

Advanced competencies mapping of critical care nursing: a qualitative research in two Intensive Care Units

Emanuela Alfieri¹, Marina Mori², Valentina Barbui³, Leopoldo Sarli¹

¹ Department of Medicine and Surgery - University of Parma; ² Respiratory Care - University Hospital of Parma; ³ Intensive Care Unit 2 - ASUI of Udine

Abstract. *Background and aim:* Nowadays, in Italy, the nursing profession has suffered important changes in response to the needs of citizens' health and to improve the quality of the health service in the country. At the basis of this development there is an increase of the nurses' knowledge, competencies and responsibilities. Currently, the presence of nurses who have followed post-basic training paths, and the subsequent acquisition of advanced clinical knowledge and specializations, has made it essential for the presence of competencies mappings for each specialty, also to differentiate them from general care nurses. The objective is to get a mapping of nurse's individual competencies working in critical care, to analyze the context of the Parma Hospital and comparing it with the Lebanon Heart Hospital in Lebanon. *Method:* The survey has been done through a series of interviews involving some of the hospital staff, in order to collect opinions about the ICU nurses' competencies. *Results:* What emerged from the data allowed us to get a list of important abilities, competencies, character traits and intensive care nurse activities. Italians and Lebanese nurses appear to be prepared from a technical point of view, with a desire for improvement through specializations, masters and enabling courses in advanced health maneuvers. By respondents nurses can seize a strong desire for professional improvement. *Conclusions:* At the end of our research we were able to draw a list of different individual competencies, behavioral and moral characteristics. The nurse figure has a high potential and large professional improvement prospects, if more taken into account by the health system.

Key words: nurse's competencies, intensive care unit, mapping, advanced competencies, critical area

Abbreviation

D.M.: Ministerial decree;
CU: Care Unit;
ICU: Intensive Care Unit;
RAD: Departmental of assistance representative;
OSS: Healthcare Assistants
BLS/D: Basic Life Support Defibrillation;
ACLS: Advanced Cardiac Life Support;
EPC: Emergency Pediatric Care;
PHTC: PreHospital Trauma Care;
PALS: Pediatric Advanced Life Support;
AMLS: Advanced Medical Life Support;
PBLS/D: Pediatric Basic Life Support Defibrillation;
PHTLS: PreHospital Trauma Life Support;
ECMO: ExtraCorporeal Membrane Oxygenator;

ECG: Electrocardiogram;
PICC: Peripherally Inserted Central Catheter;
ABG: Arterial blood gases;
TPM: Transplant Procurement Management.

Introduction

In the past, according to the definition of professional profile of the nurse (D.M. 14/09/1994 nr. 739), the nurse was considered as the healthcare professional who was responsible for the general care (1).

For example, the highly qualified nurse in Intensive Care Units (ICUs) is responsible for the manage-

ment of the entire nursing process in a critical area, such as analyzing the care and the assistance needs in critical area, and planning and coordinating the development and the implementation of the care training pathway. Furthermore, the nurse has to guarantee and promote the care continuity and the integration between different areas, in a continuous interaction with the other healthcare experts (2).

Thus, the nurse has to reach the necessary competence in the clinic practice in order to guarantee a high-quality patient's care and to increase the staff satisfaction as well (3-9).

In literature there are several definitions of competence:

- Intrinsic feature of a person accidentally related to an excellent performance in a job, characterized by motivations, self-images, social roles, knowledge, abilities and skills (10);
- A pool of related abilities, commitments, knowledge and skills that enable a person to act effectively in a wide range during the nursing job (3);
- The capability to integrate knowledge, ability, attitudes and values in specific situations of practice (4).

Benner stated that the use of guidelines, procedures and protocols can lead nurses to reach an expert competence (6).

The nurse can develop these skills in the understanding of patient care over time, through an educational training as well as a multitude of experiences (6).

Aäri et al. (11) underlined that the graduating nurse students are not necessarily equipped to work in ICUs due to a lack of knowledge and skills. They should reach a higher level of competences (12, 13).

In order to guarantee a high level of competence, the nurses need a continuous training which is important to their cultural growth, responsibility and career as well. It could be useful to analyze and evaluate their current knowledge through explorative studies in order to improve the nurses' basic and post-basic education (8). To get a mapping of nurse's individual competences by the Hospital and to develop a portfolio, describing all the experiences, skills and abilities, can lead to the valorization of the person's experience (14, 15), guaranteeing a High level of qualification and competence, as an index of professionalism for the patient's care (5).

Objective

The main aim of the research is then to focus the attention on the competences, knowledge and responsibilities of the nurses working in critic area.

The specific purpose is to examine the nurses' skills and to map them thanks to some interviews and personal experiences which stress what is fundamental to do best at their own job.

