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Qualitative research on clinical risk perception in Pediatric Intensive Care Unit

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ABSTRACT

Background: the Pediatric Intensive Care field is characterized by the criticality of newborns and children who access it, as well as by a high complexity of care. This entails the need of an optimal integration between the various professional figures working in Pediatric Intensive Care Units (PICUs) and their ability to work in team. **Purpose**: to describe how nurses perceive clinical risk and relate to it; to identify adverse events and related risk factors. **Methods**: the focus group was used to identify and analyze the risks, or possible risks, that may occur in the intensive pediatric field. Nine nurses with different work experience in PICU, two moderators and one external observer participated in the focus group. **Results**: through qualitative analysis, 9 themes describing the clinical risk perception by nurses working in PICUs were identified: teamwork, specific training, time management, team communication, clinical management, individual errors, facility criticalities, patient factors/characteristics, standardization. **Conclusions**: the culture of safety can be promoted by management through learning spirit and free speech without fearing negative effects.

INTRODUCTION

Patient safety is a central issue in healthcare. It is especially crucial in Intensive Care Units (ICUs), mainly in Pediatric Intensive Care Units (PICUs), as many errors threaten patient safety, due to substantial and complex situations[1]. One of the essential steps of improving

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patient safety is the promotion of the Patient Safety Culture (PSC)[2]. The concept of safety culture is relatively new and not enough is known about its current state in the Italian PICUs. The term 'safety culture' was introduced in 1991 and later improved globally, as stated in the following definition: "Safety culture is the lasting value and priority placed for the worker and public safety for all, in all groups and all levels of an organization"1. Developing a culture of safety is a core element to improve patient safety and care quality[2]. The PSC is defined as "the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management". Referring to the Agency for Healthcare Research and Quality (AHRQ) measures to describe the safety culture, the dimensions to consider include: "teamwork", "staffing", "compliance with procedures", "training and skills", "non-punitive response to mistakes", "handoffs", "feedback and communication about incidents", "communication openness", "supervisor expectations and actions", "overall perceptions of safety", "management support" and "organizational learning" [3]. An approach to optimize the safety results in health care is often referred to Safety I. This system through a retrospective investigation evaluates the causes of an error or individual failures for redesign the system and reduce the like future events[4]. However, these measures can be better identified in the Safety II method that is an approach to safety that recognizes complex systems and unpredictable circumstances, imposing flexibility and resilience within systems and between individuals to avoid errors[4]. Literature shows that safety culture and the concept of safety climate are related, as higher error reporting, to reductions in adverse events and reduced mortality[5]. In order to increase knowledge about nursing safety culture, this study aimed to bring out the dimensions of the PSC from the perspective of nurses, who play an important role in the provision of health services[6] and are in contact with patients in the PICU[5]. Nurses' role provides various opportunities of reducing adverse events and catch errors before they happen. A positive work environment, a managerial commitment, a high nurses' education level, and errors reporting have a positive impact on patient safety outcomes[7].

A qualitative research approach helps to identify factors of failure in the PICU environment where children have a higher illness severity[4]. An analysis carried out by Salem et al, 2019 revealed that patient safety was a primary goal of nursing before 1900 and reflection on this analysis can inspire nurses to take actions that improve patient safety today[5].

The aim of this study is to describe the perception of: i. clinical risk and ii. nurse's role in patient safety by nurses working in PICUs.

METHODS

A qualitative research approach was used, specifically the Focus Group technique allowing to gather detailed opinions and knowledge.

Focus groups are defined as semi-structured discussions, mediated by moderators, by groups of 4–12 people that aim to explore a specific set of issues[8]. Moderators usually start the focus group by asking broad questions about the topic of interest, before asking the focal questions. Although the participation is individual, participants are encouraged to talk and interact with each other. This technique is built on the notion that the group interaction stimulates respondents to explore and clarify individual and shared

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perspectives[8]. Through this qualitative method people's experience is carried out, along with how they understand events. In focus group interviews[9], the questions are discussed from several perspectives, providing participants' points of view and meanings.

We conducted a 2-hours focus group session with PICU's nurses who participated voluntarily.

The session had 9 participants, all nurses, 7 women and 2 men, (Table 1), 2 moderators (master's students in clinical risk) and 1 observer (expert in clinical risk and focus groups).

The moderators were chosen on the basis of at least 5 years of clinical activity and proven experience in the field of clinical research, particularly qualitative (education qualification, participation in specific courses).

