





Missed nursing care: A cross-sectional and multi-centric study from Turkey

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Abstract

Aim: The aim of this study is to explore the extent of missed nursing care in Turkey and identify its predictors.

Design: This was a descriptive, cross-sectional, multicentre study.

Methods: A total of 477 nurses working in seven public hospitals participated in this study from March to July 2019. The survey included two components: a personal and professional characteristics data form and the MISSCARE survey.

Results: The study revealed that emotional support, patient bathing and ambulation were the most frequently missed nursing care activities. An inadequate number of assistive personnel and staff, along with an unexpected increase in patient volume, were identified as the primary reasons for missed nursing care. Of the 21 missed nursing care activities, nine predictive models showed statistical significance ($p < 0.05$). Factors such as the type of unit, years of work experience, working hours, number of patients cared for in a shift and intention to leave the unit were found to be significant predictors of seven missed nursing care activities ($p < 0.05$).

Conclusion: This study found that numerous variables influence each care activity, which suggests the need to devise more targeted and specific strategies to minimize missed nursing care. Thorough investigation into the impact of these strategies on each care activity is essential.

KEYWORDS

caring, MISSCARE survey, missed nursing care, nursing, Turkey

Summary statement

What is already known about this topic?

- The problem of missed nursing care (MNC) affects healthcare institutions universally.

- MNC can serve as an indicator of patient safety, practice environment and quality of care.
- Intrapersonal, interpersonal, organizational and cultural factors may contribute to MNC.

What this paper adds:

- This study found that nurses prioritize more structured and time-sensitive care activities.
- This study showed the significant influence of staffing adequacy, patient volume and other variables on MNC.
- This study identified several significant predictors for each care activity, including the nature of the unit, weekly working hours, nurse-to-patient ratio, professional experience and intention to leave.

The implications of this paper:

- To effectively reduce or eliminate MNC, the nature of each care activity should be examined separately.
- To develop more targeted, specific and comprehensive strategies, predictors of each care activity should be considered.
- A combination of observation and interview methods is recommended for a comprehensive evaluation of the effectiveness of the developed strategies.

1 | INTRODUCTION

Missed nursing care (MNC) is defined as comprising 'an omission error that occurs when any part of needed patient care is omitted or delayed' (Kalisch et al., 2009). MNC has become a worldwide, multi-faceted and complex socioeconomic phenomenon, garnering significant scholarly attention across diverse cultures and contexts for nearly 17 years (Jarošová et al., 2021; Nahasaram et al., 2021). International studies consistently reveal a high prevalence of MNC, with estimates ranging from 52% to 86% (Saar et al., 2021; Simonetti et al., 2021).

MNC reflects nurses' intricate decision-making processes. In a chaotic healthcare environment, nurses strategically prioritize care activities based on patients' needs. Time constraints and competing demands influence nurses' decision-making, leading them to focus on more structured protocols and fixed time frames (Mandal & Seethalakshmi, 2023). Some activities are inevitably missed, particularly those related to emotional and psychological needs (Campbell et al., 2020; Cho et al., 2020; Jarošová et al., 2021).

Numerous factors contribute to MNC, primarily labour and material resources. Common reasons include 'heavy admission and discharge activities', 'insufficient staffing levels' and 'inadequate support personnel' (Dutra & Guirardello, 2021; Nahasaram et al., 2021), resulting in negative outcomes for patients and nurses (Cho et al., 2020; Nantsupawat et al., 2022). MNC has been shown to significantly affect patient outcomes, leading to decreased quality of care, higher mortality rates, reduced patient satisfaction and increased adverse events (Nantsupawat et al., 2022; Wiczorek-Wojcik et al., 2020).

Furthermore, MNC has been found to have detrimental effects, including decreased job satisfaction and job enjoyment and increased intentions among nurses to leave their positions (Cho et al., 2020; Smith et al., 2020).

Understanding the unique contributions of each predictor is crucial for developing effective strategies to mitigate and prevent MNC in healthcare settings. MNC encompasses a wide range of predictors. MNC predictors can be categorized into three levels: unit (staff, workloads, non-nursing tasks, etc.), nurse (age, sex, professional experience, etc.) and patient (clinical instability) (Chiappinotto et al., 2022). Previous studies have found that a healthy work environment, a low nurse-patient ratio and adequate staffing levels are linked to a reduced occurrence of MNC (Nantsupawat et al., 2022; Simonetti et al., 2021). Job satisfaction among nurses has also emerged as a significant predictor at the nursing level, with higher satisfaction being associated with lower MNC rates (Campbell et al., 2020). Additionally, MNC increases with the clinical complexity of the patients (Abdelhadi et al., 2023).

An important observation is that existing studies predominantly concentrate on investigating the causes and predictors of MNC, primarily within the realm of prevalence. However, the literature lacks a clear understanding of the primary factors that affect each care activity, despite their consistent mention in almost all studies. Minor issues in various aspects of human existence have a significant impact on overall well-being, affecting physical, emotional and existential dimensions. Consequently, MNC activities lead to a decline in holistic health. Therefore, conducting comprehensive analyses of the factors contributing to MNC and interventions, and developing improvement

strategies based on these findings is crucial. Previous studies have primarily focused on increasing the patient–nurse ratio, empowering nurses, establishing a supervision system, improving the work environment and providing team training (Janatolmakan & Khatony, 2022; Longhini et al., 2021). However, these strategies often lack specific approaches to MNC activities. While most studies assessed findings based on overall scale averages, one notable study examined how specific predictors influence nurses' decision-making for different care activities. These findings indicate that heavy workloads increase the likelihood of MNC, with lower occurrences of discharge planning and higher occurrences of emotional support and patient mobility. Patients with high clinical complexity are more likely to experience missed mobility tasks than missed medication administration tasks (Abdelhadi et al., 2023). Therefore, there is a need for more targeted and specific approaches to develop effective strategies for mitigating MNC.

