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Original research article

Missed nursing care and its association with the work environment of nurses working in pediatrics

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Abstract
Objective: To examine the association between missed nursing care and the work environment in selected pediatric care units in the Czech Republic.
Design: A descriptive cross-sectional study.
Methods: Data collection was carried out from January to March 2021 using the MISSCARE Survey-Pediatric and Practice Environment Scale – Nursing Work Index instruments. The respondents were pediatric nurses (*N* = 138) from five care units in the Czech Republic.
Results: The most frequently missed nursing care activities were assessing the activities attributes to a caregiver, promoting neuro-evolutionary development, or emotional support to the child and/or family. Correlations between missed nursing care and work environment have not been confirmed. However, the relationship between the work environment and perceived staff adequacy was proved.
Conclusions: Consistent with other studies, we have confirmed that pediatric nurses missed mainly independent nursing care activities, similar to adult nurses. Likewise, we have proved that the workload associated with an unexpected increase in the number or severity of patients on the care units is one of the most important reasons for the phenomenon. Despite unconfirmed associations between missed nursing care and the work environment, further research should focus on its closer examination in a larger sample of pediatric nurses.

Keywords: Missed care; Nurses; Nursing; Pediatrics; Work environment

Introduction

In recent years, the phenomenon of missed care in has received increasing attention in nursing due to its seriousness worldwide (Jones et al., 2015). Missed nursing care directly results from the nurses' internal decision-making process in the context of priorities in providing nursing care. The term "missed nursing care" originated in the USA. It was used for the first time in the qualitative research study of Kalisch (2006). At the same time, she identified nine nursing care activities regularly missed by medical-surgical nurses, and seven reasons for their delays or omissions. In 2009, the conceptual framework of missed nursing care was presented, and the term was defined as: "Any nursing activity necessary for the patient that is not performed or is severely delayed in the process of providing care" (Kalisch et al., 2009). Later, missed nursing care was also defined in the literature as "an error due to neglect in the care process" (Kalisch et al., 2012). Due to the significance of the phenomenon, the instrument for measuring missed nursing care in acute care facilities was developed (Kalisch and Williams, 2009). However, the instrument was designed only for measuring missed care in adult care units. Thus, researchers Tubbs-Cooley et al. (2015), aimed to modify MISSCARE Survey to measure missed nursing care in other settings, namely neonatal intensive care units. This adaptation was necessary because nurses working in neonatal intensive care units provide different activities, thus differentiating them from standard adult care units. However, this also applies to general pediatric facilities. Children also have different age-specific and clinical needs, so Bagnasco et al. (2018) developed and tested the MISSCARE Survey Pediatric version (MISSCARE Survey-Ped) in terms of validity and reliability. The MISSCARE Survey-Ped questionnaire was designed primarily to capture the complex nature of the nursing care provided to pediatric patients according to their specific needs, and to record this data objectively, as in the original version of the MISSCARE Survey (Bagnasco et al., 2018). Assessing missed nursing care in pediatrics is essential to ensure high-quality and safe care. Moreover, missed nursing care is a common phenomenon in pediatric settings. Pediatric patients are one of the most vulnerable patient populations who might experience long hospi-

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talization and require complex nursing care, especially when hospitalized in intensive care units (Lake et al., 2020). There is a gap in the literature that should be addressed in further research. Moreover, measuring missed nursing care and evaluating the work environment in pediatrics is meaningful due to its direct impact on patient and family outcomes. Our study aimed to examine the relationship between missed nursing care and work environment in selected pediatric care units in the Czech Republic.

Materials and methods

This paper presents the findings from a descriptive cross-sectional study. The institutional board review and the pertinent ethics committee approved the research (UP-OL-15913/1030S-2021).

Sample

All pediatric departments in the Czech Republic (N = 79) were asked to participate in the research study. However, due to the COVID-19 pandemic, only five departments were granted permission to conduct the research study. From these departments, nurses were selected by the purposeful method. Nurses were included in the sample if they: (a) worked at the bedside; (b) were qualified to work as pediatric nurses; (c) provided informed consent. On the contrary, nurses were excluded from the sample if they: (a) worked in primary care; (b) had managerial positions.

