CE **1.5 ANCC Contact Hours**

Abstract

Introduction: Missed nursing care is required care that is delayed, incomplete, or left undone during a nurse's working shift. Missed nursing care is most often studied in adult populations; however, it may have significant consequences in pediatric and neonatal care settings. The purpose of this integrative review is to describe missed nursing care in pediatric and neonatal nursing care settings.

Methods: SCOPUS and PubMed were used in the literature search. Multiple combinations of the keywords and phrases "missed nursing care," "pediatric," "neonatal," "care left undone," or "nursing care rationing" were used for the literature search. Missed nursing care is a relatively new topic as the first article on the subject was published in 2006; therefore, inclusion criteria were set to English articles published between January 1, 2006 and October 11, 2019 that reported on missed nursing care in pediatric and neonatal inpatient care settings.

Results: Fourteen articles met inclusion criteria. Missed nursing care in pediatric and neonatal nursing care settings is associated with workload, patient acuity, work environment, and nurse characteristics, and is related to prolonged hospitalization of preterm infants.

Clinical Implications: Providing nurses with an adequate amount of resources and tools to avoid missed nursing care will continue to improve care delivery. Missed nursing care and related patient and nurse outcomes in diverse pediatric and neonatal samples remains an area for future research.

Key words: Missed care; Neonatal; Nurse; Pediatric.

MISSED NURSING CARE IN PEDIATRIC AND NEONATAL CARE SETTINGS: AN INTEGRATIVE REVIEW

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Nurses often face the dilemma of prioritizing patient care under conditions of time constraints and competing demands. Consequently, nurses may miss or delay required care over the course of their shift. Missed nursing care, defined as necessary nursing care that is delayed, incomplete, or left undone during a nurse's working shift (Kalisch, 2006), is a known outcome of hospital working conditions based on over a decade of research predominantly generated in adult inpatient care environments (Jones et al., 2015; Recio-Saucedo et al., 2018). Research on missed nursing care has substantially increased in recent years due to persistent challenges influencing the quality of bedside care such as staffing, workload, resources, and complexities in patient care. A state of the science review by Jones et al. (2015) identified associations between missed care and insufficient labor and material resources, unit staffing, safety climate, and poor patient and nursing staff outcomes. More recently, a systematic review of nursing care left undone in nursing homes and adult acute care units revealed that outcomes such as pressure ulcers, medication errors, readmissions, and patient mortality increased when missed nursing care is more frequent (Recio-Saucedo et al.). However, these reviews largely focused on missed nursing care in adult populations, despite an increasing body of work in pediatric and neonatal care settings.

Neonatal and pediatric patients as well as medically complex patients are vulnerable populations who can have relatively long hospitalizations and require complex nursing care, especially

those in intensive care units. Nursing care has strong potential to influence outcomes of neonates and children during and after hospitalization. For example, nurses educate and counsel parents of neonatal intensive care unit (NICU) patients about their infant's care needs, engaging them in care to enhance developmental outcomes, family functioning, and discharge readiness (Purdy et al., 2015). Nursing care omissions in these patient populations have potential to exert strong and meaningful effects on clinical, safety, and family outcomes. Given that current reviews of working conditions and outcomes associated with missed nursing care have focused on primarily adult patient populations and care settings, we completed an integrative review on missed nursing care in pediatric and neonatal inpatient care settings to fill a key gap in the literature.

Background

Complexity and demands of nursing care continually increase as advances in technology and therapeutics push the boundaries of clinical care and the intensity of nurses' work. A human-factors engineering analysis showed that nurses continuously engage in planned and unplanned cognitive shifts (or conscious shifts in thinking) throughout the day and, on average, are required to shift focus from one patient to another every 6 to 7 minutes (Potter et al., 2005). Projections for the next 7 years show that nursing is expected to experience the highest job growth of all occupations with a need for over 200,000 new registered nurses each year (U.S. Bureau of Labor Statistics, 2019). The growing demand for nursing care may exceed the availability of nurses, causing nurses to take on heavier patient loads with the same professional expectations of holistic, equitable, safe, timely, and quality nursing care. The demands on nurses compounded by a bedside nurse shortage can make meeting the physical and cognitive demands of bedside care a challenge.

