

## Advanced nursing competencies in critical care: education and evaluation tools. A narrative review

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### ABSTRACT

**Introduction:** advanced nursing competencies refer to expanded and improved health care services and interventions delivered by nurses who, with advanced skills, influence clinical health outcomes and deliver direct health services to individuals, families, and communities. What distinguishes the critical care from other settings, where nurses can develop advanced skills, is its complexity and dynamism. The aim of this review is to outline the advanced skills in critical areas through training path description for their achievement and the tools used to evaluate them in the international context.

**Materials and Methods:** a narrative literature review has been performed. The main scientific databases were consulted (Medline/PubMed, CINAHL, Cochrane Library, EMBASE), selecting articles in English and Italian published in the last ten years, since the establishment of the working group for advanced skills of the European federation of Critical Care Nurses Association (EfCCNa). All the articles dealing with advanced skills in the critical area and the related evaluation tools were included.

**Results:** a total of thirteen articles were selected, including two literature reviews. Formal training programs for critical care nurses are present in 17 out of 24 European countries and critical care nursing has been recognized as a specialty in 13 of them. There are ten assessment tools for assessing advanced critical care skills.

**Discussion:** the educational status of critical care nurses in the EU is extremely varied and disomogeneous. Currently, the literature offers valid and reliable assessment tools for skills, but they are heterogeneous and not usable in every context.

**Conclusions:** it is necessary an institutional intervention at national and community level, aimed at regulating the training and recognition of nursing competencies in critical care also through a uniformity of evaluation tools.

**Key words:** advanced practice nursing; critical care; critical care nursing; nurse specialist.

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## Introduction

During the SARS-CoV-2 pandemic, intensive care units and local emergency departments were put to the test due to the increase in workloads about the number of resources available. For this reason, nurses without any critical care experience were temporarily reassigned to intensive care units.<sup>1</sup>

The high number of nurses without any professional experience in critical care assigned to intensive care units has reignited the debate on the advanced competencies of critical care nurses.<sup>1</sup> To deal with this phenomenon, ANIARTI itself (Italian National Association of Critical Area Nurses) has proposed the document “Approach scheme for routine nursing care for patients in intensive care”, shared and translated in many European countries. The SARS-CoV-2 pandemic has highlighted the particular competencies and skills of nurses with complementary and specific education for intensive care settings.<sup>2</sup>

Advanced Practice Nursing refers to expanded and improved health services and interventions provided by nurses who, with advanced skills, influence clinical health outcomes and provide direct health services to individuals, families and communities.<sup>3</sup>

The Advanced Practice Nurse is therefore defined as “a generalist or specialist nurse who has acquired, through advanced university education, an expert-level knowledge base, complex decision-making ability and clinical skills to carry out advanced prac-

tice. The characteristics of this figure depend on the context and/or the country in which is authorized to practice”.<sup>3,4</sup>

In particular, the International Council of Nurses (ICN) identifies two types of nurses with advanced competencies: the “Clinical Nurse Specialists” (CNSs) and the “Nurse Practitioners” (NPs).

The substantial differences between these two figures are the following: the scope of practice (settings and type of patients), prescriptive and discharge autonomy, and professional responsibility. NPs usually work in various contexts and with patients without a defined diagnosis, have autonomy in prescribing, discharge and hospitalization and have full clinical and management responsibility for the patients in their care (Table 1).<sup>3</sup>

There is a third type of figure described by ICN and the European Specialist Nurses Organization (ESNO): the “Specialised Nurse”, which represents an intermediate figure between the “Generalist Nurse” and the CNS. The “Specialised Nurse” is a nurse with a lot of experience who has specialized in the field or with post-graduate courses. The CNS must instead have obtained at least a Master’s Degree (equivalent of the Master’s Degree within the Italian training system) with a focus on a specific specialty.<sup>3</sup>

In addition to a difference between figures with advanced competencies and those with specialist skills, the literature reports different descriptions for specialist nursing practice and advanced nursing practice. By specialist nursing practice, the ICN and the European Federation of Nurses (EFN) mean “in-depth compe-