Data collection

The study was conducted between January and March 2021. Missed nursing care was measured by specific instrument MISSCARE Survey-Ped (Bagnasco et al., 2018). Written permission to use and validate the tool was obtained from the authors in January 2019 via email. The instrument was validated to the Czech language according to the linguistic validation process by Wild et al. (2005). This validation process consisted of the translation of the original Italian version by two freelance translators into the Czech language, the creation of the Czech version, and the subsequent back translation of this version by two freelance translators into the Italian language, and a comparison with the original version. The four researchers then specified the problematic items, adjusted them, and incorporated them into the final Czech version MISSCARE Survey-Ped-CZ. The comprehensibility of the final Czech version was subsequently tested through a pre-version survey of six experts from pediatric care (pediatric nurses with at least ten years of experience). The instrument MISSCARE Survey-Ped-CZ and the original version of this tool consist of 46 items grouped into two parts. The first part – part A, consists of 29 items referring to the list of nursing care activities. Responses are reported using the frequency scale (0 – not applicable; 1 – never; 2 – rarely; 3 – sometimes; 4 – often; 5 – always). The second part, part B, consists of 17 items related to missed nursing care. Responses are evaluated using a frequency scale (1 – no reason; 2 – less important; 3 – important; 4 – very important reason). Two types of scoring procedures were used for part A and B – computing the item-level mean frequencies (M), standard deviation (SD) and dichotomized responses (percentage of nurses who rated the items with a higher score than never in part A and a higher score than *no reason* in part B). In addition, a mean frequency rating across all items (a composite score) of part A was used.

The work environment of nurses was measured by Practice Environment Scale – Nursing Work Index (PES-NWI) (Lake, 2002). Permission to use the survey was obtained from the author in August 2020, whereas its Czech version has been created within the University of Ostrava (Jarošová and Zeleníková, 2017, ersonal communication). We used the Czech version of PES-NWI after receiving the consent of the authors of this version via email. The instrument consists of 31 items grouped into five subscales: nurse participation in hospital affairs; nursing foundations for quality of care; nurse manager ability, leadership, and support of nurses; staffing and resource adequacy; and collegial nurse-physician relations. Responses are recorded by the extent of agreement using the Likert scale (1 – strongly disagree; 2 – disagree; 3 – agree; 4 – strongly agree). A composite score of subscales PES-NWI was also calculated. The Cronbach's alpha coefficient (α) for the PES-NWI in this study was 0.973 in total; the α for the individual subscales of the PES-NWI-CZ scale are shown in Table 4.

The set of questionnaires also contained sociodemographic data, which were added by authors of this study, and were as follows: age, education, nurse experience in the current unit, nurse experience in nursing, nurse specialization training programme, week hours, overtime hours, missed hours, perceived staff adequacy, intention to leave current position, and healthcare provider.

Before the research, the workplace management was asked for informed consent. At the same time they were also asked about the benefits and risks and the need to collect data strictly anonymously. Before the actual data collection, the respondents were informed about their voluntary participation in the separated introductory part, and were made aware that by completing the set of questionnaires they consent to the data processing.

Data analysis

Data were analyzed using the SPSS version 25.0 statistical software. Data were analyzed for frequency and pattern of missing data at the item and participant level. At any point, data imputation was not indicated. Missing data ranged from 0.3 to 0.6%, demonstrating the high acceptability of the MISSCARE Survey-Ped-CZ and PES-NWI-CZ instruments. The MISSCARE Survey-Ped-CZ was analyzed by construct validity and reliability. Concerning construct validity, we used the exploratory factor analysis (EFA) for part B of the instrument. For testing the reliability, Cronbach alpha's values (α) were determined. The nonparametric Spearman correlations and Pearson's chi-squared test analyzed the relationship between missed nursing care and work environment. The results were tested on the significance level $p \leq 0.05$.

Results

Nurses' characteristics

Overall, 180 questionnaire sets were distributed, and 138 were returned. The response rate was 76.6%. The research sample (N = 138) consisted of registered nurses working at five pediatric care units in the Czech Republic. Sample characteristics are fully reported in Table 1.

Table 1. Sample characteristics

Variable	*N* = 138	%
Nurse experience in the current unit (years)		
Up to 5 years	29	21.0
6–10 years	20	14.5
11–15 years	26	18.8
16–20 years	19	13.8
More than 21 years	44	31.9
M ± SD (range)		
16.4 ± 11.1 (0.5–41)		
Median – 15.0		
Nurse experience in nursing (years)		
Up to 5 years	9	6.5
6–10 years	6	4.3
11–15 years	15	10.9
16–20 years	14	10.1
More than 21 years	94	68.1
M ± SD (range)		
25.1 ± 10.7 (0.5–46)		
Median – 26.0		
Age		
20 to 30 years	8	5.8
31 to 40 years	21	15.2
41 to 50 years	63	45.7
51 to 60 years	39	28.3
More than 60 years	7	5.1
M ± SD (range)		
46.5 ± 9.2 (22–66)		
Median – 46.0		
Nurse education level		
Secondary vocational education	96	69.6
Higher education	18	13.0
Bachelor's degree	20	14.5
Master's degree or higher	4	2.9
Nurse specialization training program		
Yes – Nursing care in pediatrics	37	26.8
Yes – Other training programs	39	28.3
No	62	44.9
Week hours		
Less than 30 hours/week	16	11.6
30 or more hours/week	122	88.4
Overtime hours (in the past three months)		
None	26	18.8
Less than 12 hours	50	36.2
More than 12 hours	62	44.9
Missed hours (due to injury, illness)		
None	107	77.5
1 shift	4	2.9
2–3 shifts	3	2.2
More than 4 shifts	24	17.4
Perceived staff adequacy		
0% of the time (not adequate at all)	5	3.6
25% of the time	6	4.3
50% of the time	35	25.4
75% of the time	43	31.2
100% of the time (fully adequate)	49	35.5
Intention to leave current position		
In the next 6 months	5	3.6
In the next 1 year	2	1.4
In more than 1 year	15	10.9
No plans to leave	116	84.1
Healthcare provider		
Public	115	83.3
Private	23	16.7

