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Mapping the nursing competences in neonatology: a qualitative research

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Abstract. *Background and aim:* There are several studies that support the importance of advanced expertise and specialization of the neonatal pediatric nurse. However, proceeding with a analysis of the scientific literature regarding the nursing advanced competence in neonatology, very few studies specify and define these competences. The aim of the study is investigate and analyze skills, tasks and responsibilities of the neonatal pediatric nurse, to map a "neonatal nurse competence profile", offered from the points of view of the Neonatology Units professionals. *Methods:* 32 professionals (nurses, physicians, psychologists, healthcare assistants) operating in the Neonatal Intensive Care Unit of two Italian Hospitals were interviewed. The semi-structured interviews have been performed, transcribed and analyzed following the Levati's model (based on Activity, Expectations and Evaluation system). *Results:* About the nurses activities, the participants underlined the newborn care, the care of the caregiver and the "bureaucratic" activities. About the system of expectations, the participants marked on specific skills but those are described only comprehensively. About the evaluation system there are different perceptions among the professionals, but the nurses themselves feel that they have to answer for their actions primarily to infants and families, indicating a sense of responsibility towards the patients. *Conclusions:* On the basis of the interviews a profile of a neonatal nurse competences has been drawn up. This consists of 42 competences that future studies can further specify, integrate and expand.

Key words: nursing, neonatal intensive care, competence, mapping, interview, health professionals

Introduction

Nurses have been considered for a long time in the Italian reality as mere "executors" of tasks included in a process governed by knowledge, ruled and transmitted by other professional figures (1). It consisted in a reality in which the professional training was organized in order to produce a nursing model based on technique and on a general and executive nursing culture (2).

Nowadays, the nurse has become the health professional responsible for general nursing assistance, identifying the needs of the single person and of the community, planning, managing and evaluating the care intervention (3). Nursing is thus currently seen as a real science and as a profession that prescribes and practices activities aimed to acquire well-being, on the basis of acquired and consolidated expertise and scientific knowledge.

We find ourselves in front of a renovated professional that seeks the meeting with the patient through communication and confrontation, "in order to establish effective and personalized interaction, aimed to satisfy the needs, the recovery of autonomy and adaptation to the stress that any form of discomfort or illness brings with it" (4).

In this scenario arises the concept of "specialist nurses" who acquired skills, knowledge and abilities through post-basic courses, promoting a real cultur-

al and professional growth in the healthcare structures (5). The Joint Commission on Accreditation of Healthcare Organizations has established that hospitals should check the acquisition of skills required from its professionals to be appropriate for work. Moreover, these skills need to be assessed upon entering into the health facility and during working life. Similarly, the Italian health authorities, which must give an immediate response to the needs of citizens in terms of improving the quality of services, ensure recognition of professionalism through the identification, description and promotion of technical knowledge and skills present in an organization. The management of competences, at various organizational levels, forces the facility to consider the knowledge as the true patrimony of the organization itself: this heritage must therefore be known, promoted, spread, developed and protected.

Mapping the role skills can lead to a change of ways to take action to address the complexity of the role and to be able to implement policies to develop human resources effectively (6).

Many studies show that the nurse who works with children and infants must have specific skills (7). Nevertheless the neonatal area has a relatively recent origin and even if several studies that support the importance of the advanced specific competences of the pediatric nurse, no study lists entirely and specifically these skills.

A study having the aim of creating nursing care quality indicators in postpartum period and neonatal period, concludes that the development of nursing indicators should be carried through the articulation of practical knowledge and theory, and its application on the control of intra and extra department quality. Moreover, measuring and monitoring the evolution of the indicators allows to evaluate the effectiveness of the service. Evaluation instruments shared by the team are needed to find solutions for problems concerning management, care, teaching and research that can positively affect the quality of nursing care (8). A study performed a review of the literature and evaluated different assessment tools used for the nurses in general, concluding that practical assessment is a key component of professionalism that allows the nurse to grow both personally and professionally (9). Unfortunately, these tools are not considered the best for the evaluation of the neonatal nurse specifically. Only Buus-Frank (10) showed an assessment tool for neonatal nurses: the Dartmouth-Hitchcock Neonatal Nurse Practitioner Evolution Instrument (Dart-NNPEI). This instrument is the only one in literature that is specific for neonatal nurse assessments. The Dart-NNPEI includes the assessment sections for the main components of the role: clinical practice, education and research. Each section was then further divided to include the essential components for each area.