Given the universal nature of MNC, research findings in different contexts can guide institutions and policymakers in addressing this widespread issue. By understanding the unique factors that affect MNC in various settings, institutions can develop targeted interventions and policies to address the specific challenges faced in each context. Therefore, this study aimed to explore the extent of MNC in Turkey and identify its predictors. The research questions addressed in this study were as follows:

- What are the levels of each MNC activity?
- What are the reasons for MNC?
- What are the predictors of each MNC activity?

2 | METHODS

2.1 | Study design

This was a descriptive, cross-sectional, multicentre study. This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist (von Elm et al., 2014).

2.2 | Settings and participants

This study was conducted in seven hospitals with bed capacities of over 600 beds each, representing different regions of Turkey (north, middle and south). Hospital selection was based on accessibility and the assumption that different types of hospitals and geographical regions would influence nurses' perceptions.

The sample size was determined using stratified and simple random sampling for finite populations, considering a population of 13 887 nurses (Ministry of Health, 2016) and an estimated MNC prevalence of approximately 30%, with a 95% confidence level and 5% estimator precision (Kalisch et al., 2012). The formula provided in Appendix A was used to perform sampling. The calculated sample size was 315, and a total of 550 nurses working in surgical, medical and

intensive care units were invited to participate in the study. In total, 477 nurses agreed to participate, resulting in an 87% response rate.

The inclusion criteria were nurses who completed the institution's orientation process were currently assigned to adult clinics and voluntarily agreed to participate in the study. Nurses in managerial positions, those not directly involved in patient care and those assigned to specialized units (operating rooms, emergency departments, etc.), were excluded from the study.

2.3 | Data collection

Data collection was conducted from March to July 2019. Prior to data collection, information about the study's content and measurement instruments was disseminated to nurses in seven geographic regions. The data collection process involved the use of a self-reported data collection form that consisted of personal and professional characteristics data forms and a MISSCARE survey. Each participant took approximately 15–20 min to complete the data collection instruments.

2.4 | Measures

2.4.1 | A personal and professional characteristics data form

The data collection form consisted of 15 questions, including demographics such as age, sex, educational level and working unit. Two questions were related to years of experience in the nursing profession and years of experience in a specific unit. Another set of three questions gathered information on workload factors, including the number of patients cared for in a shift, number of nurses working in a shift, rotating shift status, number of shifts in a month and working hours per week. Additionally, there were two questions asking participants about their intention to leave their profession and unit, with response options including 'Never', 'Occasionally' and 'Too often'.

2.4.2 | MISSCARE survey—Turkish

The MISSCARE survey was selected as the primary data collection tool for this study. This is a well-validated survey widely used in multiple countries, making it a reliable measurement tool for MNC. The MISSCARE survey assesses the occurrence of MNC and focuses on identifying its causes, allowing for a comprehensive understanding of MNC's antecedents and the design of appropriate actions (Palese et al., 2021). The survey's established validity and comprehensive approach made it an ideal choice for this study.

The MISSCARE survey used in this study was an adapted Turkish version of the original survey developed by Kalisch et al. (2012). Permission was obtained from the researchers to use the Turkish version

of this study. The survey consisted of two parts: Part A assessed the perception of MNC, and Part B focused on the reasons for MNC. In Part A, nurses were asked to rate the frequency of missing each of the 21 nursing care activities on a 4-point scale, ranging from 'rarely' to 'occasionally', 'frequently' or 'always'. Part B was divided into three subscales: communication, labour and material resources. It included 16 reasons for MNC, and nurses were asked to indicate the significance level of each reason on a 4-point scale, ranging from 'not a reason' to 'minor reason', 'moderate reason' or 'significant reason'. In this study, the internal consistency of the survey was evaluated using Cronbach's coefficient, resulting in a reliability score of 0.93 for the 21 activities of MNC and 0.92 for the 16 reasons for MNC.

2.5 | Ethical considerations

Ethical committee approval for this study was obtained from the Clinical Research Ethics Committee of the researchers' university (date: 6 November 2018; No: 504). Permission was obtained from all the institutions involved in this study. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

2.6 | Data analysis

Data analysis was conducted using IBM SPSS Statistics for Windows, Version 23 (IBM Corp., Armonk, NY, IBM Corp). The MNC activities in this study were categorized into three groups based on their occurrence: rare, frequent or always. Similarly, the frequency of the reasons for MNC was classified as minor, moderate or severe (Kalisch et al., 2012). Descriptive statistics such as frequency, percentage, mean and standard deviation (SD) were used to summarize the demographic variables of the participants. Multivariate logistic regression analysis was conducted to assess the likelihood of the 21 MNC activities. This approach allowed the identification of significant predictors and their impact on the occurrence of MNC activities. The regression model included 10 predictor variables: unit, working years in the profession and unit, working hours per week, number of patients cared for in a shift, number of nurses working in the shift, shift status, shift counts, and intention to leave the unit and profession. These variables were used to determine their associations with MNC activities.

