

# “The influence of selected work characteristics on missed and unfinished nursing care in hospitals: Evidence from the Czech Republic”

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# THE INFLUENCE OF SELECTED WORK CHARACTERISTICS ON MISSED AND UNFINISHED NURSING CARE IN HOSPITALS: EVIDENCE FROM THE CZECH REPUBLIC

## Abstract

Missed and unfinished nursing care in hospitals depends on the quality of human resources. This paper aims to analyze the influence of selected work characteristics on missing and incomplete nursing care in inpatient wards of Czech hospitals. The relationship between the rate of missed and unfinished nursing care and selected work characteristics was studied using the Czech version of the standardized questionnaire, the MISSCARE Survey. The study was conducted from September 26, 2021, to October 15, 2021. Controlled interviews with 1,205 nurses working in ward blocks in Czech hospitals were used. The research results showed statistically significant connections between selected work characteristics and missed and unfinished nursing care. Nurses with the highest level of education (Master, Ph.D.), nurses with specialized education, nurses with the lowest number of working hours (less than 30 hours per week), and nurses with the highest number of years of work experience (21 years and over) show a significantly lower rate of missed nursing care. Nurses from surgical departments, specialist nurses, and nurses with the highest education (Master, Ph.D.) report statistically significantly lower unfinished care levels. In contrast, nurses from regional/district hospitals, practical nurses/nursing assistants, and nurses with the lowest education (secondary school of nursing) report significantly higher unfinished nursing care levels. The information obtained can be used to improve nursing processes in the identified weak parts, strategic planning of nursing care, and sufficient personnel.

## Keywords

work characteristics, nursing process, nursing care

## JEL Classification

M10, M12, M19

## INTRODUCTION

The central priority of hospital management is to ensure quality patient care and set the nursing process so that patients are provided with complete care, not only part of it. Missing and unfinished care is associated with inadequate staffing of nurses in hospitals. Care not provided or partially provided can have fatal consequences – death of the patient. It can also result in less serious consequences, such as falls, pressure ulcers, nosocomial infections, and others, which negatively affect the treatment process. For these reasons, the lack of care, especially in recent years, has become an indispensable tool for evaluating the quality of all facilities associated with human care. From a managerial point of view, it is based on the adequate use of human resources and, as a result, affects the quality of all nursing processes and the risk of unwanted events. Chaboyer et al. (2021) show that missed care may not be planned or reasoned and may not be because of a lack of resources identified, but caused by a variety of nurse factors including team norms, decision-making, internal values, and beliefs and habits.

## 1. LITERATURE REVIEW

Missed and unfinished nursing care can be defined as needed and not or only partially provided nursing care, although the patient needed or required such care. According to Kalánková et al. (2019), factors that can lead to missed care include the hospital's organizational structure and the nursing care process. Missed care is related to the lack of staff, nurses' overtime (Bagnasco et al., 2017; Vincelette et al., 2019), little time for their mental hygiene, and the risk of adverse events, such as errors of omission (Jones et al., 2015). This is contrary to international standards of patient safety and the quality of provided care (Cho et al., 2016). Inadequate staffing of nurses in hospitals is associated with missing and incomplete care, which in turn causes a lower quality of care in hospitals (Nantsupawat et al., 2022). The model of Kalisch et al. (2009a) represents the conceptual framework for this area. It defines the basic components of missed nursing care and the consequences of unfinished care. Kalisch et al. (2011a) showed that 14% to 69% of all treatment errors are due to nurses' omissions. Aiken et al. (2018), Ball et al. (2018), and Griffiths et al. (2018) highlight unfinished care as a crucial factor for the development of adverse events. According to Jones et al. (2015), the prevalence of unfinished care in OECD and other countries ranges from 55% to 98%. Ausserhofer et al. (2014) state that an average of 3.6 nursing activities out of 13 are not performed in European countries.

The second, but no less important, component of insufficient care can be a lack of technical and material character, due to which safe care cannot be provided at the highest possible level of quality (Bragadóttir & Kalisch, 2018; Cho et al., 2015; Kalisch et al., 2009b). Insufficient care is often related to inefficient communication (Bittner & Gravlin, 2009), poor interpersonal relationships (Cho et al., 2016), insufficient managerial support (Vryonides et al., 2015), and acute deterioration of the patient's condition or an unexpected increase in the number of patients (Bragadóttir & Kalisch, 2018; Zeleníková et al., 2019; Zeleníková et al., 2023). Based on this conceptual framework, the MISSCARE Survey was developed (Kalisch & Williams, 2009). The validity of the MISSCARE questionnaire was qualitatively and quantitatively tested in the United States (Kalisch, 2006; Kalisch et al., 2009a; Kalisch & Williams, 2009).

