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Telehomecare: A Comprehensive Analysis of Its Relevance and Impact

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ABSTRACT

The domestic conveyance of healthcare administrations to patients utilizing broadcast communications innovations that capture quiet clinical status estimations to empower and encourage timely instruction, data spread, social, emotional, and self-care support, as well as care administration by a healthcare professional at an outside location or unscheduled domestic visits based on require. This paper reviews the Telehomecare concepts, challenges, and constraints that need to be addressed for the successful implementation of the Telehomecare system. The narrative overview of the literature synthesizes the findings retrieved from searches of computerized databases, hand searches, and authoritative texts. The results have been summarized and categorized according to the parameters of the Telehomecare impact framework. This comprehensive analysis examines the relevance and impact of Telehomecare, highlighting its benefits, challenges, and future prospects. By understanding the implications of Telehomecare, healthcare systems can make informed decisions regarding its adoption and integration into existing care models.

1. Introduction

Telemedicine is the use of technology to deliver healthcare services over a distance between patients and health workers. Telehomecare, a form of telemedicine based in the patient's home, is a communication and clinical information system that allows for the interaction of voice, video, and health-related data using normal telephone lines [5].

Telehomecare is an innovative way to provide care, monitor a patient, and provide education using the latest telecommunication technology [25]. Each monitoring unit provides the nurse with vital data, including blood pressure, blood glucose monitoring, pulse oximetry, heart rate, and weight [4][26][27]. The Telehomecare monitoring system is simple to use, and the data is automatically transmitted to the respective nurse through a wireless two-way pager system or standard telephone

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line [5]. Patient monitoring allows for early warning of changes in health status, preventing a chronic condition from growing into something more serious.

Telehomecare is also defined as the remote transmission by patients and collection of physiological and biological data, such as vital signs and symptoms, by healthcare professionals for the purposes of patient monitoring, data interpretation, and clinical decision-making [12]. Most home care agencies are accepting the Telehomecare system to assist with the care of the rising population of chronically ill adults.

The objective of the analysis is to thoroughly examine the concept of Telehomecare and evaluate its relevance and impact on healthcare delivery and patient outcomes. The analysis aims to provide a comprehensive understanding of Telehomecare by exploring its benefits, challenges, and prospects. By conducting a detailed examination of the existing literature and research, the objective is to present a well-rounded assessment of Telehomecare and its potential implications for healthcare systems.

The aim of this analysis is to shed light on the relevance and impact of Telehomecare in the field of healthcare. The analysis seeks to accomplish the following, to identify the various advantages associated with Telehomecare, such as improved access to healthcare services, cost-effectiveness, enhanced patient engagement, and early detection of health issues [9][17]. The aim also is to examine the different Telehomecare technologies, including remote monitoring devices, teleconsultation services, health apps, and digital platforms. Additionally, the analysis aims to explore how these technologies can be integrated into existing healthcare systems. By achieving these aims, the analysis aims to contribute to the existing body of knowledge on Telehomecare, enabling healthcare systems and stakeholders to make informed decisions regarding its adoption, implementation, and integration into healthcare practices [28].

This paper reviews the Telehomecare concepts, challenges, and constraints that need to be addressed for the successful implementation of the Telehomecare system.

2. Constraints of Telehomecare System

Telehomecare system is still relatively new to Malaysia's healthcare system. Before it can be successfully implemented, several issues and constraints need to be highlighted. This paper will discuss three major constraints as listed below:

2.1 Fragmentation

Measurement and reporting of patients' experiences have become a significant element of health-service assessment worldwide [4]. Fragmentation of modern healthcare systems has serious effects on patient's quality of care [8] despite the demand for modern healthcare systems to provide a sophisticated level of medical care, knowledge, and technology. However, fragmentation between sectors also poses a challenge for patients and healthcare providers. This is most evident in the increasing complexity of managing patients living with chronic diseases, where many healthcare workers are involved in the transfer of a complex chain of care across multiple sectors [4].

Fragmentation, by itself or in coincidence with other factors, can lead to worries about access to services, delivery of services of poor technical quality, unreasonable and unproductive use of resources, unnecessary increases in production costs, and low user satisfaction [14]. Fragmentation manifests itself as a lack of synchronization between the different levels and settings of care, replication of services and infrastructure, unutilized productive capacity, and healthcare provided at the least appropriate location, especially hospitals. Furthermore, in fragmented systems, users

experience a lack of access to services, loss of continuity of care, and the failure of health services to meet their needs.