3 | RESULTS

3.1 | Demographic characteristics

A total of 477 nurses participated in this study. The nurses' mean age was 31.92 years ($SD = 7.21$). Most participants (81.1%) were women, and 63.7% held a bachelor's degree. In terms of working units, 44.2% of nurses worked in surgical clinics. The mean number of years working in the nursing profession was 10.22 ($SD = 7.35$), while the mean

number of years working in the specific clinic was 5.43 ($SD = 5.71$). More than 70% of nurses reported working rotating shifts. Nurses worked approximately 43.73 h per week ($SD = 8.61$). The mean number of patients cared for in a single shift was 15.92 ($SD = 10.51$). The mean number of nurses working a shift was 3.00 ($SD = 1.70$). In terms of nurses' intention to leave their unit and profession, 62.1% of nurses stated that they intended to leave the unit occasionally, while 55.3% expressed an occasional intention to leave the nursing profession (Table 1).

3.2 | The levels of each MNC activity

The study identified the following MNC activities as the most frequently reported by nurses: emotional support for patients and/or family (43%), patient bathing/skin care (37.3%) and ambulation three times per day or as ordered (36.3%) (Figure 1).

3.3 | The reasons for MNC

The study revealed several significant reasons for MNC, including an inadequate number of assistive personnel (98.1%), inadequate number of staff (97.9%) and unexpected rise in patient volume and/or acuity in the unit (97.5%) (Figure 2).

TABLE 1 The demographic characteristics of nurses.

Characteristics	% (n)
Sex	
Female	81.1 (387)
Male	18.9 (90)
Educational level	
College	22.6 (108)
Bachelor's	63.7 (304)
Master's	65 (13.6)
Working unit	
Medical units	34.6 (165)
Surgical units	44.2 (211)
Intensive care units	21.2 (101)
Rotating shift status	
Working in rotating shift	71.5 (341)
Not working in rotating shift	28.5 (136)
Intention to leave the unit	
Never	26.2 (125)
Occasionally	62.1 (296)
Too often	11.7 (56)
Intention to leave the profession	
Never	29.8 (142)
Occasionally	55.3 (264)
Too often	14.9 (71)

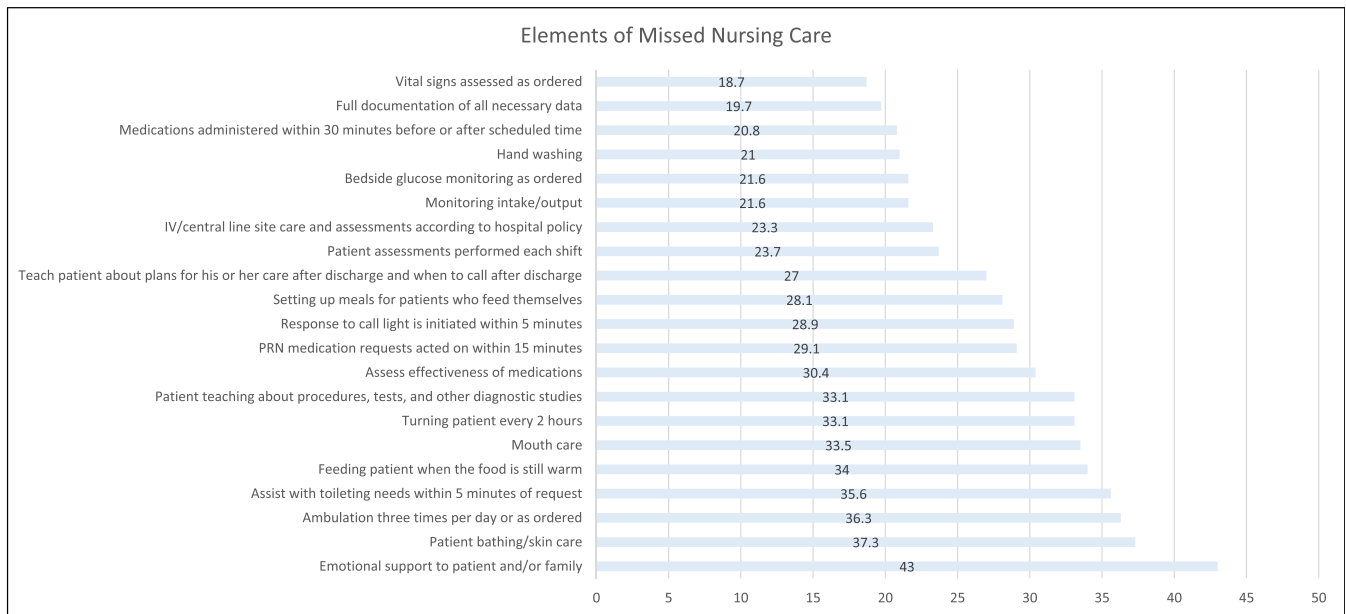


FIGURE 1 Elements of missed nursing care.



FIGURE 2 Reasons for missed nursing care.

3.4 | The predictors of each MNC activity

Multivariate logistic regression analysis was performed to determine the predictors of MNC activity. Nine predictive models were statistically significant for 21 MNC activities (likelihood ratio chi-squared ranged from 38.238 to 22.613 [13], $p < 0.05$) (Table 2).

Unit type was found to be a significant predictor of ambulation (odds ratio [OR] 0.49, 95% confidence interval [CI] 0.30–0.82), vital sign assessment (OR 0.38, 95% CI 0.15–1.95), monitoring intake/output (OR 0.32, 95% CI 0.12–0.80), bedside glucose monitoring (OR 0.25, 95% CI 0.10–0.59), response to call lights (OR 0.51, 95% CI

0.30–0.85) and as-needed (PRN) medication requests (OR 0.34, 95% CI 0.16–0.74). After adjusting for the other nine variables, ambulation and response to call lights were significantly less likely to be missed in surgical units than in medical clinics. Additionally, vital sign assessment, intake/output monitoring, bedside glucose monitoring, response to call lights and PRN medication requests were significantly less likely to be missed in intensive care units than in medical clinics (Table 2).