Missing and incomplete nursing care has been addressed on a global level due to its negative impact on the nursing process and patient safety to determine what causes missing and incomplete nursing care and how to set up the processes to minimize them. Therefore, this paper aims to describe and analyze the influence of selected work characteristics on missed and unfinished nursing care in inpatient wards of Czech hospitals.

## 2. METHOD

The relationship between the rate of missed and unfinished nursing care and selected work characteristics was studied using the standardized MISSCARE Survey (Kalisch & Williams, 2009). This questionnaire was piloted in a modified environment in the Czech Republic (Zeleníková et al., 2019) after obtaining consent from the authors of the original and Czech versions of the questionnaire.

The MISSCARE Survey concerning missed and unfinished nursing care contained 15 questions with five possible answers: 1) always missed, 2) often missed, 3) sometimes missed, 4) rarely missed, and 5) never missed. Mean values were calculated for individual questions – mode, median, mean, variance, and standard deviation. Subsequently, the overall averages of the individual parts were calculated. The next step was the answer ordinalization of the individual parts by the averages of the answers to the individual questions in the following format:

- 1) always missed to often missed (average value 1.00-2.00);
- 2) often missed to occasionally missed (average value 2.01-3.00);
- 3) sometimes missed to rarely missed (average value 3.01-4.00);
- 4) rarely missed to never missed (mean value 4.01-5.00).

The connection between the rate of missed and unfinished nursing care and selected work characteristics was examined, i.e., type of hospital,

number of patients in regular work shifts, type of department, nurses' gender and age, the nursing care model, medication administration system, the nurses' job position, education, years of experience, and the standard weekly working hours.

The analysis was carried out using a quantitative research strategy. The data collection was conducted in the second half of 2021. The field investigation was conducted throughout the Czech Republic from September 26, 2021, to October 15, 2021. The field investigation was a standardized, controlled interview between the interviewer and the respondent (face-to-face).

Statistical data processing was performed using SASD 1.5.8 and SPSS software. The analysis was based on the first and second sorting levels. In the first stage of sorting, frequency tables were constructed for individual indicators, and absolute and relative frequencies and mean values were calculated (mode, median, mean, variance, standard deviation, range, variance and standard deviation estimate, and interval estimate of mean value and variance for 0.05). In the second classification stage, contingency tables were constructed with absolute and relative frequencies (column, row, total, and expected). As part of the correlation analysis, the Chi-square goodness-of-fit test, X<sup>2</sup> (Pearson Chi-Square), and the Test of Independence were applied according to the nature of the character distribution and the number of observations. Person contingency coefficient, Standardized Person contingency coefficient, Čuprov's coefficient, Cramer's coefficient, Walis coefficient, Spearman coefficient, and correlation coefficient were calculated. The relationship strength was measured at three significance levels (0.05, 0.01, and 0.001). In the case of an insufficient number of observations, Yates correction was applied.

The research sample included 1,205 nurses working in the inpatient wards of Czech hospitals. The research group was representative in terms of age, gender, and regional affiliation, i.e., regions of the Czech Republic (Table 1). Table 2 contains other socio-demographic characteristics of the sample group of nurses. Table 3 shows the work characteristics of the sample group of nurses.

**Table 1.** General characteristics of the sample group

Variable	N	%	DEVIATION
<b>AGE (N = 1,205)</b>			
Up to 34 years	294	24.4	+0.1
35 – 44 years	306	25.4	+0.1
45 – 54 years	363	30.1	0.0
55 – 64 years	201	16.7	-0.3
65 years and over	41	3.4	+0.1
<b>GENDER (N = 1,205)</b>			
Men	44	3.7	+0.5
Women	1161	96.3	-0.5
<b>REGIONAL AFFILIATION – CZECH REGION (N = 1,205)</b>			
Prague	206	17.1	-0.2
Central Bohemia	102	8.5	-0.1
South Bohemia	66	5.5	+0.1
Pilsen	66	5.5	+0.1
Karlovy Vary	30	2.5	0.0
Ústí	72	6.0	-0.1
Liberec	48	4.0	+0.1
Hradec Králové	68	5.6	0.0
Pardubice	54	4.5	+0.2
Vysočina	64	5.3	+0.1
South Moravia	145	12.0	-0.1
Olomouc	77	6.4	0.0
Zlín	63	5.2	-0.1
Moravian-Silesian	144	12.0	0.0

