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Research Commentary

Translational Research – Focusing on Quality of Pediatric Nursing Care and Reducing Safety Risks for Children and Families

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The foundation of pediatric nursing care focuses on providing quality healthcare to children and their families while reducing risks to ensure a safe environment. Regardless of healthcare setting, the goal of pediatric nursing for children and families is to maximize the quality of care and minimize safety risk. Hospitalization poses new challenges to children and families creating additional vulnerability. Pediatric nurses improve care quality for children and advance practice through new interventions developed and evaluated through research, quality improvement projects, and evidence-based practice projects. Implementation of new intervention strategies improves the quality of pediatric nursing care for children and their families by enhancing their ability to cope with the stress of hospitalization and health challenges, as well as reducing their vulnerability to physical and psychological risk (Christian, 2018).

Improving health outcomes for children and their families depends on evidence derived from nursing research that is then translated into evidence-based practice, thereby improving the quality of pediatric nursing care (Hockenberry, Wilson, & Rodgers, 2019; Melnyk & Fineout-Overholt, 2018; Polit & Beck, 2017). Research, evidence-based practice projects, and quality improvement projects employ new interventions that lead to improvements in the quality of care for children and their families (Christian, 2011, 2015, 2017). In this way, new interventions extend and build upon current best practices, while improving the quality of care and reducing safety risks. Ultimately, these changes advance pediatric nursing science and practice.

In this issue of the *Journal of Pediatric Nursing,* a combination of research, quality improvement projects, and evidence-based practice articles present evidence focused on new interventions for improving the quality of care for children and their families, while reducing risks to ensure a safe environment, including the following: (a) the effectiveness of pet therapy in reducing anxiety in hospitalized children; (b) an intervention to improve safety with respect to NG/OG tube placement in hospitalized infants and children; (c) a review of the evidence on the efficacy of temporal artery thermometry in pediatric patients; (d) an intervention bundle to improve patient safety by reducing pediatric falls among hospitalized children; (e) an exploration of the barriers and enablers to the use of the Children's Hospital Early Warning Score (CHEWS) assessment on a pediatric inpatient unit; (f) implementation of delirium screening tool intervention by PICU nurses; (g) a review of the evidence on parental perspectives about roles of parents and healthcare providers in end-of-life decision-making in the PICU; (h) implementation of a nursing order set intervention to improve time-to-antibiotic administration for pediatric oncology patients with neutropenia and fever receiving care in the emergency department; (i) the effectiveness of the use of contingent lullaby music on mother-infant interaction and infant crying during the first six weeks of life: (j) an intervention to improve postpartum depression screening in pediatric primary care; and (k) a concept analysis of trauma coercive bonding with respect to sex trafficking of adolescents in the Commercial Sexual Exploitation of Children.

The articles in this issue of the *Journal of Pediatric Nursing* present new interventions designed to improve the quality of care for children and their families, while reducing risks to ensure a safe environment, as follows:

- A quasi-experimental design study was conducted to evaluate the effect of a pet therapy intervention on anxiety in hospitalized children and adolescents (ages 6 to 17 years; $N = 93$), as compared to a group who completed a jigsaw puzzle (Hinic, Kowalski, Holtzman, & Mobus, 2019). Two female dog handler teams in conjunction with the child life specialist were used in the pet therapy intervention program throughout the study. Baseline comparisons of groups indicated equivalence on state anxiety scores. Although state anxiety decreased in both the pet therapy group and the puzzle comparison group of children, those who received pet therapy demonstrated statistically significant lower state anxiety ($p = .02$). Moreover, children in the intervention group responded in a similar positive manner to pet therapy regardless of whether or not they had a pet at home. The overwhelming majority (95.7%) of parents reported that pet therapy was beneficial for their child. Thus, the pet therapy intervention was effective in reducing anxiety among hospitalized children and adolescents.
- An evidence-based practice project was conducted to improve NG/OG tube placement verification in infants and children in the hospital setting (Kisting, Korcal, & Schutte, 2019). Based on a systematic review of the literature (1995 to 2014), evidence from 40 studies provided the foundation for the development of an algorithm for safe NG/OG tube placement in infants and children. Nurses from five pediatric units ($n = 71$) were surveyed about NG/OG tube placement practices pre- and post-implementation. Prior to project implementation, the most common practice for assessing correct placement was auscultation (88%), while pH aspiration (11.3%) was the least common practice.