In the adjusted model, it was found that for each additional year in the profession, the likelihood of nurses reporting MNC in terms of ambulation decreased (OR 0.94, 95% CI 0.90–0.98). Similarly, the

TABLE 2 Multivariate logistic regression results predicting the probability of missed nursing care (MNC; $N = 477$).

	B	S.E.	Wald	df	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Ambulation three times per day or as ordered^a								
Unit ^b								
Surgical unit	-0.697	0.255	7.467	1	0.006	0.498	0.302	0.821
Intensive care unit	-0.536	0.352	2.311	1	0.128	0.585	0.293	1.168
Working years in the profession	-0.058	0.021	7.649	1	0.006	0.943	0.905	0.983
Working years in the unit	-0.003	0.027	0.011	1	0.918	0.997	0.947	1.051
Working hours per week	0.020	0.013	2.299	1	0.129	1.020	0.994	1.048
Number of patients cared for in a shift	0.033	0.012	7.588	1	0.006	1.034	1.010	1.059
Number of nurses working in the shift	0.028	0.065	0.189	1	0.664	1.029	0.905	1.169
Shifts status ^c	0.629	0.407	2.386	1	0.122	1.875	0.844	4.164
Shifts counts	-0.026	0.035	0.567	1	0.452	0.974	0.909	1.043
Intention to leave the unit ^d			1.877	2	0.391			
Occasionally	0.267	0.287	0.860	1	0.354	1.305	0.743	2.293
Too often	0.561	0.422	1.766	1	0.184	1.753	0.766	4.013
Intention to leave the profession ^d			1.528	2	0.466			
Occasionally	-0.329	0.275	1.439	1	0.230	0.719	0.420	1.232
Too often	-0.108	0.377	0.082	1	0.775	0.898	0.429	1.879
Constant	-1.085	0.748	2.105	1	0.147	0.338		
Turning patient every 2 h^e								
Unit ^b			1.197	2	0.550			
Surgical unit	-0.098	0.259	0.142	1	0.706	0.907	0.546	1.506
Intensive care unit	0.280	0.350	0.638	1	0.425	1.323	0.666	2.628
Working years in the profession	-0.039	0.021	3.484	1	0.062	0.962	0.923	1.002
Working years in the unit	0.037	0.026	2.047	1	0.153	1.038	0.986	1.091
Working hours per week	0.030	0.013	5.258	1	0.022	1.031	1.004	1.058
Number of patients cared for in a shift	0.026	0.012	4.633	1	0.031	1.026	1.002	1.050
Number of nurses working in the shift	-0.091	0.070	1.657	1	0.198	0.913	0.796	1.049
Shifts status ^c	0.274	0.415	0.437	1	0.509	1.315	0.584	2.964
Shifts counts	0.021	0.034	0.375	1	0.541	1.021	0.955	1.092
Intention to leave the unit ^d			6.799	2	0.033			
Occasionally	0.382	0.295	1.671	1	0.196	1.465	0.821	2.614
Too often	1.111	0.426	6.798	1	0.009	3.038	1.318	7.002
Intention to leave the profession ^d			1.750	2	0.417			
Occasionally	-0.134	0.274	0.238	1	0.625	0.875	0.511	1.497
Too often	-0.523	0.397	1.737	1	0.187	0.593	0.272	1.290
Constant	-2.475	0.750	10.889	1	0.001	0.084		
Vital signs assessed as ordered^f								
Unit ^b			4.454	2	0.108			
Surgical unit	-0.090	0.294	0.094	1	0.759	0.914	0.513	1.627
Intensive care unit	-0.955	0.463	4.265	1	0.039	0.385	0.155	0.952
Working years in the profession	0.031	0.023	1.810	1	0.178	1.031	0.986	1.079
Working years in the unit	-0.112	0.039	8.445	1	0.004	0.894	0.829	0.964
Working hours per week	0.037	0.016	5.596	1	0.018	1.038	1.006	1.070
Number of patients cared for in a shift	0.012	0.014	0.794	1	0.373	1.012	0.985	1.040
Number of nurses working in the shift	0.041	0.075	0.302	1	0.583	1.042	0.899	1.208

TABLE 2 (Continued)