Missed nursing care represents a form of cognitive prioritization that occurs in the midst of external influence (Wakefield, 2014). This prioritization may be based upon immediate and direct patient care needs such as medication administration, as well as mandatory tasks such as documentation (Wakefield). In the literature, missed nursing care has been referred to as nursing task incompletion (Al-Kandari &Thomas, 2009), nursing tasks left undone (Bekker et al., 2015), and implicit rationing of care (Schubert et al., 2009), all of which share key similarities in conceptual and operational definitions. Current studies of nursing task incompletion define it as any nursing task required for patient care that a nurse was unable to perform fully during the working shift (Al-Kandari &

Over one-third of pediatric and neonatal nurses report missing at least one care activity on their last shift.

Thomas). Nursing tasks left undone is defined similarly but includes a time element and is operationalized by the question "On your most recent shift, which of the following activities were necessary, but left undone because you lacked time to complete them?" (Bekker et al., p. 1112). Implicit rationing of care has a stronger negative framing but shares a comparable definition with the aforementioned terms: withholding or failing to perform necessary nursing tasks due to a lack of resources (Schubert et al., 2009). For the purpose of this review, we focused on missed nursing care as the primary phenomena of interest, but included studies using these terms (nursing task incompletion, nursing tasks left undone, and implicit rationing of care) if they met our inclusion criteria.

Methods

Search Methods

A literature search was conducted in October of 2019 using SCOPUS, a comprehensive database of peer-reviewed literature updated daily with multidisciplinary content, and PubMed, a global database of biomedical literature. Multiple combinations of the keywords and phrases "missed nursing care," "pediatric," "neonatal," "care left undone," or "nursing care rationing" were used for the literature search. These terms were searched within abstracts, titles, and keywords. Missed nursing care is a relatively new topic as the first article on the subject was published in 2006. Therefore, to capture all articles relevant to this review, the inclusion criteria were set to English articles published within the last 13 years, between January 1, 2006 and October 11, 2019 that reported on missed nursing care in pediatric and neonatal inpatient care settings. A PRISMA flow diagram was developed based on the literature review procedures and article selection (Figure 1). In total, 3,774 articles were populated in SCOPUS (1,543) and PubMed (2,231). The ancestry approach (Atkinson et al., 2015) was used in the search strategy and articles within reference lists were examined. Although articles on "nursing care rationing" are included in this review, articles on "health care rationing" were excluded due to the connotation of the phrase being associated with the restrictive provision of health care services. Studies that described a mixed sample of adult and pediatric and/or neonatal nurses or settings were included only if pediatric and/or neonatal care settings were identifiable in the sample and results. The first author (AO) conducted the initial search and two additional authors (HTC, TB) reviewed and confirmed selection of papers meeting inclusion criteria. Fourteen articles met inclusion criteria and are discussed within the context of this review.

Quality Appraisal

Each paper was rated by the first author according to the Johns Hopkins Level of Evidence and Quality Guide (Dearholt & Dang, 2012). This scale measures level of evidence on a scale of I–V. Level I represents experimental studies, level II represents quasi-experimental studies, and level III represents nonexperimental studies (Dearholt & Dang). Levels IV and V are based on nonresearch evidence (Dearholt & Dang). Quality of papers was rated as High, Good, and Low. High-quality reports are articles with consistent generalizable results and recommendations based on sound scientific evidence. Good-quality evidence is indicative of generally consistent results, sample size, control, and recommendations (Dearholt & Dang). Low-quality studies possess significant flaws that limit the conclusiveness of the report (Dearholt & Dang). All of the articles in this review were rated at level III evidence and were of either good (n = 5) or high quality (n = 9).

Results

Sample Characteristics

A literature table was created abstracting information from the 14 articles on study design, measures, sample, location, and findings (Table 1). Articles in this review included NICU nurses (n = 9), pediatric nurses and pediatric intensive care nurses (n = 1), obstetric nurses (n = 3), and newborn nurses (n = 1). The majority of studies reviewed were conducted in NICUs (n = 9). This review is a representative of an international sample of articles about nurses from the United States (n = 9), Canada (n = 2), Ireland (n = 1), Israel (n = 2), and Kenya (n = 1). All studies used descriptive or correlational cross-sectional designs except three: one prospective study (Tubbs-Cooley et al., 2019), a secondary analysis of qualitative data (Simpson et al., 2016), and a secondary analysis of a completed randomized controlled trial (Tubbs-Cooley, Pickler, & Meinzen-Derr, 2015).