Participants were invited to participate in the study via email request and subsequently also verbally. Only the observer had professional relationships and knowledge with the participants while the remainder were meeting them for the first time. The conduct of the focus group and the data collection method were explained to them.

Participants were informed they were being audio recorded. Eight open-ended questions were used (Table 2). The session implementation was divided into 3 parts: the first part (questions no. 1, 2, 3, 4) concerning the criticalities and adverse events in the PICU and the factors that could solve those criticalities; the second part (questions no. 5, 8) concerning the measures in place and what can be improved; finally a third part (questions no. 6, 7) focusing on the nurses' role. Participants were asked what nurses are doing for clinical risk management and what the goal of their role is, along with the measures they already implement and want to develop in the future. No educational sessions were held prior to the focus group, all the responses were based solely on the participants' experience.

To conduct the focus group the COREQ methodological guidelines8 were followed.

The transcripts of the interviews were analyzed according to the content analysis approach, which takes place in 4 phases[8]:

1) *familiarization with the material*: each transcript is read repeatedly to obtain an overall view of the material;

2) *independent analysis by two researchers to identify the units of significant text*: the words and/or phrases that are significant in relation to the search question are identified;

3) *summary of each significant text unit using a descriptive label* (identified as theme);

4) *grouping of descriptive labels (identified as quote) that present a certain analogy into codes*.

The audio Recording of the interviews and word-for-word transcription ensured the accuracy of the data and increased the credibility of the research material. The analysis of the transcripts was carried out independently by two researchers with nursing education and experience in qualitative research. A constant comparison with the data was implemented, with a continuous return to original transcripts and significant text units to verify that all levels of analysis were more faithful as possible to the textual material and the meaning of the participants' words.

Alongside conventional content analysis using a comparative approach, general principles to assure quality in qualitative research were followed[10;11;12]:

– the interviews, which were audio-recorded and transcribed faithfully verbatim word

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on a word file, were made anonymous with the use of codes assigned to the participants at the moment of involvement;

– a summary report was generated outlining quotes, codes (intended as assigning labels to words or phrases that present analogy) and the final theme. The Word files containing transcripts and other material, such as memos, field notes, and researchers' diaries were kept on a password-protected computer accessible only to researchers;

– finally, the work was judged by the moderators and the external observer.

ETHICAL CONSIDERATIONS

The data was collected in an aggregate and anonymous form, without any possibility of tracing the identity of the participant. All participants were informed of the purpose and design of the study and were guaranteed anonymity and confidentiality throughout. Participation in the study was voluntary and participants could withdraw at any point without penalty.

For this study there was no need for approval from the ethics committee, because it does not involve the disclosure of sensitive data.

RESULTS

In the qualitative analysis, 9 themes describing the clinical risk perception by nurses working in PICUs were identified (Table 3). The themes identified are mainly related to the characteristics of the workplace or work management. Only two issues concern the specific characteristics of the professionals or patients.

1. *Teamwork*

Criticalities identified by participants in organization of work among staff were: the lack of control in the administration of therapy by, at least, two nurses or a nurse and a doctor, which can be seen in a broader vision, always reported by the participants in the Focus Group, as a lack of discussion between colleagues (quote 1) and collaboration between different health professionals. The double check also concerns the shared medical records and the metabolic screening (quote 2).

2. *Specific training*

Focus Group participants revealed a perceived training gap in the topic of clinical risk both for residents and nurses. The lack of organizational knowledge from the whole team (quote 3), the inadequate support of the new employee from the point of both medical and nursing view, (e.g. lack of knowledge of the correct compilation of the therapy sheet or inability to correctly read the prescription by nurses), the need to increase the use of incident reporting, the absence of specific and mandatory courses on clinical risk reveal the lack of continuous education and training provided by hospital on this topic. In addition to the last, there is also a lack of awareness that results in the non-request for specific education and training (quote 4) by the nurses' coordinator to the central hospital management or to the hospital training service. This gap could be overcome

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through a targeted and specific education and training offer and the provision of training events with high fidelity drills (quote 5).

3. *Time management*

Another criticality that emerged from the Focus Group is related to time management, both as regards the preparation of therapy, often interrupted by questions from colleagues or patient's family members, and more complex procedures that are not adequately managed over time (time of day in which to carry them out).

An absence of care priorities has also been reported by the participants (quote 6) which is correlated to poor time management for invasive procedures, handover, prescriptions, etc. (quote 7).