	B	S.E.	Wald	df	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Shifts status ^c	-0.193	0.488	0.157	1	0.692	0.824	0.317	2.144
Shifts counts	-0.067	0.044	2.379	1	0.123	0.935	0.858	1.018
Intention to leave the unit ^d			1.412	2	0.494			
Occasionally	0.229	0.344	0.442	1	0.506	1.257	0.640	2.469
Too often	-0.287	0.522	0.303	1	0.582	0.750	0.270	2.086
Intention to leave the profession ^d			2.329	2	0.312			
Occasionally	0.150	0.325	0.212	1	0.645	1.162	0.614	2.197
Too often	0.640	0.428	2.239	1	0.135	1.896	0.820	4.384
Constant	-2.732	0.882	9.594	1	0.002	0.065		
Monitoring intake/output^g								
Unit ^b			5.951	2	0.051			
Surgical unit	-0.168	0.279	0.361	1	0.548	0.845	0.489	1.462
Intensive care unit	-1.136	0.467	5.921	1	0.015	0.321	0.129	0.802
Working years in the profession	0.025	0.023	1.251	1	0.263	1.026	0.981	1.072
Working years in the unit	-0.051	0.033	2.396	1	0.122	0.950	0.890	1.014
Working hours per week	0.035	0.015	5.629	1	0.018	1.036	1.006	1.067
Number of patients cared for in a shift	0.024	0.013	3.298	1	0.069	1.024	0.998	1.051
Number of nurses working in the shift	-0.011	0.079	0.021	1	0.885	0.989	0.847	1.155
Shifts status ^c	-0.278	0.484	0.329	1	0.566	0.757	0.293	1.957
Shifts counts	0.003	0.039	0.007	1	0.932	1.003	0.929	1.084
Intention to leave the unit ^d			0.565	2	0.754			
Occasionally	0.016	0.332	0.002	1	0.963	1.016	0.530	1.946
Too often	0.308	0.459	0.451	1	0.502	1.360	0.554	3.342
Intention to leave the profession ^d			1.650	2	0.438			
Occasionally	-0.191	0.312	0.373	1	0.541	0.826	0.448	1.524
Too often	0.287	0.404	0.505	1	0.477	1.332	0.604	2.939
Constant	-2.927	0.845	11.987	1	0.001	0.054		
Mouth care^h								
Unit ^b			3.050	2	0.218			
Surgical unit	-0.134	0.256	0.274	1	0.601	0.875	0.530	1.445
Intensive care unit	-0.630	0.362	3.028	1	0.082	0.533	0.262	1.083
Working years in the profession	-0.035	0.021	2.693	1	0.101	0.966	0.927	1.007
Working years in the unit	-0.036	0.030	1.475	1	0.225	0.964	0.909	1.023
Working hours per week	0.024	0.013	3.287	1	0.070	1.024	0.998	1.052
Number of patients cared for in a shift	0.009	0.012	0.601	1	0.438	1.009	0.986	1.033
Number of nurses working in the shift	-0.009	0.067	0.016	1	0.899	0.991	0.869	1.131
Shifts status ^c	-0.226	0.420	0.289	1	0.591	0.798	0.351	1.816
Shifts counts	-0.032	0.035	0.855	1	0.355	0.968	0.905	1.037
Intention to leave the unit ^d			9.053	2	0.011			
Occasionally	0.046	0.289	0.025	1	0.874	1.047	0.594	1.846
Too often	1.145	0.422	7.350	1	0.007	3.143	1.373	7.194
Intention to leave the profession ^d			0.582	2	0.748			
Occasionally	0.206	0.278	0.548	1	0.459	1.229	0.712	2.119
Too often	0.071	0.385	0.034	1	0.854	1.073	0.505	2.283
Constant	-1.226	0.749	2.677	1	0.102	0.294		

(Continues)

TABLE 2 (Continued)

	B	S.E.	Wald	df	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Bedside glucose monitoring as ordered ⁱ								
Unit ^b			9.822	2	0.007			
Surgical unit	−0.400	0.285	1.970	1	0.160	.670	0.384	1.172
Intensive care unit	−1.387	0.446	9.665	1	0.002	0.250	0.104	0.599
Working years in the profession	0.029	0.023	1.564	1	0.211	1.029	0.984	1.077
Working years in the unit	−0.078	0.036	4.751	1	0.029	0.925	0.862	0.992
Working hours per week	0.045	0.015	9.323	1	0.002	1.046	1.016	1.077
Number of patients cared for in a shift	−0.014	0.015	0.900	1	0.343	0.986	0.959	1.015
Number of nurses working in the shift	−0.018	0.084	0.048	1	0.827	0.982	0.834	1.157
Shifts status ^c	−0.397	0.492	0.652	1	0.419	0.672	0.256	1.762
Shifts counts	−0.036	0.041	0.778	1	0.378	0.965	0.891	1.045
Intention to leave the unit ^d			1.426	2	0.490			
Occasionally	−0.238	0.324	0.537	1	0.464	0.789	0.418	1.489
Too often	0.216	0.453	0.226	1	0.635	1.241	0.510	3.017
Intention to leave the profession ^d			3.329	2	0.189			
Occasionally	−0.037	0.315	0.014	1	0.906	0.964	0.519	1.788
Too often	0.621	0.403	2.375	1	0.123	1.861	0.845	4.100
Constant	−2.187	0.838	6.803	1	0.009	0.112		
Response to call light is initiated within 5 min ^j								
Unit ^b			11.356	2	0.003			
Surgical unit	−0.667	0.261	6.534	1	0.011	0.513	0.308	0.856
Intensive care unit	−1.121	0.383	8.568	1	0.003	0.326	0.154	0.690
Working years in the profession	−0.012	0.021	0.331	1	0.565	0.988	0.947	1.030
Working years in the unit	−0.035	0.030	1.388	1	0.239	0.965	0.911	1.024
Working hours per week	0.027	0.014	3.771	1	0.052	1.027	1.000	1.055
Number of patients cared for in a shift	−0.001	0.013	0.009	1	0.924	0.999	0.974	1.024
Number of nurses working in the shift	−0.076	0.075	1.047	1	0.306	0.926	0.800	1.073
Shifts status ^c	0.074	0.435	0.029	1	0.864	1.077	0.459	2.527
Shifts counts	−0.018	0.036	0.242	1	0.623	0.982	0.914	1.055
Intention to leave the unit ^d			1.598	2	0.450			
Occasionally	0.217	0.305	0.503	1	0.478	1.242	0.683	2.259
Too often	0.549	0.435	1.590	1	0.207	1.731	0.738	4.064
Intention to leave the profession ^d			3.070	2	0.215			
Occasionally	0.466	0.294	2.511	1	0.113	1.594	0.895	2.838
Too often	0.569	0.395	2.071	1	0.150	1.766	0.814	3.834
Constant	−1.498	0.781	3.676	1	0.055	0.224		
PRN medication requests acted on within 15 min ^k								
Unit ^b			7.474	2	0.024			
Surgical unit	−0.165	0.256	0.412	1	0.521	0.848	0.513	1.402
Intensive care unit	−1.061	0.391	7.368	1	0.007	0.346	0.161	0.745
Working years in the profession	−0.014	0.021	0.466	1	0.495	0.986	0.946	1.027
Working years in the unit	−0.014	0.027	0.243	1	0.622	0.987	0.935	1.041
Working hours per week	0.036	0.014	7.120	1	0.008	1.037	1.010	1.065
Number of patients cared for in a shift	−0.005	0.012	0.165	1	0.685	0.995	0.971	1.020
Number of nurses working in the shift	−0.073	0.074	0.955	1	0.328	0.930	0.804	1.076