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A Competency Fair was conducted to provide safe NG/OG tube placement education to nurses. Post-intervention nurses' knowledge of NG/OG tube placement was measured ($n = 64$) with a statistically significant increase from 74% to 94% of nurse respondents who correctly identified the problem with respect to aspiration ($p < .0001$). Importantly, 70% of nurse respondents indicated that their practice had changed since algorithm implementation. One year after implementation, a chart audit was performed to evaluate sustained practice change based on 231 NG/OG tube placements in infants and children over four months. Results of chart review indicated that the algorithm practice change was sustained over time with 23% NG/OG tube placements in infants and children verified by radiograph, 65% documented pH aspiration, 91% documented tube length, 15% visualization of aspirate, and 0% auscultation.

- A systematic review and meta-analysis was conducted to determine the accuracy and precision of temporal artery thermometry, as well as the sensitivity and specificity for fever detection in children <18 years of age (Kiekkas, Aretha, Almpani, & Stefanopoulos, 2019). A search of the relevant literature published from January 2000 through October 2018 was conducted using CINAHL, PubMed, Web of Science, Cochrane Library, EMBASE, and Scopus databases and following PRISMA flow diagram. Of the 418 articles retrieved, 30 articles met the inclusion criteria. Accuracy and precision of temporal artery thermometry were reported in 27 studies of pediatric patients ($N = 5178$); sensitivity and specificity for fever detection in children were reported in 21 studies ($N = 5619$). Results of the meta-analysis indicate that temporal artery thermometry underestimated temperature in children by 0.01 °C (95% Level of Agreement: −0.06 to 0.03 °C). Sensitivity of temporal artery thermometry for fever detection in children was 0.72 (95% CI: 0.66 to 0.79), with specificity of 0.91 (95% CI: 0.86 to 0.93), indicating that temporal artery thermometry demonstrated high sensitivity, but low specificity for detecting fever in children. Although temporal artery thermometry demonstrated satisfactory accuracy, precision, and sensitivity, specificity for detecting fever in children was low. Thus, the results indicate that temporal artery thermometry is not suitable for detecting fever in children <18 years of age.
- A quality improvement project was implemented to evaluate an evidence-based pediatric falls prevention bundle on two acute care units at a children's hospital (Benning & Webb, 2019). The Plan-Do-Study-Act (PDSA) method was used to guide development and implementation of the pediatric falls prevention bundle (birth to 21 years of age). The project included a needs assessment survey of nurses; pilot testing of the falls prevention bundle; comprehensive hospital-wide education for nurses, patients, and families; standardized pediatric falls risk assessment tool (Humpty Dumpty Falls Scale), and integration of falls assessment and documentation in the electronic health record (EHR). Results indicate that adherence with the pediatric falls bundle increased from pre-implementation rate of 27% to 36% to 88% post-implementation. Rate of falls per 1000 patient days on two pediatric units identified zero patient falls during five of six months post-implementation. Thus, implementation of the quality improvement project was successful in increasing adherence to the pediatric falls bundle and reducing pediatric falls, thereby improving patient safety.
- A qualitative descriptive design study guided by the Theoretical Domains Framework was employed to determine barriers and enablers to implementing the Children's Hospital Early Warning Score (CHEWS) with nurses on a pediatric inpatient unit (Cassidy et al., 2019). Two focus groups were conducted with nurses ($n = 15$) pre-implementation and individual interviews with nurses ($n = 8$) were conducted post-implementation. Content analysis and inductive thematic analysis were used to analyze the data. Six themes were identified that nurses described as barriers and enablers to implementation of the CHEWS: (a) Compatibility with nursing practice; (b) Influence on clinical decision-making; (c) Interprofessional relations; (d) Unit context; a (e) Quality of care and patient safety; and (f) Influence of emotions. These results highlight nurses' perceptions about using CHEWS and the barriers they identified that hinder clinical decision-making and interprofessional collaboration. Identifying barriers to the use of CHEWS by pediatric nurses provides a guide for tailoring interventions to increase usage of CHEWS to improve the quality of pediatric patient care.
