Chapter 1

The Historical Development of Tools and Equipment Used in Nursing Care: A Chronological Review From Antiquity to The Present

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Abstract

The fundamental role of nursing is to provide care, and this role has continuously evolved in parallel with the development of tools and equipment used in nursing practice throughout history. Nurses utilize a wide range of simple and advanced technological instruments in clinical and community-based settings to meet individuals' health needs. The development of these tools has been shaped by scientific progress, technological transformations, wars, social and demographic changes, and shifts in disease patterns. This study examines the historical development of the tools and equipment used in nursing care from ancient civilizations to the present day using a chronological approach. Starting from the primitive care practices and surgical instruments of Mesopotamian, Ancient Egyptian, Ancient Greek, and Roman periods, the evolution of hospital organization and hygiene in the Middle Ages and Islamic civilizations is discussed. Furthermore, the emergence of anatomy-based medical instruments during the Renaissance and Industrial Revolution, and the development of essential tools such as thermometers, sphygmomanometers, microscopes, syringes, forceps, ophthalmoscopes, and laryngoscopes with the rise of modern medicine in the 19th century are addressed. The widespread use of patient monitoring systems, aspiration devices, oxygen masks, urinary catheters, and intravenous equipment after World War II, as well as the impact of digital health, telehealth, simulation technologies, and recent innovative applications on nursing care are also evaluated. In conclusion, although technological advancements have significantly improved the safety, effectiveness, and quality of nursing care, it is emphasized that these developments should support—not replace—the human-centered nature of nursing.

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1. Introduction

The foundation of nursing is caregiving, which encompasses a holistic approach to the physiological, psychological, social, and cultural needs encountered by individuals throughout the life course. While fulfilling their caregiving role, nurses utilize a wide range of tools and equipment in diagnostic, therapeutic, monitoring, preventive, and rehabilitative processes across both clinical and community-based practices. These tools are used in diverse areas, from the assessment of vital signs and monitoring of treatment responses to the maintenance of hygiene and the provision of life-support interventions. Today, the instruments and equipment used in nursing care not only facilitate technical practices but also directly influence the safety, effectiveness, and quality of care.

The increasing patient load, the rising prevalence of chronic diseases, changes in lifestyle and demographic structures, population aging, the growing complexity of care needs, and the digitalization of health services have necessitated the continuous development of tools used in nursing practice (Blaxter, 1990; Booth et al., 2021; Kaplan & Yavuz Van Giersbergen, 2025). Especially in intensive care units, emergency departments, surgical clinics, and community health settings, nurses work with advanced technological equipment, and patient monitoring, medication administration, and life-support interventions are largely carried out through technological devices. This situation demonstrates that the nursing profession has evolved not only as a role centered on humane care but also as a professional discipline requiring technological competence. From the perspective of equipment and instruments, the history of nursing is generally examined under two main periods: the pre–World War II period and the post–World War II period. The pre–World War II era is characterized by the development of basic care tools, with a focus on hygiene, wound care, vital sign monitoring, and simple interventions. In contrast, the rapid advances in science, medicine, and engineering after World War II led to a fundamental transformation in nursing practices (Fairman, 2002). Monitored patient surveillance systems, mechanical ventilators, infusion pumps, advanced diagnostic devices, and computer-based recording systems are among the most prominent products of this period (Xue et al., 2008).

However, the development of tools and equipment used in nursing is not limited to the modern era. From the earliest periods of human history, various instruments were developed in parallel with efforts to provide care and combat disease. From ancient civilizations through the Middle Ages, the Renaissance, the Industrial Revolution, and into today's digital health

applications, the tools and equipment used in nursing care have undergone continuous change and transformation in light of accumulated scientific knowledge and technological progress. In this context, the aim of this study is to examine, through a chronological approach, the historical development of the tools and equipment used in nursing care from antiquity to the present, and to evaluate, from a holistic perspective, the care instruments that came to the fore in different periods, their purposes of use, and their impact on nursing practices.

1.1. Health Instruments and Equipment in Ancient Civilizations

The earliest written records related to health care date back to the civilizations of Mesopotamia and Ancient Egypt, which are regarded as the first periods in which medical practices and care instruments were systematically documented. In Mesopotamia, the presence of detailed provisions regarding surgical interventions, malpractice, and the instruments used in the Code of Hammurabi indicates that medical practices of the period were conducted within a defined regulatory framework (Bynum, 2008). During this era, bronze knives, scalpel-like cutting instruments, bandages, forceps, and bloodletting vessels were widely used; rudimentary splints and bandaging techniques constituted an important part of care in the treatment of fractures and dislocations. These instruments enabled the provision of care both in the treatment of diseases and in war-related injuries.