The most common measures of missed nursing care and related concepts used among the 14 articles were the MISSCARE Survey (n = 2), RN4CAST (n = 2), and the Neonatal Extent of Work Rationing Instrument (NEWRI; n = 2). The MISSCARE Survey, used to measure missed nursing care, has shown evidence of acceptable psychometric properties (Kalisch & Williams, 2009). Studies that described adaptations of this survey cited additional psychometric evidence obtained for adapted tools (Castner et al., 2015; Tubbs-Cooley et al., 2019; Tubbs-Cooley et al., 2017; Tubbs-Cooley, Pickler, Younger, et al., 2015). Two studies that measured care left undone using a subsection of the RN4CAST nursing workforce survey have limited information on the reliability of the section measuring care left undone (Lake et al., 2017; Lake, Staiger, Edwards, et al., 2018), but there is evidence of rigorous content validity testing of the entire nursing workforce survey instrument (Squires et al., 2012). The NEWRI, measuring rationing of neonatal nursing care, has shown evidence of validity and reliability (Rochefort & Clarke, 2010; Rochefort et al., 2016).

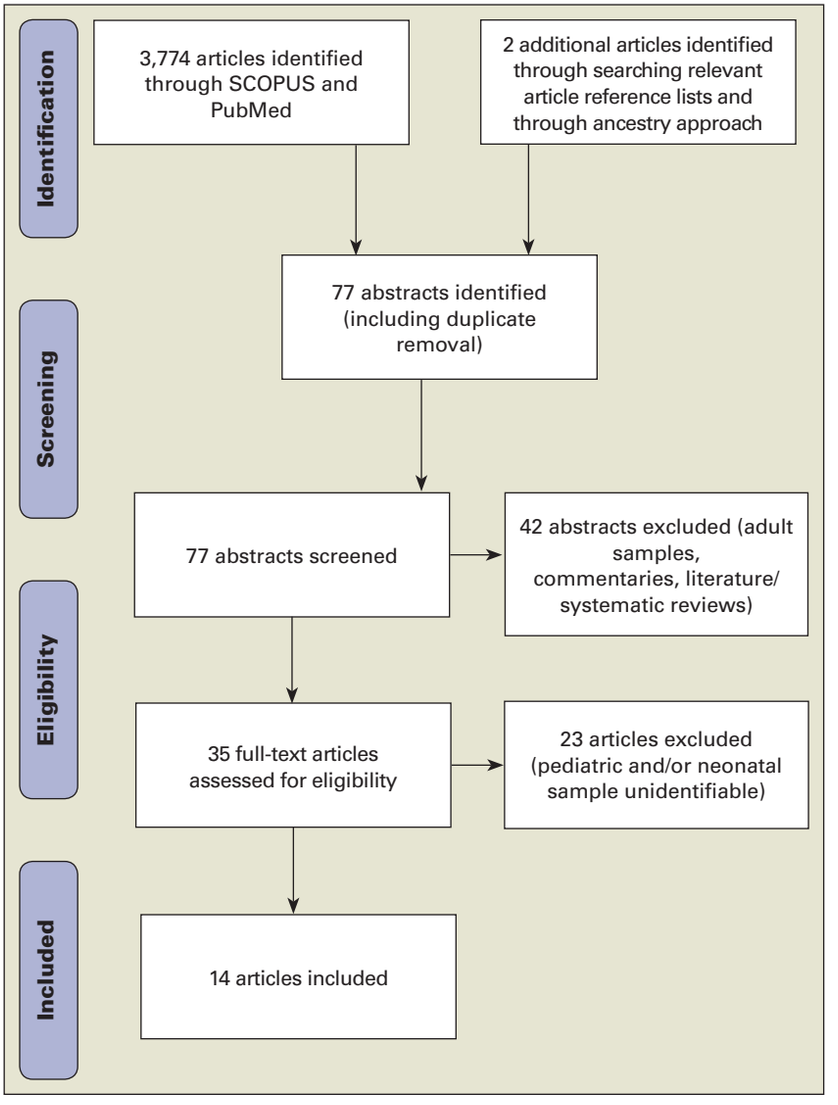
Frequency and Type of Missed Nursing Care

Three studies documented the frequency and type of missed nursing care in pediatric and neonatal settings, including inpatient care and public health or community environments. Data collected over a 2-year period revealed that more than 50% of nurses working in NICUs, pediatric intensive care units (PICUs), or general pediat-

ric units in 223 hospitals reported missing at least one or more care activities on their most recent shift (Lake et al., 2017). Oral care, feeding patients, bathing, and setting up patient's meals were frequently cited as missed by nurses ending their shifts and incoming nurses asked to describe perceived missed care from the previous shift (Srulovici & Drach-Zahavy, 2017). Frequency of missed nursing care on pediatric and neonatal units appears to be lower than on adult care units, where nurses report missed care approximately 55% to 98% of the time (Jones et al., 2015).