2.2 Low Health Literacy

Historically, patients have gone to their healthcare providers to receive reliable health information. Although health information is now widely available via the internet, patients who are less educated, have less money, and are minorities are more likely to have inadequate health literacy because these individuals often do not have regular access to the internet [4]. They continue to receive most of their health information from healthcare providers. Patients are likely to get information from knowledgeable healthcare providers. One of the most difficult challenges healthcare providers may need to overcome when speaking with persons having low health literacy is gaining their trust. When the provider is different from the patient in terms of age, ethnic background, education, and socio-economic status, it may be difficult for the patient to feel comfortable asking questions or disclosing personal health information. In fact, many patients work hard to hide the fact that they have trouble understanding something they are told or given to read because they are embarrassed and do not want to appear to challenge the healthcare provider in any way [4]. To make matters worse, many people with low health literacy often do not see the same provider each time they seek care, making it even more challenging for providers to develop and maintain good relationships. Additionally, time is often in short supply during medical interviews and examinations, as pressures continue to mount for healthcare providers to increase the number of patients, they see each day. When time is limited, and patients do not feel comfortable communicating, it can be very difficult for a healthcare provider to determine what the patient does not understand and to address this knowledge gap adequately.

2.3 Cost

The costs of acquiring equipment in the early stages of development are high. As the Telehomecare system grows, however, equipment costs are expected to decrease [9]. Additionally, as the Telehomecare system becomes more prevalent, a potential secondary market may emerge. A substantial amount of the costs associated with Telehomecare implementation are related to developing the skill levels of the end-users. Some patients had difficulty operating the equipment, which raised questions about the selection of the most appropriate candidates for use. Many nurses had minimal exposure to computers, and they were hesitant to switch to typewritten nurse notes [19][20]. Instead, they preferred to document video visits using both the electronic record and handwritten notes. However, as the Telehomecare system grows and becomes more pervasive, end-users will likely become increasingly comfortable and efficient.

2.4 Others

There are other constraints such as privacy and security concerns related to patient data, technological barriers and the digital divide, regulatory and legal considerations, limitations in physical examinations and hands-on procedures and resistance to change among healthcare professionals and patients.

3. Review of Telehomecare

The review examines the current state of Telehomecare implementation, its benefits and challenges, and its impact on patient outcomes, healthcare costs, and healthcare systems. Additionally, it explores the role of Telehomecare in managing chronic diseases, improving access to care, and enhancing patient satisfaction. The findings of this review demonstrate the growing significance of Telehomecare and its potential to revolutionize healthcare delivery. It will cover the definition and concept of Telehomecare, technologies and platforms used in Telehomecare, barriers and enablers of Telehomecare implementation, enhanced patient engagement and self-management, technical challenges, and infrastructure requirements. privacy and security concerns, patient satisfaction and quality of life, resource utilization and healthcare utilization patterns, integration with existing healthcare systems, scalability and future directions and others.

This comprehensive literature review provides a thorough examination of Telehomecare, encompassing its relevance and impact in healthcare. It addresses the benefits and challenges associated with Telehomecare implementation, as well as its impact on patient outcomes, healthcare costs, and healthcare systems. The review underscores the growing importance of Telehomecare as a transformative approach to healthcare delivery, highlighting its potential to improve access, enhance patient engagement, and achieve cost savings. The findings from this review can inform healthcare professionals, policymakers, and researchers in further developing and implementing Telehomecare programs to optimize patient care and outcomes.

4. Methodology

Searches for peer-reviewed journal articles and dissertations were conducted using online databases in Telehomecare and Telehealth. The Google Scholar search engine was also used to conduct more general searches. All searches were limited to research with humans, published in English.

Table 1
Sources of Database and Search Keywords

Database searched	Terminology in Abstract	Articles Selected
Pub Med	Telehomecare or telehealth	8
All UiTM databases	Telehomecare or telehealth	6
ISI Web of Knowledge	Telehomecare or telehealth	2
Telemedicine journal and e-health	Telehomecare or telehealth	5

Information used to write this paper was collected from the sources listed in Table 1 and the selection is based on inclusion criteria in Table 2.

