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The Role of Telehealth in Strengthening Health Education and Health Service Quality: A Systematic Review

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ABSTRACT

Purpose of the study: This study aims to systematically examine the role of telehealth in strengthening health education while simultaneously improving the quality of healthcare services, particularly in contexts with limited access to face-to-face healthcare delivery.

Methodology: This study employed a systematic review method. Data were collected from pubmed, scopus, sciencedirect, and proquest databases using a peo-based search strategy. Article screening followed prisma guidelines, and methodological quality was assessed using the Critical Appraisal Skills Programme checklist. Descriptive and thematic synthesis techniques were applied.

Main Findings: The findings indicate that telehealth enhances healthcare accessibility, service efficiency, continuity of care, and patient engagement. Telehealth platforms such as video conferencing and audio-based communication support both clinical services and health education, enabling improved patient understanding, self-management, and satisfaction across diverse healthcare settings.

Novelty/Originality of this study: This study offers a novel contribution by synthesizing evidence on telehealth as an integrated approach combining healthcare service delivery and structured health education. Unlike previous fragmented studies, this review highlights the dual function of telehealth in improving service quality and patient empowerment within digital health systems.

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1. INTRODUCTION

The rapid advancement of information technology has driven a global transformation in healthcare service systems, including the adoption of telehealth, which has been shown to improve access to and efficiency of healthcare services across various countries [1]. Telehealth enables the delivery of remote healthcare services by utilizing digital communication technologies such as video conferencing, mobile applications, and web-based systems that facilitate interaction between healthcare professionals and patients [2]. This innovation not only serves as a means of clinical service delivery but also functions as a medium for health education, particularly in enhancing health literacy among patients with chronic diseases [3]. Health education delivered through telehealth plays a crucial role in improving patients' understanding, awareness, and self-management abilities in managing their health conditions independently and sustainably [4]. Therefore, telehealth is regarded as a

strategic approach to supporting the continuous improvement of healthcare quality through the integration of clinical services and technology-based health education.

Despite the rapid growth of telehealth, the quality of healthcare services and the effectiveness of health education remain major challenges in its implementation across healthcare systems, largely due to disparities in access to technology and variations in service regulations [5]. Not all telehealth services are able to ensure safe, effective, and patient-centered care as a result of differences in service standards, infrastructure readiness, and healthcare workforce competencies [6]. In addition, the use of telehealth as a medium for health education is often not systematically integrated into healthcare service workflows, which limits the overall effectiveness of patient education [7]. The lack of standardized frameworks and the diversity of implementation models lead to variations in service quality and educational outcomes, particularly among populations with limited access to digital technologies [8]. These conditions raise questions regarding the extent to which telehealth truly contributes to strengthening health education and improving healthcare quality, highlighting the need for more structured and evidence-based telehealth implementation models.

A number of previous studies have demonstrated that telehealth can improve access to healthcare services and enhance the efficiency of healthcare delivery systems [9]. Other studies have reported that telehealth has the potential to increase patient adherence, improve health condition monitoring, and enhance user satisfaction with healthcare services [10]. Several studies have also highlighted the role of telehealth in supporting patient education related to chronic disease management and disease prevention [11]. However, most of these studies primarily focus on clinical contexts or examine service effectiveness as isolated outcomes [12]. Research that directly integrates telehealth, health education, and healthcare service quality within a single analytical framework remains limited [13].

Based on a critical review of prior studies, a clear gap can be identified in the comprehensive understanding of the simultaneous role of telehealth in health education and healthcare service quality [14]. Many existing studies predominantly frame telehealth as a technological or service-delivery innovation, without systematically examining its function as an educational medium for patients and communities [15]. Moreover, the available empirical evidence remains fragmented and reports inconsistent findings across different healthcare contexts, populations, and telehealth models [16]. This heterogeneity makes it difficult to draw robust and generalizable conclusions regarding the effectiveness of telehealth in addressing both health education outcomes and service quality improvement simultaneously [17]. Therefore, further research is required to synthesize existing evidence in a systematic manner to better clarify the integrated role of telehealth in enhancing health education and overall healthcare quality [18].