Five studies described missed nursing care in NICUs. In a sample of 303 NICUs in 41 states, Lake, Staiger, Cramer, et al. (2018) found that 36% of nurses in their sample reported missing one or more care activities on their last shift. Two studies described discharge preparation, parental support and teaching, and infant comfort care as frequently missed nursing care items by NICU nurses (Rochefort & Clarke, 2010; Rochefort et al., 2016). Consistent with other studies of NICU missed nursing care, Lake, Staiger, Cramer, et al. reported teaching/counseling, comfort talk, assisting with breastfeeding, and discharge preparation as more commonly missed nursing care activities. Hourly checks of intravenous sites and adherence to central line-associated bloodstream infection (CLABSI) prevention bundles were the most commonly missed activities in a 52-bed level IV NICU (Tubbs-Cooley et al., 2019). Attendance at daily rounds, oral care for ventilated babies, routine bathing, parental involvement in infant care, and parent education have also been reported as commonly missed nursing care activities in the NICU (Tubbs-Cooley, Pickler, Younger, et al., 2015). Communication with and education of parents, turning and repositioning infants was frequently observed to be missed in several newborn units (Gathara et al., 2020).

FIGURE 1. ARTICLE SELECTION PROCEDURE



Note. Adapted from Moher et al. (2009)

Factors Associated with Missed Nursing Care

Workload. Multiple studies demonstrated associations between nurse workload and increased missed nursing care. Lake et al. (2017) described nurse workload as the number of patients per nurse and reported that an additional patient per nurse increased the chances of care being missed by 70% on NICU, PICU, and general pediatric units. Workload similarly defined in another study found that fewer patients per nurse were associated with fewer occurrences of missed nursing care among a total of 32 nursing units in Israel that included pediatric and obstetric nursing units (Srulovici & Drach-Zahavy, 2017). Missed nursing care was also noted to be associated with higher patient-to-nurse ratios on Kenyan newborn units (Gathara et al., 2020). An increase in situation-level workload (a temporally bound unit or hospital-specific workload aspect that can affect performance) was found to be associated with increased missed nursing care among five hospital systems (one of which included a children's specialty hospital) undergoing hospital merger and realignment (Castner et al., 2015). Increases in staff composition or skill mix in the same study were found to decrease missed nursing care (Castner et al.). However, Tubbs-Cooley et al. (2019) discovered in a sample of 136

TABLE 1. LITERATURE EVIDENCE

First Author	Design	Level of Evidence	Sample and Country	Measures	
Castner et al. (2015)	Exploratory descriptive, cross-sectional survey	III-B	533 RNs in direct patient care or unit-level management in one hospital system (five hospitals total, including one specialty children's hospital) undergoing merger. United States	15-item survey adaptation of the MISSCARE survey	
Drach-Zahavy et al. (2019)	Cross-sectional	III-B	290 RNs working in direct care units, including pediatric and obstetric units. Israel	22-item MISSCARE survey	
Gathara et al. (2020)	Cross-sectional	III	216 newborns in six health facilities. Kenya	Nursing Care Index (NCI)	
Lake, Staiger, Cramer, et al. (2018)	Cross-sectional, correlational	III-A	303 NICUs in 41 States involving 5,861 nurses. United States	17-item survey adaptation of the National Database of Nursing Quality Indicators	
Lake et al. (2017)	Cross-sectional	III-A	2,187 NICU, PICU, and general pediatric nurses in 223 hospitals in four states. United States	12-item RN4CAST nursing workforce survey (Ausserhofer et al., 2014)	
Lake, Staiger, Edwards, et al. (2018)	Retrospective, cross-sectional, secondary analysis of data	III-B	1,037 RNs in 134 NICUs in acute care hospitals across four states. United States	12-item RN4CAST nursing workforce survey (Ausserhofer et al., 2014)	
Rochefort et al. (2010)	Cross-sectional correlational survey	III-A	339 registered neonatal nurses working in nine NICUs in large urban public teaching hospitals. Canada	52-item Neonatal Extent of Work Rationing Instrument (NERWI)	
Rochefort et al. (2016)	Cross-sectional survey	III-A	125 RNs working in one of seven NICUs. Canada	59-item NERWI	
Simpson et al. (2016)	Secondary analysis of qualitative data	III-B	884 RN members of the Association of Women's Health, Obstetric and Neonatal Nurses. United States	No survey instrument used	
Srulovici et al. (2017)	Cross-sectional	III-B	172 RNs from 32 nursing units (including pediatric and obstetric units) in eight general-public hospitals. Israel	22-item MISSCARE survey	
Tubbs-Cooley et al. (2017)	Cross-sectional web-based survey, secondary analysis of data	III-A	230 certified NICU nurses who provide direct care across seven states. United States	59-item survey adaptation of the MISSCARE survey	
Tubbs-Cooley, Pickler, & Meinzen-Derr (2015)	Secondary analysis of a completed clinical trial	III-A	89 premature infants in a level III NICU in an academic medical center. United States	No survey instrument used.	
Tubbs-Cooley, Pickler, Younger, et al. (2015)	Descriptive, cross-sectional web-based survey	III-A	230 certified NICU nurses working in seven states. United States	59-item survey adaptation of the MISSCARE survey	
Tubbs-Cooley et al. (2019)	Prospective	III-A	136 nurses (BSN, ADN) in a level IV NICU. United States	11-item survey adaptation of the MISSCARE survey	

