The Impact of Health Technology on the Role of Nursing in the Care of Chronic Patients

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Abstract

Healthcare systems reflect high growth in chronic care management, motivated by the increase of the aging population, the reduction of mortality by preventing and controlling acute diseases, and the difficulty in changing lifestyle habits over the years. In the framework of managing chronic patients, multidisciplinary teams could assure more qualitative and effective care and offer solutions and approaches to increase the population's trust in primary healthcare services. In this context, a significant evolution is recorded in the type of health technologies developed, which, using modern information technology, increasingly contain the acquisition of physiological monitoring and patient behavior data. The study proposes to approach several research aims, namely the impact of health technology on the role of nursing, technology, and communication between specialists and chronic patients, and technology as support in monitoring established therapeutics. (Kendzerska et al.2021)

Current nursing activities are focused on the wearing of sensors and applications that automatically guide the reception, emergency room, or dialysis center. The implementation of telemonitoring systems led to an observable increase in efficiency; likewise, there are conclusions that show a significant impact on the quick diagnosis of patients with other underlying pathologies. According to several doctors, the introduction of telemedicine services has contributed to the reduction of the number of patients' presentations by a significant percentage. In general, a significant improvement was observed in the healing time of various chronic diseases. Physicians and assistants reported a reduction in visits, which allowed them to focus on the reconstruction of follow-up relationships with patients. It has been shown that the use of this technology by a healthcare provider can revolutionize the behavior of patients, who can become active members of their own monitoring team. It is mandatory for nursing to adapt to this growing technology, especially because it contributes to changes in work processes, not only between specialists but also at an international level. This means that the same steps, such as monitoring the health of chronic patients by using telemedicine, provide an increase in diagnostic accuracy, patient

compliance, better work collaboration, and constant feedback. There is a need for nurses to refine their day-to-day expertise, including the ability to interpret the meaning of data captured from sensors used by chronic patients, and mostly to help the chronic patient establish this electric continuity as a therapeutic element. Ethical responsibility resides in the completion of these steps, their fair transmission to the patient, involvement in the treatment, and consideration for their human and professional aspects. (Joshi & Verma, 2021)

1. Introduction

In recent decades, the growing incidence and prevalence of chronic illnesses have led to the call for more effective management strategies to improve the quality of life for sufferers and to create more efficient care delivery systems. The development of health technology is increasingly being seen as integral to the future of health and aged care. The changing face of nursing practice, in relation to the inclusion of health technology into care, has only recently been the focus of nursing intervention studies. Health technology can be seen to have snowballed the opportunities and pressures on contemporary health services.

It is nurses who, for the most part, provide direct patient care and fulfill the role of case managers. In this situation, nurse case managers are seen very much in the attempt to integrate health technology use into the community clinical care infrastructure. It is not surprising that the nurses who are involved in case management are known to prioritize the role of patient advocate to enable positive nurse-client interactions and benefit patient outcomes. It remains currently unknown to what extent health technology is employed in the management of people with multidimensional chronic illnesses by the nurses. Furthermore, the effect of health technology use by nurses on outcomes for patients is unknown for this clientele. This paper recognizes the increasing importance of understanding the point at which nursing activity and health technology intersect and could

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coexist; nurse and health technology fit. The purpose of this essay is to examine the literature for current practices and possible future directions in understanding patients with chronic illnesses and how health technology is used by contemporary nurses. The intent of the knowledge collection and evaluation is to form a map of the current offering in terms of future nursing activities and conclusions for patient benefit. (Nilsen et al., 2020)(Fletcher-Brown et al.2021)