- A quality improvement project using the Plan-Do-Study-Act (PDSA) method was used to implement delirium screening by pediatric intensive care unit (PICU) nurses ($N = 42$) and to evaluate the impact of education on PICU nurses' knowledge, self-confidence, and attitudes about delirium in a community-based teaching hospital (Norman & Taha, 2019). Three PDSA cycles were conducted for development and implementation of the project, including: (a) assessment of current delirium practices, knowledge, self-confidence, and attitudes about delirium at baseline (pre-intervention), (b) development and implementation of didactic delirium education program with immediate assessment post-intervention, and (c) 3-month, post-implementation assessment of the delirium screening education and practice change in the PICU. Results of the program indicated statistically significant differences between pre-and post-intervention with improvement in delirium knowledge ($p = .003$), self-confidence ($p < .001$), and attitudes ($p = .036$), and this improvement in delirium screening practices among PICU nurses was sustained at 3-months post-implementation ($p = .023$; $p < .001$; $p = .027$, respectively). Most notable was the increase in PICU nurses' self-confidence in delirium screening among critically ill children. Additionally, chart audits ($n = 176$) were conducted at 1-month and 3-months post-implementation to evaluate practice change indicating 67% adherence (1-month) and 100% adherence (3-months) to delirium screening. Thus, this quality improvement project demonstrated successful implementation of the delirium knowledge and screening program for PICU nurses resulting in practice change.
- An integrative review of the literature was conducted to explore parental perspectives of parents' and healthcare providers' roles in end-of-life decision-making in the pediatric intensive care unit (PICU) (Bennett & LeBaron, 2019). A search of the relevant literature published (2008–2018) was conducted using multiple databases, including CINAHL, PubMed, OVID Medline, Web of Science, Social Science Database, PsychINFO, and Google Scholar (limited to first 200 records) and the PRISMA flow diagram. The search yielded 2889 articles; of these, 11 articles met the inclusion criteria. Results identified four key themes that described parents' views of roles in end-of-life (EOL) decision-making, as follows: (a) the role of being the "good parent"; (b) parents have primary responsibility for EOL decision-making, although a minority of parents assumed EOL decision-making is the physician's responsibility; (c) EOL decision-making is highly personal, based on emotion and perceptions, not medical information or physician recommendation; and (d) parents preference for HCPs who are trustworthy, with good communication skills and the ability to deal with disagreements about decisions, serving as an ally rather than adversary. It is important to note that the specific role of the PICU nurse in EOL decision-making was "under-represented and under-examined" in the literature. Thus, parental perspectives of roles in EOL decision-making are essential to improving parents' ability to cope with their child's death.
- A quality improvement project was implemented to reduce the time-to-antibiotic administration for pediatric oncology patients with neutropenia and fever who are admitted to the emergency department (Lukes, Schjodt, & Struwe, 2019). A review of the literature indicated that guidelines for best practice include a goal of <60 min for time-to-antibiotic administration for pediatric oncology patients. A six-month retrospective chart review ($n = 69$ patients) was conducted to evaluate the average time-to-antibiotic administration for baseline comparison indicated that none of the patients met the 60-minute guideline. The Plan-Do-Study-Act (PDSA) method was used throughout the development and implementation of the project, and was comprised of three steps in the process that focused on improving provider workflow, changing provider and nursing workflow, and creation of a triage nurse order set intervention for pediatric oncology patients in the ED.

Results of the intervention indicated statistically significant decreases in median time-to-antibiotic administration for three of four cohorts of patients, ranging in time from baseline at 108 min ($p < .01$), to cohort 1 at 77 min ($p = .039$), cohort 2 at 91 min (NS), cohort 3 at 47 min ($p < .01$), with practice change sustainability cohort 4 at 51 min ($p < .01$). Thus, this quality improvement project employing changes in provider and nursing workflow and the use of a triage nurse order set was successful in changing practice and reducing the time-to-antibiotic administration from 128 min to <60 min for pediatric oncology patients admitted to the emergency department.