Among the studies considered, many of them describe the development of pediatric training programs, recognizing pediatric nursing as a specific competence. A study conducted in Scotland (8) underlined that the nurses have four levels of professionalism: 1 new operator, 2 competent operator, 3 skilled operator, 4 experienced operator The study was aimed to produce develop and draft the competences and the clinical skills of neonatal nurses at different levels. Through a study group formed by neonatal nurses and a national guidance on skills, there were identified seven key factors: 1. communication reports, 2. professional development; 3. health and safety; 4. development of services; 5. quality; 6. equality, diversity and rights; 7. responsibility for the patient care.

Other studies reported specific competence areas, but without actually deepen the matter or list them in their entirety: the child's growth phases and his development, calculation of pediatric doses, fluid balance, use of specific devices, specific skills for age and management of complications, recognition and interpretation of pain indicators in the newborn, family-centered care, are some of the reported skills (11).

On the whole, despite these sporadic studies, it seems difficult to define a competences profile of neonatal nurses.

Aim

In this current scenario the paper has the goal to investigate, analyze and map the skills, the tasks and responsibilities of the "expert nurses", in pediatric neonatal field, using a self-assessment of the nurses and their collaborators.

The final goal is to identify pediatric nurse specific skills in neonatal context, given that there are no specific indications in literature about the skills that a pediatric nurse should have from a practical point of view.

Method

The mapping of competences leads to change the system in which the professional is inserted; this because it involves the analysis of different coordinates: Enhancement of experience; Centrality of the subject; Centrality of "learning to learn"; Training considered as a continuous process (12).

Thinking about mapping of competences in this respect, the activities to be carried out can be considered as a check-up of the organizational system, starting in first place by the protagonists of the system. The advantage of this system, compared to the more traditional check-up, is that it offers a dynamic and easily updated context. Indeed, the key element is role, which has greater amplitude and stability than position or task. Being mapping an action that involves people, it should be conducted with special attention towards the aspects of communication and transparency. The sources from which the information are collected or validated, are precisely people themselves. For this reason, it should be ensured a climate of trust and awareness of the benefits that everyone can take from contributing to the good evolution of the work. The initial stage of the model building process will cover the identification of behavior, since only behaviors are the visible and objectively verifiable elements (12).

The necessary starting information for this purpose can be derived from three sources: Job description; Organization charts; Products.

We must be especially careful to define behaviors from the activities, because sometimes words can be used in different ways and be misleading. Positions and roles identify two different concepts: it is possible that different positions require the same role behaviors and then the same capabilities. The difference will consist in the quality and quantity of knowledge and experience required. Therefore, it becomes interesting to determine the relationship between roles and positions in order to define the possible paths, since while capability cannot be created, opportunities for experience and know-how (skills) knowledge can be planned and implemented. In this perspective, there should be a switch from teaching, considered as knowledge transfer, to learning intended as a process that involves a relatively stable change in the way we think, feel and act, changing the organization of knowledge and experience and leading to the exercise of new capabilities by changing the image of the person and his role. Mapping will therefore be the clear graphical representation of a model that allows us to highlight the competences that characterize professional action in a detailed, measurable and certifiable way, as well as determining the knowledge, skills and behavior, in order to create real "expendable" experts in organizations.

Context

We analyzed the role and responsibilities of the nurse in the neonatal field in two contexts in the Emilia Romagna Region (Italy), based on convenient sampling:

- Neonatal Intensive and sub-intensive Care Unit (NICU) of the Hospital Santa Maria Nuova Hospital in Reggio Emilia;
- Neonatal Intensive and sub-intensive Care Unit (NICU) of the University Hospital of Parma.