4. *Team communication*

Participants identified, first of all, an incomplete communication between doctors and nurses (quote 8) during briefing and debriefing, another issue deemed risky due to the related possibility of making mistakes. Communication between doctors and nurses can be a transversal aspect and touch points of time management and teamwork, but is characterized in its own way by reported episodes of inadequate or incomplete information (quote 9), incomplete communication between professionals during briefings, deliveries that focus on certain problems without emphasizing others and also the lack of a shared procedure on the handover, as well as the absence of a multidisciplinary meeting with doctors and nurses.

5. *Clinical Management*

An aspect that the participants criticized compared to the nursing coordinator is the inadequate management of shifts, which can lead to many overtime hours for some nurses, irregular shifts with a consequent increase in tiredness and in the risk of error. In addition, an inadequate distribution of activities is reported among the various health professionals. This is mainly linked to the expertise of the individual, so those with more seniority tend to have to intervene several times in more complex procedures and "leave" the caring of their patients to a colleague, with a notable increase in the risk of error (quote 10).

Finally, regarding the nursing coordinator, a bad organization of dangerous drugs was reported for which it would be necessary to find shared management and storage solutions.

6. *Individual errors*

First of all, the participants reported critical issues linked to illegible prescriptions by doctors (quote 11) and, in the worst case, incorrect prescriptions, for example in dosage, posology or administration times. Another point concerns the bad management of the patient's folders, the mess, which can lead to delays (quote 12) and whose solution is necessarily linked to a better awareness and education of the team regarding clinical risks. This theme is therefore linked to that of specific training.

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7. *Facility criticalities*

In addition to the risk linked to the human factor, seen in the previous paragraph, Focus Group nurses also reported facilities' structural/organizational deficiencies in the hospital, such as a PICU linked to old care models, therefore dispersive and with inadequate spaces (quote 13), and problems related to drug packaging (similar packaging) that can lead to confusion and error in an emergency situation.

Participants proposed as first solution to have a complete therapy cart with a room dedicated to the preparation of drugs and infusions (quote 14).

8. *Patient factors/characteristics*

According to the Focus Group results, one of the main criticalities in nursing management is related to the situation of the patient, who could face accidental falls, accidental removal of devices (central venous catheter, peripherally inserted central catheter), accidental extubations (quote 15). These variables are also difficult to resolve for nurses. A solution could be linked to the ability to keep caregivers in the room and educate them adequately about these possible events.

9. *Standardization*

A final element that the participants underlined during the Focus Group is the need to standardize the various activities as much as possible: the need to use labels to distinguish the various infusions (maybe with different colors), the need to standardize prescriptions and use IT-tools as much as possible (quote 16). Finally, also linked to the need of a better communication and training, another possible solution is to reduce the risk of error through the introduction of checklists (quote 17).

DISCUSSION

The Focus Group results highlighted critical points in the different phases of healthcare processes and procedures within the system. The main difficulty that emerged is working in a high quality PICU and ensuring optimal patient safety with scarce resources. Teamwork, communication and safety culture are essential factors for providing effective and safe care7, above all in the PICU due to the criticality of the patient. Among the various articles in the literature14;15;16;17;18;19;20;21;22;23 that have investigated practices and systems that focused on improving these aspects to increase the culture of patient safety, Merandi et al. (2018) outline that the mainly used approach to optimize patient safety in healthcare is that defined Safety I. However, this system incorporates a retrospective investigation after a failure, to determine individual failures to preserve from future events. Therefore, the behaviours of Safety I24 are those that prevent people from repeating the same mistakes; in fact, people focused on the event and not enough on prevention and improvement. In the development toward Safety II, which focuses on what is already positive in the system, recognizing that systems are complex and seeing human behaviour as a source of creativity versus a dangerous threat, people can be better engaged4. Promotion of patient safety culture can best be synthesized as a series of leadership interventions, behaviour change and above all teamwork2. Multiprofessional

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care is defined as the provision of collaborative and integrated health care among professionals from numerous disciplines and professions with various backgrounds in training and experience in response to the patient's needs25. Reeves et al. (2010), in association with the UK Centre for Advancement of Interprofessional Education (CAIPE), published the CAIPE framework who identifies three key areas, each contributing to multiprofessional teamwork: relational factors; processual factors; and organizational and contextual factors26. Overall, such results suggest evidence to support the effectiveness of such interventions in improving clinician and staff perceptions of elements of safety culture.

