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An Integrative Review of Pediatric Fall Risk Assessment Tools☆

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ABSTRACT

Problem: Patient fall prevention begins with accurate risk assessment. However, sustained improvements in prevention and quality of care include use of validated fall risk assessment tools (FRATs). The goal of FRATs is to identify patients at highest risk. Adult FRATs are often borrowed from to create tools for pediatric patients. Though factors associated with pediatric falls in the hospital setting are similar to those in adults, such as mobility, medication use, and cognitive impairment, adult FRATs and the factors associated with them do not adequately assess risk in children.
Eligibility Criteria: Articles were limited to English language, ages 0–21 years, and publish date 2006–2015.
Sample: The search yielded 22 articles. Ten were excluded as the population was primarily adult or lacked discussion of a FRAT. Critical appraisal and findings were synthesized using the Johns Hopkins Nursing evidence appraisal system.
Results: Twelve articles relevant to fall prevention in the pediatric hospital setting that discussed fall risk assessment and use of a FRAT were reviewed. Comparison between and accuracy of FRATs is challenged when different classifications, definitions, risk stratification, and inclusion criteria are used.
Conclusions: Though there are several pediatric FRATs published in the literature, none have been found to be reliable and valid across institutions and diverse populations.
Implications: This integrative review highlights the importance of choosing a FRAT based on an institution's identified risk factors and validating the tool for one's own patient population as well as using the tool in conjunction with nursing clinical judgment to guide interventions.

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Falls are a nursing sensitive indicator tracked by Magnet® designated institutions, all of which are seeking to better understand and prevent falls in their specific setting. The Joint Commission's National Patient Safety Goals deem inpatient falls as a significant patient safety risk and require organizations assess fall risk and implement interventions to reduce fall risk (The Joint Commission, 2015). A commonly used definition of a fall comes from the National Database for Nursing Quality Indicators (NDNQI) as "a sudden, unintentional descent, with or without injury to the patient that results in the patient coming to rest on the floor, on or against some other surface, on another person, or an object" (NDNQI, 2016).

Adult studies report that fall prevention programs with sustained improvement include the use of validated fall risk assessment tools (FRATs). Extensive literature exists on fall risk assessment and the impact of fall prevention programs in the adult population (Matarese, Ivziku, Bartolozzi, Piredda, & De Maranis, 2015); however, we have begun to fully explore the unique risks of the pediatric patient just over the past several years. Several pediatric FRATs exist; though, more research is needed to establish their reliability and validity (Harvey, Kramlick, Chapman, Parker, & Blades, 2010; Jamerson et al., 2014; Ryan-Wenger, Kimchi-Woods, Erbaugh, LaFolette, & Lathrop, 2012). Due to patient variability across pediatric hospitals, no single FRAT has been found to reliably and accurately assess every type of patient. The purpose of this integrative review is to synthesize the existing literature on pediatric FRATs and provide recommendations for choosing the best tool that meets your institution's needs.

Clinical Problem

Falls are the leading cause of childhood injury with as many as nearly three million children experiencing fall related injuries annually (Centers for Disease Control and Prevention, 2016). Recent studies report the incidence of pediatric falls in the hospital inpatient setting ranging from an incidence rate of 0.51 to 1.0 per 1000 patient days (Cooper & Nolt, 2007; Hill-Rodriquez et al., 2009; Jamerson et al., 2014; Kingston, Bryant, & Speer, 2010; Neiman, Rannie, Thrasher, Terry, & Kahn, 2011; Schaffer et al., 2012). Though these rates are low when compared to adult rates, the incidence of injury is significant at 30–35% (Jamerson et al., 2014; Kingston et al., 2010). Comparing the incidence of pediatric falls between hospital settings is challenging due to the differences in fall definitions, patient populations, classifications, and measurement across institutions. Pediatric falls are often classified as one of four types: accidental, anticipated physiologic, unanticipated physiologic, and developmental. Prior to the NDNQI definition for a fall, institutions typically defined a fall simply as a descent to the floor. The Child Health Corporation of America (CHCA) Nursing Falls Study Task Force recently conducted a multi-site study of CHCA member hospitals to address this issue by using a consistent definition and data collection tool. Although the authors found that fall rates in hospitalized children is low at 0.88 per 1000 patient days compared to adult rates at 3.2–10.7 per 1000 patient days, they acknowledged the study did not control for factors that can vary across institutions such as how each institution identified the occurrence of a fall event (i.e., formal tracking system, verbal report) and determination of fall risk (Jamerson et al., 2014).