2. Understanding Chronic Illness and the Role of Nursing

The Issue of Chronic Illness A variety of definitions of chronic illness exist in the healthcare literature. While it is noted that asymptomatic periods are associated with acute or communicable illness and symptomatic periods with chronic or degenerative conditions, a set definition is not. Healthcare professionals commonly work with chronic conditions manifesting in physical, emotional, psychological, and social dimensions that affect functioning on a day-to-day basis. Some common examples of chronic illness indications include pain, ache, low energy, functional depletion, fatigue, reduction of mobility, reduced tolerance to stress, depression, and helplessness. Chronic illnesses often lead to specific complications in one or more body systems, increasing the complexity of management. Typically, chronic illness is characterized by one or more of the following: a permanent change in body structure; a long period of clinical evolution; and/or functional and psychological alteration of the affected individual which is not resolved by cure. The Role of Nursing and Chronic Illness Management Self-evident in high levels of literature, toughness and resilience are required for experiencing chronic illnesses, as individuals must develop skills in integrating their daily life with prolonged medical treatment and frequent visits to healthcare services. Nurses perform a multitude of functions to assist individuals in dealing with chronic health concerns. Crucial to all their functions is the holistic view of an individual's health, encompassing physical, psychological, emotional, and social health. They might educate the individual to self-manage changes and problems associated with medications, alongside advocating for inclusion and recognition of an individual's medical wishes. They can also support the provision of welfare counseling or spiritual support. These dynamic functions are performed to increase an individual's ability to lead a quality life despite their ongoing disease. By working on a daily basis with chronic illness, nurses often receive positive feedback about the work they do to maintain the patient's quality of life. For example, the centering of nursing intervention on an individual's quality of life management was demonstrated by the receipt of positive messaging by two nurses. In a case study, one nurse reported the story of a 40-year-old woman with chronic nerve damage to the face due to a brain tumor. Until she was stage four, she had held a part-time job. She could not complete a job due to her illness stage, though she still completed housekeeping. The nurse organizing care in the prosthetics and wig service and a dietitian working extensively with her portrayed how a multidisciplinary approach was employed to provide alternative strategies for predictable, immediate relief from facial nerve pain. The goal of the therapy did not encounter any improvement in condition. The patient-nurse relationship has been found to have a significant impact on the development of patient adherence to particular chronic illness medical treatments. (Anderson & Bury, 2024)

2.1. Definition and Types of Chronic Illness

A general definition of chronic disease is often made in opposition to acute disease because, while both acute and chronic conditions often require active medical interventions, their time course, outcomes, and implications for maintaining life and health are considerably different. Acute illness is defined by its severity and short-term impact; in essence, an acute condition is resolved either completely or incompletely. In contrast, chronic diseases are long-lasting illnesses that are seldom resolved completely; instead, they are typically managed by ongoing medical care. Popular chronic conditions on which many health authorities have focused are diseases such as heart disease, cancers, musculoskeletal conditions such as arthritis, and diabetes, predominantly because of the numbers of people affected by these conditions and the treatment costs in terms of health impact, disability, lost productivity, and early death.

A major health concern across much of the world is the increasing incidence of chronic diseases and the larger proportion of health care budgets being spent on caring for chronic illnesses. Many argue that these conditions are complex to manage because they involve multiple body systems and that people with chronic diseases are adapted very differently to illness than are people experiencing acute illness. Additionally, prevention of chronic diseases is linked to complex lifestyle choices influenced not only by biological vulnerability and social factors but also by more subtle social forces, values, and beliefs regarding health. Thus, in addition to individualized care and treatment of risk factors, many people believe that, to be effective, interventions must also target the social, physical, and cultural environments in which people live. (Meyerowitz-Katz et al.2020)

2.2. The Role of Nursing in Chronic Care Management

The main functions of home care nursing for patients with chronic illness are to (1) assess the needs of the patient and modify the care plans in relation to the natural history of the disease, (2) continue monitoring the effectiveness of given care and lifestyle changes made to gather beneficial effects, (3) be responsible for ongoing patient and family education on all relevant issues, (4) make appropriate referrals based on actual or anticipated complications, and (5) provide continuing resources and support. Patients and families do better when they are supported in their goals and have a good sense of the care plans and resources available to them. Bedside problem solving and ongoing teaching are the strengths of home care nursing. Providing constructive hands-on assistance is inherently a collaborative function and is tied in many cases to the nature of the patient's interaction with the family and their environment. Operating within this complex situation and serving multiple functions requires effective relationships both within and outside the nursing environment. In many programs, an interdisciplinary team approach includes the involvement of other licensed, as well as unlicensed, practitioners. There are many ways in which nurses build a therapeutic relationship with patients and families. Telehealth and electronic health records all have the ability to enhance the effect of these therapeutic techniques. The problem, however, is to make sure that these tools are consistent with the nature and purpose of nursing within the chronic care paradigm. Although nursing prognosticates better patient outcomes using these strategies, they do not come free. Each takes a different set of skills, including new nursing therapies, for reaching the best results. It is the pressing need for ongoing staff development and changes in the staffing mix that