Themes that emerged from the focus group analysis are part of these factors:

- Themes "1. Team work" and "4. Team communication" reflect the relational factors. These factors describe the mentality and influence the relationship between professionals. There are some aspects that need to be considered that can hinder proper management by the multi-professional team: the power, hierarchy, composition together with the roles of the team, and the tension between senior and junior healthcare professionals, doctors and nurses and between the parents of a child and hospital staff at the PICU[25]. To have a united and cohesive team, regardless of hierarchy, the responsibility should be shared between a network of equivalent partners[25]. Teamwork is crucial in the cause and prevention of adverse events[7]. Effective communication is important for keeping patient safety and it exists if there is a culture of respect, fostered through shared mental models and efficient communication between team members, including patient's parents and relatives, which form the basis for effective team management in a PICU[25]. Moreover, encouraging nurses to report events is very crucial to improve patient' safety; however, this require non-punitive environment where people are not blamed on[7];

- Themes "3. Team management", "6. Individual errors", "8. Patient factors/ characteristics" and "9. Standardization" can be included in the process factors. Process factors describe the processes involved in teamwork. Working competently as a team is a learning process, it means to be part of a very complex system of activities (routine and rituals, roles and rules with a high load of unpredictability and urgency). The challenge is to learn by structuring clinical work as a learning process to improve patient safety. In healthcare organizations, formal and team-based learning is possible in simulation[25;27]. Creating effective teamwork and enabling learning during the work requires leadership and cultural change, which favours the management of the multiprofessional team[25]. It is essential to consider mistakes as important learning opportunities to improve patient safety culture and not as personal failures. This type of vision creates a guilt-free environment in which nurses are able to identify and promptly report errors, thereby improving patient safety. Developing a safety culture requires a no-fault and error-reporting environment[7];

- Themes "2. Specific training", "5. Clinical Management" and "7. Facility criticalities" can be included in organizational and contextual factors. The organization, leadership and contextual culture is responsible for the organizational environment and is considered an important factor for the management of the multiprofessional team[30]. The literature shows that managers' expectations and actions, feedback and communication on errors, teamwork between hospital units[28;29] and hospital hand-offs and transitions[29] predict the overall perception of patient safety culture[7;28;7;30]. This demonstrates how important it is managers to encourage patient safety commitment, through the following approaches: providing feedback and communications about errors in the unit and

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proactively respond to staff recommendations to improve patient safety and to prevent errors from happening[7]. It is an important aspect that the nurses' perceptions and recognition of patient safety culture increase with increasing professional experience if they work in teaching hospital settings[7].

The findings of the current study are in line with those of other studies[1;2;3;7;25;26;28;29;30] which show that communications about error, teamwork across hospital units, specific training are predictors of overall perception of patient safety culture.

Limitations and strengths of the study have to be considered. As regards limits, the data was obtained from a single centre involved and this could affect results generalizability. Concerning strengths, the careful choice of moderators, in terms of clinical and researchexperience, allows to guarantee the methodological rigour of the study; the careful selection of participants, who didn't know each other before the Focus Group, reduces possible bias in the results.

What the main study implications?

To encourage a culture of safety could improve the quality of care delivery processes in a setting of PICU.

The implementation of multi-professional meetings, workshops and educational activities that promote a culture of respect could be used to develop policies that will improve healthcare quality.

Engaging nurses of PICUs to promote Patient Safety could improve break down the barriers that keep nurses from fulfilling their role.

Explore future research on clinical risk perception in PICUs, even through multicenter studies, could help to further develop our understanding of the topic and find new strategies for nurture PSC in this care setting.

CONCLUSION

This study shows the importance of promoting a culture of safety in a delicate and critical care setting such as the PICU, and identifies 9 themes describing the nurses' perception of clinical risk in PICU.

To encourage a culture of safety, there is a need to replace the traditional culture of shame/blame with a non-punitive culture, share information, and learning from events. In fact, the culture of safety can only take place throughout the implementation of: multi-professional meetings, workshops and educational activities that promote a culture of respect and shared mental models; individual and team briefing-debriefing, feedback, focus group, coaching and mentoring; communication training; simulation training; mortality-and-morbidity conference; critical incident reporting system; dissemination of reported errors and solutions; acknowledging and supporting bottom–up initiatives and projects.

Nurses in PICUs have to stand up to promote patient safety, aware that this will allow organization to optimize its processes, staff wellbeing to increase, nurses to improve their care and outcomes, fulfilling their mission.

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