The Santa Maria Nuova Hospital in Reggio Emilia is focused on the departmental model. It is intended to promote the professional integration within and among individual organizational structures, creating the widest possible participation, decentralization and collegiality in taking strategic decisions by the General Director related to the development and provision of benefits and services of high technical, professional and relational quality. It is divided into 9 departments, including Neonatology Unit. The NICU department admits children born prematurely or born at term but with health issues. The mission is to welcome all newborns coming from the province needing intensive and sub-intensive care. The NICU of Reggio Emilia is able to deal with any neonatal medical emergency and assist all pathological newborns.

The University Hospital of Parma is a multi-specialized hospital, offering citizens a complete availability of diagnostic, therapeutic and rehabilitation services. It follows an organizational model, that is characterized by the concentration of high complexity assistance in centers of excellence ("hub" centers) supported by a network of services ("spoke" centers) with the responsibility of selecting patients and sending them to reference centers when a certain threshold of clinical seriousness is reached.. The Hospital is divided into five integrated departments, including Maternal and Child Department, to which the Neonatology Unit belongs. The department also assists preterm infants of extremely low gestational age and infants needing assistance for various reasons, guarantees assistance to all those born at the Operative Unit of Obstetrics and Gynecology and is the reference center for pathological newborns of Piacenza and Fidenza.

Participants

The selection criterion of participants was based on all of the professionals operating in the unit by more than a year and in contact periodically with the neonatal nurse.

A total of 32 professionals have taken part in the research. In each context eight nurses, two healthcare workers, two medical doctors, one psychologist, one physiotherapist, and the coordinator and the director of the NICU have participated.

Instruments

The instrument used for mapping competences were two: the organizational chart and semi-structured interviews. The analysis of the organizational chart allowed us to identify the professionals to be involved in the sample and their different specialization.

The semi-structured interview investigated activities, role, decisions and responsibilities required and performed by the neonatal nurses, from the nurses themselves and from the professionals working closely with the neonatal nurses. The sequence of questions has to go from general to particular. The ladder must be fully coherent and contain questions that help the interviewer to solicit an opinion in cases where the respondent is reluctant or does not have a structured opinion on the subject in that moment (13). In our case, we used 3 types of interviews, one for each of the 3 subjects of research: nurses (role witnesses), other healthcare professionals working with the role witnesses and the heads of the department (nurse coordinator and head physician).

Here are some examples of the questions proposed:

Could you describe the typical working day of the neonatal nurse? What are the expectations on the professional role of the neonatal nurse?

Who evaluates the neonatal nurse's competences?

Data Analysis

Following the Levati metod (12, 14) we performed a qualitative data analysis in which the content emerged from the study of the interviews was clarified. Then we analyzed the two contexts in the three aspects regarding the witness of the role (neonatal nurse): Activity; Evaluation system; Expectations. Subsequently, in each context we analyzed the data obtained from different professionals. In particular, we analyzed in detail the area of the competencies of the neonatal nurse.

Results

Concerning the "*perception of nurses activities*", the professionals agree in both contexts that the handover is the fundamental initial moment of shifts. This is the moment in which there is an exchange of information and the organization of work. "*At first they take vision of the situation, of what has happened during their absence, and receive the handover of the unit. (…) Handover is a fundamental moment, aiming to transmit information, which must be correct and precise*".

Another common point is that the nursing work depends on the clinical seriousness of newborn and their number. This factor was more evident in Reggio Emilia. "*There exists a different ratio between intensive and post-intensive care, being one to two in intensive care and one to five in post-intensive. Therefore, the activity changes depending on the number of occupied incubators.*"

The nurses of both departments affirmed that Neonatology/NICU unit is chaotic because the work organization changes depending on the critical situations. "*my first idea… the first word coming in my mind was chaotic. (…) But you can go from all to nothing, from nothing to all in such a short amount of time, and so… it is strongly needed to be able to adapt to many variables that can interfere and come during the day*."