Construct validity and reliability of the MISSCARE Survey-Ped-CZ – results of exploratory factor analysis (EFA) and internal consistency

As part of linguistic validation, we determined the psychometric properties of the MISSCARE Survey-Ped-CZ – the factor structure and internal consistency of section B. Since part A is an inventory of activities, factor analysis was performed only for part B (Bagnasco et al., 2018). We followed the original validation study (Bagnasco et al., 2018). In the first phase, we determined the suitability of items for factor analysis. In the correlation matrix, the values of correlation coefficients ranged from 0.168 to 0.844. We also used the Kaiser–Meyer–Olkin statistics (KMO) and Bartlett's sphericity test to assess the suitability of the factor analysis. The KMO value was high (0.904), and the Bartlett sphericity test was significant (χ^2 = 1742.1; df = 136; $p < 0.0001$). The KMO values for individual items in the Anti-image matrix were also assessed. Values for all items ranged from 0.829 to 0.939. According to the measures of sampling adequacy (MSA), no item had to be excluded from the analysis. Principal Component Analysis performed factor extraction. Factor rotation was performed using orthogonal Varimax rotation. The number of factors was decided based on the eigenvalue criterion (Eigenvalue higher than 1) and by visual inspection of the Scree plot. Three factors were extracted, which interpret 69.7% of the total variability. Factor F1 contains seven items; factor F2 consists of four items, and factor 3 contains six items. Furthermore, through the calculation of factor loads, we determined which items are the individual factors saturated, therefore which items fall into which factor. After orthogonal Varimax rotation, the factor loads were distributed into three factors, as follows (Table 3):

- Factor 1 (material resources and communication issues across units) saturated seven items: 6–12.
- Factor 2 (workflow predictability and work intensity) saturated four items: 1, 13, 14, and 17.
- Factor 3 (human resources and teamwork/communication within the unit) saturated six items: 2, 3, 4, 5, 15, and 16.

Of these, items 4, 6, 15 and 16 were saturated by almost two factors. Item 4 had a higher saturation in F1 than in F3, but we assigned it to F3 in terms of content.

The internal consistency of the MISSCARE Survey-Ped-CZ for Part B was determined by Cronbach's alpha coefficient with a value of 0.939; for Part A, it was 0.993. The Cronbach alpha coefficient for the whole instrument MISSCARE Survey-Ped-CZ represented the value 0.973.

Prevalence and patterns of missed nursing care in pediatric care units

Overall, 84.8% of pediatric nurses missed at least one or more nursing care activities during their last working shift. The mean frequency rating number of nursing care activities being missed was determined to be 10.9 per nurse. Nursing care activities (from the least to the most frequently missed) are reported in Table 2.

Reasons for missed nursing care in pediatric care units

The most important reasons for missed nursing care in pediatric care units were "frequent interruptions" (2.64 ± 1.05; 81.2%), "unexpected rise in patient volume and/or acuity on the unit" (2.33 ± 0.99; 73.2%), and "urgent patient situation" (2.19 ± 1.05; 66.7%). Other reasons are stated in Table 3.