	First Author	Findings
	Castner et al. (2015)	36% of the variation in missed nursing care is due to the unit context with a corresponding 64% due to individual nurse differences. Workload, skill mix, and critical unit type affected the amount of missed nursing care.
	Drach-Zahavy et al. (2019)	Higher personal accountability was related to lower frequency of missed nursing care ($r = 0.280$, $p < 0.01$). Conscientiousness (r = -0.217, p < 0.01), agreeableness ($r = -0.225$, $p < 0.01$), and neuroticism ($r = 0.115$, $p < 0.05$) were significantly associated with missed nursing care. Personal accountability mediated the relationship between personality traits and missed nursing care.
	Gathara et al. (2020)	Commonly missed care tasks included nursing review of newborns, cord care, turning and repositioning, and skin assessment of babies receiving phototherapy. A lower NCI was associated with higher patient-to-nurse ratios.
	Lake, Staiger, Cramer, et al. (2018)	36% of nurses report missing one or more care activities on their last shift. 1 standard deviation (SD) increase in acuity-adjusted workload was associated with a 0.61 increase in missed nursing care frequency ($p < 0.001$). 1 SD increase in the average acuity is associated with a 47% increase in the odds of missed nursing care ($p < 0.001$). The number of NICU beds was significantly positively associated with missed care frequency and odds of missing care.
	Lake et al. (2017)	For 9 of 12 nursing activities, missed nursing care was more prevalent in poor work environments ($p < 0.05$).
	Lake, Staiger, Edwards, et al. (2018)	Nurses working in NICUs with more black infants missed nearly 50% more nursing care than in NICUs with a low number of black infants (mean totals of missed care: 1.51 vs. 1.05, $p = 0.03$). 44% of nurses missed one or more care activities. The average patient-to-nurse ratio was higher in units with more black infants (2.50 vs. 2.20, $p = 0.04$).
	Rochefort et al. (2010)	Favorable views of work environments were correlated with lower levels of nursing care rationing. Care items most commonly rationed were discharge planning, parental support, teaching, and comfort care.
	Rochefort et al. (2016)	40% of respondents reported rationing discharge preparation and infant comfort care often or very often.
	Simpson et al. (2016)	Three themes of missed care, potential for adverse outcomes, and job-related stress and dissatisfaction emerged when nurses were asked for input of considerations for staffing of perinatal units.
	Srulovici et al. (2017)	Fewer patients per nurse was associated with lower frequency of missed nursing care ($r = 0.213$, $p < 0.05$). Higher personal accountability was associated with less-frequent missed nursing care ($\beta = -0.29$, $p < 0.01$).
	Tubbs-Cooley et al. (2017)	There was no significant difference found in missed nursing care between Magnet and non-Magnet hospitals. There were significant relationships found between Magnet status and reasons for missed nursing care.
	Tubbs-Cooley, Pickler, & Meinzen-Derr (2015)	A 1% increase in the proportion of missed oral feeding opportunities increased time to achieve full oral feedings by 1.45 days ($p = 0.007$) and extended time to discharge by 1.36 days ($p = 0.047$).
	Tubbs-Cooley, Pickler, Younger, et al. (2015)	52% of nurses reported missing at least one care activity on their last working shift. Most common reasons for missed care were frequent interruptions (73.6%), urgent patient situations (66%), and an unexpected rise in patient volume and/or acuity (61.4%).
	Tubbs-Cooley et al. (2019)	Small increases in acuity were significantly associated with increased odds of missed care for 3 out of 12 missed care items. A 5-point increase in a nurse's NASA-TLX (workload assessment) rating was associated with a 22% increase in the likelihood of a nurse missing any care for an infant during the shift (95% CrI, 1.19–1.24, $p < 0.004$).

