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# Examining the reasons for missed nursing care from the viewpoints of nurses in public, private, and university hospitals in Jordan: A cross-sectional research

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## ABSTRACT

**Background:** Missed nursing care is an indicator of quality nursing care. It is a significant healthcare delivery problem, especially given increased demand and limited resources worldwide, including in Jordan. It is paramount to identify the reasons for missed care in hospital settings.

**Aim:** To identify the perceptions of registered nurses for missed nursing care in medical and surgical wards in Jordanian hospitals. We also aimed to identify differences in the reported reasons for missed nursing care across three healthcare sectors: public, private, and university.

**Methods:** A quantitative approach utilising a cross-sectional design was conducted by surveying registered nurses at 10 hospitals in Jordan. This study employed the *MISSCARE Survey* tool. The data collection was performed between March and July 2021. Descriptive statistics and analysis of variance were used to address the objectives.

**Findings:** A sample of 672 registered nurses working in medical and surgical wards in 10 acute care hospitals in Jordan were recruited. The major reason for missed nursing care was inadequate number of staff. Communication issues were more important to missed nursing care in university hospitals than public and private hospitals.

**Conclusion:** A study of Jordanian registered nurses revealed that a perceived shortage of human resources is the principal reason for missed nursing care in medical and surgical wards. Comparing the reasons for missed nursing care between the three hospital sectors could help nursing administrators to tailor operational interventions to mitigate the effect of these causes. Therefore, reducing missed nursing care.

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### Summary of relevance

#### Problem or Issue

Little is known about missed nursing care reasons in the Jordanian context.

#### What is already known

Missed nursing care refers to elements of nursing care elements that are not provided or delayed significantly for patients. Missed nursing care endangers patient safety and outcomes.

#### What this paper adds

The results of this research could assist nurse managers and decision-makers to create appropriate interventions to reduce missed care events. This would promote the provision of quality and safe nursing care.

## 1. Introduction and background

Patient safety has become a central priority of healthcare systems across the globe (Nantsupawat et al., 2021). Nurses constitute the largest proportion of healthcare providers (Marufu, Collins, Vargas, Gillespie, & Almghairbi, 2021). Research reveals that nursing care significantly influences patient safety (Najafi, 2021) and the overall quality of healthcare (Aiken et al., 2017; Marufu et al., 2021). Missed nursing care (MNC) is a global healthcare issue (Janatolmakan & Khatony, 2022; Najafi, 2021) that causes increased concern due to its impact on both patient safety and nursing care quality (Lee & Kalisch, 2021). Evidence demonstrates that more than 50% of the nurses stated that they always or frequently leave at least one patient care item undone during their shifts (Lake et al., 2017; Lake, French, O'Rourke, Sanders, & Srinivas, 2020). Therefore, there is an increased emphasis on exploring this dilemma in research and nursing practice worldwide (Imam et al., 2021).

MNC is defined as “any aspect of required patient care that is omitted (either in part or in whole) or delayed” (Kalisch, Landstrom, & Hinshaw, 2009, p. 1510). Therefore, MNC may be considered as errors of omission (Jones, Hamilton, & Murry, 2015). It is also referred to as care left undone or task incompleteness. It is a significant predictor of adverse patient outcomes and an important indicator for quality healthcare in healthcare institutions (Imam et al., 2021). Evidence demonstrates that MNC is associated with higher rates of mortality, failure to maintain, and adverse events (Willis & Brady, 2021). MNC also has negative consequences on the nurses themselves, such as absenteeism and reduced job satisfaction (Ausserhofer et al., 2014), as well as high rates of burnout and turnover of nursing staff (Bryant & Yoder, 2021), which in turn results in a significant burden on the healthcare system and patient safety (Lee & Kalisch, 2021).

The research literature reveals several fundamental reasons for MNC in hospital settings including inadequate staffing levels, lack of material resources, and poor communication (Kalisch, Tschannen, Lee, & Friese, 2011). A cross-sectional study conducted in the Czech Republic found that staffing and labour resources were the most important reasons for MNC. This study also found significant variations between university and regional hospitals in material and human resources (Gurková, Bartoničková, Mikšová, Labudíková, & Chocholková, 2021).

A previous study in Jordan with 362 nurses revealed labour resources, followed by material resources, and poor communication as the most common reasons for missed care (Saqr & AbuAlRub, 2018). This was confirmed in another Jordanian study conducted in three hospitals with 300 nurses, which found that labour resources were the most common reasons for MNC (Al-

Faouri, Obaidat, & AbuAlRub, 2021). Similar studies in Saudi Arabian hospitals have shown that the foremost reason for missed nursing care is labour shortages, followed by lack of material and poor communication (Alasmari et al., 2021). A high patient-to-nurse ratio was found to negatively impact on instances of missed care in another Saudi study (Tenorio et al., 2021). Another study in Iran found that staff shortages, time constraints, and shortage of materials and equipment were identified as reasons for MNC (Dehghan-Nayeri, Shali, Navabi, & Ghaffari, 2018). These studies illustrate the impact of worldwide nursing shortages on the occurrence of MNC (Marufu et al., 2021).