**Table 2.** Other socio-demographic characteristics of the sample group

Variable	N	%
<b>EDUCATION (N = 1,205)</b>		
Nursing High School	447	37.1
Higher Vocational School	352	29.2
Bachelor's Degree	335	27.8
Master's Degree, Ph.D.	71	5.9
<b>SPECIALIZED EDUCATION (N = 1,205)</b>		
Has specialized education	209	17.3
Does not have specialized education	996	82.7
<b>WORKPLACE TYPE (N = 1,205)</b>		
Faculty hospital	244	20.2
County hospital	348	28.9
Regional/district hospital	466	38.7
Other	147	12.2
<b>WARD TYPE EXPERIENCE (N = 1,205)</b>		
Up to 5 years	204	16.9
6 – 10 years	166	13.8
11 – 15 years	171	14.2
16 – 20 years	150	12.4
21 years and over	514	42.7
<b>EXPERIENCE AT THE WARD (N = 1,205)</b>		
Up to 5 years	498	41.3
6 – 10 years	307	25.5
11 – 15 years	173	14.4
16 – 20 years	100	8.3
21 years and over	127	10.5

**Table 3.** Work characteristics of the sample group

Variable	N	%
<b>NUMBER OF PATIENTS IN STANDARD WORK SHIFTS (N = 1,205)</b>		
1 – 20 patients	709	58.8
21 – 30 patients	379	31.5
30 patients and more	117	9.7
<b>NURSING CARE MODEL, MEDICATION ADMINISTRATION SYSTEM (N = 1,205)</b>		
Team	1,045	86.7
Primary	138	11.5
Other	22	1.8
<b>MEDICATION ADMINISTRATION SYSTEM (N = 1,205)</b>		
Mobile pharmacy, medication preparation at the patient's bedside	450	37.3
Mobile pharmacy, medication preparation in front of the patient's room	296	24.6
Mobile pharmacy, medication preparation at the nurses' office	418	34.7
Other	41	3.4
<b>HOSPITAL WARD TYPE (N = 1,205)</b>		
Surgery	433	35.9
Internal	600	49.8
Aftercare	172	14.3
<b>NURSES' JOB POSITION (N = 1,205)</b>		
General nurse	813	67.5
Specialist nurse	123	10.2
Practical nurse/medical assistant	206	17.1
Head nurse/station nurse	63	5.2
<b>STANDARD WEEKLY WORKING HOURS (N = 1,205)</b>		
Less than 30 hours a week	207	17.2
30 and more hours a week	998	82.8

The study was approved by the Ethics Committee of the University of South Bohemia in České Budějovice, Faculty of Health and Social

Sciences, on June 18, 2019, in accordance with the Declaration of Helsinki. The nurses' participation was voluntary and based on informed consent.

### 3. RESULTS

The Czech version of the standardized questionnaire, the MISSCARE Survey, was used to determine the connections between selected work characteristics and the degree of missed and unfinished nursing care.

The research results showed statistically significant connections between the rate of missed nursing care, the nurse's job position, level of education, specialization, standard weekly working hours, and years of work as a nurse. The findings also showed a statistically significant connection between selected work characteristics and the degree of missed nursing care (Table 4).

The research results showed statistically significant connections between the rate of missed nursing care, the nurse's job position, level of education, specialization, standard weekly working hours, and years of work as a nurse. Moreover, the results show a statistically significant relationship between hospital type and missed nursing care level. Regarding work characteristics, nurses from regional/district hospitals report a significantly greater missed nursing care level than nurses from faculty and regional hospitals.

**Table 4.** Connection between selected work characteristics and the degree of missed nursing care

A1. to A15. – LEVEL OF MISSED NURSING CARE IN TERMS OF WORK CHARACTERISTICS AND ...	VALUE X <sup>2</sup>	df	p	Stat. significance
<b>HOSPITAL TYPE</b>	17.827	9	<0.05	*
PATIENTS IN STANDARD SHIFT	5.918	6	0.432	n.s.
NURSING CARE MODEL	7.203	6	0.302	n.s.
MEDICATION ADMINISTRATION SYSTEM	15.490	9	0.078	n.s.
WARD TYPE	18.835	6	<0.01	**
GENDER	4.159	3	0.245	n.s.
AGE	14.287	12	0.283	n.s.
JOB POSITION/RANK	40.172	9	<0.001	***
HIGHEST EDUCATION LEVEL	21.346	9	<0.05	*
SPECIALIZED EDUCATION	8.479	3	<0.05	*
STANDARD WORKING HOURS	21.915	3	<0.001	***
YEARS OF BEING A NURSE	21.365	12	<0.05	*

Note: X<sup>2</sup> – chi-square; p – independence test; df – degree of freedom. n.s. – Statistically insignificant difference. \* – Statistically significant difference for significance level α = 0.05). \*\* – Statistically significant difference for significance level α = 0.01). \*\*\* – Statistically significant difference for significance level α = 0.001).