NICU nurses in one level IV NICU that the associations of staffing ratios and missed nursing care were attenuated when a measure of nurses' subjective workload was added to the model, indicating the importance of measuring multiple domains of workload when studying missed care. The relationships between workload and missed nursing care were based upon longitudinal analyses of nested data at the level of the nurse and at the level of infants within nurse shifts; representing stronger causal modeling of relationships between workload and missed care.

Lake, Staiger, Edwards, et al. (2018) studied influencing factors and variation of missed nursing care in hospitals that disproportionately serve African-American infants. The resulting sample was composed of 134 hospitals, the majority of which were medium-sized (250–500 beds) advanced technology teaching institutions with 71% being classified as an American Academy of Pediatrics level III NICU (American Academy of Pediatrics, 2012). Findings indicated that nurses serving in hospitals with greater than 31% very low birthweight (VLBW) African-American infants missed almost 50% more care than nurses serving in hospitals with <11% of VLBW African-American infants. Differences were noted more in the areas of teaching and counseling, timely medication administration, and comfort/talk with patients. The significant racial disparities in missed nursing care were overall attributed to higher nurse workload and poorer unit-level staffing in hospitals serving more prematurely born African-American infants. This is the only study to date that has explored the relationship of missed nursing care and health disparities in neonates.

A secondary analysis of data designed to understand nurses' perceptions of consequences of inadequate nurse staffing among perinatal units revealed through qualitative analysis that nurses perceived that care could not be completed as necessary when there were staffing issues (Simpson et al., 2016). Poor staffing was perceived to result in preventable harm and job dissatisfaction and stress. Compounding the issue of poor staffing was the issue of the newborn or the fetus not being counted as a patient. Many perinatal units do not consider the newborn or fetus as a patient and therefore the additional time and care needed was not taken into staffing considerations. For newborns specifically, care at risk for being missed on perinatal units includes, but is not limited to thermoregulation, neonatal abstinence assessment and care, hypoglycemia identification, and lactation assistance. Missed care was perceived by nurses in this study (Simpson et al.) to be a consequence of inadequate staffing which is consistent with other studies that assert the association.

Patient acuity. In a study involving 5,861 nurses working in 303 NICUs in 41 states across the United States, Lake, Staiger, Cramer, et al. (2018) found that nurses who had high infant acuity assignments had the highest levels of missed nursing care compared with nurses with low-acuity assignments. Infant acuity in this study was measured based upon five categories of level of patient care. Acuity-adjusted workload was then calculated using the acuity weight and the calculated workload and defined as the number of patients assigned to a nurse on a shift. Nurses in this study with high acuity-adjusted workloads were associated with two to three times more missed nursing care than nurses with low acuity-adjusted workloads. Tubbs-Cooley et al. (2019) further discovered that minor increases in acuity were associated with higher odds of missing nursing care. Infant acuity in this study was measured per nurse shift by an electronic health record calculated classification system based upon patient nursing care hours per day and weighted clinical indicators of nursing intensity.

Work environment associations. Work environment, defined by the Practice Environment Scale of the Nursing Work Index (Warshawsky & Havens, 2011) and characterized by measures of leadership and support, nursing involvement, and foundations of quality care, was found to be associated with missed nursing care; 15% more care was missed in hospital NICU, PICU, or general pediatric units with poorly rated work environments (Lake et al., 2017). Likewise, in another study involving NICU nurses in the Canadian province of Québec, nurses who rated their nursing staffing and resource adequacy (a metric of the work environment) more positively reported less missed nursing care of teaching, support, comfort care, and discharge planning (Rochefort & Clarke, 2010).

Work environments associated with Magnet-designated hospitals are known for providing high-quality care, safe practice environments, and an overall structural program designed to enhance nursing practice and the nursing experience. Contrary to prior evidence showing an association between Magnet status and missed nursing care in adult inpatient units, Tubbs-Cooley et al. (2017) found no association between Magnet status and the occurrence of missed nursing care on NICUs. Reasons for missed nursing care, however, significantly differed in Magnet and non-Magnet hospitals. For example, nurses working in Magnet hospitals were less likely to report communication breakdowns with other nurses or medical staff as a reason for missed nursing care (Tubbs-Cooley et al., 2017). Compared with nurses working in non-Magnet hospitals, nurses working in Magnet hospitals were also less likely to report a lack of familiarity with equipment, a procedure, or policy as a reason for missed nursing care (Tubbs-Cooley et al.).

