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REFLECTION ARTICLE

Intensive care unit - past, present and future: an invitation to reflect

Unidade de terapia intensiva - passado, presente e futuro: um convite à reflexão

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ABSTRACT

Objective: To provide a comprehensive overview of the evolution of critical care, highlighting its historical origins, identifying important milestones in its development, and examining technological advances over time. It also aims to address the current challenges facing intensive care as a specialty, contributing to an in-depth understanding of its complexity and relevance in the healthcare context. **Method:** This is a theoretical-reflective essay based on historical research and the knowledge of the authors, who analyze, reflect, and contextualize the construction of intensive care units, their current guidelines, and prospects. **Results:** The manuscript deepens the theoretical framework described and brings concrete elements that generate concerns to elicit more pertinent behavior in the care of critically ill patients. This means combining the use of available technology with more humanized care practices. **Conclusion:** We believe that accurate knowledge of legal regulations and resolutions promotes and sustains the necessary improvements in the care process, ensuring safe and effective care for critically ill patients. It also provides planned and organized working conditions.

Keywords: Critical Care; History of Medicine; Critical Care Nursing; Legislation as Topic; Technological Development.

RESUMO

Objetivo: Apresentar uma visão abrangente da evolução da terapia intensiva, destacando sua origem histórica, identificando marcos importantes em sua trajetória de desenvolvimento e examinando os avanços tecnológicos ao longo do tempo. Além disso, pretende abordar os desafios atuais enfrentados pela terapia intensiva como especialidade, contribuindo para uma compreensão aprofundada de sua complexidade e relevância no contexto da saúde. **Método:** Trata-se de um ensaio teórico-reflexivo apoiado na busca histórica e no conhecimento dos autores, os quais analisam, refletem e contextualizam a construção das unidades de terapia intensiva, suas diretrizes atuais e perspectivas futuras. **Resultados:** O manuscrito aprofunda o arcabouço teórico descrito e traz elementos concretos que geram inquietações para suscitar condutas mais pertinentes no atendimento dos pacientes críticos. Isso significa aliar a utilização da tecnologia disponível com práticas assistenciais mais humanizadas. **Conclusão:** Consideramos que o conhecimento acurado das normativas e resoluções legais promove e sustenta as melhorias necessárias no processo assistencial, garantindo a segurança e eficácia do cuidado aos pacientes críticos. Além disso, oferece condições de trabalho planejadas e organizadas.

Descritores: Cuidados Críticos; História da Medicina; Enfermagem de Cuidados Críticos; Legislação como Assunto; Desenvolvimento Tecnológico.

INTRODUCTION

It is well known that the act of caring has always been an essential part of the various dimensions of the process of life, illness, and death. Throughout the wars, various rescue and healing techniques were developed, but it was during World War II that the concept of tria-

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ge emerged. The first intensive care unit (ICU) beds were created in 1923 by Dr. Walter Edward Dandy at Johns Hopkins Hospital in Baltimore, USA. It was at this hospital that the first ICU with full-time medical staff was established 35 years later. Over time, there was a need to expand services to include the care of critically ill and traumatized patients who needed life support, as well as the care of pediatric patients[1]. Inspired by post-operative recovery rooms, special care units began to be established[2].

However, the concept of intensive care existed before the first ICU was developed. After the tragedy at the Coconut Grove nightclub in Boston, USA, in 1942, seriously injured victims were taken to Massachusetts General Hospital. To provide the necessary care, an entire floor of the hospital had to be evacuated and quickly adapted to the needs of the victims. In addition to the physical adaptations, a full-time medical and nursing team was needed, trained to care for and assist the patients, and to monitor their progress until they were in good enough condition to be transferred to other wards[2].

In this scenario, the ICU was characterized by its physical area with limited access to patients and technological resources, as well as the presence of a specialized and trained team capable of managing the admission and discharge criteria for patients. The first respiratory ICU was established in Scandinavia in the early 1950s, where a medical team performed artificial lung ventilation using the Drinker tank ventilator, also known as the steel lung, which simulated the physiological process of breathing. These simulators were integrated into intensive care units, changing the reality of emergency care and becoming an ally in saving lives. This technology evolved, being perfected and adapted to better meet the needs of the time, and in 1951 the Engstrom respirator proved superior to the previous technology and began to be used in various ICUs. In Brazil, São Paulo was the first city to receive the first action lungs in 1955, which led to the first Brazilian intensive care units[2].