Table 2. Nursing care activities regularly missed

No.	Item	M	SD	%*
10.	Pain assessment with pharmacological or with non-pharmacological care approaches, according to protocol	1.60	1.43	19.5
22.	Central line site and peripheral line site care per protocol	1.75	1.55	26.7
23.	Assessment of effectiveness of medications	1.72	1.42	29.0
27.	Hand washing	1.87	1.52	30.0
17.	Response to call light, to intervention request, or alarm is initiated in 5 min (i.e., monitor, infusion pumps, ventilator)	1.80	1.51	30.7
19.	Labs/specimen obtained as ordered	1.84	1.48	31.8
7.	Patient and family education	1.78	1.40	31.9
25.	Vital signs assessed according to the nursing plan	1.88	1.44	34.7
11.	Medication requests acted on in 15 min	1.82	1.41	35.6
24.	Monitoring intake/output of solid and liquid	1.86	1.44	36.9
5.	Mouth care	1.83	1.50	38.4
13.	Communication of all relevant information during shift change or handover	1.96	1.50	39.1
16.	Assist child with toileting needs in 5 min of request (i.e., go with baby to the toilet or give appropriate devices if bedridden)	1.80	1.59	39.1
6.	Parents included in child's care	2.00	1.46	40.5
14.	Satisfaction of eating need according to child's clinical conditions (i.e., encourages oral feeding and/or nutrition at the request on the newborn; encourages a correct alimentation in accordance with personal taste)	1.96	1.47	41.3
20.	Body hygiene and skin care	2.01	1.49	42.7
21.	Central line site and peripheral line site assessment per protocol	1.80	1.54	43.4
26.	Focused reassessments of the child's condition to assess improvements or deterioration during the shift	1.93	1.38	43.4
4.	Passive mobilization of child every 2 h or as ordered	1.76	1.35	43.8
12.	Full documentation of all necessary data	2.04	1.47	44.9
23.	Adoption of the necessary precautions for infections control as per protocol (Individual Protection Devices, devices disinfection, isolation, correct waste disposal)	1.98	1.42	45.6
8.	Discussion with child and his/her family about plans for discharge and care at home	1.85	1.38	46.0
1.	Attendance at daily rounds at the bedside	2.04	1.46	46.4
15.	Medications administered in the 30 min before or after scheduled time (i.e., scheduled time 8 p.m., administration between 7:30 p.m. and 8:30 p.m.)	1.96	1.34	47.0
29.	Safety and hygiene checks of bedside equipment completed once per shift or per protocol (i.e., bed, nightstand, devices)	2.01	1.47	47.1
2.	Ambulation 3 times per day or as per nursing plan, if clinical conditions allow	1.64	1.39	50.0
18.	Emotional support to child and/or family	2.10	1.43	51.5
9.	Promote neuro-evolutionary development, according to age and child's clinical conditions (i.e., neonatal care, cognitive and relational development in child or in adolescent)	2.07	1.29	63.0
28.	Assessment of the activities attributed to caregiver	2.10	1.35	63.1

Note: * Percentage of positive responses greater than 1 (never).

The work environment of nurses and its association with missed nursing care

Generally, pediatric nurses rated their practice environment relatively high, as indicated by the mean composite score (Table 4). The work environment was categorized into three groups (Lake and Friese, 2006), based on the number of subscales with a score higher than 2.5. Using this procedure, 70.3% of nurses rated work environment as favourable (mean score in four or five subscales was higher than 2.5), 27.5% as mixed (mean score in two or three subscales were higher than 2.5), and 2.2% as unfavourable (none or only one of the five subscales reached a value higher than 2.5). In addition, a significant difference was not found in the rating of the nurse work environment (favourable, mixed, unfavourable) according to health care provider ($p = 0.093$).

The overall score of PES-NWI was not significantly associated with missed nursing care. All subscales of PES-NWI were not significantly associated with missed nursing care at pediatric care units. Significant correlations were found between perceived staff adequacy and all domains of the PES-NWI (Table 5).

Table 3. Reasons for missed nursing care in pediatric care units

No.	Item	M	SD	%*	Factor loadings
	Workflow predictability and work intensity				
1.	Frequent interruptions	2.64	1.05	81.2	0.782
13.	Unexpected rise in patient volume and/or acuity on the unit	2.33	0.99	73.2	0.791
14.	Urgent patient situation (i.e., a patient´s condition worsening)	2.19	1.05	66.7	0.775
17.	Unbalanced patient assignments	2.14	1.04	63.0	0.572
	Human resources and teamwork/communication within the unit				
2.	Tension or communication breakdowns within the nursing team	1.71	0.89	45.6	0.662
3.	Lack of collaboration from team members (i.e., nurses, practical nurses, physicians)	1.74	0.90	49.3	0.789
4.	Practical nurse did not communicate that care to the baby was not done	1.43	0.71	31.9	0.388
5.	Tension or communication breakdowns within the medical staff	1.91	0.95	56.6	0.721
15.	Inadequate number of nurses	1.91	0.99	53.6	0.671
16.	Inadequate number of personnel (i.e., practical nurses)	1.79	0.93	50.7	0.580
	Material resources and communication issues across units				
6.	Tension or communication breakdowns with other services or departments (i.e., transfusion center, radiology examinations, hospital pharmacy, etc.)	1.72	0.77	52.9	0.547
7.	Other services or departments did not provide the care needed (i.e., laboratory, hospital pharmacy)	1.70	0.84	47.8	0.795
8.	Inadequate hand-off from previous shift or sending unit	1.62	0.86	41.3	0.771
9.	Supplies/equipment not available when needed (i.e., infusion pumps, surgical instruments)	1.55	0.84	36.2	0.857
10.	Supplies/equipment not properly functioning when needed	1.72	0.83	51.4	0.788
11.	Medications were not available when needed	1.62	0.83	43.8	0.867
12.	Lack of familiarity with equipment/procedure/policy	1.53	0.75	38.4	0.711

Note: * Percentage of positive responses greater than 1 (no reason).