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constitutes the greatest systemic challenge in nursing today relating to chronic illness. (Dowding et al.2020)

3. Evolution of Health Technology in Nursing Care

From the very beginning, hacking pieces out of the skull or at a painful molar until it falls out like the Bushmen in the Plio-Pleistocene, medical technology underwent significant evolutions in practice. At its essence, technology is the use of a process, its uses arranged into a system which usually results in the reinvestment of profit for the production of the next cylinder. Yet the adoption of formal market practices saw the introduction of "rigorous experiment" and the introduction of medical instrumentation such as the "stethoscope", the sphygmomanometer, or the electrocardiogram (ECG) which have become staple accessories worn around some practitioners' necks almost two centuries ago. Every day, patients have been asking, "I need to write this down - what have I got?"; yet it was almost that long ago that pen and paper took the form of digitized systematic record-keeping with the invention of computers for an accurate systemic medical history available worldwide. Used wisely, it is now a requisite form of technological literacy included in a nursing portfolio of qualifications as required by "hard data" from the hospital that wraps itself around the globe; diagnosing disease and effectiveness of cure.

Modern nursing has been reshaped in response to the increasing demand for more healthcare practitioners who are educated in the technological environment. Currently, healthcare technology is undergoing a meld between the provision of elements of corporally integrated health capability and nursing, in its nursing informatician guise, currently pampers and powders the "Informatics for the Modern Intensive Care" as found in the open access Nursing in Critical Care. Accordingly, the advent of patient monitoring technology in the late 19th century has undergone significant shifts from "the latest in diagnostic" technology, which until recently allowed the "early discovery of pneumonia" to around-the-clock remote heart monitoring. One does not really see the nurse's wish "that their patients will return in 30 days, rip all of their clothes off, and get back into bed for another 30-day stay", but the sentiment of nurse Elizabeth Ward, captured in Time magazine, is clear to see in another study to which up to 64% of care-seeking visits are "chronic care" related and account for 75% of all the dollar spent on the American metabolism. The increased investment in telehealth technology, such as glucose and other monitors by the sooty drone amongst simultaneously "droning" healthcare consumers of today, is aimed at these diseases which launch their attacks from within, from new color displays to MRI-guided minimally invasive ablation. Both aid in increasing care provider efficiency and better tailoring care to the chronic patient by placing the unique, the individual, the one and only "you" back into the practice of healthcare. Yet, if we take our messianic suggestions seriously further on in this paper, we will find that the rise of personal and portable self-performance and diagnostic technology seems to be not only ushering in a new monoculture of health. These "ubiqui-tech" capabilities are also playing around with a lateralized twist on a metaphor that gives participant-observers extra eyes on the future of nursing. (Bardhan et al., 2020)

3.1. Historical Perspective

Nursing does not exist independently of the evolution of health technology. In the centuries of hospitals before Florence Nightingale, what we would now term nursing was carried out

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almost exclusively by friends and family of patients, or by charitable institutions, all involved in direct care, without any difference and at the same level as those who were not technically a nurse. It was first from the incorporation of glamorous status into the nursing profession, and then from neurophysiological discoveries, that together revealed the technical and vocational possibilities of training "simple" individuals with the basics of biochemistry and physiology and in teaching them distinguishing signs characterized by statistically high "objects observable at a glance," that nursing has an independent identity and a professional function.