The study also aimed to analyze two different contexts, in order to obtain a larger pattern of data which widely and accurately describe the nursing skills, abilities, competencies and care activities in critical area. This study was based on Levati's (10) model of mapping competences. Through this model, the authors investigated which skills nurses feel they should possess, and which ones, on the other hand, they have to possess according to the other healthcare professionals' point of view.

Method

These interviews are made according to a qualitative research and questions are formulated in a semi-structuring way.

Instrument

The competences have been mapped through semi-structured questions in order to identify which are, according to the interviewees, the skills of an ICU's nurse (10).

Through the semi-structured questions, the authors investigated what kind of competence has to have a nurse who works in critic area. The interview is composed by six parts:

1. Interviewed people's education and years of work (which courses they have followed or which ones they would like to follow);
2. Daily activities, such as what nurses do during the shift work;
3. Technical aspects of nursing related to several functions of the human organism such as respiratory and cardiovascular function;
4. Relational capabilities, focused on the nurse's relationship with colleagues, other experts and patient's relatives as well;

5. Evaluative system, that investigated people who evaluate the nursing job;
6. The interviewed people's expectations both towards themselves and towards what other people expect from them as well.

Context

The study analyzes two different ICU contexts: the Parma Hospital, in Italy and the Lebanon Heart Hospital of Tripoli.

Lebanon: Tripoli

In Lebanon Heart Hospital there are patients with high level of vital criticism and/or compromised organs, post-operated patients, people with serious cardiac and pulmonary issues or with neurological disorders (ischemic and haemorrhagic stroke), polytrauma, burnt and wounded people, and patients with oncological terminal illness with compromised kidney function or sepsis. In this ICU there are 6 beds and the nurse-to-patient ratio is 1:2 or 3.

Italy: Parma

The hospital of Parma is a medical centre of excellence where there are people who need greater level of nursing care (they so called "hub"); but at the main time the hospital is facilitated by a network of services (named as "spoke") whose task is to select patients and then to send them to the right centre once an established level of criticism has been overcome.

In this hospital there are two intensive care units; in the first one, where interviews were carried out, there are 14 beds and the nurse-to-patient ratio is 1:2. In this ICU people carry out treatments and care in order to maintain a good level of the cardio-circulatory, neurological and respiratory functions; in addition, nurses are responsible for giving anesthesia before surgeries, for monitoring and intensive care assistance of post-operated patients and they also deal with organ and tissue donation and sampling.

The main differences between the two contexts are: Different availability towards treatments, hos-

pitals, doctors, medicines and drugs in the Lebanon regions; several insurance policies to cover public and private health costs in Lebanon; lower level of prevention in Lebanon in comparison to Italy (16, 17).

Participants

After examining the organization chart, 22 interviews have been carried out: 11 in Parma and 11 in Tripoli. This specific number was chosen because it is the minimum proper number to gain sufficient data for skills' mapping activity.

The participants are composed by five nurses, a nurse coordinator, two doctors, two healthcare assistants and one departmental of assistance representative (RAD).

The Lebanese ICU was chosen since it possesses an ICU that is as advanced as that in Parma.

Results

Data from each of the investigated areas have been analyzed in order to highlight the perceptions and expectations of the nurses themselves, and of the other professionals of the ICU.

Education area: perceptions and expectations

The studies of the people interviewed follow the legislation that was effective at the time they started their education. Later, some of them got a master's degree in a critical area. Everybody indicates as necessary the BLS and ACLS courses. In Italy people name also the PHTC, PALS, AMLS, PBLSD, PHTLS, ECMO courses while in Lebanon people attend courses about the interpretation of ECG, the management of ventilators, pain management, the dangerous drugs and about intubations.

Both of the two contexts focus their attention on the nurses' continuous vocational training according to the new guidelines and they ask for much more attention towards topics regarding the critical area (traumas, burns) already during the basic education.

According to the Italian doctors, it would be useful if a nurse could position the PICC and they could

do an ultrasound in order to have a better collaboration.

Activities area: perceptions

All the surveyed people agree with the carried out activities. The nursing shift begins with the handover, hygiene and care of the patient, their mobilization, the monitoring of vital signs, the management of therapies according to the organization of the ICU, collaboration with doctors during the patients' visit, the implementation of a procedure and during the management of the urgencies.

A relevant difference between the two contexts concerns the professional figure of the healthcare assistant. While in Italy they do not get in touch with the patient because their activities and tasks concern the preparation of materials for the sterilization and the preparation of beds, in Lebanon they remain with nurses during several activities such as hygiene and care of the patient and the monitoring of vital signs.

Technical area: perceptions and expectations about competences

All the people interviewed agree to assert that at the basis of their professional education there is a good knowledge of anatomy, physiology and main pathologies of different apparatus.