With the growth of ICU facilities in hospitals, especially in Latin America, there was a period when assistive technologies were valued for monitoring patients beyond human experience. Over the years, the need for efficient records to represent the constant fluctuations in the clinical status of unstable patients led to the implementation of a nursing work system. One of the most significant technological advances occurred in the 1960s, driven by advances in aerospace technology, due to the need for continuous and remote monitoring of astronauts, which also had an impact on the ICU. During the same period, renal replacement therapy began as an integral part of intensive care, aiming to remove fluids from uremic patients with water overload[3].

In this context, the aim of this article is to provide a comprehensive overview of the evolution of intensive care, covering its origins, important milestones in its development, and technological advances over time, as well as the challenges facing the field, to contribute to an understanding of the complexity and importance of this specialty.

METHOD

This article adopts a theoretical-reflective approach, based on meticulous historical research and critical analysis of the authors' contributions. The analysis focuses on contextualizing and reflecting on the evolution of ICUs, as well as their current guidelines and the prospects inherent in this field of study.

ICU: a new specialty in the social context

In Brazil, the medical specialty of Intensive Care Medicine was not recognized until 1991, but the struggle to increase the visibility of this sector began much earlier, with the creation of the Brazilian Society of Intensive Care Medicine (1979), which became the Brazilian Association of Intensive Care Medicine (AMIB) in 1980. It was through this medical association, with the participation of ICU nurses, that the Nursing Department of AMIB was created in 1992. In the 1990s, ICU nurses organized themselves and founded the São Paulo Society of ICU Nurses in 1994, which became the Brazilian Society of ICU Nurses (SOBETI) in 1996, active until 2004. Together with the Brazilian Nursing Association (ABEn), SOBETI made it official to obtain the title of Specialist in Intensive Care in 1996, through the first exam held during the 48th Brazilian Nursing Congress in São Paulo. The second examination to obtain the title was held in 1998, and the academic results at that time contributed to a special issue of the SOBETI Journal in 1998[2].

During the South Brazilian Congress of Intensive Care Medicine in 2003, a forum for ICU nurses was held to discuss issues of care, health management in the ICU, and the participation of ICU nurses in public ICU policies. From this

event, a movement of ICU nurses emerged to revitalize the Brazilian Society of ICU Nursing (SOBETI), but without success. Over the years, this movement grew and brought together nurses from all over the country, led by the Nursing Department of the Brazilian Association of Intensive Care Medicine (AMIB). After the demise of SOBETI, the Brazilian Association of Nursing and Intensive Care (ABENTI) was created in December 2009 and registered with a notary on February 5, 2010[4].

In 2011, the public competition for the title of Specialist Nurse in Adult, Pediatric, and Neonatal Intensive Care began. From 2011 to 2015, the title was awarded based on skills and by passing a theoretical examination. In 2016, the acquisition of the title by proficiency was temporarily suspended and replaced by the introduction of a practical skills assessment[4].

The main objective of the certification of critical care nurses for adult, pediatric, and neonatal patients is to guarantee the competence of nurses to provide safe and quality care to critically ill patients and their families. ABENTI, in partnership with AMIB's Nursing Department, aims to promote the integration of nurses working in intensive care in Brazil and abroad. This is done by facilitating the exchange of knowledge and experience, contributing to the enrichment and dissemination of the work of this professional category. It is important to note that ABENTI is affiliated with both the Latin American Federation of Critical Care Nurses (FLECI) and the World Federation of Critical Care Nurses (WFCCN).

Legislation and regulations for intensive care and nursing

With the advancement in the specialization of ICU physicians and nurses, and the growing need for trained professionals in this area, it has become essential to create legal regulations to protect professionals and patients, as well as to guarantee the quality of services provided. Until 2010, no legislation/standardization in Brazil applied to all public, private, philanthropic, and military ICUs in the country. Decree 3432/GM of August 1998 only regulated public ICUs or ICUs that received SUS patients.

Subsequently, Resolution of the Collegiate Council (RDC) No. 7/2010[5] was drafted, which es - tablished minimum guidelines for the full operation of ICUs. Its main objective is to minimize potential risks to patients, visitors, and health professionals, as well as to the environment. It is important to note that this regulation covers all ICUs in the country, regardless of whether they are public, private, or philanthropic, as well as those of a civilian or military nature.

