ARTICLE

Utilization of the Premature Birth Knowledge Scale to Assess Pediatric Provider Knowledge of Neurodevelopmental Outcomes

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ABSTRACT

Introduction: Prematurity affects a significant portion (10–12%) of children in the Unites States, with potential for physical, psychological, neurodevelopmental, and behavioral impairments continuing long past the neonatal period. The specific aim of this research was to evaluate pediatric primary and specialty care providers' knowledge and understanding of neurodevelopmental outcomes of children born prematurely.

Methods: Pediatric nurse practitioner (PNP) members of the National Association of Pediatric Nurse Practitioners participated in an online survey using the 33-item Premature Birth Knowledge Scale (PB-KS) to assess their knowledge of current neurodevelopmental outcomes of children born prematurely.

Results: Neither years of practice as a registered nurse nor as a PNP predicted performance on the PB-KS. The mean score on the PB-KS in the PNP sample was 17.8 (possible score = 0–33), with a mean accuracy of 53.9%. Higher scores on the PB-KS were correlated with higher perceived level of preparation to care for children born prematurely.

Discussion: To our knowledge, this is the first study to use the PB-KS with pediatric primary and specialty providers. PNPs are uniquely situated to educate and support families facing the long-term consequences of premature birth; to do so they must maintain accurate understanding of current outcomes. J Pediatr Health Care. (2017) ■, ■-■.

KEY WORDS

Neurodevelopmental outcomes, pediatric nurse practitioners, premature, preterm

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The Alpha Nu Chapter of Sigma Theta Tau International provided funding for this research.

Conflicts of interest: None to report.

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0891-5245/$36.00

http://dx.doi.org/10.1016/j.pedhc.2016.12.006

INTRODUCTION

Prematurity affects 10% to 12% of children in the United States, with significant potential for physical,

psychological, neurodevelopmental, and behavioral impairments continuing long past the neonatal period. According to the National Survey of Children's Health 2011/2012 data, 14.1% of U.S. children born prematurely experience special health care needs, and 19.1% experience complex medical needs (National Survey of Children's Health, 2016). These comorbidities place children at risk and are often no longer attributed to premature birth. Children born prematurely represent a vulnerable population with and without visible comorbidities whose neurodevelopmental limitations require recognition and proactive management by pediatric primary and specialty care providers (Kelly, 2006a; Lahood & Bryant, 2007). By recognizing the risks and educating families, pediatric nurse practitioners (PNPs) may strive to bridge the gap between health care practitioners and educators to support the neurodevelopmental needs of this population. The Institute of Medicine and National Research Council asserted that characteristics of premature birth matter to children's future health, not because premature birth presents an overwhelming obstacle but because it is the foundation of adult well-being (National Research Council & Institute of Medicine, 2004). The specific aim of this PNP Premature Birth Knowledge Scale (PB-KS) project was to evaluate pediatric primary and specialty care providers' knowledge and understanding of neurodevelopmental outcomes of children born prematurely.

Research addressing various neurodevelopmental outcomes in early childhood is abundant; however, results of outcome research conducted by neonatal or developmental specialists may not be fully disseminated to those providing pediatric primary and specialty care. A search of CINAHL, PubMed, and Proquest databases from 2005 through 2015 shows fewer than 25 publications specifically related to the primary care of children born prematurely (search terms: *primary care, children,* and *prematur**). These articles focus on the transition from the NICU to primary care and health management in infancy (Gauer, Burket, & Horowitz, 2014; Kelly, 2006a, 2006b, 2006c; Newnam & Parrott, 2013; Phillips et al., 2013; U.S. Department of Health and Human Services & U.S. Department of Education, 2014). The high quality of literature focusing on the first year of life reflects a critical focus of practitioners and underscores the complexity of the first year of life of children born prematurely. However, a gap exists in the literature and subsequent health policy related to the ongoing care delivered by pediatric primary and specialty care providers to children born prematurely, the importance of premature birth as a relevant long-term health variable, and the role of pediatric providers in supporting the educational success of children born prematurely.

Neurodevelopmental impairments have direct relevance to the educational success of children; a sampling of the neurodevelopmental educational literature is highlighted here. In a review of neuropsychological outcome literature of 5-year-old children born late preterm (born between 33 and less than 37 weeks of gestation), Baron, Litman, Ahronovich, and Baker (2012) concluded that lower intelligence scores, poor academic achievement, and more internalizing and attention problems were reported compared with term control subjects. The risk for developmental delay, suspension from kindergarten, and greater need for special education services was seen in apparently healthy children born late preterm (Baron et al., 2012).

Aarnoudse-Moens, Oosterlaan, Duivenvoorden, van Goudoever, and Weisglas-Kuperus (2011) found patterns of increasing difficulties with linguistic performance in 4- to 6-year-old and 6- to 12-year-old children born very preterm (born between 28 and 32 weeks' gestation). The children born very preterm were comparable with term peers in preschool linguistic skills; however, they failed to master the increasing demands of school-age skills. Mathematics performance in the preterm children was significantly lower than term peers beginning in preschool and continued to lag behind at school age. In a prospective study of children born very preterm, Pritchard, Bora, Austin, Levin, and Woodward (2014) evaluated school readiness at 4 years of age compared with educational abilities at 6 and 9 years of age. These children also displayed increased educational difficulties over time; at 6 years of age, 60% of the sample had education delays; at 9 years of age, this increased to 64% of the sample (Pritchard et al., 2014).

Extremely premature infants (born at less than 28 weeks' gestation) participating in mainstream education at 6 years of age were shown to perform one standard deviation below their peers in the same school setting in visuospatial, perceptuomotor, attention-executive, and gross motor function (Marlow, Hennessy, Bracewell, Wolke, & The EPICure Study Group, 2007). Wong et al. (2014) observed children born extremely premature participating in U.S. kindergarten and reported lower scores on cognitive tests, higher teacher rating of behavioral problems, and lower rates of social competence than their term peers. In kindergarten, the premature children were more likely to require individualized instruction and were more often off-task than their term peers (Wong et al., 2014). Difficulty meeting classroom instructional demands may arise in kindergarten in children previously evaluated as developmentally on target (Wong et al., 2014).

Chyi, Lee, Hintz, Gould, and Sutcliffe (2008) used the U.S. Department of Education's Early Childhood Longitudinal Study–Kindergarten Cohort to compare the educational needs of children born preterm from kindergarten through fifth grade, including teacher evaluations, individualized educational plans, special