Prior to the refinement of the bioclinical sciences, and of the inexorable drive of the financial dimension in all sociohuman activities, the technology and science of nursing consisted exclusively of a sort of file on paper records of "the product that had to be produced," and of actual production processes. It was in this highly idiosyncratic historical situation of "proto-digital-physical" nursing that antiseptic and aseptic techniques were refused by his own profession for the duration of menstruation, and the proposals to adopt it were considered very strange indeed, to say the least. At that time, nurses were astonishingly powerful; physical reality influenced the body of the patients behind time and before space: a deep structure, if within the scope of Symbolic, to be more precise. Nevertheless, the first and widespread introduction in clinical care of a physical "objet" de médecine évident à première vue was the stethoscope, in the mid-19th century. In the beginning, the nursing profession was strongly committed to the "audition" of the body, instead of to its reception and food and drink. However, it did not display any special devices for the purpose. With the development of computerized tomography in the 1970s, the spatial dimension of the medical gaze has progressively become dominant in nursing. The introduction issued in 1979 was one of the first widely disseminated documents to reveal this point. Convergently, as the vocations of health technology could no longer be stopped, a number of national and international healthcare plans and decrees institutionalized crucial psychological and socio-economic new approaches based on the promotion of new technological principles of health care, where healthcare investment would be a priority of the broad spectrum "profitable," "zooming technosphere" – covering both scopes of the clinical and research sector. (Harris & Rice, 2022)

3.2. Current State of Health Technology in Nursing

In health care institutions, more and more attention is paid to the integration of various health technology tools and systems for medical assistance in clinical procedures. Stages 1 and 2 of the cybernetic process were created in the health sector by the development of digitized medical records, the transition from personal to telehealth, video conferencing by smartphone, and mobile health apps for healthcare. Digital registered nurse standards were defined to delineate the professional practice standards. Not only do health professionals use computers to record, store, or manage the health information of patients, but they also access and browse the information presented in electronic health records, such as recordings on body temperature, respiratory rate, blood pressure, and oxygen saturation by pulse oximetry, etc. In qualitative research, nurses argued that EHR helped them work faster, without losing so much time collecting documentation for the patient's record, and reduced the risk of misdiagnosis, which contributed significantly to patient care. (Nnabuife, 2024)

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Better use of health information technologies also shows promise for improving care processes, the effectiveness of healthcare, and personal engagement of patients and their caregivers. Mobile health and digital self-monitoring devices can enhance both e-communication and telecare in long-term home care. Currently, some nurses are combining the vast amount of data with specialized AI-infused tools to make intelligent decisions about complex treatment strategies. An added factor in telehealth for the nurse-patient relationship remains the problem of the "digital divide." Research has shown that the older patient population tends to have lower rates of internet usage and remote patient telehealth interventions due to a lack of computer literacy and familiarity with mHealth and other communication devices. The increasing use of health technology of all kinds has the potential to substantially benefit the nurse-patient relationship through communication. Patients can be provided care at a distance in a timelier fashion. In informatics education, nursing schools provide computer literacy courses as standalone courses, but also as an integrated component of the nursing program. The curriculum has been updated and developed to encompass nursing informatics. (Rush et al.2022)

4. Integration of Health Technology in Chronic Care Management

The use of new technology to optimize health care is considered an important reform for simplifying daily practice and enhancing coordinated and integrated care. With regard to chronic illness, disease monitoring should be patient-centered and based on gathering specific biometric and patient-reported measurements that can be classified and prioritized according to the patients' clinical parameters. Health technology purports to optimize and improve patient care and is the key to direct home health nursing as a form of practice development. Monitoring, coaching, and education using assistive technology tailored to individual illness perceptions and family situations can heighten insight and encourage adherence to treatment and self-management. The dissemination and use of new technology have made nurses reconsider and discuss the meaning of e-health nursing care and to develop simpler ways of describing how to manage daily practice, going from good local experiences to generalizable knowledge and evidence-based care. (Al-Jaroodi et al., 2020)

Nevertheless, the use of technology is not a panacea for care coordination and faces moral, ethical, and practical constraints. Enabling technology that fits the organizational needs and strategies is vital for professional cooperation and contributes to individual care paths. Digital tools can be used to support personalized communication and the receipt and sending of care plans and can give patients insight into care pathways and stakeholders. Best practices for implementing new technology include assuring that such technology fits into nurse workflows and improves the overall quality of care through family members and patients through environmental scanning. Technology cannot be understood as a solution for care, but technology needs care. Ideally, technology goes hand in hand with improving the professional identity of nursing and the health care sector. The following limit the use of a complex system approach to health care in chronic patients. Managerial solutions should not neglect the patient experience regarding integration. Available evidence about how to best integrate care is fragmentary and unclear.