Concerning the cardio-circulatory system, surveyed people state that the nurse has to know how to monitor the hemodynamic of the patient, and that they have to take vitals with invasive and non-invasive methods. They have to know how to do an ECG, they have to read it and understand it to call immediately doctors in case of urgency. One of most important nurse's competences is to resuscitate a patient through BLS and ACLS algorithms.

In order to manage the respiratory function, nurses have to manage the respiratory frequency and the saturation, they have to recognize the signs of a respiratory insufficiency and they have to do and to understand an ABG. It is important to know the way oxygen is supplied and the different kind of ventilation (the invasive and non-invasive ones).

Nurses can do an endotracheal intubations, both collaborating with doctors during the procedure and

managing the device. They are supposed to do a bronchoaspiration. In addition, they should understand x-ray reports and relate them with the patient's conditions.

The metabolic function includes measuring and managing blood glucose level, managing physiological and enteral tube feeding (choice of the diet, management of device) and monitoring of the body weight. In addition, nurses have to understand laboratory tests about pancreas and thyroid and they have to be able to recognize symptoms of acidosis and alkalosis.

Concerning the renal aspects, nurses have to monitor diuresis, water balance and be able to understand laboratory tests in order to identify a renal impairment.

They are supposed to use and to position the catheter, to handle a dialysis patient and to manage the entire device used during the procedure.

The neurological evaluation is very important in the context of the critical area. First of all the result obtained have to be related with the drugs administered to the patient. The evaluation is done through some scales, such as the Cincinnati and the Glasgow Coma Scale, and the control of the pupil dilation.

The nurse is responsible for monitoring and managing the intracranial pressure and they have to be able to understand the patient's non-verbal communication.

Speaking about the thermoregulation, it is important to know about measurement of the central and peripheral temperature and nurses have to know all the physical methods (and not only the pharmacological ones) in order to manage the different changes of temperature (Hypothermia and Hyperthermia). In addition, nurses are supposed to acknowledge and then to manage the therapeutic hypothermia often used in critical areas.

A crucial difference has been noticed during the organ removal from a brain-dead patient. In Parma there is a specific professional figure who attended the TPM course in order to manage the legal aspects and bureaucracy relating to the organ removal. Italian nurses are supposed to have not only a technical education, which is necessary to support vital functions during the organ removal, but also a moral and ethical one to face such situations. On the contrary, In Lebanon there are no transplants from a brain-dead patient.

Another difference concerns drugs. According to Lebanon nurses, managing the dosage and the drugs administration is very important. This could be explained because, In Lebanon, it is the nurse's own task to decide the right dose and the right drugs that should be given to the patients.

Expectations about competences

Generally, all the participants are satisfied about their competences and skills in the management and organization of their own job.

In Italy the participants stress the necessity to develop more ethical and motivational skills while in Lebanon they notice the importance to have much more experience and confidence in themselves, especially when working in a critical area.

Relational area and nurse's inter-professional relationship: perceptions and expectations

The survey focuses on the importance of the confidence in the relationship with the patient's relatives, with the colleagues and with the other health professionals. It is important to use a language that is appropriate to the level of the relatives and this aspect could be improved through communication courses.

A relevant difference between the two contexts is the relationship between nurses and relatives. In Parma, nurses are satisfied about it while in Lebanon participants stress a lack in the relationship competences.

Hierarchy area and evaluation towards the nurse: perceptions

The evaluation system is very different in the two contexts: in Parma, an unspecific report is used while in Lebanon there are two different kinds of evaluation. The first one concerns general aspects (such as presence, punctuality, safety) and it is filled every year; the second one is more specific and is related to the nurse's abilities and skills and it is filled every six months.

Everybody gives importance to the self-evaluation in order to improve the patient care.

Expectations area

The nurses interviewed agree that what people expect from them is a professional, diligent and polite behavior, the respect of rules and protocols, and availability to help people and relatives to understand the clinical situation. At the meantime, it is necessary to have a team spirit and collaboration. In this sense, the Italian nurses hope to have much more consideration by doctors and RAD.

Conclusion

In the last few years, the nursing profession has suffered an important change which has permitted to transform it from a healthcare auxiliary profession to a healthcare profession. Although the Ministerial Decree 739/94 defined the five area of the specific education, it was only in 2015 that the legislator defined, through the Stability Act, who the critical area nurse was (1, 16).

According to this survey, there is an agreement between professionals and the existing legislation. In fact, every competence declared as necessary is recognized by the Law and it does not violate other professions.

The present study found that all the activities, attributed to nurses in the ICU in Parma, are the same as the ones in Tripoli, such as the hand-over, the basic and advanced nursing assistance, the continuous monitoring and the preparation of the therapy.

However, the interviews show important differences as well, such as the nurse's skills relating to the organ transplants since Italian nurses carry out the verification of the brain death while in Lebanon neither they are responsible for verifying it nor they are engaged in the following steps of organ transplant.