The research results showed the relationship between the level of missed care and the type of hospital department. Based on the research results, nurses from surgical departments show a significantly lower level of missed nursing care. Regarding job position/rank, practical nurses/medical assistants, nurses with the lowest level of education (secondary school of health), and nurses without specialized education show a significantly higher degree of missed nursing care. Nurses with the highest level of education (Master, Ph.D.) and nurses with specialized education show a significantly lower rate of missed nursing care.

Regarding a statistically significant connection between the standard working hours and missed nursing care level, the results showed that nurses with the lowest number of working hours (less than 30 hours per week) and nurses with the highest number of hours worked (30 or more hours per week) show a significantly lower missed nursing care level.

The research results showed a statistically significantly higher level of missed care by nurses with the shortest experience (up to five years). On the contrary, nurses with the longest experience (21 and over) report a significantly lower level of missed nursing care regarding work characteristics. In other cases, there was no statistically significant correlation between the missed nursing care level and work characteristics. The paper also demonstrated a statistically significant connection between the unfinished nursing care level and the characteristics listed in Table 5.

Regarding unfinished nursing care, the analysis showed statistically significant associations between the unfinished care level and hospital type, department type, and the nurse's job position.

The research results showed a statistically significant association between the hospital type and the unfinished care level. Nurses from regional/district hospitals report a significantly higher unfinished care level than nurses from faculty and county hospitals. Nurses from surgical departments report a statistically significantly lower unfinished care level. The study demonstrated a statistically significant connection between the unfinished care level, the nurse's job position, and education. Practical nurses/nursing assistants and nurses with the lowest education (secondary school of nursing) report a significantly higher unfinished nursing care level. On the other hand, the unfinished care level was significantly lower in specialist nurses and nurses with the highest education (Master, Ph.D.).

Concerning working hours and experience, nurses with the lowest number of working hours (less than 30 hours per week) and nurses with the shortest experience (up to 10 years) report a significantly higher unfinished nursing care level. The nurses with the highest number of working hours (30 or more hours per week) and nurses with the longest experience (21 or more years) show a significantly lower unfinished nursing care level. Concerning nursing process settings, nurses caring for fewer patients (up to 20 patients) and nurses preparing medication at the patient's bedside report a signifi-

**Table 5.** The relationship between selected work characteristics and unfinished nursing care level

A16. to A24. – UNFINISHED NURSING CARE LEVEL AND...	VALUE $X^2$	df	P	Stat. significance
<b>HOSPITAL TYPE</b>	34.911	9	<0.001	***
PATIENTS IN STANDARD SHIFT	14.300	6	<0.05	*
NURSING CARE MODEL	8.283	6	0.218	n.s.
MEDICATION ADMINISTRATION SYSTEM	18.043	9	<0.05	*
WARD TYPE	23.335	6	<0.001	***
GENDER	3.169	3	0.366	n.s.
AGE	15.335	12	0.224	n.s.
JOB POSITION/RANK	42.827	9	<0.001	***
HIGHEST EDUCATION LEVEL	23.506	9	<0.01	**
SPECIALIZED EDUCATION	3.369	3	0.338	n.s.
STANDARD WORKING HOURS	16.234	3	<0.01	**
YEARS OF BEING A NURSE	25.525	12	<0.05	*

Note:  $X^2$  – chi-square;  $p$  – independence test;  $df$  – degree of freedom. *n.s.* – Statistically insignificant difference. \* – Statistically significant difference for significance level  $\alpha = 0.05$ . \*\* – Statistically significant difference for significance level  $\alpha = 0.01$ . \*\*\* – Statistically significant difference for significance level  $\alpha = 0.001$ .

cantly lower unfinished nursing care level. For the other work characteristics, no statistically significant association between the characteristics was demonstrated.

## 4. DISCUSSION

The results demonstrated significant statistical connections between selected work characteristics and missed and unfinished care levels in inpatient hospital wards. Accordingly, missed and unfinished care levels are statistically significantly related to the hospital and ward types. Carter (2014), Kalisch et al. (2011a), and Hernández-Cruz et al. (2017) showed the influence of organizational structure aspects and work organization in hospitals (Chapman et al., 2017) on missed and unfinished care levels. This study showed that missed and unfinished care levels are related to other work characteristics, especially the nurse's job position, education, and experience. Human resources are the most critical resource of the healthcare system, and special attention should be paid to their development (Radojicic, 2020; Srulovici & Drach-Zahavy, 2017).