A comprehensive understanding of the role of telehealth is critically important in supporting policy decision-making and the development of digital health services [19]. The integration of health education and service quality is a key factor in creating patient-centered healthcare systems. Without a strong evidence base, the implementation of telehealth risks being suboptimal and unsustainable. Therefore, systematic reviews are required to provide a comprehensive overview of best practices as well as the challenges encountered in implementing telehealth across various healthcare contexts [20]. Consequently, the findings of this review are expected to serve as a reference for healthcare practitioners, health educators, and policymakers.

The novelty of this study lies in its systematic approach to examining the integrated role of telehealth in both health education and healthcare service quality. In contrast to previous studies that have adopted a partial or fragmented perspective, this study synthesizes scientific evidence from a wide range of research in a comprehensive manner. This research not only evaluates the benefits of telehealth but also identifies patterns, strategies, and their implications for service quality. The results of this systematic review are expected to address existing research gaps. Thus, this study provides a novel contribution to the development of telehealth-based healthcare services and health education.

2. RESEARCH METHOD

2.1 Types of research

This study employed a systematic review method to examine the role of telehealth in strengthening health education and healthcare service quality. A systematic review is a literature synthesis method conducted in a structured, transparent, and reproducible manner to ensure the reliability of findings [21]. This method enables researchers to systematically identify, critically appraise, and synthesize evidence from relevant studies addressing similar research questions [22]. Such an approach is particularly appropriate for summarizing scientific evidence related to the implementation of telehealth in both educational and healthcare service contexts. Through this method, a comprehensive overview of the role of telehealth can be derived based on evidence from previous empirical studies.

2.2 Data collection

Data collection was conducted through a literature search in PubMed, Scopus, ScienceDirect, and ProQuest databases. Articles were searched using keywords relevant to the research topic and Boolean operators (AND, OR). The search strategy was developed based on the PEO (Population, Exposure, Outcome) framework to ensure alignment with the research objectives. The data used were secondary data obtained from scientific publications. The search process was conducted systematically to identify relevant articles. The literature search strategy was developed based on the Population, Exposure, and Outcome (PEO) framework, as presented below.

Table 1. PEO Strategy

Description of PEO (Population, Eksposure, Outcome)	
P	Patient OR Client OR User
E	Telehealth
O	Utilization OR Benefit

2.3 Data Analysis

The collected data were systematically screened and analyzed to ensure relevance and methodological rigor. Article relevance and quality were assessed using the Critical Appraisal Skills Programme (CASP) checklist to evaluate the trustworthiness and validity of the included studies [23]. Studies that met the inclusion criteria were further analyzed by constructing a synthesis grid to organize and compare key findings across articles [24]. Data analysis was conducted using descriptive and thematic approaches to identify recurring patterns and research themes [25]. The analytical focus was directed toward examining the role of telehealth in health education and healthcare service quality across different contexts.

2.4 Study Selection and Quality Assessment

Study selection was conducted in a staged process following the PRISMA guidelines to ensure transparency and reproducibility. Retrieved articles were screened based on titles, abstracts, and full texts according to predefined inclusion and exclusion criteria. Methodological quality assessment of the selected studies was performed using the CASP appraisal tool, and only studies with adequate methodological quality were included in the final synthesis [23]. This selection and appraisal process aimed to minimize bias and enhance the validity of the review findings. A flow diagram illustrating the literature search process from four databases PubMed, Scopus, ScienceDirect, and ProQuest is presented accordingly.