It is essential to continuously monitor ICUs and document their performance analysis, as well as assess the overall standard of operation and record events that may suggest improvements in the quality of care provided. ICU patients must be assessed using a system that classifies their care needs. The management of the hospital in which the ICU is located must guarantee the availability of the human and material resources necessary to maintain the full functioning of the unit and ensure continuity of care, in strict compliance with the guidelines outlined in the RDC[5].

The revision of RDC 7/2010 by RDC 26/2012[6] was carried out by Regulation No. 332 of March 24, 2000, for neonatal patients and Regulation No. 895/2017[7] for adult and pediatric patients of the Ministry of Health, which regulates ICUs that care for SUS patients. It was deemed necessary to differentiate between type III and type II ICUs, with a ratio of 5 patients per nurse in type III ICUs and 10 patients per nurse in type II ICUs. This regulation also defined and specified the progressive care of critically and/or seriously ill patients, giving professionals the ability to admit and discharge, classify and activate ICU beds according to the existing categories in the SUS (adult, pediatric, coronary unit, burns, and intermediate care), as well as addressing the organization of ICUs and ICUs in terms of qualifications, indicators, materials, and equipment. It's important to note that standards and regulations exist, but they must be applied according to the needs of patients the different realities of each country, and the complexity of ICUs.

This process of reformulation has also led to a debate on the training required for intensivists. To improve and increase the quality of care provided, on February 8, 2017, RDC 137[8] entered into force, bringing changes to the training requirements for those who hold the positions of technical managers and team coordinators. Article 13[1] of the RDC stipulates that the medical-technical manager, as well as the nursing and physiotherapy coordinators, must hold a professional qualification by the guidelines established by the respective professional councils and recognized associations. Contrary to the requirements of RDC 7/2010, which required a Lato Sensu training in intensive care and/

or related fields, RDC 137 qualifies the ICU nursing coordinator, provided that the professional obtains the professional certification of the title of Specialist Nurse in Intensive Care, granted by the professional association of reference, in this case, ABENTI, recognized by ABEn and registered with COFEN. This certification is based on a method of evaluation (written and practical) of knowledge, skills, practices, and clinical experience, to ensure that the intensive care nurse in a coordinating position is as qualified as possible, guaranteeing the quality and safety of the care provided.

It is important to note that the certification and diploma processes are different and completely independent. Lato Sensu certification is based on continuing education and qualified, formal specialization by specific, well-founded requirements for the practice of the profession and is regulated by the MEC. The qualification process, on the other hand, is validated by a non-governmental body, based on predetermined standards, qualifying and recognizing nurses for the area in which they wish to work, giving prestige to their specificity in the eyes of the work team and other professionals, legitimizing their scientific and professional competence. It is important to note that the process of qualification of specialist nurses in intensive care is officially recognized by COFEN Resolution 625/2020. This resolution updates the procedures for the registration of Lato and Stricto Sensu postgraduate degrees awarded to nurses within the COFEN system/Regional Nursing Councils and lists the recognized specialties[9].

Certification is an important differentiator in the career of an ICU nurse because it not only promotes the primacy of continuing education in critical care, but also validates this knowledge to patients, families, employers, and professionals in the field themselves. It is also mandatory for all ICU nurse coordinators[8]. Differences of opinion between professionals and the Ministry of Health regarding the nurse-physician-patient relationship led to several changes in the rules for the ratio of nursing professionals per bed, which was modified from 1 nurse for every 8 beds or fraction thereof[5] to 1 nurse for every 10 beds or fraction thereof[6].

The Federal Council of Nurses (COFEN) issues resolutions that establish guidelines for the size of the nursing staff in ICUs, to ensure adequacy in both quantitative and qualitative terms to meet the needs of patient care. The main objective is to maintain quality in the provision of services by establishing a minimum number of hours so that these professionals can work safely[10], by the Code of Ethics for Nursing Professionals.

There are two resolutions dealing with guidelines for ICU staffing: Resolution No. 527/2016[11] and Resolution No. 543/2017[12], which is currently in force. These resolutions are complementary, since the first one establishes the ratio of professionals per patient in ICUs (1 nurse for 1.33 to 1.5 patients, 1 nurse for 2.56 to 2.5 patients, and 1 nursing technician for 2.77 to 3 patients), while the second one regulates the number of hours that these professionals must work (18 nursing hours per patient in ICUs and the use of the Patient Classification System (PCS) with a minimum of 52% nurses, with the remaining professionals being nursing technicians).

