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Pediatric Early Warning Score Systems, Nurses Perspective – A Focus Group Study

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ABSTRACT

Purpose: Pediatric early warning score (PEWS) systems are used to monitor pediatric patients' vital signs and facilitate the treatment of patients at risk of deteriorating. The aim of this study was to gain knowledge about nurses' experiences with PEWS and to highlight factors facilitating and impeding the use of PEWS tools in clinical practice.
Design and Methods: An exploratory qualitative design was chosen using focus group interviews to gain a deeper understanding of nurses' experiences with PEWS. A total of five focus group interviews were conducted at three hospitals, and a qualitative meaning condensation analysis as described by Kvale and Brinkmann was performed.
Results: Seven themes were identified, including i) lack of interdisciplinary awareness, ii) clinical judgment and PEWS—a multi-faceted approach, iii) PEWS supports a professional language, iv) monitoring the patient's – a challenge, v) PEWS helps to visualize the need for escalating care, vi) an inflexible and challenging tool, and vii) supportive tools enhance the nurses' experiences of PEWS positively.
Conclusions: Our findings suggest that attention should be given to nurses' perceptions of how both clinical judgment and PEWS should be seen as essential in providing nurses with information about the patients' conditions. If not, the risk of failing to recognize patients' deteriorating conditions will remain as this can have an impeding influence on nurses' use of PEWS. From the nurses' perspective, medical doctors seemed unaware of their role in using PEWS.

Background

Children often present symptoms of deterioration in the 24 h preceding cardiac arrest (McLellan, Gauvreau, & Connor, 2017; Robson, Cooper, Medicus, Quinyero, & Zuniga, 2013), and many pediatric deaths have been described as either avoidable or potentially avoidable (Pearson, 2008). Pediatric early warning score (PEWS) systems serve to alert staff to children's deteriorating conditions. The majority of PEWS systems are based on vital signs, where each vital sign is valued according to its variance from normal and combined with other vital signs to produce an overall score. A high score indicates a risk of critical illness and prompts an escalating series of actions (Jensen, Aagaard, Olesen, & Kirkegaard, 2017). Hence, there are solid grounds for increased attention to the recognition of clinical deterioration through the implementation of PEWS. Surprisingly few studies have explored healthcare professionals' perceptions of using the systems in a clinical setting (Bonafide et al., 2013; Fox & Elliott, 2015; Lydon, Byrne, Offiah, Gleeson, & O'Connor, 2016; Stafseth, Grønbeck, Lien, Randen, & Lerdal, 2016). Experiences from early warning score systems for adult patients indicate that a variety of factors influence the degree to which the systems can be implemented successfully (Niegsch, Fabritius, & Anhøj, 2013; Patterson et al., 2011). Patterson et al. (2011) suggest that implementation problems are rooted in the absence of a standardized national early warning score system that provides an observation chart, staff training program, and review mechanism. Other authors suggest that the problems are staff-related—for example, lack of awareness

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from physicians' and that ward nurses lack confidence in calling for help whenever they think patients are unwell but cannot provide quantifiable information to substantiate their suspicion and therefore are reluctant to activate medical teams (Fox & Elliott, 2015; Stafseth et al., 2016). PEWS systems are mostly simple in design, yet Pearson (2008) reveals problems such as staff failure to recognize deteriorating patients and delayed responses to the systems, which suggests the suboptimal implementation of such systems may signify shortcomings in healthcare delivery. Studies considering issues related to PEWS' implementation and the healthcare professionals' experiences with PEWS systems are therefore warranted. Nurses play a central role in implementing PEWS systems, and it is therefore important to capture their "voice" when evaluating the effectiveness and use of this tool.

The present study is part of a larger ongoing randomized clinical trial evaluating two PEWS models (reference absent due to the anonymity of the manuscript), and the current study was initiated when PEWS had been implemented for a minimum period of one year to ensure that the staff had gained some experience using the PEWS systems. The two PEWS tools investigated were the bedside PEWS (Parshuram, 2009; Parshuram, 2011; Parshuram, Bayliss, Reimer, Middaugh, & Blanchard, 2010) and a modified version called the Central Denmark Region PEWS model (Jensen et al., 2017) (Table 1). Teaching sessions were performed for both nurses and medical doctors, separately. The included children were monitored using one of the two different PEWS tools. PEWS scores were obtained upon admission; re-scoring and actions according to the severity of the child's illness would then follow the PEWS algorithm which were identical for both PEWS tools (Supplementary material). An electronic patient chart was developed providing age-specific sub-scores for each of the seven parameters and an aggregated PEWS score. The age specific sub-scores are not presented in this paper but can be found in Jensen et al. (2017). A mini pamphlet was developed for the project containing: Decision algorithm for both PEWS; clinical decision support; Identify, Situation, Background, Assessment and Recommendation (ISBAR) communication tool; cardiopulmonary resuscitation (CPR) guidelines; content of the two PEWS and assessment tool for respiration effort assessment.