In Ancient Egypt, the emphasis placed on health care, particularly through mummification practices, contributed to the advancement of anatomical knowledge. Papyrus texts describe detailed care practices for wound management, burn treatment, and eye diseases. Honey and wine were used for wound cleansing due to their antiseptic properties, and dressings made of linen were applied for bandaging. Because eye diseases were common, special eye-dropping tubes were developed, while hollow tubes were used as enemas for digestive system disorders. It is also known that simple obstetric instruments were utilized in childbirth for the care of both the mother and the newborn. These practices demonstrate that care was not limited solely to treatment but also encompassed hygiene, nutrition, and prevention.

In Ancient Greek civilization, with Hippocrates, the understanding of disease independent of supernatural causes and based on observation and environmental factors laid the foundations of scientific medicine. Hippocrates emphasized the importance of care in monitoring the course of illness and stated that applications of heat and cold, dietary regulation, and rest were integral components of treatment (Hippocrates, 1931). During this period,

metal surgical instruments, bloodletting vessels, bandages, compression devices, and materials for hot and cold applications were widely used. Practices aimed at patient hygiene, nutrition, and observation—considered primitive forms of nursing care—continued to hold significance.

In the Roman period, the development of military medicine in particular led to notable advances in health instruments and equipment. The widespread nature of war injuries necessitated the diversification and practical refinement of surgical tools. Primitive forms of forceps, metal urinary catheters, drainage tubes for wounds, suturing needles, and surgical clamps were used during this time. In the military hospitals known as valetudinaria established in Rome, wounded soldiers received systematic care, including wound cleansing, dressing, and infection prevention practices. Moreover, improved hygiene conditions achieved through advanced aqueducts and sewage systems were directly reflected in the quality of care.

In conclusion, although the health instruments and equipment used in ancient civilizations appear primitive when compared with today's technological standards, they clearly demonstrate the early emergence of systematic tool use in fundamental areas of care such as surgical interventions, wound management, hygiene practices, and the treatment of eye and digestive system disorders. The instruments and care practices developed during this period formed the foundation for modern medical and nursing equipment in subsequent centuries.

1.2. Instruments and Equipment in the Middle Ages and Islamic Civilizations

In medieval Europe, health services were largely provided within monasteries and church-affiliated infirmaries, and patient care was primarily delivered by nuns and religious personnel. During this period, the causes of diseases were often associated with supernatural forces, and treatment and care practices were carried out alongside religious rituals. Although the range of instruments and equipment was limited, bloodletting vessels, leech therapy, simple surgical knives, suturing needles, heated stones, and herbal ointments were widely used (Bynum, 2008). Bloodletting was regarded as a fundamental therapeutic method believed to regulate the balance of the "four humors" in the body; therefore, bloodletting cups and leeches became indispensable tools of medieval care practices. The core elements of nursing care in this era were structured around maintaining cleanliness, sustaining nutrition, protecting wounds with simple dressings, and providing companionship to the patient.

The widespread occurrence of epidemic diseases in medieval Europe, particularly plague and leprosy, led to the development of arrangements for the isolated care of patients. Care was provided in quarantine centers known as lazarets, where basic instruments such as simple bedding equipment, tools for hot and cold applications, and wound care materials were used. However, due to the limited scientific knowledge regarding sterilization and infection control at the time, care practices often resulted in high mortality rates.

In contrast, Islamic civilization reached a far more advanced level in medical and care practices throughout the Middle Ages compared with Europe. The bimaristans (darüşşifas) established during this period are regarded as the precursors of modern hospitals, where patients were observed in inpatient wards and where regular care, nutrition, and hygiene needs were systematically met. Bimaristans included patient wards, pharmacies, surgical units, and educational sections, and care was delivered through a multidisciplinary approach. One of the most prominent figures of Islamic medicine, Al-Zahrawi (Abulcasis), described more than 200 surgical instruments in his work Kitab al-Tasrif, together with detailed illustrations and explanations of their use (Sari, 2020; Yıldırım, 2017). These instruments included forceps-like obstetric tools, metal probes, urinary catheters, bloodletting vessels, suturing needles, knives, scissors, and drainage tubes. The tools described by Al-Zahrawi are considered the precursors of modern surgical and nursing equipment.