4.1. Benefits and Challenges of Technology Integration

Extracting knowledge from patient data is one of the most promising aspects of health technology integration. Big data and data analytics can lead to reduced workload and lessen some of the burdens on health and social care systems. The use of predictive modeling would be well suited to healthcare where regular monitoring could anticipate clinical exacerbations or patients' changing needs to prevent avoidable emergency or primary care visits. In the home telehealth sphere, the use of this technology can track patient conditions and ensure that patients with serious or complex conditions are seen in the right place, in the right setting, and by the right people.

However, reported challenges must not be ignored. Firstly, investment in health technology is very expensive. Large-scale chronic disease management technology systems can run into millions to roll out—smaller scale projects are still very costly and may not treat the same number of patients. The use of smart technologies at scale also requires that every health professional comes on board and receives training. It can be argued that the move in culture from the traditional model of health and social care to one that embraces telehealth and telecare will lessen the demand for traditional frontline staff: this can be a real barrier. The use of personal health data also signals a number of risks, and leading organizations speak of concerns around abusive data usage, with the public less assured and less comfortable in organizational abilities to protect their health data. Importantly, these concerns cross socio-economic and cultural spheres and are not limited to elderly populations with chronic diseases. Technology is synonymous with trust and the personal touch of face-to-face relationships: often, a technological approach is perceived as less human. For technology to work equitably, it must appeal to the rich and the poor, the sick and the well. Data harvesting attempts would benefit from a cross-healthcare economic footprint to make technology accessible to all. Fundamentally, technology must reinforce the role of human agencies by lessening workload, increasing control, and general patient education on disease self-management. Furthermore, the long-term application of technology should celebrate what is done well and what is not; it is the role of human agencies that will enable this to happen. (Vassolo et al.2021)

4.2. Best Practices for Implementing Health Technology in Chronic Care

Implementation will be more successful if potential stakeholders are engaged during every step. Including patients and families will lead to understanding and alleviation of fears and a focus on features and working mechanisms that are beneficial and acceptable. A training program that fits the digital literacy of the healthcare provider improves acceptance. Poor digital literacy can be partly mitigated by reflection and skills programs, explicitly focusing on working with e-health, m-health, and blended health care.

Effective communication strategies are crucial to overcome the concerns of organizational changes and to create a positive attitude and expectations of the target group. Addressing the target group's concerns and assessments and communicating the value of modernization and new ways of working are needed. Transparency and continuity of change have to be emphasized. Innovative care concepts driven by technology will fail if they solve a technological issue rather than addressing a real concern and offering a solution to users' needs. Technology needs to uphold, simplify, and transform the work of nursing practice. Health technology is at its most effective when it can support nursing and contribute to

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reaching the care goals of the individual patient. Technology and nursing become truly interactive and reinforce each other's strengths, referred to as symbiotic nursing. The vision of the desired effects or behaviors is cast in an extended care study with the help of relevant stakeholders. In the field of chronic care and chronic positioning, patients can also be involved as important stakeholders in the establishment of vision. (Brown et al.2020)

