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REVIEW

Integrative Review of Instruments to Measure Team Performance During Neonatal Resuscitation Simulations in the Birthing Room

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ABSTRACT

Objective: To identify instruments appropriate to measure interprofessional team performance in neonatal resuscitation (NR), describe the validity and reliability of extant NR instruments, and determine instruments for use in interprofessional birthing room NR simulations.

Data Sources: The Cumulative Index to Nursing and Allied Health Literature, Ovid, Proquest, ScienceDirect, and Q1 Scopus databases were searched.

Study Selection: We used inclusion and exclusion criteria and screened 641 abstracts from January 2000 through December 2014 for relevance to the research question. We reviewed 78 full-text primary research publications in English and excluded 37 publications not specific to pediatrics or neonatology. After in-depth review of the 41 studies that remained, we excluded additional studies if they did not have an interprofessional focus, include psychometric information, or include a measurement instrument. Ten publications met the inclusion criteria.

Data Extraction and Synthesis: Studies were reviewed, categorized, and scored to identify instruments to measure interprofessional team performance in simulations of birthing room NR. A social ecological model was used as a guide framework to identify multiple influencing factors at various levels that affect team performance. Ten instruments with documentation of validity and reliability for technical competence and team processes in interprofessional birthing room NR teams were identified.

Conclusion: Extant instruments rarely address the multiple factors that may impede interprofessional team performance in birthing room NR. It is necessary for researchers to engage in rigorous psychometric testing of measurement instruments to ensure their validity and reliability for interprofessional NR teams and consider tests or updates (if necessary) of extant instruments rather than the development of new instruments.

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Most neonates will transition normally with little intervention and promotion of skin-to-skin contact and bonding (Dani et al., 2015). However, more than 400,000 neonates per year in the United States require assistance to establish ventilations at birth; less than 1% of all neonates require extensive resuscitation (Nahidi, Tavafian, Haidarzade, & Hajizadeh, 2014; Rich, Leone, & Finer, 2010). The first minutes of life are crucial for compromised neonates and necessitate timely intervention, team cohesion, and coordinated efforts for the best outcomes. Researchers demonstrated that effective teamwork improves quality of care in neonatal resuscitation (NR; Sawyer, Laubach, Hudak, Yamamura, & Pocrnich, 2013). Unfortunately, an effective team needs more than just a group of NR experts (Miller, Riley, Davis, & Hansen, 2008). A team that functions well in NR events in the birthing room Q2 requires an orchestration of skills from diverse team members, each with various skill levels and knowledge. Multiple factors affect team cohesion and can serve as facilitators or barriers to NR team functioning.

After the 2004 Joint Commission recommendation for improved collaboration and communication in perinatal teams, the Neonatal Resuscitation Program (NRP) developers identified a need to integrate behavioral skills and

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Measures to assess interprofessional team processes such as team performance and interaction are inconsistently reported in the literature.

teamwork into the NRP curriculum (Katakam, Trickey, & Thomas, 2012). To answer the call for better perinatal outcomes, many hospitals are developing simulation-based educational programs with the aim to improve care delivery. However, there are few effective measurement instruments with evidence of reliability and validity to assess team functioning and performance, especially in diverse interprofessional teams (Thomas et al., 2010). Although technical performance or team processes are evaluated in most studies of interprofessional teams, it has become apparent that both qualities together are required for better outcomes (Schmutz & Manser, 2013). In interprofessional NR, team performance and proficiency are highly dependent on social interaction among team members, which is in turn influenced by interpersonal, environmental, and organizational factors (Masiello, 2012). Although effective team competency in the management of NR events in the birthing room involves technical skills critical for optimal patient outcomes, measures to assess interprofessional team processes such as team performance and interaction are inconsistent (Masiello, 2012). Furthermore, reliability and validity have not been documented for many of the extant published measurement instruments for interprofessional team performance in resuscitation (Kardong-Edgren, Adamson, & Fitzgerald, 2010).

Purpose

The purposes of this integrative review were to (a) identify measurement instruments that are currently used to assess interprofessional teamwork technical functioning and team performance in NR in the birthing room, (b) describe the reliability and validity of the extant instruments, and (c) determine which of these instruments are appropriate for use in simulations of NR in the birthing room. To effectively address multiple factors in the health care setting, we used the McLeroy, Bibeau, Steckler, and Glanz (1988) application of a social ecological model (SEM) as the theoretical framework to guide this integrative review (Golden & Earp, 2012).

Background

Patient safety initiatives can benefit from an enhanced understanding of team processes and how to develop team functioning to improve performance. In 1999, the Institute of Medicine (IOM) identified the need for interprofessional training in the formative education of health care professionals with continued interprofessional education throughout team members' careers. In 2003, the IOM strongly suggested that interprofessional education initiatives would improve patient outcomes; however, health professional education remains discipline specific. Subsequently, Congress amended Title IX of the Public Health Service Act to designate the Agency for Healthcare Research and Quality (AHRQ) to conduct and support research with the goal to improve patient safety and outcomes (IOM, 1999). In response to this directive, interprofessional educational programs that use simulation-based learning activities are in development in hospitals. Although the number of measurement tools for technical performance has increased exponentially, there are few instruments to appropriately measure interprofessional teamwork processes and team performance because of the lack of reliability and validity of these measurements (Jeffcott & Mackenzie, 2008).

Although evidence shows that simulation-based NR exercises improve team performance in simulation settings, the effect of simulation-based learning on interprofessional NR team performance during actual real-time resuscitations remains unknown. Furthermore, because of inconsistent determination of outcomes, little support of the effectiveness of simulation-based training exists in the literature (Dadiz et al., 2013; Rubio-Gurung et al., 2014). More research to explore the effects of interprofessional simulation-based education on interprofessional team processes is necessary to refine this educational strategy for translation of skills to the clinical area and improvement of patient outcomes. Clinical simulations are rapidly becoming central to interprofessional efforts to improve patient outcomes. In a meta-analysis of technology-enhanced simulation in pediatric educational studies, researchers found that few studies included an interprofessional learner group and patient care–related outcomes (Cheng, Lang, Starr, Pusic, & Cook, 2014). Moreover, most research on simulation-based learning in the various professions occurs in silos specific to the respective profession, and the authors of many of these studies rely on measurement instruments with minimal or no documented psychometric properties.

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