In line with the strong emphasis placed on hygiene in Islamic civilization, water-based cleansing, wound irrigation, dressing applications, and personal care were systematized. Herbal mixtures known to have antiseptic properties, as well as vinegar- and alcohol-like solutions, were used in wound care, and wounds were covered with sterile cloths. Moreover, patients' nutrition, rest, and psychological support were regarded as integral components of care. This approach reflects the historical foundations of the holistic care philosophy embraced in contemporary nursing.

In conclusion, while a relatively limited development in health instruments and equipment is observed in medieval Europe, Islamic civilization is characterized by the systematic description of surgical tools, the prioritization of hygiene, and the advancement of hospital-based care. The instruments and care practices developed during this period constituted an important source of knowledge that later contributed to the scientific advancements experienced in Europe during and after the Renaissance.

1.3. The Renaissance, the Industrial Revolution, and the Nineteenth Century

The Renaissance represents the rebirth of scientific thought in terms of medical and care practices. With the acceleration of anatomical studies during this period, the structure of the human body began to be understood in greater detail, and surgical interventions started to be performed on the basis of observation and experience. Vesalius's anatomical atlases provided a scientific foundation for surgical practice, and in parallel, surgical instruments began to be designed in a more deliberate and functional manner (Bynum, 2008). Advances in metalworking enabled the production of knives, suturing needles, forceps, and clamps with greater durability and standardized dimensions. These developments contributed to making the instruments used in care practices safer.

With the Industrial Revolution, the major transformation in production techniques was also reflected in the health sector, and mass production made medical instruments and equipment more accessible. Developments in the glass and metal industries increased the variety of measurement and application tools. Particularly in the nineteenth century, the advancement of the microscope enabled the identification of microorganisms; thus, the causes of infections were better understood, and the importance of hygiene in care practices was grounded in scientific evidence. During the same period, Lister's principles of antiseptic surgery shaped modern approaches to infection control and emphasized the significance of sterilization practices (Lister, 1867). In this era, practices related to cleanliness, wound care, and the prevention of infection in nursing care became systematized. The years between 1850 and 1900 are regarded as a critical period in which the foundations of modern nursing care, in terms of instruments and equipment, were established. During this process, the stethoscope, glass syringe, bandages, wheelchairs, feeding bottles, and serum bottles began to be widely used, and standard practices in patient care were formed (Fairman, 2002; Fouad et al., 2025; Slawson, 2019). In particular, Florence Nightingale's emphasis on hygiene and her observation-based approach to patient care systematized the use of nursing-related instruments. In this period, nurses began to monitor patients' vital signs regularly, and the tools used for this purpose became an integral part of care.

With the widespread use of thermometers in the late nineteenth century, temperature monitoring became a standard nursing practice. This development made a significant contribution to the early detection of infections and to the monitoring of the course of disease. The regular

measurement of body temperature strengthened the use of objective data in nursing care. The sphygmomanometer developed by Riva-Rocci in 1896 revolutionized the assessment of the circulatory system and made blood pressure measurement one of the fundamental indicators of clinical care (Riva-Rocci, 1896). Although these devices were initially large and cumbersome, they gradually became portable instruments that nurses could easily use at the bedside. Regular monitoring of blood pressure increased the safety of care, particularly in surgical interventions and internal medicine settings. The syringe, developed in 1853, enabled the safe direct administration of medications into the body and initiated a new era in medication administration in nursing care. Early syringes, made of glass and metal, required sterilization and were reused. This condition necessitated greater attention by nurses to sterilization and aseptic practices. The ophthalmoscope, developed by Helmholtz in 1851, made examination of the ocular fundus possible and represented a major advance in the diagnosis and monitoring of eye diseases (Jaeger, 1995). Through this instrument, nurses began to take an active role, together with physicians, in the follow-up of patients' vision-related problems. The laryngoscope, by enabling the direct visualization of the upper airways, facilitated the care process particularly in cases of airway obstruction, foreign body aspiration, and during surgical interventions (Bynum, 2008; Xue et al., 2008).

In conclusion, the Renaissance, the Industrial Revolution, and especially the nineteenth century represent a period in which the instruments and equipment used in nursing care were developed on scientific foundations and in which measurement-, diagnosis-, and treatment-oriented practices became standardized. The tools developed during this period formed the basis of the modern technological equipment used in contemporary nursing practice.