5. Impact of Health Technology on Nursing Practice

Health technology can have a multifaceted impact on nursing practice, including the transformation of the roles and responsibilities of nurses, treatment methods, management protocols, organizational culture, and the relationship with patients, as well as the establishment of medical standards. The technology changes the traditional standards of care and the distribution of roles and may even lead to the loss of some professional positions. It increases nurses' access to health data, improves timely, continuous, and comprehensive patient information, and enhances communication between nurses and patients. In addition, health technology tools can improve nurse satisfaction, alleviate nursing shortages, and promote clinical nursing quality. The integration of more technology into nursing practice is seen as a signal of a shortage of medical resources in the next decade, and nursing activities related to patient care are being transformed. For example, with respect to chronic care, health technology has transformed the role of nurses from passive waiting, from 'treating diseases' to 'managing chronic diseases', and from hospital treatment to health management after discharge. As in primary care provision, a shift from taking care of the acutely ill to participating in the management of persons with chronic diseases, such as those resulting from lifestyle, is occurring. Health technology can facilitate improved communication possibilities between healthcare teams, including the patient. Patient compliance can be advanced, and patient satisfaction improved. With access to various technologies, numerous possibilities are available for healthcare support systems, self-management programs, chronic illness resources, disease management support, health information, and teleconsultation. Recent work on such topics illustrates how technology can be used for proactive care. Data are increasingly being used both at an individual patient level and at a broader population level as the major determinant of nursing care. The individual patient story is increasingly being told through tables and graphic forms, transforming the one-time narrative of history and physical findings into a data story. Care algorithms, protocols, and guidelines increasingly distill data and evidence into care decisions. The culture of nursing practice in many settings is moving towards evidence-based care in both philosophical stance and practical application. In considering these as e-health technologies, there are reports that distributive computing technologies promise to lower nursing visits and catch medical problems earlier. There are, however, other challenges. Nursing practitioners will need to be trained further in the appropriate use of technology for diagnostic accuracy and for maintaining the patient-nurse relationship. The possible adverse effects of depersonalizing care should be considered. Further studies are required, particularly regarding the details of service provision and associated organization, to explore the impact of such health technology on medical staff of all types and on organizations as a whole. In the context of the assignment for this special issue, it should be noted that the multifaceted character of care delivery is focused on the development of technical aids for self-care orientation, education, and lifestyle promotions. A strong aspect of this research underpins diabetology. There are a number of studies about

technology-assisted care, the uptake of technological devices, and individual characteristics. (Burnier, 2024)

5.1. Enhanced Communication and Collaboration

Enhanced communication within nursing is one specific area in which technology has been shown to have a positive impact. Several studies have shown that many forms of care in nursing include working with other health professionals with different professional backgrounds. Several skill sets are constantly needed in complex care for chronically ill patients, including effective teamwork and collaboration, as well as good communication. The use of electronic health records facilitates the flow of information among healthcare settings and providers and has been shown to improve patient outcomes. Informatic systems have also been shown to improve communication within nursing, as they lend themselves to nursing documentation, care planning, and uniform data collection as well as communication.

Telecommunication platforms can be implemented in cardiovascular care. Reviews of how to utilize teamwork among interdisciplinary members indicate that the use of telemedicine creates more coordinated care for patients provided by multidisciplinary teams. Another benefit of improved communication is greater transparency and individual accountability. Many aspects of the necessity for transparency and individual accountability for actions are important to ensure mutual trust and respect between a patient and nursing caregiver. This provides a forum for not only improving the quality and safety of care but also for recognizing the expertise of those in the caring role.

Case studies indicated that communication had improved throughout the implementation process. Those who used a device increased divert referrals from healthcare facilities to home care and saved money. Good communication skills, where information is shared

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accurately and efficiently, are important not only in managing care in an era of information overload, but also because good communication is the cornerstone of all chronic care. Technology is, in some cases, also being developed to ensure that this personal care does not take a back seat in the digital age. For example, a digital platform may be used. Recently, nursing has initiated using social networks for communication with a young audience to improve healthcare. (Song et al.2020)

5.2. Improved Patient Monitoring and Management

The evolution of hardware and software technologies allows for improvements in daily patient management care, especially for those suffering from chronic diseases. Currently available technological solutions offer the possibility of tracking patients' health status by providing dependable self-monitoring for varied types of required information. Examples of hardware devices include wearables and other home monitoring devices, telehealth services, and remote patient monitoring systems. These technologies permit real-time collection of data from various vital signs and health parameters. This continuous influx of measurements from these monitoring devices and sensors allows for the presentation of very accurate and clinically validated information to the nursing care team dealing with the specific patient in question to choose the best treatment or nursing intervention. In addition to continuous monitoring by nurses, patients are also responsible for keeping track of and managing their diseases. E-mental health interventions delivered by apps support self-care for complex chronic physical health conditions and improve the outcomes of a particular aspect of care. Using individualized dosing algorithms to elevate the self-management of a patient's disease is further discussed. E-assessments enable personalized care through the intelligent clinical decision support of a standard protocol, and patient self-management improvements are also separately discussed. Among the wide variety of resources available that encompass the technologies developed to improve health care, it often becomes difficult to identify practical strategies aimed at enhancing the patient care process itself, which should be the core focus of any device developed. Some of the above aspects will be reflected in the individual case studies described in the following subsection. Integration within the current system and the adherence of both patients and nursing staff to the proposed system remain significant challenges. However, nursing staff must continuously adapt to these new opportunities as they develop to utilize and implement these new resources in their day-to-day work. This can only be achieved by maintaining their hardware and software skills via continuous education and practice. (Ding et al.2020)