Assessing risk factors for pediatric falls differs from adults. Though factors associated with pediatric falls in the hospital setting are similar to those in adults, such as mobility, medication use, and cognitive impairment, many experts agree that adult FRATs and the factors associated with them do not adequately assess risk in children (Kingston et al., 2010; Ryan-Wenger et al., 2012; Razmus, Wilson, Smith, & Newman, 2006). Historically, falls in children have been considered a normal part of childhood growth and development (Harvey et al., 2010). For example, falls that happen during the time a child is learning to walk are classified as developmental and do not count negatively towards a fall rate unless an injury occurs. However, we must be careful to not deem all children at risk so that we can focus prevention efforts on those at highest risk such as children with physiological, behavioral, or mobility issues. The goal of all FRATs is to identify the patient at highest risk (Razmus & Davis, 2012); however, there is limited literature available that identifies a comprehensive list of risk factors associated with falls in the pediatric patient.

Significance of the Clinical Problem

To implement appropriate fall prevention interventions specific to the pediatric patient population, we must begin with the identification of variables that increase a pediatric patient's fall risk. Studies have found that medication use, an unfamiliar environment, and underlying medical conditions can hinder a child's orientation and understanding, thus increasing their risk for falling (Cooper & Nolt, 2007; Hill-Rodriquez et al., 2009). Other studies show that common pediatric inpatient fall risk factors include: mobility and mental status impairment, increased length of stay, and history of falls (Cummings, 2006; Graf, 2011; Razmus et al., 2006), but less is known about the correlation between a child's developmental level, illness, hospital environment, and the risk for falling. Some hospitals have developed their own FRAT, many based on adult tools, to assess risk in their specific patient population. In 2009, a CHCA sponsored study revealed their member hospitals were using a variety of FRATs, with only six hospitals reporting use of a validated pediatric tool (Child Health Corporation of America (CHCA), Nursing Falls Study Task Force, 2009). The majority of hospitals were using internally created tools developed from retrospective medical record review and analysis of fall events in their population. In a follow-up study, CHCA examined the sensitivity of the FRATs used at the 26 member hospitals and raised further concern as to whether these site specific tools accurately assessed risk of the children who fell (Jamerson et al., 2014). Though creation and use of these tools may have led to initial reduction in fall rates for these institutions, many have not been validated beyond the initial testing and are restricted to that single institution's population.

Search Strategy

An extensive literature search was conducted for pediatric FRATs. Online databases were searched including MEDLINE and CINAHL. The search was limited to English language, ages 0–21 years of age, and included evidence published between 2006 and 2015 to ensure the most up-to-date information. Relevant search terms included: fall prevention, fall tool, fall assessment tool, fall risk assessment tool, pediatric fall, pediatric fall tool, pediatric fall risk assessment tool, fall risk, pediatric fall prevention, and fall prevention interventions. Wildcards, truncations and adjacencies were also used. Due to a lack of published literature, we also conducted an internet search using the relevant search terms to locate any pertinent grey literature such as conference proceedings, organizational documents, and abstracts. We also used reference lists from each article to identify additional literature.

The search yielded 22 articles relevant to fall prevention in the hospital setting. Articles were excluded if the population was primarily adult (>21yo) (5 articles) or lacked discussion of fall risk assessment using a FRAT (5 articles). Ultimately, 12 articles were included in this integrative review and were evaluated using the Johns Hopkins Nursing evidence appraisal system (Dearholt & Dang, 2012). Strength of evidence can range from Level I (highest) to Level V (lowest). Quality of evidence ratings of A = High, B = Good, and C = Low/Major flaw were also assigned. All articles reviewed were of high to good quality (Table 1). The authors critically appraised and agreed on the reviews.

Critical Appraisal

When evaluating the extent to which scores on these FRATs are predictive of children at highest risk to fall, precision, accuracy, and error

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