Table 2
Inclusion Criteria

Inclusion Criteria
<ul style="list-style-type: none">▪ Published in English▪ Research contributes to the findings of at least one of the elements in the Telehomecare system framework or Telehealth.▪ Journals dated from 2020

Based on findings, here are the key elements typically present in the Telehomecare system framework such as telecommunication technologies, patient monitoring and data collection, communication and collaboration, clinical decision support, patient education and self-management, privacy and security and evaluation and quality improvement.

5. Results and Discussion

The result of this research has provided valuable insights into the current impact of Telehomecare. Based on the literature findings, a conceptual framework for Telehomecare impact is presented in Figure 1. The framework identifies five significant elements that contribute to Telehomecare impact: accessibility, acceptability, integration, outcomes, and cost [7].

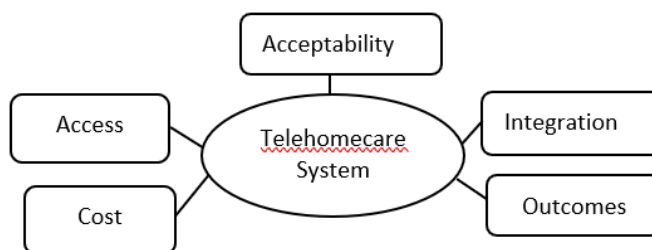


Fig. 1. Elements that Contribute to Telehomecare Impact

5.1 Accessibility

Accessibility is defined as the availability of the right support services at the right time without unnecessary problems. Telehomecare offers one way to improve access to information, education, and decision-making support services. Access to information and decision-making support provided by telecommunications equipment has been largely inferred from the use of the Telehomecare service.

5.2 Acceptability

Acceptability is the degree to which patients are satisfied with a service or are willing to use it. Studies of satisfaction may examine different aspects of the patient's experience. For example, satisfaction with the equipment and technical support, satisfaction with the quality of the Telehomecare consultation compared to a face-to-face consultation, overall satisfaction, and so forth. In two separate systematic reviews of the broader Telehomecare literature on satisfaction, [3] found that low sample size and poor study designs limited the generalizability of the results.

5.3 Integration

Integration is defined as the degree to which Telehomecare services and other healthcare services work with one another to support the needs of patients to reduce their care burden or improve their quality of life. Many, if not all, Telehomecare (and telehealth) services start as pilot projects and are likely to be less well integrated with existing healthcare services. To be effective, telehealth and, by implication, Telehomecare, cannot be layered onto existing health services without careful planning as to how it will become an integral part of health care delivery. Of course, integration is not an issue unique to Telehomecare only. It is an ongoing issue for the health care system as new knowledge, techniques, processes, or organizational structures are introduced and adopted or abandoned. It was supported in the literature review that the integration of Telehomecare into mainstream health care and homecare is largely anecdotal, though an increasing number of Telehomecare services usage [18]. The healthcare institutions' and stakeholders' readiness for the implementation and integration of Telehomecare are of considerable interest and importance [5].

5.4 Cost and Benefits

Costs and benefits are defined from the perspective of time, convenience, and mental and physical health. Telehomecare could save time in transporting patients from home to the hospital, and it was more convenient than a standard home care visit. Parents of cancer patients were asked to provide their perceptions of the benefits of Telehomecare, and they agreed with the statements that Telehomecare will reduce travel costs and is useful for remote communities [15][10]. A comparison of rural and urban groups in this study found that rural parents gave higher ratings to the impact of time and distance.

5.5 Outcomes

The quality of outcomes is the degree to which Telehomecare service directly or indirectly reduces the care or cost burden or improves health outcomes. Results from studies that focus on the impact of Telehomecare suggest that these interventions may be as good or better than alternative interventions. There was no significant difference between telephone support groups and in-person support groups with respect to the change over time in family functioning, caregiver burden, or distress.

5.6 Discussion

The methods used in this study were to search and select Telehomecare concepts, challenges, constraints, and contributions of Telehomecare. The advancement of Telehomecare innovation is happening on a global scale. The term Telehomecare refers to the provision of healthcare services and treatment across divisions through information or communication technology. It is believed that Telehomecare technology can reduce the need for readmission of chronically ill patients and improve integration between primary and secondary care sectors. Another goal of Telehomecare is to improve the quality of life for patients who stay at home while being monitored by healthcare professionals [2].

The home health industry is coping with challenges, including a nursing shortage, increased concern over the quality of care, decreasing reimbursements, and an aging population with complex chronic illnesses. These challenges require new and creative ways to deliver efficient, high-quality care. Telehomecare is believed to be an effective and innovative way to deliver services under these demanding conditions, and the home care industry is increasingly integrating this technology [22].