1.4. The Historical Development of Fundamental Diagnostic and Interventional Instruments: From Forceps to the Syringe

One of the most significant transformations in the history of medicine and nursing has been the development of specific tools and instruments that rendered care more measurable, standardized, and safe. Especially from the seventeenth century onward, several fundamental instruments not only directly influenced nursing care but also profoundly altered clinical decision-making processes (Bynum, 2008; Gelijns et al., 1989; Rampton et al., 2022; Xue et al., 2008; Durdona et al., 2025; Fairman, 2002).

1.4.1. Obstetric Forceps

The origin of obstetric forceps used in childbirth dates back to the late sixteenth and early seventeenth centuries and to the Chamberlen family in England. Peter Chamberlen and his family developed this instrument, which facilitates delivery by grasping the fetal head in difficult births, and kept it as a commercial secret for many years (Barnawi et al., 2013; McIntosh, 2012; Loudon, 1992). Over time, different designs emerged, and with the widespread use of obstetric forceps in the nineteenth century, a significant reduction in maternal and neonatal mortality rates was achieved. In nursing care, this instrument further emphasized the importance of postpartum monitoring of the mother and the newborn, hemorrhage control, and infection prevention practices (Durdona et al., 2025).

1.4.2. Microscope

The first compound microscope is generally accepted to have been developed in the Netherlands in the 1590s by Zacharias and Hans Janssen (Bynum, 2008). In the seventeenth century, Antonie van Leeuwenhoek laid the foundations of microbiology by observing bacteria, unicellular organisms, and blood cells with his single-lens microscopes that provided high magnification (Durdona et al., 2025). The development of the microscope enabled the understanding of the causes of infections and contributed to placing asepsis, antisepsis, isolation, and hand hygiene practices in nursing on a scientific basis.

1.4.3. Thermometer

The first instruments for measuring body temperature began with Galileo's water thermoscope in the late sixteenth century, while their clinical usability became possible in the early seventeenth century with the graduated thermometers of Sanctorius Santorio (Bynum, 2008; Durdona et al., 2025). In the nineteenth century, Carl Wunderlich defined normal body temperature ranges based on data obtained from thousands of patients and scientifically demonstrated the importance of fever in the course of disease (Wunderlich, 1871). Thus, the thermometer became one of the fundamental tools of regular vital sign monitoring in nursing.

1.4.4. Sphygmomanometer (Blood Pressure Device)

The clinical measurement of blood pressure became possible in 1896 with the development of the mercury sphygmomanometer by the Italian physician Scipione Riva-Rocci (O'Brien, 1996). With the identification of

Korotkoff sounds in 1905, diastolic pressure could also be measured, and blood pressure monitoring became an indispensable part of clinical practice (Booth et al., 2021; Durdona et al., 2025). This development marked a critical milestone in nursing care for the monitoring of hypertension, shock, heart failure, and perioperative patients.

1.4.5. Ophthalmoscope

The ophthalmoscope, which enabled the examination of the fundus of the eye, was developed in 1851 by the German physician and physicist Hermann von Helmholtz (Jaeger, 1995). This instrument made direct observation of the retina and optic nerve in the living eye possible, and the role of nurses increased, particularly in the monitoring of ocular findings related to diabetes and hypertension (Durdona et al., 2025).

1.4.6. Laryngoscope

The foundations of laryngoscopy were laid in the 1850s when Manuel Garcia observed his own vocal cords using a double-mirror apparatus. This method was later introduced into clinical practice by Johann Czermak and Ludwig Türck. In 1895, with Kirstein's description of the direct laryngoscope, airway assessment and intubation became safer (Bynum, 2008; Durdona et al., 2025). These instruments increased nurses' responsibilities in monitoring airway patency and providing post-aspiration care.

1.4.7. Syringe (Hypodermic Syringe)

The modern form of the hypodermic syringe was independently developed in 1853 by the Scottish physician Alexander Wood and the French surgeon Charles Gabriel Pravaz. These glass- and metal-bodied syringes enabled the measured administration of medications directly into the subcutaneous tissue and the bloodstream. In the mid-twentieth century, the development of single-use plastic syringes constituted a critical step for asepsis and patient safety in nursing care (Durdona et al., 2025).

1.4.8. Intravenous (IV) Therapy and Infusion Sets

The first experiments on the intravascular administration of substances were conducted in the seventeenth century by Sir Christopher Wren. IV fluid therapy gained clinical importance in 1831 when Thomas Latta successfully applied saline infusion during a cholera epidemic (Bynum, 2008). With the development of plastic IV sets and infusion pumps in the twentieth century, IV therapy became central to nursing care (Finkelman, 2024; Fairman, 2002).