It is essential to emphasize the relevance of these parameters for the proper planning of the number of professionals needed in teams working in ICUs during the provision of care. In addition to the previously defined number of professionals, it is crucial to include a Technical Safety Index (TSI) of at least 15% of the total, divided into 8.3% allocated to cover vacation periods and 6.7% for unscheduled absences. In cases where the team of care professionals in the care units is made up of 50% or more people over the age of 50 or includes 20% or more professionals with limitations or restrictions in the performance of their activities, it is recommended to add 10% to the sector's staff[13].

The differences in the parameters established by governmental and non-governmental bodies are clear and hinder the installation of strategies and policies aimed at the qualitative and quantitative adequacy of the nursing workforce in Brazilian ICUs. This creates a conflict between the administration of health institutions and the technical nurses, making it difficult to implement policies that promote and sustain the necessary improvements in the care process[14]. These improvements are essential to guarantee safe and effective patient care and to create working conditions that are conducive to the results of the care provided.

Law 7.498/86[15] establishes the duties of nurses, which include planning, organizing, coordinating, implementing, and evaluating care, as well as performing exclusive leadership and management activities. In addition to these administrative tasks, nurses are directly responsible for the care of patients in critical conditions and those requiring sound scientific knowledge

and the ability to make immediate decisions. Because nurses are in close contact with patients daily and provide continuous care, they can recognize and even prevent critical situations.

The physical space of ICUs

The physical, social, professional, and interpersonal environments constitute the ambiance that must be taken into account to provide welcoming, problem-solving, and humane care to the people involved. The nurse must be the protagonist in this scenario since his or her knowledge is fundamental to the development of a successful project and an infrastructure that provides an environment conducive to healing. The standards for the physical infrastructure of healthcare facilities aim to ensure uniformity of information and quality of services provided. The main Brazilian standard for healthcare projects is Resolution RDC No. 50 - ANVISA[16], which needs to be updated to meet the current needs of ICUs. Legislation can be enriched by manuals developed by bodies in charge of certifying and accrediting healthcare institutions, such as the National Accreditation Organization (ONA in Portuguese). These manuals can include the evaluation of the perception of the physical space by both the patient and the provider, as a new variable to be included in the criteria for evaluating facilities[17].

The presence of natural light in environments plays a fundamental role in the perception of time, distinguishing day from night, and is an influential factor in people's state of health. In this context, natural light also plays a positive role in the treatment of critically ill patients. The combination of natural and artificial light helps to reduce symptoms of depression and helps to maintain the health of patients. The environment must be designed to be multi-sensory, providing visual stimuli, such as the viewing of pictures and the presence of vegetation or indoor gardens, as well as natural light. In addition, auditory stimuli such as music and the opportunity for emotional interaction with other patients in the same situation are equally important. An environment that promotes these positive aspects is intrinsically linked to different situations and plays a preventive role in the occurrence of adverse events[18].

Patient-centered care is a current vision that replaces the concept of patient isolation in the ICU. Family participation plays an extremely important role in the recovery process of critically ill patients. It is essential to plan a space near the bed to accommodate family members and also to provide a living area with sanitary facilities to help them feel more comfortable and rest properly. Natural lighting and a multi-sensory environment are positive factors in the treatment of critically ill patients, as are privacy and individuality, which can be achieved through partitions that allow for integration and privacy. Updating standards and guidelines is necessary to meet the needs of patient-centered care and the current Brazilian health scenario[18].

Current situation and future challenges for intensive care nursing

The magnitude of the COVID-19 (SARS-CoV-2) pandemic crisis has highlighted the disparity between nations in terms of coping strategies and has brought to the fore cultural differences. This crisis has exposed the weaknesses of health systems and social inequalities around the world, but it has also highlighted the fundamental role of nursing in situations of extreme population vulnerability.

In 2020, the Pan American Health Organization (PAHO) and the World Health Organization (WHO) proclaimed the "International Year of Nurses and Midwives" to recognize the significant work of these professionals on a global scale. The purpose of this initiative was to recognize the significant contribution made by these professionals around the world, to advocate for greater investment in their fields, and to improve their working conditions, education, and professional development[19].

