuracy of diagnoses and treatment instructions. Therefore, training in the use of the technology is also required before implementing this telehealth programme. Without updates to the information and technology used, the implementation of telehealth will be impeded.

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Author Contributions

W.W.: Conceptualization, literature search, data extraction, analysis, writing – original draft.

S.H.A.: Methodology, validation, supervision, writing – review & editing.

A.A.: Data curation, analysis support, writing – review & editing.

R.N.S.: Supervision, validation, final approval of manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Data Availability Statement

The data supporting the findings of this study are derived from publicly available articles included in this systematic review. All data sources are cited within the article, and additional details can be obtained from the corresponding author upon reasonable request.

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