**Table 1.** Article selected and divided by topic.

Authors (Year)	Population	Aim	Methods
<b>Education</b>			
Egerod <i>et al.</i> (2021)	/	Describe the skills and competencies of nurses with competencies in critical care and the relative policy	Scoping Review
Endacott <i>et al.</i> (2015)	24 nurses representing European country	To map the educational programme for adult critical care nurses, examine the structure, the process and the educational outcome existing, and identify the barriers to the progress of educational programme for critical care nurses in all the Europe	Survey
Imbriaco <i>et al.</i> (2015)	646 ex-students of 4 1st-level master in critical care in Italy	Analyze the figure of a specialist nurse with 1st level master’s in critical care about the perception of his role in the equipment and another aspect such as involvement in the activity of education, participation in scientific projects, congress and publication, and evaluation of career development.	Survey
<b>Evaluation tools</b>			
Øvrebo <i>et al.</i> (2022)	/	Give an overview of methods and evaluation tools for the competencies of nursing critical care student	Scoping Review
Endacott (2022)	Expert recruited by EfCCNa and the European Society of Intensive Care Medicine (ESICM) of 20 European countries	Identify and define the core competence of the advanced practice nurse in the European ICU.	Survey (E-Delphi a 3 round)
Martesson (2020)	Teachers from 23 universities (28-56 participants for each workshop) in Sweden	Update and validate the tools AssCE-master for its use in clinical practice and in the nursing education	Mix Method
Mattsson (2016)	4 group of nurse students	Development and evaluation of new individualized tools that help to find the gap in individual knowledge and at the same time reflect the general aim of learning, competencies and skills of nursing in the ICU	Focus group
Gill FJ (2015)	105 experts from Australia	Development of standards for education in critical care	Survey (E-Delphi)
Lakanmaa RL (2015)	431 ICU nurse from Finland	Describe and evaluate of competencies of the intensive care unit and factors related to them by auto-evaluation	Cross-sectional survey
Gill FJ (2014)	A panel of Australian expert nurses	Development and validation of SPECT (Standards of Practice and Evaluation of Critical -Care-Nursing -Tool )	Survey
European federation of Critical Care Nursing associations (EfCCNa) (2013)	Nurses from EfCCNa country member	Develop a European set of nursing competencies for ICU that could be used for the practice to evaluate the competencies and facilitate the continuous professional development	Survey (e-Delphi)
Hadjilalassi M (2012)	234 expert nurses in Cyprus	Development of a new tool to determine what competencies are expected from ICU nurses after their degree.	Mix Method
Gill FJ (2006)	6 nurses who work in pediatric/adult ICU	This project aimed to evaluate the efficacy of the Clinical Performance Assessment Tool (CPAT) to measure the clinical performance of adult ICU nurses and pediatric ICU nurses.	Mix Method

tence, through a post-basic training course and experience in a particular clinical, organizational, consultancy and research field. The nurse with advanced competence leads and coordinates the treatment of patients in the field of specialization, and also implements treatments and diagnostic interventions, including invasive ones, to guarantee the continuity and completeness of care. In Italy, the reference training course is the 1st level Master”.<sup>3-5</sup>

By advanced nursing care (“Advanced Practice Nursing”), however, we mean “a level of nursing care that extends and expands the boundaries of professional action, contributes to the development of knowledge and promotes the progress of the profession. It is characterized by the integration and application of a wide range of theoretical and practical knowledge, based on evidence of effectiveness. “Advanced practice nursing” interventions, characterized by broad professional autonomy, including prescribing authority, influence clinical health care outcomes for individuals, families and diverse populations. Advanced practice nursing is based on second-level training (minimum Master’s degree level) aimed at developing an expert knowledge base, skills for making complex decisions and skills ethics for expanded professional practice. It is necessary a provision of a legislative or regulatory nature aimed at protecting.

ANIARTI (National Association of Critical Area Nurses) has defined the Critical Area as “the set of intensive intra- and extra-hospital structures and the set of situations characterized by the criticality and instability of the patient and the complexity of the ‘nursing intervention’”.<sup>6</sup>

Critical care area distinguishes itself from other contexts where nurses can develop advanced competencies because it is a complex and dynamic specialty, which aims to treat the delicate health needs of acute or critical patients and their families. The role of critical care nurses is invaluable in transmitting evidence-based care and is central to the multi-professional critical care team.<sup>7</sup>

Due to the increase in complexity and the holistic nature of the care offered in critical care, a unique combination of skills, knowledge and an ever-increasing attitude is required. These skills can only be acquired with an adequate level of training and must be assessed with specific tools.