About the "perception on the activities of nurses" the staff of professionals of Parma speak or about more technical activities or about the relationship with parents, but few professional have a holistic view of the nursing competence, which instead in Reggio Emilia is more clear, and shared among the team. All of the Nurses of Reggio Emilia argue that education and assistance to the family are a fundamental part of their work. In telling their daily activities, they show contradictory aspects, depending on whether the person who is speaking is a "shift worker" or an "day worker". Parma's nurses are instead focused mainly on the morning activities, seen as the most important of the day. *"Morning includes many activities… it implies a lot of nursing work, very concentrated."*

Speaking about the "*perception on the system of expectations*", one point in common between the two Hospitals was the perception, on the part of the nurses collaborators, that users expect interpersonal skills, understanding, acceptance, assistance, support and parents education. "*Users expect to be embraced and helped in orienting. When they arrive they are "thrown in", so they expect to be welcomed, to receive a uniform communication and to have coherent and congruent information. (…) They expect to be helped in knowing their child, to be supported, to see a professional competence. (…)* to be cared for and considered.

The nurses of the both contexts have expectations on teamwork and the desire to create more interaction and collaboration among the various professionals. Still, there are very contrasting expectations between nurses: some (with more experience) do not expect anything else from their work, while others (with less experience), have the will to improve and grow professionally. "*To perform nursing activities in the best way and improve the capabilities in the resolution of the various cases, through continuous training*".

Concerning the "*perception on the system of expectations*" by the nurses coworkers, in the Reggio Emilia the expectations are mostly high professionalism, flawlessness from a clinical point of view, management of critical situations and fast timing in assistance management.

The team of Parma highlighted expectations mostly in the relational area, regarding the relationship with the parents but especially the mutual understanding between professionals and the team work. "*I expect the research for a higher synchrony of the interventions between nurses and medical doctors, "harmonization", being a better group and the availability to coordinate each individual's work. An attempt to set up more an individualized assistance of the child, on the aspect of care, including the observations of mothers who stay here all the day*."

In Reggio Emilia Hospital there is the expectation that people (both users and others professional) recognize the role of the nurse: all respondents have a common idea of the expectations that vertices and other professionals may have towards them. This is not so clear in the Hospital of Parma. "*I would like to work in order that people recognizes the extremely important role of the nurse in improving the hospital stay in both quantity and quality of days of admission*." "*Each professional expects that his work is recognized, so that he is pushed to improve more and more*."

About the "*perception on evaluation expectations*," the coworkers thought that the nurses evaluation should be made by the coordinator, although they not always know the methods of evaluation and of timing: "*I believe that nursing competences are evaluated at first by the coordinator."* All the professionals agree that a specialist training can bring benefit to clinical care and to the whole group, even if the method/process of "specialization" is not defined. In the eyes of the nurses of the two hospitals, the, nurse is considered responsible for his work at first place to himself and to the patient: there is a belief that the nurse works according to his own morality and according to the satisfaction of the needs of the patient and his family. As for the need for specific training, both contexts actually agree that the "knowledge" (and then an advanced course/CME course or master) are insufficient if not accompanied to practical experience. "*I*

believe that a specialist training in pediatrics is absolutely needed and that the presence of a trained professional is surely useful."

About the perception by coworkers collaborating with the nurses, in Reggio Emilia, the participants showed conflicting ideas on the evaluation of their work: who attributes it to the coordinator, who to the doctors, who to the colleagues. In Parma instead all respondents agree on the fact that the assessment should be made periodically by the nursing coordinator.

As for the need for specific training, some of the nurses in Reggio Emilia believe that specialization may lead to discrepancies and lack of homogeneity between trained and not trained nurses.

This aspect was not found in Parma. "*Nurse is a professional. I think that more than specialist training, there would be needed medium/long term periods of supervised training with expert professionals acting as tutors. At the moment, I do not think that a certificate would be useful. [..]. It is fundamental to be in the field, with the newborn, work with him, assist him and assist his family.*"

Discussion

The purpose of this qualitative study was to produce a profile of skills dictated not only by an abstract and hypothetical drawing, but by the entire staff point of view.

A first consideration concerns the perception of the neonatal nurse activity. The professional nurse who works in NICU must necessarily have advanced techniques and expertise: the repeated critical events in the department, the unique aspects of the patient's type, the fundamental presence of the caregiver and so on. All this leads to a high complexity care that requires professionalism, specialties and training. The newborn care is the basis of daily activities: from hygiene to feeding, to more or less invasive procedures such as performing blood/arterial samples, application of nasogastric tubes, preparation and administration of therapy, equipment management. A second aspect not less important, is represented by the activities carried out with the parents: health education, support, monitoring of parenting and caregiving skills. There were also highlighted the "bureaucratic" activities to be carried out from nurses, such as , the management of new patients, transfers, provision of medicines, beds management.