Nurse characteristics. Increased perceptions of personal accountability, the expectation of being transparent with actions and taking full responsibility for actions, were found to be significantly associated with fewer occurrences of missed nursing care on nursing units in eight hospitals that included pediatric and obstetric units (Srulovici & Drach-Zahavy, 2017). Meanwhile, Drach-Zahavy and Srulovici (2019) discovered that personal accountability mediated the relationship between personality traits and missed nursing care; personality traits shape personal accountability, which in turn leads to a greater or lesser degree of missed nursing care by the nurse. Specific personality traits found to be negatively

associated with missed nursing care were conscientiousness and agreeableness, whereas neuroticism was found to have a weak positive correlation with missed nursing care (Drach-Zahavy & Srulovici, 2019).

Outcomes of Missed Nursing Care

Infants born prematurely often struggle to safely and successfully orally feed as their suck, swallow, and breathe pattern is immature and uncoordinated (Lau, 2015). Mastering oral feedings is one of several requirements that preterm infants must achieve to be discharged. Oral feedings are primarily provided by nurses and are based upon nurses' assessment of the patient's readiness to feed and clinical stability. Results from a secondary data analysis from a completed randomized controlled trial showed that missed nursing care, specifically missed oral feeding opportunities, were associated with preterm infants' prolongation of time to achieve full oral feedings and extended NICU hospitalization (Tubbs-Cooley, Pickler, & Meinzen-Derr, 2015).

Perceptions of parental support and teaching and infant comfort care were missed more frequently on neonatal units and were associated with increased perceptions of poor pain control on the unit (Rochefort & Clarke, 2010). Missed discharge preparation was found to be significantly related to lower perceptions of readiness for discharge (Rochefort et al., 2016). These findings may be suggestive of an increased potential for issues in the home environment postdischarge and an increased possibility for readmission to the hospital.

Discussion

Overall, 14 articles were reviewed to describe missed nursing care in pediatric and neonatal care settings, including contributors and outcomes of missed nursing care. The most common necessary care items missed were oral care, discharge preparation, and patient teaching. Tubbs-Cooley, Pickler, Younger, et al. (2015) listed reasons frequently given for missed nursing care as frequent interruptions, urgent patient situations, and an unexpected rise in unit census and/or acuity. These care tasks commonly missed may be considered lower priority compared with care that is more time-sensitive.

Missed nursing care is associated with workload; considered to be nurse-to-patient ratios (Lake et al., 2017; Srulovici & Drach-Zahavy, 2017), nurse staffing (Lake, Staiger, Edwards, et al., 2018; Simpson et al., 2016), situation-level workload (Castner et al., 2015), and individual subjective nurse workload (Tubbs-Cooley et al., 2019). Subjective nurse workload appears to be the most sensitive measure of workload due to effect sizes and consistent associations with missed nursing care among NICU nurses. Among several studies involving nurses caring for adult patients, nurse workload, described as nurse–patient load has consistently been associated with missed nursing care (Al-Kandari & Thomas, 2009; Ball et al., 2016; Cho et al., 2016). Considering that subjective nurse workload has not been assessed in these previous studies involving nurses caring for adult patients, subjective nurse workload may be an important measure to consider in future work with possible implications for practice and policy. Work environment factors such as leadership and support, Magnet status, and resource adequacy are related to missed nursing care (Rochefort & Clarke, 2010; Tubbs-Cooley et al., 2017). Nurse characteristics of personal accountability, conscientiousness, and agreeableness were also associated with missed nursing care (Drach-Zahavy & Srulovici, 2019; Srulovici & Drach-Zahavy); nurses possessing these traits are less likely to report missing aspects of nursing care. These studies emphasize the personal accountability traits commonly and publicly thought to be associated with bedside nurses and suggest that these characteristics contribute to a nurses' ability to successfully function in their role.

The literature linking missed nursing care to pediatric outcomes is limited to one study on associations between preterm infants' missed oral feeding opportunities and prolongation of time to achieve oral feedings and NICU discharge (Tubbs-Cooley, Pickler, & Meinzen-Derr, 2015). In this study, missed oral feeding opportunities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The most common necessary care items missed are oral care, discharge preparation, and patient teaching.

were estimated to contribute to almost $60,000 additional dollars per infant related to increased length of hospital stay (Tubbs-Cooley, Pickler, & Meinzen-Derr). Bearing in mind the daily cost of a stay in the NICU, missed oral feedings represent significant potential expenditures related to prolonged hospitalization.