Table 4. PES-NWI items

No.	Item	Mean	SD	Cronbach alfa (α)
5.	Career development/clinical ladder opportunity	2.72	0.72	
6.	Opportunity for staff nurses to participate in policy decisions	2.43	0.70	
11.	A chief nursing officer who is highly visible and accessible to staff	2.73	0.73	
15.	A chief nurse officer equal in power and authority to other top-level hospital executives	2.96	0.64	
17.	Opportunities for advancement	2.93	0.65	
21.	Administration that listens and responds to employee concerns	2.53	0.80	
23.	Staff nurses are involved in the internal governance of the hospital (e.g., practice and policy committees)	2.52	0.81	
27.	Staff nurses have the opportunity to serve on hospital and nursing committees	2.69	0.77	
28.	Nursing administrators consult with staff on daily problems and procedures	3.09	0.63	
	Nurse participation in hospital affairs	**2.73**	**0.53**	**0.891**
4.	Active staff development or continuing education programs for nurses	2.71	0.75	
14.	High standards of nursing care are expected by the administration	3.27	0.61	
18.	A clear philosophy of nursing that pervades the patient care environment	3.06	0.58	
19.	Working with nurses who are clinically competent	3.17	0.55	
22.	An active quality assurance program	2.93	0.61	
25.	A preceptor program for newly hired RNs	3.41	0.58	
26.	Nursing care is based on a nursing, rather than a medical, model	2.84	0.61	
29.	Written, up-to-date nursing care plans for all patients	3.15	0.61	
30.	Patient care assignments that foster continuity of care, i.e., the same nurse cares for the patient from one day to the next	3.04	0.61	
31.	Use of nursing diagnoses	3.03	0.72	
	Nursing foundations for quality of care	**3.06**	**0.38**	**0.808**

Table 4. ***(continued)***

No.	Item	Mean	SD	Cronbach alfa (α)
3.	A supervisory staff that is supportive of the nurses	3.15	0.72	
7.	Supervisors use mistakes as learning opportunities, not criticism	2.69	0.75	
10.	A nurse manager who is a good manager and leader	3.12	0.70	
13.	Praise and recognition for a job well done	2.69	0.84	
20.	A nurse manager who backs up the nursing staff in decision making, even if the conflict is with a physician	2.97	0.78	
	Nurse manager ability, leadership, and support of nurses	**2.92**	**0.63**	**0.880**
1.	Adequate support services allow me to spend time with my patients	3.25	0.68	
8.	Enough time and opportunity to discuss patient care problems with other nurses	3.00	0.60	
9.	Enough registered nurses to provide quality patient care	2.91	0.78	
12.	Enough staff to get the work done	2.97	0.76	
	Staffing and resource adequacy	**3.03**	**0.57**	**0.815**
2.	Physician and nurses have good working relationships	2.93	0.77	
16.	A lot of teamwork between nurses and physicians	2.95	0.75	
24.	Collaboration (joint practice) between nurses and physicians	2.93	0.73	
	Collegial nurse-physician relations	**2.93**	**0.67**	**0.871**
	Composite score of subscales	**2.93**	**0.44**	

Table 5. Correlations between domains of PES-NWI and other variables

	Composite score of the MISSCARE Survey-Ped	Years of experience	Perceived staff adequacy
Overall PES-NWI score	–0.083	0.049	0.381**
Nurse participation in hospital affairs	–0.076	0.078	0.276**
Nursing foundations for quality of care	–0.053	0.003	0.271**
Nurse manager ability, leadership, and support of nurses	–0.101	0.039	0.199*
Staffing and resource adequacy	–0.124	0.041	0.495**
Collegial nurse-physician relations	–0.020	0.022	0.262**