A meta-ethnography published in 2021 proposed a conceptual framework to summarize the advanced competencies of critical care nurses. The two overriding themes in this meta-ethnography were patient and safety (ensuring patient safety and ensuring the patient feels safe). The conceptual categories developed around this theme were the following: “technical skills and biophysical knowledge”, “intra/interprofessional teamwork skills”, “communication skills (with patients and family members)”, “the constant and attentive presence at the patient’s bedside”, “creating participatory care”, “generating confidence in daily care”, “creating a good atmosphere and having an attitude of support and encouragement”, “building a relationship to maintain self-esteem” All these skills contribute to the “creation of trust and motivation in the patient”. It is therefore observed how these competencies and abilities are unique and peculiar to the critical area.<sup>8</sup>

If today there are definitions of nursing care with advanced competencies, its practical applications in Europe for the critical care setting are not very diversified. Therefore, after having identified the levels of advanced competencies according to the framework proposed by ICN<sup>3</sup> and having described the advanced competencies in critical care, the focuses of this review are the education and tools for evaluating the advanced skills of critical care nurses.

The objective of this review is therefore to describe the education paths and the level of education necessary to obtain advanced competencies and the tools used to evaluate them.

## Materials and Methods

A narrative review was conducted.<sup>9,10</sup>

The research question was first defined and was “What are the education paths and evaluation tools for nurses with advanced competencies in critical care?”.

The main databases were consulted (Medline/PubMed, CINAHL, Cochrane Library, EMBASE) using the following terms: “advanced practice nurse”, “intensive care unit” “competencies” “competence” “critical care nurse” “assessment tools “ with the Boolean operator “AND”.

The most relevant articles in English and Italian with full and available text, published in the last ten years (2012-2022) and conducted with any research methodology, were selected. It was chosen to focus the research on the last ten years since 2012 was the year in which the EfCCNa began, through the establishment of a specific working group, and the building of a framework for the advanced skills of critical care nurses. Other articles were found through the “snowballing” technique starting from the references of those found through bibliographic research, still others were found from scientific societies and reference journals for the topic. The relevant selection flowchart is described in Figure 1.

All studies dealing with advanced critical care competencies in the European context were included. In particular, articles dealing with the requirements, the education required for their recognition and the related assessment tools were taken into consideration.

Afterwards, the data from each article was extracted and the results deriving from the articles examined were analyzed and divided into two macro-areas, corresponding to the topics covered by the review: Education path and evaluation tools.

## Results

A total of 13 articles are considered eligible, including 2 literature reviews, summarized in the following table (Table 1).

### Education

The educational status of critical care nurses in the European Union (EU) was recently described in a Scoping Review by Egerod *et al.*<sup>1</sup> According to the authors, in some EU countries critical care nurses must continue their studies by obtaining title of Master’s Degree while in others (including Italy, Poland, Cyprus, Portugal) a post-graduate course (level 1 Master) is sufficient. Furthermore, although there are Master’s Degree programs for critical care nurses in many EU states (such as France, Germany, Greece, Italy, Norway, Poland, Portugal, Spain, and Sweden), there is no national certification and depending on the state in which the nurse practices or was trained, the latter can be classified as a CNS or NP,<sup>11</sup> underlining a lack of homogeneity in educational courses, national certifications and autonomy in prescribing and treatment.<sup>10</sup>

Already in 2015, Endacott *et al.*<sup>12</sup> were among the first to describe the education situation of critical care nurses through a survey involving 24 European Union countries. Already in 2015, formal education programs for critical care nurses were present in 17 (70%) of the 24 countries analyzed and critical care nursing had been recognized as a specialty in 13 (54.2%) of the 24 countries analyzed. Where education programs were provided, entry requirements and program duration varied considerably, from 240 hours to 24 months, with no consistency in how students were assessed/examined, or the qualification awarded. This survey was carried out following the implementation of the CoBaTrICE

Programme, a European competence-based training program for doctors and nurses. This programme, created thanks to the work of the European Society for Intensive Care Medicine, has been implemented in 15 EU countries. Despite this, challenges or problems for the education of critical care nurses had been identified in most countries participating in the survey. Among these we certainly find the lack of national standards for teaching; the lack of time for trainers to dedicate to teaching; the lack of protection for the title of critical care nurse, through to working hours that impact training and the lack of access to educational resources.<sup>12</sup>