Aim

The aim of this study was to gain knowledge about nurses' experiences with PEWS and to highlight the factors facilitating and impeding the use of PEWS tools in clinical practice.

Methods

Design

An exploratory qualitative design was chosen using focus group interview to gain a deeper understanding of nurses' experiences with PEWS (Polit & Beck, 2010). Focus group interviews were chosen because this method allowed us to monitor dynamic and interactive discussions to gain insight into nurses' perceptions and experiences and because the method is especially useful for revealing shared understandings and practices (Halkier, 2014; Krueger & Casey, 2009; Puchta & Potter, 2004). The aim guided the research process. As we wanted to interpret and understand the participants' experiences, a hermeneutic analytic approach was chosen. The hermeneutic interpretation follows the hermeneutical spiral, searching for the basic meaning of a text as a whole through an investigation of its parts (Kvale & Brinkmann, 2015). The three researchers' (CSJ, PBN and HA) preunderstanding was based on various experiences from clinical practice within the field of acute pediatric nursing, adolescent and diabetic nursing, and neonatal care as well as on their experiences as researchers. In an attempt to move beyond preconceptions and understand the participants' experiences of PEWS, a reflective attitude was maintained throughout the process.

Table 1
Description of the contents of the two PEWS models.

Bedside PEWS model	Central Denmark Region model
Heart rate	Heart rate
Respiratory rate	Respiratory rate
Respiratory effort	Respiratory effort
Systolic blood pressure	Level of consciousness
Pulse oximetry	Pulse oximetry
Oxygen therapy	Oxygen therapy
Capillary refill time	Capillary refill time

Setting

The study was conducted in five pediatric units at three hospitals, including two regional hospitals and a university hospital with pediatric patients ranging from 0 to 19 years of age.

Participants and Recruitment

Nurses who had had direct experience with the use of PEWS tools were invited to participate. Five focus group discussions (counting three to seven participants) were conducted. The head nurses distributed information about the study and recruited participants to the focus group discussions. Participants were recruited from participating centers in the Central Denmark Region and purposively sampled to achieve maximum diversity of experiences from work with pediatric patients (Table 2). Focus group discussions were conducted in different departments and settings to capture a breadth of opinion from November 2016 to February 2017.

Data Collection

The principal investigator (CSJ) moderated the focus group discussions, which included keeping the discussion on track and ensuring that everyone participated actively. A project nurse (PB) served as a co-moderator and was present as an observer responsible for ensuring that all questions were discussed (Halkier, 2014; Krueger & Casey, 2009). Both researchers had prior experience conducting research interviews.

The focus group discussions lasted between 43 and 82 min (mean 66 min). They were conducted close to the clinical setting to ensure a high participation rate from the nurses. All discussions were audiotaped and transcribed verbatim, and the co-moderator described the contextual details of the discussion. To facilitate the discussion, a semi-structured interview guide based on relevant literature was developed (Kvale & Brinkmann, 2015). The interview guide is presented in Table 3. To get the discussion started, the moderators were allowed to use different artifacts, such as screen prints from the electronic patient charts or different measurement instruments such as blood pressure measurement tools. Each focus group discussion began with a short, structured introduction by the moderator. The transcribed interviews were conducted in Danish and analysed in Danish and the central quotation were translated to English.

Ethical Considerations

The ethical principles highlighted in the Declaration of Helsinki were followed (World Medical Association, 2013). The participants were informed that participation was voluntary and oral and written informed consent was obtained. According to Danish law, this type of research does not need approval from an official research ethics committee. At the beginning of each focus group discussion, the participants were informed of the aim of the study, the voluntary and confidential nature of their participation, and their right to withdraw at any time without consequences.

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