6. Ethical and Legal Considerations in Health Technology

The development and implementation of health technology follow a solid normative framework that addresses the technical, legal, and ethical requirements for ensuring the best outcome for patients and healthcare professionals involved in the process. Since health technology has proven to be of substantial value in preventing illness and overall healthcare spending, health professionals have been the first to ensure its use, notwithstanding any barriers that may arise, especially when considering the direct supply of drugs. Crucial to the adequacy of health technology implementation is not only the legal framework within which it operates but also the ethical principles to which all parties involved in the process are subject.

Legal questions are fundamental to the construction of health technology. In fact, these are the normative circumstances that create the legal framework for research, development, production, testing, and sale of new forms of addressing health problems. Once again, nursing assumes a strategic role by frequently serving as a bridge between the patient and health technology, thus facilitating both understanding of use and maturation of clinical concordance following demonstration of the added value of health technologies in patient care. The knowledge derived from nursing has not only settled the economic growth of health technology companies but also the practice demands of professionals and the expectations of both patients and family members with regard to greater and more accessible prompt healthcare. These are principles applied by researchers working in research and evaluation. Nursing particularly considers technology acceptance and knows the country's legal restrictions, as it is the first positioned to see the great added value of the nursing process in care. For all these stages which precede health technology acceptance, counseling and cooperation with the patient is important, emphasizing that all precautions must be taken according to the existing legal framework in each country. The achievement acceleration in technological innovations and societal challenges depends on the ability of the research system to respond to an increasing number of challenges with unrestricted efficiency, a process that has nursing in an outstanding position taking responsibility for new research positions. (Hübner et al., 2022)

6.1. Patient Privacy and Confidentiality
In order to exploit the benefits of modern trends in health technology, collaborations between various scientific disciplines, in this case nursing and computer engineering, should be promoted. Through its structured and fundamental approaches, accurate and efficient problem-solving, as well as its vast experience with a range of data types derived from varied patients and stages, the clinical domain, particularly nursing science, contributes significantly to the development, application, and use of health technology in general and also in the specific sphere of chronic patients' care. It is through the powerful combination of knowledge from different fields and domains that the adoption of contemporary advances is generally feasible, while it ensures the acquisition of unique gains that the juxtaposition of informatics and health sectors can offer. Such cross-fertilization is the key to enhancing healthcare quality as a comprehensive product. (Webster & Wyatt, 2020)

Health technology faces different sources and unique privacy and security issues. The particular focus in this chapter on older patients raises the stakes. After reviewing some relevant nursing informatics foundational principles, key privacy and security matters that health information technology professionals, including nurses, may encounter related to the care of older chronic patients will be discussed, and some best practices to address these challenges will be examined.

6.2. Regulatory Compliance
For the use of the technology to become acceptable to the users, the technology must comply with regulatory constraints and requirements. To explore the possibility of healthcare technology being utilized in chronic patients in repairing work that worked towards meeting chronic patient management standards, called "A Step-by-Step Guide to Repairing Care." These eleven standards outline the foundational operating practices and

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job functions required to establish an effective patient care system for chronic patients in hospitals and healthcare organizations.