1.4.9. Urinary Catheters

The use of catheters for bladder drainage is known to date back to Ancient Egypt. The modern balloon-retention Foley catheter was developed in the 1930s by the American urologist Frederic Foley. The Foley catheter enabled hourly urine output monitoring in surgical and intensive care patients and became a fundamental instrument for the assessment of renal function and hemodynamic status.

1.4.10. Oxygen Masks and Oxygen Therapy

Oxygen was identified as a distinct gas in the eighteenth century, and with the development of compressed oxygen cylinders in the late nineteenth century, oxygen therapy became applicable in clinical settings. In 1917, John Scott Haldane developed special oxygen masks for soldiers exposed to chemical gases during World War I. In the 1930s and 1940s, modern mask designs emerged, and today nasal cannulas and reservoir masks have become widely used (Booth et al., 2021; Fairman, 2002).

Each of these instruments, at the time of their introduction, profoundly influenced not only medical practice but also nursing care, rendering nurses' roles in monitoring, documentation, intervention, and patient safety more visible, measurable, and standardized.

1.5. The Post–World War II Period

The post–World War II period is regarded as a major turning point during which rapid advances in medical and health technologies profoundly transformed nursing care. Experiences gained during the war related to trauma, burns, infections, and multiple injuries accelerated the development of life-support technologies and laid the groundwork for the emergence of new models of hospital care. With the establishment of intensive care units (ICUs) during this period, the use of advanced technological equipment in nursing practice became widespread (Rampton et al., 2022).

From the 1950s and 1960s onward, monitored patient surveillance systems became routine in intensive care units. The continuous monitoring of heart rhythm, respiratory rate, oxygen saturation, and blood pressure made it possible to assess patients at an early stage and to intervene rapidly in life-threatening conditions (Booth et al., 2021). This development increased nurses' responsibility for continuous observation and real-time clinical decision-making, and nurses became effective users of technological patient monitoring systems. During the same period, suction devices became indispensable tools in the care of patients with respiratory failure by enabling

the safe and effective removal of accumulated airway secretions. Oxygen masks and oxygen delivery systems also became fundamental components of life-sustaining care for patients with respiratory distress. With the standardization of oxygen therapy, nurses began to take an active role in monitoring oxygen flow rates, mask types, and patient tolerance.

Urinary catheters began to be widely used in intensive care units and surgical clinics for monitoring urine output and facilitating bladder drainage. Especially in the postoperative period, the evaluation of urine output together with vital signs became an important indicator in the assessment of fluid balance. Likewise, intravenous (IV) sets and infusion systems assumed a central role in nursing care for fluid–electrolyte balance, medication administration, and parenteral nutrition. The subsequent development of electronic infusion pumps enabled the controlled and safe administration of fluids and medications and played a significant role in reducing medication errors (Finkelman, 2024; Xue et al., 2008).

From the 1980s onward, the introduction of computer technology into health care initiated a new transformation process in nursing care. Initially used for recording patient admissions and laboratory results, computer systems gradually enabled the digital documentation of nursing care plans, medication administrations, and patient monitoring data. With this process, electronic health records (EHRs) became widespread, significantly strengthening continuity of care, data security, and interprofessional communication (McGonigle & Mastrian, 2025). As computer-based systems expanded, nursing informatics developed as a distinct area of specialization. Nurses began to take an active role in the use of clinical decision support systems, electronic care plans, patient monitoring software, and quality indicator surveillance (Agustin et al., 2020; Erdinç & Karadağ, 2016; Shortliffe & Cimino, 2021). These advancements enabled nursing care to become more evidence-based, traceable, and standardized.

In conclusion, the development of monitored patient surveillance systems, suction and oxygen support devices, urinary catheters, intravenous application sets, and computer-based documentation systems in the post–World War II period transformed nursing care into a technologically supported practice that directly influenced patient safety, effectiveness of care, and patient outcomes. During this era, nursing evolved from a profession focused solely on caregiving into a professional discipline characterized by the effective use of advanced technology.

1.6. Digital Health and Simulation Technologies

Since the 1990s, the rapid advancement of information and communication technologies has fundamentally transformed the delivery of health services, and digital health applications have become an integral component of nursing care. This process has reshaped not only the technical dimension of care but also the humanistic and artistic aspects of nursing. Technological developments have reduced nurses' workload, enhanced patient safety, and enabled more time to be allocated to direct patient care. However, the growing integration of technology into care processes has also generated new debates regarding the quality of nurse–patient interaction, ethical responsibilities, and the preservation of the human dimension of care (Kalkavan & Çoban, 2025; Rampton et al., 2022; Darvish et al., 2014; WHO, 2021).