Regarding the Italian context in a study by Imbriaco *et al.*,<sup>13</sup> it is reported that many of the former students were already working in critical at the time of the master's and only a variable share between 4 and 20% (depending on the location) of the former students not in service at the Intensive Care Unit following the 1<sup>st</sup> level master obtained the transfer to the area of specialization. This reflects the considerations made by other authors,<sup>12</sup> on the obstacles at the European level in finding employment in the area of specialization. In addition to the improvement in patient outcomes in the study, a statistically significant increase in the research activity of former master's students in the critical care area (speaker activity or scientific publications) was reported.<sup>13</sup>

### Evaluation tools

A literature review by Ovrebo *et al.*<sup>14</sup> argues that the assessment of critical care competencies is a multidimensional concept and it is strongly recommended to use a combination of different assessment methods, such as self-assessment, observation and evaluation by a mentor. The literature proposes numerous evaluation tools for the advanced competencies of critical care nurses. The 10 tools analyzed in this review are briefly summarized in Table 2.

The European Federation of Critical Care Nurses Associations (EfCCNa), the main scientific society for critical care nurses in Europe, published in 2013 the “EfCCNa Critical Care Nursing competencies”.<sup>7</sup> The tool was developed in 2009 by a specific committee which had the aim of creating a skills framework that could be used to evaluate competencies and facilitate the professional development of critical care nurses. The official tool was presented in Belgrade in 2013. This tool can be used as a self-assessment tool or to assist managers or “mentors” in observing nurses’ strengths, and areas of development and subsequently integrate them with the development plan of the staff. The tool is divided into 4 domains (“Clinical Domain”, “Professional Domain”, “Managerial Domain”, and “Education & Development Domain”) which in turn are divided into subdomains.<sup>7</sup>

Another tool proposed by the literature developed and validated in Australia is the “Standards of Practice and Evaluation of Critical Care Nursing Tool” (SPECT).<sup>15,16</sup> This tool is composed of the following domains: “Patient and Family centred care”, “Quality of care and patient safety”, “Resuscitation”, “Evaluation”, “Monitoring and interpretation of data”, “Management in critical care”, and “Teamwork and Leadership”. The instrument proved to be valid and reliable in the study in which it was validated through the Delphi methodology.<sup>15,16</sup> The authors, however, conclude that further studies must be conducted for its applicability in the international context.<sup>15,16</sup>

Among the numerous evaluation tools proposed by the literature, there is also space for “The Critical Care Competency Instrument”, developed in Cyprus in Europe, composed of the following 4 domains: “Leadership/Management”, “Decision Making and management of emergencies”, “Providing assistance and professional practice”, “Ethics”. All domains of the instrument have proven to be highly reliable with a Cronbach’s Alpha between

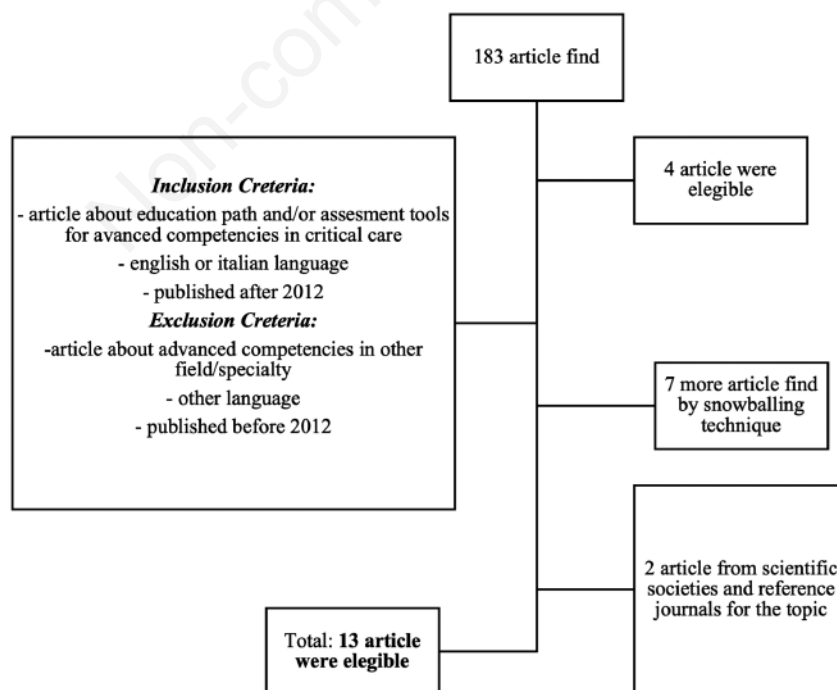


Figure 1. Flowchart of pertinent article selection.