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Discussion

This study is the first study in the Czech Republic in which the MISSCARE Survey-Ped was used. For this reason, in the first phase of the research, we performed translation and testing of the structural validity of the instrument, following the validation studies of Italian (Bagnasco et al., 2018) and Turkish versions (Incekar et al., 2020). Part A presents an inventory of nursing activities independent of each other (Bagnasco et al., 2018; Kalisch and Williams, 2009). For this reason, construct evidence for validity, specifically the factor structure, was tested only for Part B. In our study, we did not unequivocally confirm the three factors representing the main areas of missed nursing care identified in the MISSCARE Survey – human resources, material resources and communication (Bragadóttir et al., 2015; Kalisch and Williams, 2009; Kalisch et al., 2012; Sist et al., 2017). The results of the factor analysis do not correspond to the factor structure of the previous Czech version of the MISSCARE Survey (Gurková et al., 2021b; Zeleníková et al., 2019) as well as to other validation studies of the pediatric version (Bagnasco et al., 2018; Incekar et al., 2020). The factor charges of the items in the Czech version – and thus the affiliation of the individual items to the individual dimensions – differ from the original Italian version (Bagnasco et al., 2018). Items related to the variable – communication, in the Czech version break down into two factors (Material resources and communication issues across units; Human resources and teamwork/communication within the unit). If we look at the Italian and Turkish language versions of the questionnaire, we can see significant differences in the sample size of validation studies. The Italian study included 89 pediatric nurses from different care areas (Bagnasco et al., 2018), and the Turkish study involved 222 nurses from pediatric wards (Incekar et al., 2020); the Czech sample is the second largest.

The most frequently missed nursing care activities identified in our study were in line with the Turkish validation study (Incekar et al., 2020). The most frequently missed nursing care activities in pediatrics are independent ones, such as care planning, comforting or talking, teaching or counselling (Lake et al., 2017), involving the parents in child's care (Incekar et al., 2020), oral care, feeding, bathing or setting up patient's meals (Srulovici and Drach-Zahavy, 2017). In contrast, the least frequently missed nursing care activities are those re-

lated to prescribed treatment plans, such as evaluating vital signs, assessing central and peripheral catheter areas (Icekar et al., 2020), or pain management, treatments or procedures (Lake et al., 2017). Despite the mentioned evidence, pediatric nurses report less missed nursing care than nurses who care for adult patients (Lake et al., 2017; Srulovici and Drach-Zahavy, 2017). However, the pattern of missed nursing care activities is similar (Lake et al., 2016).

Along with the frequency of missed nursing care activities, it is also important to address factors contributing to the prevalence of missed nursing care. In the literature, several factors have been described as significant and contributing to missed nursing care in pediatrics (Lake et al., 2017). One of the most prominent is labour resources, including the inadequate number of nurses or assistive, unbalanced patient assignments, or urgent patient situations (Incekar et al., 2020). Other examined factors are communication and teamwork, nurses' workload or inadequate material resources. A well-examined factor in adult care has been the work environment (Jarošová et al., 2021). However, in pediatrics, this association has been studied rarely, and only lately, several researchers have started to carry out research studies examining the relationship between missed nursing care and the work environment (Jarošová et al., 2021; Kim et al., 2018; Lake et al., 2020).

The recent reviews (Gurková et al., 2021a; Zhao et al., 2020) showed the significant contribution of the nurse work environment domains on the prevalence of missed nursing care. In their synthesis, Zhao et al. (2020) have emphasized that domains such as staffing and teamwork are strong predictors of the prevalence of missed nursing care. Moreover, recently published studies conducted in acute care hospitals in the Czech Republic (Zeleníková et al., 2020, 2021; Gurková et al., 2021b) confirmed the associations between domains of nurse work environment and missed nursing care activities. However, Czech studies' samples consisted of nurses who worked in the adult surgical or internal medicine wards and excluded nurses who worked in pediatric settings. Studies performed in neonatal intensive care units (NICU) in the United States (Lake et al., 2017, 2018; Smith et al., 2020) found that in hospitals with improved work environments or nurse staffing, the prevalence and frequency of missed care decreased significantly. The nurse work environment explained significant variance in missed nursing care in these studies performed in the United States. Contrary to these studies, nonsignificant associations between the nurse work environment and missed nursing care were found in this study. Negative, weak, but statistically nonsignificant correlations were found between all domains of the PES-NWI, overall PES-NWI score, and the composite score of the MISSCARE Survey-Ped-CZ. A significant part of pediatric nurses in our sample (70.3%) considered the nurse work environment favourable. In addition, nurses working in public hospitals did not differ in the rating of nurse work environment compared to nurses working in private hospitals. Only one variable – perceived staffing adequacy was significantly related to the nurse work environment in this study. Nurses working in favourable workplace conditions reported higher scores in all domains of the nurse work environment. Notably, 66.7% of the pediatric nurses perceived the staffing in their pediatric unit as adequate 75% or 100% of the time.

The study has several limitations. The first limitation is the absence of an evaluation of the CVI index in the validation of the MISSCARE-Survey-Ped-CZ instrument for the conditions of Czech practice, even though the CVI index has already been evaluated by the authors of the original version in the past. Clarity of the instrument's content has not been formally evaluated. The second limitation might be testing the reliability of MISSCARE-Survey-Ped-CZ only in terms of internal consistency. The last limitation is the low number of participating care units. The COVID-19 pandemic has influenced their participation in our research study as this was the most frequently reported negative reason for participating. Some institutions, however, due to being too busy, did not respond anyhow.