Another highlight is the "Nursing Now" campaign, launched in February 2018 in collaboration with the World Health Organization, the International Council of Nurses, and the UK All-Party Parliamentary Group on Global Health. This initiative aims to raise the prestige and recognition of nursing worldwide and represents an international action to strengthen professionals in this field. In the Brazilian context, this campaign is promoted by COFEN, in collaboration with the WHO Collaborating Center for the Development of Nursing Research, linked to USP/Ribeirão Preto, to highlight nurses as true health leaders, play a fundamental role at the forefront of countless intensive care units around the world[20].

At the same time, Advanced Nursing Practice (ANP) represents an important milestone in healthcare, in which nurses exercise professional autonomy, apply advanced assessment skills,

and provide advice to other healthcare professionals. Training in this area requires an advanced level of education that is recognized by formal licensing and accreditation systems[21,22].

In the current context of ICU care, there is an ongoing discussion about the inclusion of EAP professionals in ICU teams. This new role brings a more specialized approach with a wider range of responsibilities and enhanced clinical skills. The presence of specialized advanced practice nurses can be a positive aspect of critical care, providing patients with a higher level of care and expertise. It is essential to reflect on professional identity. This reflection involves an analysis of the knowledge and skills historically developed and achieved by the science, discipline, and profession of nursing. This process of review and reflection will enable Brazilian nursing to adapt to the emerging needs of contemporary health practice and to face the challenges and demands of a constantly evolving scenario.

The evolution of critical care nursing and the construction of ICUs have faced numerous challenges, both in the past and the present and future, as seen in the current pandemic that has claimed countless lives daily. Although ICU care has been consolidated through world wars and previous pandemics, the current reality is marked by a highly communicable and deadly disease, especially for nurses who are on the front line of care. Infrastructure, organization, and professional qualifications are constantly being put to the test in the face of this invisible enemy called coronavirus, which is very real and palpable to the nurses who dedicate themselves daily to the critical care of these patients. Nursing has as its object of action the dimension of comprehensive care, fundamental in the past, present, and future, based on solid scientific knowledge capable of overcoming barriers and guaranteeing the safety and quality of care of patients admitted in critical conditions to ICUs. In addition to the COVID-19 pandemic, nurses and nursing technicians have shown resilience, the ability to reinvent themselves, build and train in the face of adversity to serve the Brazilian population in difficult times, as seen in the emergency care provided to the victims of the Kiss nightclub tragedy and the H1N1 outbreak in 2009. We didn't see nurses abandoning patients' beds, but rather dedicating themselves to overcoming these difficult moments in history with responsibility, commitment, scientific knowledge, and technical skills, performing their duties with excellence.

Innovation and qualification in the care process pose the challenge of a technically qualified but essentially human care system capable of translating its role to society. Nurses carry out countless activities in their daily practice, from identifying risks to patients, assessing their state of health, monitoring signs and symptoms of clinical deterioration, reducing hospital-acquired infections, providing comfort and emotional support to patients and their families, providing guidance and health education, to managing the unit in which they work.

Our confrontations must arise from safe conditions for our work and the valorization of care practices. A transformation is needed in health systems to value the category that has been dedicated throughout history to caring for people and making a difference in healthcare scenarios.

CONCLUSION

The contribution that this reflection proposes is an in-depth analysis of the construction of knowledge in the care of critically ill patients. It addresses some essential points for a more purposeful future perspective in the actions developed for these individuals, which combine the use of available technology with a more humanized care practice, placing patients and their families at the center of care.

It can be said that the installation of ICUs around the world is driven by two main factors: the increased demand for hospitalization of patients and the growing complexity of diseases and medical interventions. These factors have created challenges for care, not only in terms of material and human resources but also in terms of physical aspects, which has led to the need to adapt hospital facilities to meet this new demand. In this new scenario, the role of nurses has been highlighted and has become fundamental, as they have the necessary training and qualifications to work in the care and management of ICUs. In this sense, it is noticeable that nurses assume a position of empowerment, with the need to master knowledge based on human physiology and pathophysiology to carry out early detection and intervention aimed at maintaining or restoring compromised vital functions. In addition, they have the skills, qualifications, and clinical competencies to identify, prevent, and minimize the adverse effects of interventions on the integrity of patients, respecting their values, principles, and

wishes and valuing the human relationship. By using their skills and experience, by choosing to focus on caring for the person rather than curing the disease, and by using technology as an ally to promote patient harmonization rather than as a primary resource, nurses can strengthen and clarify their roles and functions.

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