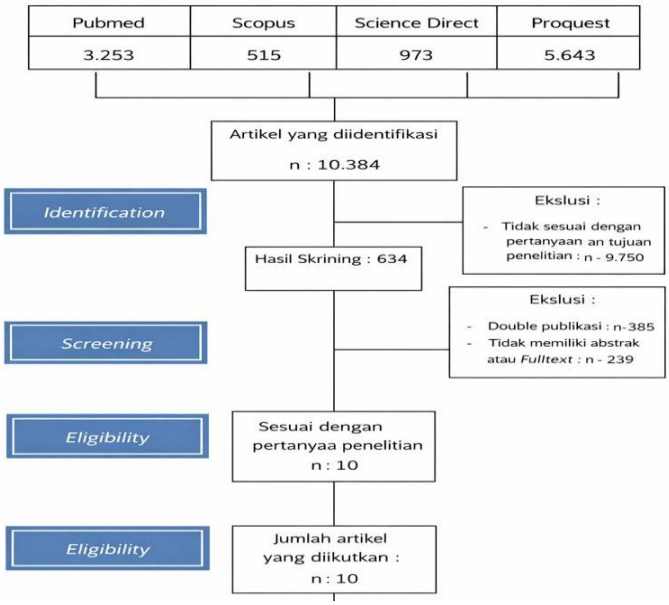

Figure 1. Flow diagram pencarian literature

3. RESULTS AND DISCUSSION

A systematic literature search was conducted using the PEO strategy across four databases: PubMed, Scopus, ScienceDirect, and ProQuest, resulting in an initial collection of 10,384 articles. All articles were then screened through title screening, abstract screening, duplication removal, and suitability assessment based on inclusion and exclusion criteria. The selection process yielded 10 articles that met the criteria for further analysis

in this study. The selected articles were then evaluated for methodological quality using the Critical Appraisal Skills Programme (CASP) instrument. The evaluation results indicated that all articles were suitable for use as data sources in this systematic review.

Based on the review of the ten articles, all studies reported the use of telehealth as a medium for healthcare services and as a means of health education for patients. The research designs used included cross-sectional, quantitative surveys, case-control, mixed methods, and systematic reviews, with patients and healthcare professionals aged 18–93 years old as subjects. The most commonly used telehealth platforms were two-way audio-visual videoconferencing and audio calls via mobile phones. These platforms were used for medical consultations, patient monitoring, and the delivery of health information and education. A summary of the research characteristics and main findings of the analyzed articles is presented in Table 2.

Table 2. Research Result

No	Author / Country / Year	Implementation of Telehealth in Health Services During the Pandemic	Platform Used in Health Services During the Pandemic
1	Anuj Goenka (2020) / New York	Implemented telehealth for oncology consultations.	Two-way audio–video communication (video conferencing)
2	Gaetano De Biase (2020)	Implemented telehealth for consultations with neurosurgical patients.	Two-way audio–video communication (video conferencing)
3	Anthony Wiliam Gilbert (2020)	Implemented telehealth for patient consultations in an orthopedic hospital.	Audio telephone calls
4	Diana Jimenez-Rodriguez (2020) / Spanyol	Implemented telehealth for patients with chronic diseases.	Two-way audio–video communication (video conferencing)
5	Jennifer Nicholas (2021) / Australia	Implemented telehealth for adolescent mental health care.	Two-way audio–video communication (video conferencing)
6	Paula Anne (2021) / Michigan, AS	Implemented telehealth services in teleophthalmology care.	Two-way audio–video communication (video conferencing)
7	Kim L. Bannell (2021) / Australia	Implemented telehealth for physiotherapy patients by providing individual and group classes, including Pilates, Good Life with Osteoarthritis, low back pain management, postnatal care, and prenatal care programs.	Two-way audio–video communication (video conferencing)
8	Jonathan D. Hron (2020) / United States	Implemented telehealth for inpatient COVID-19 and non-COVID-19 patients, including laboratory result updates, subspecialty teleconsultations, consultations with nutritionists, pharmacists, pediatric specialists, and other non-physician providers, monitoring quarantined patients at home, exercise education classes (e.g., asthma and diabetes), and operating room consultations.	Two-way audio–video communication (video conferencing)
9	Tarisai Kudakwashe (2020) / Afrika	Implemented telehealth to diagnose patients, conduct contact tracing, and manage COVID-19 patients.	Two-way audio–video communication (video conferencing)
10	Karim Shafi (2020) / New York	Implemented telehealth in spinal patient care.	Audio telephone calls

The results of this systematic review indicate that telehealth plays a crucial role as both a healthcare delivery medium and a means of health education for patients. The use of telehealth allows healthcare professionals to provide consultation, monitoring, and education services without the need for face-to-face meetings. This supports increased access to healthcare services, particularly for patients with distance and time constraints. These findings align with the research objective, which emphasizes the role of telehealth in improving the quality of healthcare services. Thus, telehealth serves not only as a communication tool but also as an educational instrument within the modern healthcare system.