A second consideration concerns the perception on the expectations system of the neonatal nurse. The expectations of the same nurses and of colleagues and users are focused on specific skills, but these skills are described in a comprehensive manner (e.g. the newborn management in its complexity) rather than in detail (e.g. drug therapy management, and related dilution, meal management, nasogastric management). This probably suggests that there is a general idea of how the neonatal nurse should be, but there are no clear ideas and related skills defined profiles of what the professional should really do to be competent in the neonatal area.

A final consideration concerns the perception on the expectations of the evaluation of the neonatal nurse: there are different perceptions among the different professionals, but the nurses who work in close contact with newborns and their families feel that they have to answer for their actions primarily to infants and parents. This indicates a great responsibility towards the patients and family.

Conclusion

In conclusion, there are several studies that support the importance of advanced expertise and competence of the neonatal/pediatric nurse, but very few of them lists entirely and specifically these skills. The list of competencies was obtained from the analysis of the interviews proposed to the 3 actors considered in the study (neonatal nurses, other healthcare professionals, heads of the department), with the aim of finding a bond between the characteristics of similarity and differentiation of the neonatal nurse, including activities but also ability, predisposition and personal skills. On the basis of Levati interview method (12, 14), we try to describe and summarize the "Profile of neonatal nurse competences". This profile is based on the 42 competencies that future studies can further specify and integrate (Table 1).

Table 1. Competences of the neonatal nurse

1. Technical and specific advanced competences
2. Adequate psychological and relational preparation
3. Communication, interpersonal, listening and sensitivity skills
4. Autonomy and collaboration skills in routine and emergency
5. Continuous update, deepen knowledge
6. Adaptability to situation and needs
7. Order and good method
8. Respect and professional sharing
9. Resolution of highly critical situations
10. Awareness of the areas of complete professional autonomy and role
11. Maintaining an organization welfare
12. Empathy, care, wellness
13. Timely management of clinical risk
14. Satisfaction of users
15. Attention to materials and waste
16. Uniformity of working methods
17. Interpretive and observational skills
18. Writing of delivery and transmission of fundamental information
19. Reading of the behavioral signs of the newborn
20. Management of the newborn in his complexity
21. Neonatal care and basic care
22. Clinical activities at high intensity care
23. Observation and assessment, planning of nursing interventions, in particular:
    - ✓ Care and power management and the elimination
    - ✓ Monitoring of vital parameters
    - ✓ Registration of vital parameters
    - ✓ Venous and arterial blood sampling
    - ✓ Urine output monitoring
    - ✓ Administration of drugs
    - ✓ Skills in dilution of drugs and management of infusive lines
    - ✓ Execution of medications
    - ✓ Change of the respirator circuit
    - ✓ Preparation of parenteral nutrition
    - ✓ Weight
    - ✓ Posture
    - ✓ Respect of sleeping and of patient's needs
    - ✓ Checking of incubator temperature
24. Organization and collaboration in the execution of instrumental exams
25. Main contributor role and support in procedures with medical doctors
26. Assisting and collaborating with medical visit
27. Support in invasive procedures
28. Management of therapeutic and nutritional needs
29. Update of nursing records and graphics
30. Bureaucratic management
31. Admission management
32. Documentation of nursing care in nursing record
33. Communication and educational support to parents (breastfeeding, kangaroo therapy, therapies, changing diapers, baby bath)
34. Parents support, help and sharing emotional experiences
35. Facilitating parents in getting their parental role
36. Key role of therapeutic alliance with the family
37. Monitoring of parenting skills and caregiving
38. Recommendation and description of parents behavior after discharge
39. Consulting in other departments or hospitals
40. Comparison and discussion with other professionals
41. Management of new admissions
42. Management to requests of urgent admission (transport, transfers, surgery room and delivery room)

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