0.895 and 0.974.<sup>17</sup> Despite this, the same authors believe that other studies in other contexts are necessary to confirm its validity and reliability.<sup>17</sup>

Other tools reported in the literature are the “Intensive and Critical Care Nursing Competence Scale version 1” (ICCN-CS-1) and the “CPAT” (Clinical Performance Assessment Tool).

Regarding ICCN CS-1. The tool is made up of the following domains: “Clinical Skills” (Nursing Assistance, Clinical Guidelines, Nursing Interventions) and “Professional Skills” (Ethical and legal activity, decision making, work development, collaboration). The tool has proven to be valid and reliable both for the evaluation of students and nurses already working in intensive care. The authors recommend a mixed use of tools such as self-assessment, portfolio, and evaluation by a mentor or peers.<sup>18</sup>

The CPAT is a tool proposed by the same authors as the SPECT in Australia, both are divided into 4 domains; providing and coordinating care, critical thinking and analysis, therapeutic practices and collaboration, and professional practice provided. The instrument has proven valid in the Australian context, but further studies are needed to test its reliability and validity in the European and international contexts.<sup>19</sup>

A further set of 95 skills was proposed by Endacott et al (20), through a study with a modified 3-phase E-Delphi involving critical care nurses from 20 European countries. The authors suggest that this set of skills can be used as a tool for training and evaluating critical care nurses. The skill set is divided into 3 domains; “Knowledge, skills and clinical performance”; “Clinical leadership, teaching and supervision”; “Personal effectiveness”.

## Discussion

Nursing education organized on multiple levels is due to the Bologna process, which also has the merit of having standardized the basic education of European nurses to facilitate their mobility within the European community. Starting from the Bologna process (1999), university education for nurses has been divided into 3 cycles identified as Bachelor’s (Bachelor’s Degree), Master’s (Master’s Degree) and Doctoral level (Research Doctorate).<sup>21</sup>

The education of nurses in Europe has changed from a hospital diploma to a Bachelor’s Degree. This process which occurred for basic education has never been transferred to specialist education, especially as regards critical care, thanks to the Bologna process.<sup>20,21</sup>

According to the framework proposed by ICN (2020), nurses with advanced competencies must possess a minimum educational level to be certified such as a Master’s Degree.<sup>3</sup> Despite what is proposed by ICN, from the analyzed literature it emerges that there are many different models of nursing specialization in the world and even within the EU itself. Advanced nursing education is largely unregulated. The existence of specific study programs does not in any way indicate that the activity for which nurses are trained exists within the aforementioned healthcare system or that role exists in the clinic. Therefore, despite the existence of university courses in critical care (Master’s Degree or post-basic courses), they do not necessarily reflect the existence of clinical roles and correspondence to the specializations formally recognized in the country.<sup>11,12</sup> The Italian context is also no exception.

This is reflected in a broader problem: many specialized nurses

**Table 2.** Tools for the evaluation of competences in the ICU.

Tool	Population	Area of interest
Objective structured clinical observation examination (OSCE) <sup>30</sup>	United Kingdom	None
The clinical competency inventory <sup>31</sup>	Iran	Care management, technical competency, individual management, human oriented care, scholarship-oriented care.
CPAT (clinical performance assessment tool) <sup>19</sup>	Australia	Provision and coordination of care, critical thinking and analysis, collaborative and therapeutic practice, professional practice provided
SPECT (Standards of Practice and Evaluation of Critical -Care-Nursing -Tool) <sup>15,16,27</sup>	Australia Sweden	Patient and family- centered care, Quality of care and patient safety, Resuscitation, Assessment, monitoring, and data interpretation, Critical care management, Teamwork and leadership
The Critical Care Competency Instrument <sup>17</sup>	Cyprus	-Leadership /management- Decision-making/ and management of emergencies- provision of care and professional practice-Ethical practice
The clinical competence assessment tool <sup>32</sup>	Irlanda (Eire)	Professional and ethical practice, interpersonal skills, practical and technical skills, critical thinking and clinical decision making and management of care.
Skill inventory assessment tool <sup>33</sup> of skills, reflection on and evaluation of practice	United Kingdom	Professional conduct, knowledge and comprehension- performance
ICCN-CS18	Finland	Clinical competence: Nursing care, Clinical guidelines, Nursing interventions Professional competence: Ethical and legal activity, decision-making, development work, collaboration
AssCE-master level <sup>28</sup>	Sweden	Communication and teaching, nursing process, examination and treatments, management and co- operation and professional approach.
EfCCNa Critical Care Nursing competencies <sup>7</sup>	Europe (Austria, Cyprus, Sweden, United Kingdom, Germany, Finland, Slovenia)	Clinical, Professional, Managerial, Education and management

do not find employment in the area of specialization as institutions and companies hire generalist nurses in those roles. Furthermore, specialized nurses who have their specialization recognized in their countries often see their professional mobility limited within the European community due to non-homogeneous recognition and regulation.<sup>11-13</sup>