Medical-surgical nurses are considered the largest group of working nurses in hospital settings. Medical-surgical nurses have been described as “the foundation of our healthcare system” (Canadian Association of Medical and Surgical Nurses (CAMSN), 2008) and the backbone of the hospital (McClain, 2020). However, medical-surgical nursing is one of the most highly demanding specialties in hospitals due to the high nurse-to-patient ratio, rapid rates of admissions and discharges, the variety of patient conditions, and the potential severity of health complications (McClain, 2020). In addition, providing care for patients in medical and surgical wards frequently requires complex nursing care (Burdeu, Lowe, Rasmussen, & Considine, 2021). Therefore, increased medical errors are experienced in these settings (Boostani et al., 2019).

Jordan is an Arab country in the north of the Arabian Peninsula to the west of Asia (Nazer & Tuffaha, 2017). Jordan's health sector is regarded as one of the most advanced and modern health systems in the Middle East region (Amarneh, Raza, Matloob, Alharbi, & Abbasi, 2021). The Jordanian health system is a complex blend of private and public sectors. There are 31 public hospitals, 12 military hospitals, 2 teaching hospitals (university affiliated), and 61 private hospitals. The public sector is made up of hospitals from the Ministry of Health (MOH), Royal Medical Services and universities. While the sector has few resources to optimise healthcare, it does serve most of the population (Ministry of Health, 2013).

Despite the surge in MNC studies, there is limited evidence on the topic of MNC in low and middle-income countries (LMICs) (Imam et al., 2021). In particular, little is currently known about the reasons for MNC in the medical and surgical wards in the Jordanian healthcare context. Given the paucity of research, there is a need to investigate nurses' views about the reasons for missed care. More specifically, this study is needed as LMICs settings have limited resources. There are variations in hospital structures, work environments, and institutional contexts that differ from developed countries. It is also suggested that the precursors that might attribute to MNC are different from those in developed settings (Imam et al., 2021). In particular, the causes of MNC can differ due to limited economic resources and environmental factors in a healthcare system for each country (Chegini et al., 2020). In developing countries, increased demands for care due to technological improvements, an ageing population, increasing demands resulting from chronic diseases and decreases in nursing staff may cause some or all of the nursing care that patients need to be left undone or delayed (Rivaz et al., 2017). This study aimed to assess Registered Nurses' (RNs) perceptions of the reasons of MNC in medical and surgical wards in Jordanian hospitals. It also sought to identify if there were differences in MNC reasons between various hospital types and how this could be explained. The goal was to gain knowledge that can be utilised by nurses, healthcare managers, and decision-makers, which subsequently may help improve quality nursing care delivered to the patient in healthcare organisations, and may lead to better approaches and measures to minimise MNC in different healthcare sectors.

## 2. Methods

### 2.1. Study design

This study was conducted using a cross-sectional design to explore the reasons for MNC as perceived by RNs in medical and surgical wards in Jordan.

### 2.2. Setting and sample

The study was performed at 10 hospitals with bed capacities of more than 150 beds at each hospital. RN's in hospitals from the north, middle, and south of Jordan were selected. Overall five public, three private, and two university hospitals were included. It was assumed that different types of hospitals and areas in the country would impact on the perceptions of nurses (Pires et al., 2018).

We used a convenience sampling technique to recruit RNs employed in medical and surgical wards in these hospitals. Convenience sampling helps gather data from individuals who are readily available to the researcher at the time of data collection (Palinkas et al., 2015). Medical and surgical wards were selected because they provide multidisciplinary care such as medical cardiology, gastroenterology, nephrology, orthopaedics, ear, nose and throat care, and urology (Coetzee, Klopper, Ellis, & Aiken, 2013). The inclusion criteria were as follows: RNs employed in the current setting for not less than a year who can read and write in English were available at the time of data collection and willing to be involved in the study. Nurses working in managerial positions who were not in direct contact with patient care, and nurses on maternity, or annual/vacation leave, during the data collection period were excluded.

A total of 1000 questionnaires were delivered to RNs in the 10 hospitals with an overall valid response rate of 67.5% ( $n = 675$ ). Three surveys had extensive missing data; leaving 672 respondents included in the final analysis.

### 2.3. Instrument and data collection

The *MISSCARE Survey* was utilised to gather data in this study. This tool was created in the USA, and it is currently one of the most widely used to measure MNC worldwide (Palese et al., 2021). Permission to use the survey was granted from the authors (Dabney, Kalisch, & Clark, 2019). The *MISSCARE Survey* had three sections, described as follows.