About the nurse's expectations in critical area: everyone stresses the desire to improve and to grow professionally and, above all, to achieve a better recognition.

Collected data show a lack of clarity regarding the evaluation criteria of the nurse's performance in Italy, due to the absence of an evaluation report.

On the contrary, in Lebanon there is a specific method for people who work in an emergency depart-

Table 1. The competences portfolio of the critical care nurse**Education:**

- Specific course about ICU (eg. BLS, ACLS)
- Master's degree in critical area

Activities:

- Handover at the end of each shift
- Basic and advanced nursing
- Monitoring vital signs
- Cooperation with doctors during medical treatment
- Cooperation in the diagnosis
- Relations with the patients' relatives
- Management of emergencies
- Management of acute disorders such as: poly-trauma, ischemic or hemorrhagic stroke, head injury, shock, viral pneumonia which needs ECMO, patient with compromised cardiac, respiratory or kidney function, post-operated patients, burnt and wounded people, patients with sepsis

Technical competences:

- Knowledge of anatomy and physiology
- Knowledge of the monitoring of vital signs
- Ability to do an ECG, to read it and understand it
- Knowledge of drugs and their side-effects
- Recognize signs and symptoms of hemodynamic problems
- Knowledge of the BLS and ACLS algorithms
- Knowledge of the ventilations system
- Knowledge of breathing functioning
- Knowledge of bronchoaspiration techniques
- Knowledge of oxygen supplying systems
- Experience in endotracheal intubation
- Understanding laboratory tests
- Monitoring body weight
- Recognition of signs of acidosis and alkalosis
- Monitoring diuresis
- Managing the device used during dialysis
- Knowledge of laboratory test for the identification of renal impairment
- Knowledge of how to do a water balance
- Managing bladder catheter
- Experience in the measurement of the central and peripheral temperature
- Recognition of and treatment of hypothermia and hyperthermia
- Knowledge of the physical and pharmacological methods in order to manage changes in body temperature
- Evaluation of the neurological situation with scales, such as the Cincinnati and the Glasgow Coma Scale;
- Evaluation of pain
- Evaluation of the level of sedation
- Support in the patient's vital functions during post-transplant period
- Knowledge of the rules on protective confinement
- Knowledge of legislation on brain death
- Moral and ethical skills
- Support in the patient's vital functions during organ removal

Relational capacities:

- Efficient communication skills
- Patient's care
- Cooperation skills when working with other professionals
- Team work with colleagues

(continued)

Table 1 (continued). The competences portfolio of the critical care nurse

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- Skills in managing, planning and assessing patients
 - Showing personality in the working activities
 - Showing effort and dedication in the working activities
 - Ability to take ethical decisions
 - Empathy and education competences

Cognitive skills:

- Ability to act with mental acuity
- Prediction and surveillance abilities
- Critical thinking

Professional competences:

- Objectivity and impartiality
 - Ability to handle stress
 - Determination and ability in taking important decisions
 - Trustworthiness, commitment, precision and efficiency in the working activities
 - Showing empathy for the patients and their relatives during the terminal stage of their disease up until death
 - Managing the patient's documents
 - Identification of the levels of responsibility in relation to organization
 - Application of emergency guidelines, protocols and procedures
 - Ability to use clinical severity score and outcome indicators
 - Management of therapy in relation to procedure
 - Application of triage's algorithms
 - Reassessment of patients with an appropriate frequency in relation to clinic condition
 - Identification of the immediate life-saving priorities in relation to many calls
 - Application of the protocols for the treatment of acute or chronic pain
 - Control over the functioning and the correct use of medical equipment
 - Granting assistance to patients' with behavioral disorders
 - Management of technologies for supporting vital functions
 - Ability to deal with emergency situations involving more persons in critical conditions
 - Management of the assistance in ICU
 - Ability to plan the nursing activities in ICU, in relation to those of other professionals
 - Multidisciplinary team work in managing the emergencies
 - Management of complex problems resulting from the administration therapy technology
 - Application of the recommendation of the good practice into personalized care
 - Management of the complex problems that are linked to skin breakdown and wound-care;
 - Collaboration in managing the process of prevention and intervention in infective risk;
 - Participation in planning relational and multidisciplinary intervention
 - Education of the caregivers
 - Management of planning admission or resignation to levels of care's intensity.
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ment, but there is the need of communication courses to improve the interpersonal relationship between nurses and relatives.

In conclusion, the authors can state that the data emerged from the survey are quite homogeneous, the competences required to work in a critical area are substantially the same.

The competences described in literature (2) are then integrated with the data obtained with the content of interviews and a portfolio of competences of the critical care nurse has been drafted (Table 1).

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Correspondence:

Emanuela Alfieri, PHD

University of Parma

Tel. +39 333 31 84 857

E-mail: emanuela.alfieri@nemo.unipr.it