Conclusions

This is the first study in the Czech Republic and one of the few studies globally where the MISSCARE Survey-Ped was used. The most frequently missed activities by pediatric nurses were independent ones, such as assessing activities attributes to the caregiver, promoting neuro-evolutionary development, or emotional support to the child and his family. In contrast, an activity never missed was pain assessment with pharmacological or non-pharmacological care approaches. The reasons for their missing were frequent interruptions, unexpected rise in patient volume and/or acuity on the unit, and children's urgent situation, which relate primarily to workload.

The work environment was, however, evaluated relatively high by pediatric nurses in our study. We anticipated a significant association between the work environment and missed nursing care within pediatric institutions in the Czech Republic, but this association was not confirmed, even in the individual subscales of the work environment. Significant correlations were found only between perceived staff adequacy and the PES-NWI instrument. However, further research is needed in this area with a larger sample size.

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Ethical aspects and conflict of interests
The study was approved by the institutional board review (UP-OL-15913/1030S-2021). The authors declare no conflict of interests.

Chybějící péče a její vztah s pracovním prostředím sester pracujících v pediatrii

Souhrn
Cíl: Zjistit souvislost mezi chybějící ošetřovatelskou péčí a pracovním prostředím na vybraných českých pediatrických odděleních.
Design: Deskriptivní průřezová studie.
Metody: Sběr údajů byl realizován od ledna do března 2021 pomocí nástrojů MISSCARE Survey-Pediatric a Practice Environment Scale – Nursing Work Index. Respondentky byly dětské sestry (*N* = 138) z pěti pediatrických pracovišť v České republice.
Výsledky: Nejčastějšími chybějícími ošetřovatelskými činnostmi byly posouzení aktivit, které jsou přisuzovány rodinnému příslušníkovi/opatrovníkovi, podpora neuropsychického vývoje dítěte a emocionální podpora dítěte a/nebo jeho rodiny. Korelace mezi chybějící ošetřovatelskou péčí a pracovním prostředím sester potvrzeny nebyly. Vztah mezi pracovním prostředním a vnímaným dostatkem personálu však prokázán byl.
Závěr: V souladu s dalšími studiemi jsme potvrdili, že dětskými sestrami byly opomíjeny především nezávislé ošetřovatelské činnosti, podobně jako u sester všeobecných pečujících o dospělé pacienty. Stejně tak jsme prokázali, že pracovní zátěž související s neočekávaným nárůstem počtu nebo závažností stavu pacientů je jedním z nejdůležitějších důvodů tohoto fenoménu. Navzdory nepotvrzeným souvislostem mezi chybějící ošetřovatelskou péčí a pracovním prostředím by se měl další výzkum zaměřit na jeho bližší zkoumání při využití většího vzorku dětských sester.

Klíčová slova: chybějící péče; ošetřovatelství; pediatrie; pracovní prostředí; sestry