Although most telemedicine concepts discussed in this study are not directly targeting individual users but rather are allocated on an institutional level, the lack of computer literacy means that most of the key personnel, such as doctors, nurses, and health officers, are not very familiar with computers [21][23][24]. More importantly, a lack of computer users also prevents the development of commercial support services. In many developing countries, it is extremely difficult to find trained staff for the installation and maintenance of computers and computer applications, and thus those using computers must often rely on themselves to fix problems [1].

Despite the usefulness of Telehomecare, many barriers and a lack of incentives have prevented the successful implementation of this strategy to promote cost and clinical efficiency. Issues related to staffing, technology, and incentives have been identified as barriers. Several solutions are proposed that require changes in policy and agency operations. Further research is needed to test these solutions for their impact on cost and clinical efficiency [6].

6. Conclusions

Telehomecare, also known as remote patient monitoring or telemonitoring, refers to the use of technology to remotely monitor and manage patients' health conditions from their homes. It has gained significant attention and has been recognized as a valuable tool in healthcare delivery, offering numerous benefits such as improved patient outcomes, increased access to care, and reduced healthcare costs.

Telehomecare has demonstrated positive impacts on patient outcomes across various health conditions. Studies have shown reductions in hospital readmissions, improved disease management, and better adherence to treatment plans. By remotely monitoring patients' vital signs, symptoms, and medication adherence, healthcare providers can intervene proactively, leading to early detection and prevention of complications.

Telehomecare addresses barriers to healthcare access, especially for individuals with limited mobility or those living in rural or underserved areas. It allows patients to receive specialized care remotely, eliminating the need for frequent clinic visits. This technology enables healthcare professionals to reach a larger population, ensuring timely interventions and reducing geographical disparities in healthcare delivery.

Telehomecare has the potential to reduce healthcare costs significantly. By preventing hospital readmissions, emergency department visits, and unnecessary outpatient appointments, healthcare expenses can be significantly reduced. Furthermore, Telehomecare reduces transportation costs for patients and caregivers, as well as the need for institutional care, resulting in substantial cost savings for both individuals and healthcare systems.

Telehomecare encourages active patient participation in their own care. Patients become more engaged as they learn to monitor their health parameters and become aware of the impact of their actions on their well-being. This empowerment can lead to better self-management skills, increased treatment adherence, and lifestyle modifications.

Despite the advancements in Telehomecare, there are still areas that require further exploration and development. Some potential avenues for future work include the establishing uniform standards and protocols for Telehomecare devices, data exchange, and interoperability is essential

for seamless integration into existing healthcare systems. This would enable effective collaboration and information sharing among healthcare providers, ensuring comprehensive patient care. As Telehomecare involves the transmission and storage of sensitive patient data, ensuring robust security measures and privacy protections is crucial. Future work should focus on developing secure Telehomecare systems and protocols to mitigate the risks associated with data breaches and unauthorized access. Continuous improvement of user interfaces, ease of use, and user experience will be key to maximizing the adoption and acceptance of Telehomecare by both patients and healthcare providers [11]. Future work should focus on designing intuitive and user-friendly interfaces that cater to diverse user populations, including older adults and individuals with limited technological literacy. Integrating AI and machine learning algorithms into Telehomecare systems can enhance early detection of health deteriorations, predictive analytics, and personalized interventions. Further research is needed to develop robust AI models that can effectively analyze telemonitoring data, identify patterns, and provide actionable insights to healthcare professionals. Conducting long-term studies to assess the sustained impact of Telehomecare on patient outcomes, healthcare utilization, and cost savings is essential. These studies would provide further evidence and support the integration of Telehomecare into routine clinical practice [29].

In summary, Telehomecare has made significant contributions to healthcare by improving patient outcomes, increasing access to care, and reducing healthcare costs. Future work should focus on standardization, data security, user-friendly technology, AI integration, and long-term evaluation to further enhance the relevance and impact of Telehomecare in healthcare delivery [13][16].

This paper provided an overview of the Telehomecare system. The impact of Telehomecare can provide a guideline to assist researchers, government agencies, and the healthcare community in standardizing and promoting an understanding of Telehomecare and planning toward an implementation strategy. Although the Telehomecare system is not a new technology, there are many considerations that need to be addressed. However, it is a good time to plan, prepare, and embark on the project at the beginning stage for future implementation.

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