- A randomized experimental, posttest-only/no-contact control group design research study was conducted to determine the effects of contingent lullaby music on mother-infant interaction and infant crying behaviors during the first six weeks of life (Robertson & Detmer, 2019). Mother-infant dyads ($N = 45$; $n = 21$ experimental, $n = 24$ control) were randomized to intervention and control groups and followed for six weeks. Mothers in the intervention group were assisted in rewriting the lyrics to a well-known lullaby personalizing how they feel about their healthy newborn. Mothers were instructed to sing the lullaby to their infant as reinforcement during periods when the infant was quiet and alert, but to stop singing during periods of crying until the infant paused or took a breath. During week six, mother-infant interactions were videotaped. Results demonstrated statistically significant differences between mothers of infants who received the lullaby intervention as compared to mothers in the control group, with decreased mean infant crying time per week over six weeks ($p < .01$), as well as mothers' interactions being more responsive ($p < .05$), and warm ($p < .01$), at six weeks post-intervention. Significant differences were found for mother-infant interactions with those in the intervention group demonstrating more eye contact ($p < .01$), talking ($p < .02$), singing ($p < .05$), and infant responsiveness ($p < .01$). No significant differences were found in mean infant crying time by demographic characteristics of mothers. Thus, mother- infant dyads participating in the contingent lullaby music intervention had significantly less infant crying and improved interactions between mothers and their infants, as compared to mother-infant dyads in the control group.
- A quality improvement project was implemented to improve postpartum depression (PPD) screening in pediatric primary care at 1-, 2-, and 6-month well-child clinic visits (Sorg, Coddington, Ahmed, & Richards, 2019). The Plan-Do-Study-Act (PDSA) method was used to guide the intervention development based on evidence-based guidelines by the American Academy of Pediatrics. During the 12-month pre-intervention period, 83% of the mothers ($n = 72$) received documented PPD screening; at 3-months post-intervention, 88% of mothers were screened ($n = 44$). Although there was an increase in PPD screening rates, these differences were not statistically significant. Mothers screened at 1-month demonstrated higher rates of PPD screening as compared to those at either 2-month or 6-month visits. Greater likelihood of mothers' positive PPD screenings was associated with male infants, Medicaid or sliding fee scale insurance, and Hispanic ethnicity. In contrast to mothers of exclusively breast-fed infants, mothers of infants who received bottle-feeding or combined feeding (formula and breast) demonstrated lower rates of positive PPD screenings. Thus, the feasibility of PPD screening of mothers in pediatric primary care during well-child clinic visits was supported.
- A concept analysis was conducted to define and clarify the concept of *trauma coercive bonding* associated with sex trafficking of adolescents with respect to the phenomenon of commercial sexual exploitation of children (CSEC) (Sanchez, Speck, & Patrician, 2019). Rodgers' evolutionary method of concept analysis was employed. A search of the published literature from 1990 to 2017 was conducted using PubMED, Scopus, Google Scholar, and CINAHL databases, yielding 21 articles that met the inclusion criteria. Three key attributes were identified that define trauma coercive bonding in CSEC: (a) severe power imbalance; (b) increasing intermittent brutal and seductive behavior; and (c) social isolation. An additional attribute expanded the definition to include the perceived inability to escape captivity that results from the adolescent victim's emotional distress of fear, shame, and associated stigma. Thus, the concept of *trauma coercive bonding* was clarified to explain the process of psychological coercion and bonding experienced by vulnerable adolescent victims of CSES and to describe their relationship with their sex traffickers. With this expanded definition, healthcare providers may achieve a better understanding of the behavior of adolescent victims of *trauma coercive bonding* associated with CSES, as well as develop more appropriate interventions.

With the development and testing of new interventions through research, quality improvement projects, and evidence-based practice projects, opportunities are created to improve nursing care quality and patient safety. These articles highlight the importance of new intervention strategies designed to improve the quality of pediatric nursing care for children and families, while reducing risks to ensure a safe environment. In this way, new evidence derived from the implementation of new interventions builds upon current best practices, resulting in improved quality of care for children and their families. Moreover, new evidence changes practice and advances pediatric nursing science.

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