The findings of this study are supported by multiple studies indicating that telehealth significantly improves patient satisfaction and the effectiveness of healthcare services [27]. Several studies report that telehealth enhances patients' access to health information and increases their engagement in the care process, particularly through remote consultations and digital communication platforms [28]. Evidence also suggests that telehealth contributes to improved continuity of care and patient-centered service delivery across diverse healthcare settings [29]. However, disparities in digital literacy among users remain a critical challenge, leading to unequal quality of telehealth implementation and outcomes [30]. Moreover, many existing studies do not comprehensively address health education as an integral component of telehealth services, highlighting a gap that warrants further investigation [31].

The novelty of this study lies in its synthesis of telehealth not only as a healthcare delivery mechanism but also as a structured medium for health education [32]. Unlike previous research that primarily emphasizes the technical or clinical dimensions of telehealth, this study underscores the educational function as a key determinant of service quality improvement [33]. This integrated perspective aligns with patient empowerment frameworks that emphasize the importance of health education in fostering self-management and informed decision-making [34]. By combining healthcare service delivery and educational functions, telehealth is positioned as a comprehensive solution for addressing complex healthcare needs [35]. This contribution is expected to enrich the telehealth literature, particularly in the context of sustainable and patient-centered healthcare systems [36].

The integration of telehealth with health education is closely aligned with patient empowerment and quality-of-care frameworks emphasized in contemporary healthcare literature [37]. Studies have shown that empowering patients through structured digital education improves self-management, treatment adherence, and health outcomes, particularly in chronic disease management [38]. Furthermore, quality-of-care models highlight that effective communication and patient education are central components of high-quality healthcare delivery, both of which can be facilitated through telehealth platforms [39]. Telehealth has also been recognized as a mechanism to strengthen patient–provider relationships by enabling continuous interaction and personalized educational support [40]. Consequently, integrating educational functions within telehealth services is essential for achieving holistic and high-quality healthcare delivery in digital health systems [41].

The implications of this study can be applied to the development of healthcare policies and service practices that support the integration of digital health technologies. Telehealth can be systematically incorporated into routine healthcare services to enhance both patient education and the effectiveness of healthcare delivery, particularly in improving access, continuity of care, and patient engagement [42]. In addition, the findings highlight the importance of strengthening healthcare professionals' digital competencies to ensure that telehealth services are delivered safely, effectively, and in a patient-centered manner [43]. Therefore, telehealth has strong potential to serve as an innovative and sustainable strategy for improving healthcare service quality within modern health systems [44].

This study has several limitations that should be considered when interpreting the findings. First, the number of articles included in the review was relatively limited, despite searching multiple international databases. Second, variations in research designs, populations, and outcome measures among the included studies contributed to heterogeneity in the findings. In addition, restricted access to certain indexed databases may have influenced the completeness of the reviewed literature. Nevertheless, these limitations are common in systematic reviews and do not diminish the value of the synthesized evidence, but rather indicate opportunities for future research to expand database coverage and include a broader range of studies [45].

4. CONCLUSION

Based on the results of the systematic review of ten articles that met the inclusion criteria, it can be concluded that telehealth plays a significant role in strengthening health education while simultaneously improving the quality of healthcare services, particularly in situations where access to face-to-face services is limited. The utilization of telehealth through various platforms, such as video conferencing and audio-based communication, has been shown to enhance service efficiency, accessibility, continuity of health education, and active patient engagement in managing their own health conditions. These findings indicate that the integration of service delivery and educational functions within telehealth supports the development of more adaptive, patient-centered healthcare systems. Therefore, it is recommended that telehealth be sustainably integrated into routine healthcare services, supported by appropriate policies, technological infrastructure, and continuous improvement of healthcare professionals' digital competencies. Furthermore, the results of this study may serve as a valuable reference for the development of health education programs and provide a foundation for future research to examine the effectiveness of telehealth across diverse healthcare contexts and broader population groups.

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USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors confirm that no artificial intelligence (AI)-assisted technologies were utilized in the preparation, analysis, or writing of this manuscript. All stages of the research process, including data collection, data interpretation, and the development of the manuscript, were conducted solely by the authors without any support from AI-based tools.

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