TABLE 2 (Continued)

	B	S.E.	Wald	df	Sig.	Exp (B)	95% CI for Exp (B)	
							Lower	Upper
Shifts status ^c	0.046	0.425	0.012	1	0.914	1.047	0.455	2.410
Shifts counts	-0.024	0.036	0.449	1	0.503	0.976	0.909	1.048
Intention to leave the unit ^d			1.153	2	0.562			
Occasionally	-0.026	0.297	0.008	1	0.930	0.974	0.545	1.743
Too often	0.378	0.425	0.790	1	0.374	1.459	0.634	3.354
Intention to leave the profession ^d			2.209	2	0.331			
Occasionally	0.373	0.288	1.676	1	0.195	1.452	0.826	2.552
Too often	0.493	0.388	1.615	1	0.204	1.636	0.766	3.498
Constant	-1.896	0.768	6.100	1	0.014	0.150		
Assess effectiveness of medications ^l								
Unit ^b			3.723	2	0.155			
Surgical unit	-0.172	0.255	0.455	1	0.500	0.842	0.510	1.388
Intensive care unit	-0.705	0.366	3.721	1	0.054	0.494	0.241	1.011
Working years in the profession	-0.028	0.021	1.783	1	0.182	0.972	0.933	1.013
Working years in the unit	0.014	0.026	0.277	1	0.599	1.014	0.963	1.067
Working hours per week	0.024	0.013	3.287	1	0.070	1.024	0.998	1.051
Number of patients cared for in a shift	-0.007	0.012	0.349	1	0.555	0.993	0.969	1.017
Number of nurses working in the shift	-0.098	0.074	1.734	1	0.188	0.907	0.784	1.049
Shifts status ^c	0.016	0.420	0.002	1	0.969	1.017	0.446	2.315
Shifts counts	-0.001	0.035	0.001	1	0.971	0.999	0.933	1.069
Intention to leave the unit ^d			4.624	2	0.099			
Occasionally	-0.157	0.288	0.297	1	0.586	0.855	0.486	1.503
Too often	0.640	0.411	2.427	1	0.119	1.897	0.848	4.245
Intention to leave the profession ^d			1.963	2	0.375			
Occasionally	0.287	0.282	1.038	1	0.308	1.332	0.767	2.314
Too often	0.504	0.377	1.783	1	0.182	1.655	0.790	3.468
Constant	-1.262	0.748	2.845	1	0.092	0.283		

^aModel (likelihood ratio) chi-square = 38.238, $df = 13$, $p = 0.000$. Nagelkerke $R^2 = 0.12$. Percent correctly classified = 65.9%.

^bReference category = medical units.

^cReference category = Not working in rotating shift.

^dReference category = Never.

^eModel (likelihood ratio) chi-square = 24.300, $df = 13$, $p = 0.028$. Nagelkerke $R^2 = 0.08$. Percent correctly classified = 71.1%.

^fModel (likelihood ratio) chi-square = 26.061, $df = 13$, $p = 0.017$. Nagelkerke $R^2 = 0.09$. Percent correctly classified = 79.9%.

^gModel (likelihood ratio) chi-square = 27.094, $df = 13$, $p = 0.012$. Nagelkerke $R^2 = 0.10$. Percent correctly classified = 78.1%.

^hModel (likelihood ratio) chi-square = 32.573, $df = 13$, $p = 0.002$. Nagelkerke $R^2 = 0.10$. Percent correctly classified = 68.7%.

ⁱModel (likelihood ratio) chi-square = 29.850, $df = 13$, $p = 0.005$. Nagelkerke $R^2 = 0.11$. Percent correctly classified = 78.4%.

^jModel (likelihood ratio) chi-square = 27.024, $df = 13$, $p = 0.012$. Nagelkerke $R^2 = 0.09$. Percent correctly classified = 71.4%.

^kModel (likelihood ratio) chi-square = 22.613, $df = 13$, $p = 0.047$. Nagelkerke $R^2 = 0.07$. Percent correctly classified = 71.9%.

^lModel (likelihood ratio) chi-square = 23.065, $df = 13$, $p = 0.041$. Nagelkerke $R^2 = 0.07$. Percent correctly classified = 69.9%.

adjusted models showed that for each additional working year in the unit, there was a decrease in the odds of MNC in vital sign assessment (OR 0.89, 95% CI 0.82–0.96) and bedside glucose monitoring (OR 0.92, 95% CI 0.86–0.99) (Table 2).

The adjusted models revealed that for every 1-h increase in weekly working hours, there was a higher likelihood of missing turning patients (OR 1.03, 95% CI 1.00–1.05), vital sign assessment (OR 1.03, 95% CI 1.00–1.07), monitoring intake/output (OR 1.03, 95% CI 1.00–

1.06), bedside glucose monitoring (OR 1.04, 95% CI 1.01–1.07) and PRN medication requests (OR 1.03, 95% CI 1.01–1.06) (Table 2).