In the Czech Republic, the percentage of higher vocational education (29.2%) and bachelor's degree holders (27.8%) with experience of mostly 21 years and above (42.7%) is higher. On the contrary, in the United States (Kalisch & Williams, 2009), on average, most participants had ten years of professional experience in nursing, and the predominant level of education was a bachelor's degree. This fact is also related to the change in the education system of nurses in the Czech Republic and its influence on the current hospital personnel situation. These results show that nurses with a lower education level (practical nurses/nursing assistants, nurses with a High School of Nursing degree, nurses without specialized education, and nurses with the lowest experience) and nurses with the shortest experience (up to five years) report a significantly higher missed nursing care level regarding working hours (less than 30 hours per week). On the contrary, the results show that specialist nurses, head/station nurses, nurses with the highest education (Master, Ph.D.), nurses with specialized nursing education, nurses with the most working hours (30 or more hours per week), and nurses with the longest experience

(21 or more years) have a significantly lower missed nursing care level. Differences were also shown by Kalisch and Lee (2012) in other countries, where one sees indicators like the number of nurses per 100,000 people or the state's healthcare expenditure. Other differences lie in nurses' work ethic and willingness to report misconduct or missed care (Kalisch & Lee, 2012).

Another statistically significant connection between missed and unfinished care levels and weekly working hours was demonstrated. In services with limited human resources, nurses limit or sometimes miss interventions, even though this may increase the risk of adverse patient outcomes (Ceballos-Vásquez et al., 2015; Monteiro et al., 2015). Nurse staffing can be measured using various sources, such as nursing hours spent on a patient per day, nurse-reported data, and hospital administrative data (Shin et al., 2019; Twigg et al., 2021; Alanazi et al., 2023). According to Ball et al. (2018) and Griffiths et al. (2018), lower nurse staffing on the ward was associated with higher medication error levels, more errors in unfinished care, and more errors in missed nursing care.

Regarding the medication administration process, the results show a statistically significant connection between the unfinished care level and the medication administration system in the department. The drug administration system is related to setting the nurse's own drug administration process. It must be continuously optimized and made more efficient using management instruments, such as SWOT analysis (Prokešová et al., 2022) and FMEA (Brabcová et al., 2021). Their results enable recommending several changes to hospital management and, currently, the transition to a comprehensive electronic documentation system, linking the hospital pharmacy information system with the hospital information system, increasing the personnel according to the situation of the given hospital, a higher clinical pharmacist use rate and sharing experience between hospitals.

This study also showed a statistically significant connection between the unfinished nursing care level and the number of patients in the nurse's standard working shift. From a managerial-economic point of view, the optimal ratio of healthcare workers providing high-quality care is necessary for ef-

efficient hospital functioning (Vaňková & Vrabková, 2022). However, planning the optimal number of beds and medical personnel is very complicated because it is necessary to maintain mutual relationships of all care forms and types (Ravaghi et al., 2020). Higher patient-to-nurse ratios, understaffing, and insufficient resources were significantly associated with higher odds of missed care (Nantsupawat et al., 2022). Jarošová and Zeleníková (2019) and Zeleníková et al. (2023) indicate that the most differences in the unfinished nursing care level were found due to the lack of staff.

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## CONCLUSION

This study aimed to analyze the effect of selected work characteristics on missing and incomplete nursing care in inpatient wards of Czech hospitals. Using the MISSCARE questionnaire, a valid measurement instrument, the study offers essential information about the nursing care provided in the inpatient wards of Czech hospitals, considering national and international comparisons. Nurses with the highest level of education, nurses with specialized education, and nurses with the lowest number of working hours (less than 30 hours per week) and a higher number of years of work experience (21 years and over) show a significantly lower rate of missed nursing care. Nurses from surgical departments, specialist nurses, and nurses with the highest education (Master, Ph.D.) report a statistically significantly lower unfinished care level. On the other hand, nurses from regional/district hospitals, practical nurses/nursing assistants, and nurses with the lowest education (secondary school of nursing) report a significantly higher unfinished nursing care level.

The information obtained can be used to improve the weaknesses in nursing processes and the strategic planning of nursing care and ensure adequate personnel. The management of Czech hospitals should pay special attention to nursing care in connection with the medication administration process. This study results are unique compared to other countries. The obtained results, like the results of studies carried out in other countries, can positively affect managerial measures, help increase nursing personnel, and ensure safe care, so that missed and unfinished nursing care does not occur.

## AUTHOR CONTRIBUTIONS

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