Furthermore, the literature proposes numerous tools<sup>14,20</sup> also validated in the European context but these find little space in organizational realities and often even within the EU itself different evaluation tools are used, once again limiting the mobility of professionals with advanced competencies within member states and the recognition of skills. Beyond this large gap at a European level, at present no evaluation tool has been translated and validated in the Italian context, therefore none of the tools mentioned above can be used in Italy.

Despite the lack of homogeneity in the type of education for critical care nurses and the tools for assessing their competencies, some studies have demonstrated how nurses with specific education for the critical care area improve patient outcomes.<sup>22,23</sup> The presence of nurses with advanced practice education and certification in the Intensive Care team plays a key role in patient satisfaction, in intercepting changes in the patient's health status, reducing rescue failures and therefore decreasing mortality. Having nurses with advanced training in the intensive care team also reduces adverse events, can also speed up patient recovery times and reduce healthcare costs.<sup>23</sup>

## Conclusions

The situation of training and certification disparity at an international and especially European level reflects what has happened in recent years in Italy regarding advanced training and the consequent attempt to pave the way for the recognition of advanced nursing competencies. The same Federation of IPASVI Colleges, currently the National Federation of Orders of Nursing Professions (FNOPI), 2015, with the evolution of nursing skills, proposed a new scheme for advanced competencies, dividing them into two paths: clinical and management.<sup>24</sup>

Starting from the document cited above, three years later, in the National Collective Agreement 2016-18,<sup>25</sup> recognition was achieved for the roles of expert professional and specialist. Expert and specialist professionals are professionals who have acquired competencies after the basic university course through regional education courses or university master's degrees. Although this first step was far-sighted in the recognition of nursing competencies, we are still far from the framework on advanced skills proposed by ICN with the figures of the nurse specialist (CNS) and the Advanced practice nurse (APN). The nurse with advanced competencies according to ICN is distinguished from the nurse with specialist skills. Furthermore, despite the presence of these two figures within the contract, in a few hospitals, there has been a real recognition of these figures.<sup>25</sup>

Even in the latest contract, 2019-2021,<sup>26</sup> the roles of expert professional and specialist were confirmed and recognized. Hospitals are also allowed to assign professional and not just organizational roles to healthcare professionals with advanced education (first-level Master's degree) and seniority. But once again we are far from what is required of us by ICN and the scheme proposed by FNOPI in 2015. The master's degree is named as the minimum requirement for access to a highly qualified professional area of both a professional and organizational nature, but in Italy no clinical master's degree program has been launched, limiting progression in this area only in terms of management.

It is therefore necessary to set ourselves a concrete and tangible objective, following what the literature suggests: an adaptation of the education courses, correlated to a specific regulation and legal and contractual recognition of the specialization and advanced competencies in critical care, as in other specific sectors of assistance nursing. This would be only the first step towards the creation of a scenario in which the critical care area is recognized as a real speciality and in which professionals will be able to express their skills and competencies to the fullest, also through formal recognition of the same.

It is necessary to understand, however, that no recognition of competencies is possible objectively and concretely, without the use of tools to evaluate competencies throughout a professional's career and a well-defined body of "core competencies". These tools, despite being reliable, are numerous, heterogeneous and not validated in all EU countries. Many have been studied and developed overseas and are not yet applicable to the European or Italian context, while others have been developed specifically for the European context, but have found little application in healthcare organizations.<sup>17,18,27,28</sup> It is therefore necessary, in parallel with the training and contractual aspect, to standardize the way of evaluating the competencies of professionals operating in critical care. The use of evaluation tools is therefore fundamental to certify and promote the professional development of nurses with a view to continuous professional development.

A recent editorial, with a provocative title, asks: "Advanced nursing competencies: if not now, when?"<sup>29</sup> The time to recognize advanced skills in critical care is not only now, but a further effort is needed on the part of the scientific community and institutions to outline a common education and certification path at a national, European and global level.

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