Increased perceptions of poor pain management and readiness for discharge were other outcomes identified related to increased perceptions of missed care or care rationing (Rochefort et al., 2016). Omission of pain management is concerning as unaddressed pain in preterm neonates negatively influences brain development with possible long-term developmental and behavioral consequences (Grunau, 2013). Education provided by nurses is critically important for decreasing parents' stress in the postdischarge period and for promoting a smoother transition to home (Purdy et al., 2015). Missed pain management and aspects of discharge teaching present substantial concerns of patient and family outcomes postdischarge.

To date, no research has been identified in the literature on the relationship between missed nursing care and nurse outcomes (e.g., burnout, job satisfaction, turnover) for pediatric and neonatal nurses, although outcomes of job satisfaction (Bekker et al., 2015; Kalisch et al., 2011), moral distress (Winters & Neville, 2012), and intent to leave (Blackman et al., 2018; Tschannen et al., 2010) are known outcomes of missed care reported by adult inpatient nurses. Understanding factors such as missed care that may contribute to avoidable turnover and other negative nurse outcomes on neonatal and pediatric units may help mitigate the effects of the current nursing shortage.

Strengths and Limitations

This review addresses an important gap in the literature offering insight into contributors to and outcomes of missed nursing care in pediatric and neonatal units. Articles were screened and selected using rigorous review methodology. Although self-report is a generally accepted method used to determine missed nursing care, a limitation common to most reviewed articles was the potential for self-report bias as nurses' reports were not validated with other sources such as electronic health records; only one study (Gathara et al., 2020) used direct observation as the sole measure of missed nursing care. Generalizability of findings are limited due to the variety of settings, particularly for countries other than the United States, Canada, and Israel. Most of the samples in this review were composed of NICU nurses, limiting generalizability for pediatric and newborn nurses.

Research Implications

Our review of the pediatric and neonatal literature raised several research considerations. Patient outcomes are the result of many different factors and linking outcomes to missed care is difficult. For example, CLABSIs in neonates are almost always due to nonadherence to central line maintenance guidelines (Hocevar et al., 2012; Milstone et al., 2013), but because signs of infection manifest days after a protocol breach, it is exceedingly difficult to attribute the outcome to an individual care provider at a certain point of time (and the infection may not be solely attributable to missed care). Future studies should assess missed care longitudinally in a way that tracks closely with how clinical care is delivered in real time so that it can be more easily linked to outcomes. Eleven of the 14 articles were cross-sectional studies based on primarily self-reported data, limiting causal inference. Future studies should be conducted using more rigorous study designs and should attempt to mitigate self-report bias by incorporating objective sources of missed care data (e.g., clinical documentation). The homogenous nature of the samples included in this review warrants more studies with nurse samples that vary by racial and ethnic background, sex, educational background and unit samples that vary by staffing and resource allocation, Magnet recognition, geographic location, and levels of care. Comparisons of nursing care delivery with varying nurse and unit samples will improve the field's ability to answer important questions about nurse and organization characteristics influencing nursing care delivery. Several articles mentioned missed nursing care as a potentially important contributor to burnout and turnover (Gathara et al., 2020; Lake, Staiger, Cramer, et al., 2018; Lake, Staiger, Edwards, et al., 2018). A greater understanding of the relationship between missed care and nurse outcomes including burnout and turnover is important for informing future intervention research to increase nurse retention in pediatric and neonatal nursing units.

Clinical Implications

Pediatric and neonatal nurses sometimes miss necessary care for reasons that are multifactorial and will require varied solutions including expanded nursing resources, workload management, and ways of delivering care that increase family caregiving capabilities and confidence. In cases where hospitals cannot hire additional nurses to support care completion or staff at richer levels, determining realistic expectations of nursing care requirements based upon important factors such as multiple measures of workload, resource adequacy, patient acuity, and staffing ratios will support nurses' tasks completion. Importantly, deimplementation of care practices that lack sufficient supportive evidence, or for which the existing evidence is low quality, is one of the most immediate and practical tools at the disposal of clinical nurses and nursing leaders to reduce nursing workload and prevent missed care. For example, eliminating redundant documentation in both electronic and paper forms and reevaluating and updating steps in care bundles could be effective initiatives. Recent evidence supports increased involvement of parents in NICU care (O'Brien et al., 2018); implementing a family integrated model of care may promote nursing care completion and increase parents' confidence in caring for their infant as parents may assist with basic care tasks for the infant such as feedings, diaper changes, and temperature checks. Addressing these factors will improve quality of care delivered by NICU nurses, increase family engagement, and ultimately are expected to decrease risk

of adverse patient outcomes such as hospital-acquired infections, mortality, and readmission although these direct linkages have not yet been empirically established in pediatrics and neonatology. ✜

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