References

1. Bagnasco A, Zanini M, Aleo G, Catania G, Kalisch BJ, Sasso L (2018). Development and Validation of the MISSCARE Survey – Pediatric Version. J Adv Nurs 74(12): 2922–2934. DOI: 10.1111/jan.13837.
2. Bragadóttir H, Kalisch BJ, Smáradóttir SB, Jónsdóttir HH (2015). Translation and psychometric testing of the Icelandic version of the MISSCARE Survey. Scand J Caring Sci 29(3): 563–572. DOI: 10.1111/scs.12150.
3. Gurková E, Bartoníčková D, Mikšová Z (2021a). Nursing work environment and unfinished nursing care in hospital settings – a scoping review. Cent Eur J Nurs Midw 12(3): 470–485. DOI: 10.15452/cejnm.2021.12.0015.
4. Gurková E, Mikšová Z, Šáteková L (2021b). Missed nursing care in hospital environments during the COVID-19 pandemic. Int Nurs Rev 00: 1–10. DOI: 10.1111/inr.12710.
5. Incekar MC, İspir Ö, Sönmez B, Selalmaz M, Erdost ŞK (2020). Turkish Validation of the MISSCARE Survey – Pediatric Version. J Pediatr Nurs 53: e156–e163. DOI: 10.1016/j.pedn.2020.03.012.
6. Jarošová D, Gurková E, Zeleníková R, Plevová I, Janíková E (2021). Hospital and unit variables of missed nursing care in acute care hospitals: A cross-sectional study. J Clin Nurs 30(7–8): 1099–1110. DOI: 10.1111/jocn.15655.
7. Jones TL, Hamilton P, Murry N (2015). Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. Int J Nurs Stud 52(6): 1121–1137. DOI: 10.1016/j.ijnurstu.2015.02.012.
8. Kalisch BJ (2006). Missed nursing care: A qualitative study. J Nurs Care Qual 21(4): 306–313. DOI: 10.1097/00001786-200610000-00006.
9. Kalisch BJ, Williams RA (2009). Development and psychometric testing of a tool to measure missed nursing care. J Nurs Adm 39(5): 211–219. DOI: 10.1097/NNA.0b013e3181a23cf5.
10. Kalisch BJ, Landstrom G, Williams RA (2009). Missed nursing care: errors of omission. Nurs Outlook 57(1): 3–9. DOI: 10.1016/j.outlook.2008.05.007.
11. Kalisch BJ, McLaughlin M, Dabney BW (2012). Patient perceptions of missed nursing care. Jt Comm J Qual Patient Saf 38(4): 161–167. DOI: 10.1016/S1553-7250(12)38021-5.
12. Kim K-J, Yoo MS, Seo EJ (2018). Exploring the Influence of Nursing Work Environment and Patient Safety Culture on Missed Nursing Care in Korea. Asian Nurs Res 12(2): 121–126. DOI: 10.1016/j.anr.2018.04.003.
13. Lake ET (2002). Development of the practice environment scale of the Nursing Work Index. Res Nurs Health 25(3): 176–188. DOI: 10.1002/nur.10032.
14. Lake ET, Friese CR (2006). Variations in nursing practice environments: relation to staffing and hospital characteristics. Nurs Res 55(1): 1–9. DOI: 10.1097/00006199-200601000-00001.
15. Lake ET, de Cordova PB, Barton S, Singh S, Agosto PD, Ely B, et al. (2017). Missed nursing care in pediatrics. Hosp Pediatr 7(7): 378–384. DOI: 10.1542/hpeds.2016-0141.
16. Lake ET, French R, O'Rourke K, Sanders J, Srinivas SK (2020). Linking the work environment to missed nursing care in labour and delivery. J Nurs Manag 28(8): 1901–1908. DOI: 10.1111/jonm.12856.
17. Lake ET, Germack HD, Viscardi MK (2016). Missed nursing care is linked to patient satisfaction: a cross-sectional study of US hospitals. BMJ Qual Saf 25(7): 535–543. DOI: 10.1136/bmjqs-2015-003961.
18. Lake ET, Staiger D, Edwards EM, Smith JG, Rogowski JA (2018). Nursing Care Disparities in Neonatal Intensive Care Units. Health Serv Res 53(Suppl. 1): 3007–3026. DOI: 10.1111/1475-6773.12762.
19. Sist L, Contini C, Bandini A, Bandini S, Massa L, Zanin R, et al. (2017). [MISSCARE Survey – Italian Version: findings from an Italian validation study.] Ig Sanita Pubbl 73(1): 29–45 (Italian).
20. Smith JG, Rogowski JA, Lake ET (2020). Missed care relates to nurse job enjoyment and intention to leave in neonatal intensive care. J Nurs Manag 28(8): 1940-1947. DOI: 10.1111/jonm.12943.
21. Srulovici E, Drach-Zahavy A (2017). Nurses' personal and ward accountability and missed nursing care: A cross-sectional study. Int J Nurs Stud 16(75): 163–171. DOI: 10.1016/j.ijnurstu.2017.08.003.
22. Tuubs-Cooley HL, Pickler RH, Younger JB, Mark BA (2015). A descriptive study of nurse-reported missed care in neonatal intensive care units. J Adv Nurs 71(4): 813–824. DOI: 10.1111/jan.12578.

23. Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, et al. (2005). Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: Report of the ISPOR Task Force for Translation and Cultural Adaptation. Vaue Health 8(2): 94–104. DOI: 10.1111/j.1524-4733.2005.04054.x.
24. Zeleníková R, Gurková E, Jarošová D (2019). Missed nursing care measured by MISSCARE Survey – the first pilot study in the Czech Republic and Slovakia. Cent Eur J Nurs Midw 10(1): 958–966. DOI: 10.15452/CEJNM.2019.10.000.
25. Zeleníková R, Jarošová D, Plevová I, Janíková E (2020). Nurses' Perceptions of Professional Practice Environment and Its Relation to Missed Nursing Care and Nurse Satisfaction. Int J Environ Res Public Health 17(11): 3805–3805. DOI: 10.3390/ijerph17113805.
26. Zeleníková R, Jarošová D, Plevová I, Janíková E, Polanská A, Mynaříková E (2021). Relationship between nursing practice environment and unfinished nursing care – the first results of research in the Czech Republic. Zdrav listy 9(1): 12–18.
27. Zhao Y, Ma D, Wan Z, Sun D, Li H, Sun J (2020). Associations between work environment and implicit rationing of nursing care: A systematic review. J Nurs Manag 28(8): 1841–1850. DOI: 10.1111/jonm.12895.