The number of patients cared for in a shift was found to be a significant predictor of ambulation (OR 1.03, 95% CI 1.01–1.05). The likelihood of missing ambulation increases with every increase in the number of patients cared for in a shift. However, the number of nurses in the shift, shift status and number of shifts were not found to be significant predictors of MNC activities (Table 2).

According to adjusted models, nurses who had an intention to leave the unit too frequently had significantly higher probabilities of missing the turning of patients (OR 3.03, 95% CI 1.31–7.00) and mouth care (OR 3.14, 95% CI 1.37–7.19) compared with nurses who had no desire to leave. However, intention to leave the profession was not found to be a significant predictor of MNC activities (Table 2).

4 | DISCUSSION

4.1 | The levels of each MNC activity

This study found that emotional support, patient bathing and ambulation were the most frequent MNC activities, whereas vital sign assessments, documentation and drug delivery were the least frequent. These findings are consistent with those of previous studies showing high rates of missed emotional support (88%) (Saar et al., 2021), bathing (81%) and ambulation (78%) (Cho et al., 2020). Medication administration (Simonetti et al., 2021) and vital signs monitoring (Nahasaram et al., 2021) were also identified as infrequent MNC activities. Nurses tended to prioritize structured and time-sensitive care activities, indicating the influence of the dominant biomedical model in the healthcare system. The biomedical model creates challenges in delivering holistic and patient-centred care, including a reductionist approach, disease-centric paradigm, technological dependency and fragmented care delivery (Maeda & Socha-Dietrich, 2021). Similar challenges exist in Turkey's healthcare system, in which treatment-oriented and disease-centred approaches are prioritized. Efforts should be made to address these barriers and promote patient-centred care models that prioritize well-being and patient preferences.

4.2 | The reasons for MNC

Inadequate staffing and increased patient volume were identified as the primary reasons for MNC. Similar findings have been reported in studies conducted in Malaysia (Nahasaram et al., 2021) and the Czech Republic (Jarošová et al., 2021), where insufficient staff and urgent situations are common issues for MNC. It is believed that the work environment, including a high workload, staffing shortages, time constraints, inadequate resources and lack of support, significantly contributes to MNC. Studies have shown that a better work environment, including adequate staffing and resources, is associated with higher work satisfaction, improved safety perception and fewer reasons for MNC (Dutra & Guirardello, 2021). Poor staffing and resource adequacy are strongly linked to an increased likelihood of MNC, whereas an improved work environment is associated with less MNC and better patient outcomes. Nantsupawat et al. (2022) show a 39% increase in the likelihood of MNC with each unit increase in poor staffing and resource adequacy score. Simonetti et al. (2021) found that a one-SD increase in the quality of the work environment was associated with a 20% reduction in the odds of MNC. Creating and sustaining a healthy work environment with adequate staffing,

resources and supportive management practices is crucial for enhancing nurses' satisfaction, reducing MNC and improving the quality of patient care.

4.3 | The predictors of each MNC activity

This study found significant variations in six MNC activities based on the unit. Ambulation and responses to call lights were less frequently missed in surgery units, whereas close patient monitoring was less frequently missed in intensive care units. Previous studies have consistently reported similar variations based on unit or healthcare setting (Campbell et al., 2020; Jarošová et al., 2021). Factors such as patient complexity, available resources, staffing levels and nature of the care provided are thought to contribute to these differences. In specialized clinics or critical care units with complex patient conditions, the likelihood of MNC may be higher than in general outpatient clinics or less acute settings. Nurses adjust their care according to patients' conditions and caregiving demands (Minton & Batten, 2021). Considering that the unit context and patient acuity are crucial when addressing MNC, tailored strategies and resources may be needed to mitigate MNC in different unit types.

The study revealed that as nurses' professional and clinical experience increased, the occurrence of MNC activities such as ambulation, vital sign monitoring and glucose monitoring decreased. Ambulation, vital sign monitoring and glucose monitoring are vital assessments that enable nurses to gather crucial information for evaluating patients and making informed care decisions. These findings suggest that experienced nurses prioritize their care activities differently based on their clinical reasoning skills, knowledge bases and proactive care approaches. As nurses become more experienced, they develop problem-solving skills that enhance their ability to assess patients and make critical judgements. Experienced nurses rely more on their intuition, beliefs and knowledge when providing care (Kwon et al., 2020; Tan et al., 2016).

This study showed an association between increased weekly working hours and a higher likelihood of missing vital sign assessments, intake/output monitoring, bedside glucose monitoring and PRN medication requests. These nursing activities require close monitoring and are crucial for patient safety. Missing these activities leads to adverse patient outcomes, particularly when sudden changes in a patient's condition are overlooked. Shorter shifts have been associated with lower MNC rates and fewer adverse events than longer shifts (Koy et al., 2022). Previous studies have highlighted that prolonged work hours can have detrimental effects on nurses, including distraction from important nursing activities, decreased cognitive effectiveness and job performance, increased fatigue and burnout, and hindered overall performance (James et al., 2020; Lin et al., 2021). In fact, work-related burnout doubles when hours exceed 60, triples when hours exceed 74 and quadruples when hours surpass 84 compared to a standard 40-h workweek (Lin et al., 2021). Healthcare organizations and policymakers should acknowledge the potential consequences of long working hours on nursing care quality and

patient safety. Implementing strategies to address workload issues, optimize staffing levels, promote work-life balance, and provide adequate breaks and rest periods can help mitigate the risk associated with extended work hours.