Mobile health (mHealth) technologies, through smartphones and portable devices, have enabled real-time data sharing for both patients and nurses. With blood glucose monitoring systems, blood pressure tracking applications, wearable health technologies, and remote monitoring platforms, individuals' health data have become continuously observable, thereby increasing opportunities for early intervention in nursing care. These developments have strengthened continuity of care and patient safety, particularly in the management of chronic diseases. The use of simulation technologies in nursing care gained momentum after the 2000s and has brought about a major transformation in nursing education (Kim et al., 2016; Karlsaune et al., 2023). Through high-fidelity simulators, virtual patient scenarios, and computer-based training programs, nurses are able to practice medication administration, emergency interventions, intensive care procedures, resuscitation, and patient safety applications without posing risks to real patients. Simulation-based education significantly enhances nurses' clinical decision-making skills, teamwork communication, critical thinking abilities, and awareness of patient safety (Darvish et al., 2014; Öztürk & Azizoğlu, 2025).

Today, artificial intelligence (AI) and clinical decision support systems represent a new era in nursing care. AI-based early warning systems analyze patient data to predict clinical deterioration in advance and can alert nurses about conditions such as pressure injury risk, fall risk, sepsis development, and drug interactions (Nashwan et al., 2025; Booth et al., 2021; O'Connor et al., 2023). Clinical decision support systems guide nurses in the development of care plans, the control of medication administration, and the monitoring of care outcomes. These systems make significant contributions

to reducing care-related errors and standardizing the quality of care (Çırlak & Gökdemir, 2025; Sun & Hopkins, 2025). In addition, electronic health records, big data analytics, cloud-based health systems, and AI-supported triage applications aim to reduce nurses' workload, accelerate care processes, and enhance patient safety (Shortliffe & Cimino, 2021; Öztürk & Azizoğlu, 2025). However, alongside increasing digitalization, new areas of concern such as data security, protection of privacy, ethical responsibilities, and technological dependence have also entered the agenda of nursing care. Therefore, the integration of digital health applications into nursing practice requires not only technological competence but also careful consideration of ethical, legal, and humanistic dimensions.

In conclusion, digital health, telehealth, simulation technologies, and artificial intelligence applications have significantly enhanced the quality, safety, and accessibility of nursing care. Nevertheless, it is more important than ever that these technologies be used as supportive tools that reinforce the human-centered and holistic approach that lies at the core of nursing practice.

2. Conclusion

The instruments and equipment used in nursing care have undergone a continuous process of development, extending from the simple practices of early human history to today's advanced technological applications supported by artificial intelligence, big data, and digital health systems. This historical trajectory—from rudimentary tools used for wound care and hygiene in ancient times, to the surgical instruments of the Middle Ages; from the advancement of measurement and diagnostic devices during the Renaissance and the Industrial Revolution, to the widespread use of life-support systems and monitored surveillance technologies after World War II, and finally to contemporary digital health, simulation, and artificial intelligence applications—has progressively strengthened the scientific and technological foundations of nursing care.

Technological advancements have significantly enhanced the safety, effectiveness, accuracy, and traceability of nursing care, contributing to continuity in patient monitoring, early diagnosis, prevention of complications, and improvement of care outcomes (Öztürk & Azizoğlu, 2025). Monitored surveillance systems, infusion pumps, suction devices, electronic health records, and digital decision support systems have enabled nurses to conduct care processes in a more systematic, evidence-based, and safe manner. In addition, simulation technologies have become an important tool in nursing

education by enhancing clinical competence and indirectly supporting patient safety. Nevertheless, despite the expanding role of technology in nursing care, the human-centered approach that constitutes the foundation of the nurse–patient relationship remains indispensable. Technological tools should be used to support, facilitate, and strengthen nursing care, but they must not overshadow its human, ethical, and emotional dimensions (McGonigle & Mastrian, 2025). Touch, empathy, communication, and the therapeutic relationship established with the patient remain fundamental components of care that cannot be replaced by any technological system.

In conclusion, the historical development of the instruments and equipment used in nursing care from past to present has reinforced nursing as a scientific discipline and improved the quality of care. In the future, artificial intelligence, robotic systems, and advanced digital health applications are expected to assume an even greater role in nursing practice. However, throughout this process of technological transformation, preserving the human-centered, safe, ethical, and holistic approach that constitutes the essence of nursing care, and integrating it with technology in a balanced manner, will continue to be a fundamental necessity.

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