At first glance, these standards would indicate that all of the requirements do not necessarily have to be met by technology. However, once a breakdown of the standards is carried out, it appears that most of the job functions that deal with the care of these patients when they come in with acute illnesses can potentially be addressed with technology. The tool indicated that at least half of the activities needed in helping and caring for chronic patients when they presented with acute illnesses closely correlated with technology functions. Interestingly, it was noted that care activities that were not directly related to technology had the highest human errors. This led to a rethinking of processes and support that was needed for human activities that coexist as part of the workflow within the acute admission setting. At the hospital, perceptions of their clinical systems are being fundamentally changed, first because they are no longer paper-based systems, but also because of research findings: users expect reliability and error-free performance from their clinical systems, but in reality, human error comprises a major component of the performance. (Shah et al.2020)

7. Future Trends and Innovations in Health Technology for Chronic Care
Over the years, technological advances in health have improved patient outcomes for chronic conditions. The next decade will be marked by a range of information and technology innovations that will significantly shape the way in which patients will be assessed, managed, and treated. This section will further highlight innovations in chronic care that will shape health technology. Current innovation is in the area of artificial intelligence with a range of machine learning models. Health technologies are also looking at the application of advanced analytics for patient needs. A whole-of-population predictive model is a goal for many areas, as this will enable a broader perspective of the patient journey, not just from a limited cohort group. The next step in personalized healthcare is the integration of data across different sources such as genetic information obtained from a blood sample, physical examination, medical history, and other diagnostics. This will revolutionize how we assess our patients and provide treatment strategies that are tailored to each patient's individual needs. Identifying patterns of people's behavior to refine strategies and health policy is expected to have an enhanced application through big data and predictive analytics. In the area of self-management, we expect to see new platforms for the integration of health and wellness with a focus on purpose and positive aging, combined with non-pharmacological therapeutic interventions, and such an approach appeals to the younger generation. The end in sight is the convenience of home care, as close to your normal life as possible without hospital needs. The importance of ongoing research and development on future health technology innovations cannot be understated. Health systems have been slow to adopt new technologies for a range of reasons such as limited funding, perceived clinician training needs, and misconceptions of safety. Stakeholders have referred to the current pace of health technology adoption as frustrating. In order to reduce the time and barriers to health technology adoption, all efforts should be made to research and develop new treatments that harness new technologies effectively. Collaboration with other disciplines such as psychology and mental health for developing a consumer-designed approach for patient interactions in healthcare is needed. (Haleem et al., 2021)

One significant challenge in the use of health technology and the management of chronic diseases is the cost of accessing appropriate staff. This challenge will be magnified in the future as the penetration of health technologies into everyday life and clinical settings rises. One way to mitigate this is with collaborative healthcare. In order to deliver collaborative healthcare, a focus on health technology that is patient-centric and empowers the consumer is needed, as adults prefer to manage their health using digital technologies. Consumers continue with lifestyle behavior change regardless of their views on the effectiveness of technologies to drive change. In the future, the use of health technologies by adults is anticipated to reduce out-of-pocket spending during the acute phase of recovery and after an event.

8. Conclusion
In the care of chronic patients, the use of a mix of different types of health technology could change the nursing role. The new emphasis for the care of chronic, multiple morbid patients might go back to outpatient nursing, primary care, the use of new health technologies, and new collaboration between professionals at the outpatient clinics. The heart of nursing is caring for concerns and comforting the humane integrity as a whole. Nurses are often the intermediaries between humans and technology and have a significant role in the definition of health. Decision-making processes and the patient's dependency have changed through technology. Sex, social position, classified level of education, and economic dependency are the background of the evolution of older clients. Another aspect identified is the increasing amount of 'lay expertise' present in society, as well as detailed knowledge of recent technology in health. (Booth et al.2021)

In conclusion, new types of health technology could change the picture of the care of chronic, multiple morbid patients. Nurses will undoubtedly have the major role and responsibility to adapt to using advanced health technology, keeping in mind the essence of nursing, whereby comfort and concern for the humane side should always go hand in hand with the application of technical expertise. The use of health technology in an intense integrated nursing system of outpatient clinics can improve the quality of nursing care. We should keep in mind, however, that it is not the technology itself that makes a difference, but how we use these tools. The optimal use of health technology in nursing is, however, to balance technology and techniques with attention to humane care. Governing and financing the use of technologies in healthcare in ethically responsible ways is the major challenge of the future. As managers are responsible for what is ethically sound in home care organizations, they must be role models for nursing care. Consequently, keeping up to date with all the new technologies that are introduced in the workplace is of major importance. (Fang et al.2020)

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