This study demonstrated a concerning trend as the likelihood of missing ambulation increased with each additional patient being cared for during a nursing shift. Ambulation is a care activity that requires dedicated time and close patient follow-up (Doherty-King et al., 2014). With a higher patient load, nurses have less time available for individual patient care (Moghadam et al., 2021), which can pose challenges in providing adequate attention and supervision during ambulation. This has implications for patient safety and well-being. Wiczorek-Wojcik et al. (2020) found that an increase in nursing hours per patient day was associated with a decrease in the likelihood of unplanned death events by 36%. Addressing the issue of patient load and its impact on MNC activities requires a multifaceted approach, including appropriate staffing levels, effective workload management strategies, and consideration of patient complexity and acuity when determining nurse-patient ratios.

Nurses who frequently expressed an intention to leave the unit had higher rates of MNC in important aspects, such as patient turning and mouth care. This aligns with previous research that emphasized the impact of the intention to leave on MNC. Smith et al. (2020) indicate a 46% higher likelihood of intending to leave for every SD increase in MNC. The intention to leave among nurses negatively affects the care process, fostering dissatisfaction and creating an uneasy working environment. Nurses with such intentions often feel unsafe and experience reduced job satisfaction (Kox et al., 2020; Zhu et al., 2021). Conversely, job satisfaction is associated with a focus on addressing patient care needs and ensuring quality care (Karlsson et al., 2019). Additionally, nurses' perspectives on these care activities were significant. Patient turning and mouth care require comprehensive evaluation and responsibility for patient well-being and safety (Brooker et al., 2020; Coker et al., 2017). However, nurses may lack willingness to perform these activities, perceiving them as challenging and unappealing and prioritizing other tasks instead (Doshi et al., 2021; van Noort et al., 2020). Considering both the intention to leave and the nurses' perceptions, it is understandable that these care activities are frequently missed. Promoting job satisfaction and creating a supportive culture can mitigate the intention to leave and its negative impact on MNC.

4.4 | Limitations and strengths

This study had several limitations. First, the generalisability of the results may have been limited by the specific context in which the study was conducted. Second, relying solely on self-reported surveys to assess MNC activities and causes introduces the possibility of bias and may not capture the full extent of the phenomenon. The original plan of the study was to include a larger sample from 24 hospitals across Turkey. However, challenges in obtaining research permissions and subsequent delays resulted in a final sample size of only seven healthcare institutions. The COVID-19 pandemic has also presented

challenges in data collection, leading to restrictions on face-to-face interactions. Despite these limitations, this study adhered to the STROBE checklist to report essential methodological details and provided valuable insights into the MNC situation in different regions of Turkey, offering a broader perspective on this issue. Additionally, the interpretation of MNC in each care activity is valuable because it sheds light on more effective and comprehensive strategies.

5 | CONCLUSION

The findings of this study align with those of previous studies and highlight MNC as a universal challenge in healthcare systems. Overall, MNC was reported at a low level. Life-threatening procedures were missed the least, while person-centred care activities were missed more frequently. Significant factors contributing to MNC were identified, including unit type, nurses' experience, nurse-patient ratio, working hours and intention to leave. The research findings unequivocally demonstrate that multiple variables influence each care activity. Consequently, multidimensional strategies must be developed to address this issue. It is crucial to examine the impact of each strategy on reducing each MNC activity. Therefore, researchers should focus on these aspects.

AUTHORSHIP STATEMENT

All listed authors meet the authorship criteria, and all authors agree with the manuscript's content. All authors were responsible for the conception and study design. Bahar Çiftçi, Hayat Yalin, Emine Geçkil, Sümeyra Mihrap İlater, Banu Terzi, Mağfired Kaşıkçı and Şule Ecevit Alpar were responsible for data collection. Fatma Dursun Ergezen, Ayşegül Korkmaz Doğdu and Emine Kol were responsible for analysis and interpretation of data. Fatma Dursun Ergezen was responsible for drafting of the article. Bahar Çiftçi, Hayat Yalin, Emine Geçkil, Banu Terzi, Emine Kol, Mağfired Kaşıkçı and Şule Ecevit Alpar were responsible for revising it critically for important intellectual content. All authors approved the final version for submission.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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APPENDIX A.

The formula:

$$\frac{NZ_a^2pq}{d^2(N-1) + Z_a^2pq}$$

N = Total of eligible nurses (13,887)

Z_a = 95% confidence level

p = prevalence (30%)

d = 5% precision

$$\left[(13.887) \times (1.96^2) \times (0.3) \times (0.7) \right] / \left[(0.05^2) \times (13.887) + (1.96^2) \times (0.3) \times (0.7) \right] = 315$$

Statistical Region Units Classification	Number of nurses in the province in the last year	Stratified weight*	Number of nurses to be included **	Number of nurses included in the study
West Marmara Region	1.061	1.061/13.887 = 0.07	0.07 x 315=24	61
West Anatolia Region	4.562	4.562/13.887 = 0.32	0.32 x 315=104	120
Mediterranean Region	2.067	2.067/13.887 = 0.14	0.14 x 315= 47	96
Middle Anatolia	1.362	1.362/13.887 = 0.09	0.09 x 315= 31	51
East Black Sea Region	1.514	1.514/13.887 = 0.10	0.10 x 315= 34	52
Northeast Anatolia Region	1.759	1.759/13.887 = 0.12	0.12 x 315= 40	48
Central East Anatolia Region	1.562	1.562/13.887 = 0.11	0.11 x 315= 35	49