Questions that address demographic and work-related characteristics such as the type of ward, age, gender, experience, education level, overtime, number of patients cared for in the current or previous shift, numbers of admissions and discharges during the last shift, missing days or shifts in the past three months. In Part A (elements of MNC), nursing staff are asked to indicate the elements of missed nursing care and to grade the relative frequency of care missed for each element. The options are categorised into a five-point Likert scale (always missed, frequently missed, occasionally missed, rarely missed, and never missed). In Part B (Reasons for MNC), nursing staff are asked to specify the reasons for missing care. The options are categorised into a four-point Likert scale (significant reason, moderate reason, a minor reason, or not a reason for missed care). As per the objectives of the current study, we concentrated on analysing the elements in Part B in the *MISSCARE Survey*. The findings of Part A of the *MISSCARE Survey* will be reported separately. A pilot study was conducted to test the clarity of the survey items. Five ( $N = 5$ ) nurses from one hospital participated in the pilot study. Based on the analysis of pilot study, the instrument was deemed to be

clear and comprehensible, so, no modifications were made to the questionnaire.

The study was conducted during the second wave of the COVID-19 pandemic between March and July 2021. The data for the study were collected with assistance from six research assistants who have at least a bachelor's degree in nursing. Once approval to perform the study was obtained from the hospitals, all nurses in the medical and surgical wards were approached to participate in the survey. After answering the questionnaire, the participants were asked to drop the completed survey in their department's secured data collection box. Research assistants followed up with participants with weekly reminders to increase the response rate. The completed surveys were returned to the unit manager's office and then recollected by the designated research assistants in each hospital, who handed them over to the principal investigator in a sealed envelope. Questionnaires were delivered in English as it is the main language used by the nursing staff in the Jordanian hospitals. English is the primary language for both nursing education and documentation in the Jordanian healthcare system (Al-Hamdan, Manojlovich, & Tanima, 2017; Obeidat, Qan'ir, & Turaani, 2018).

### 2.4. Data analysis

The data were entered and analysed using the Statistical Package for Social Science (SPSS) version 21. Descriptive analysis with frequencies, percentages, means and standard deviation were generated to describe the participants' demographic and work-related attributes and their perceptions about reasons behind missed nursing care.

For the purposes of understanding and evaluating the Likert scale responses for nursing attitudes towards MNC, all item scores in section B of the *MISSCARE Survey* were converted to a dichotomous score, whereby significant and moderate reason (codes 4 and 3) were regarded as a reason for MNC and minor and not a reason (codes 2 and 1) were considered as not a reason for MNC. Reasons for missed nursing care as perceived by respondents were then described using frequencies and percentages.

To further investigate differences in reasons for MNC among different sectors, total scores were created for subscales (labour, material resources and communication). The subscales were described using means and standard deviations (SD) and analysed using analysis of variance. Post-hoc tests were performed to examine differences between groups with mean differences and 95% confidence intervals reported. Residuals of the model were checked for normality and homoscedasticity by examining descriptive statistics and plots. To address assumption violations, bias-corrected and accelerated (BCa) bootstrap estimates (5000 resamples) were used to produce robust standard errors and confidence intervals. The significance level for this study was 0.05 with  $p < 0.05$  considered statistically significant.

The internal consistency reliability estimated using Cronbach's coefficient alpha of the original English version of the *MISSCARE Survey* ranged between 0.64 and 0.86 (Kalisch et al., 2011). In the present study, the internal consistency analysis of the instrument of Part B was done using the Alpha Cronbach coefficient, whose value was 0.95, which is above the recommended level of 0.70 (Sekaran & Bougie, 2010).

### 2.5. Ethical considerations

The study was approved by the university human subjects' ethics committee (reference number: 67/2020/4598). Approval from the institutional review board at the Ministry of Health, and hospital administrators was also obtained. Official letters

**Table 1**  
Demographic and work-related characteristics of respondents (n = 672).

	Characteristic	Number	%
Gender	Female	421	62.6
	Male	251	37.4
Highest education level	Diploma	35	5.2
	Bachelor	577	85.9
	Graduate	60	8.9
Shifts	Morning	383	57
	Evening	146	21.7
	Night	143	21.3
Wards	Medical	263	39.1
	Surgical	311	46.3
	Combined	98	14.6
Hospital type	Public	297	44.2
	Private	164	24.4
	University	211	31.4
	Mean	SD	
Age	30.67	5.60	
Hours of overtime in the past 3 months	3.54	15.36	
Days or shifts missed due to illness in the past 3 months	1.27	3.70	
Number of patients cared for in the current or last shift	10.9	7.3	
Patient admissions	3.9	3.8	
Patient discharges	3.3	3.6	

of co-operation were written to all hospitals to gain their co-operation in facilitating the study. Information on the study was provided to the participants, including the procedures followed, the potential hazards and advantages of the study, ethical information including that survey participation was voluntary and anonymous, and that by completing the survey they were giving their consent to be involved in this research. The respondents were informed of their right to refuse or withdraw from the study at any time and that refusing to participate in the study did not have any negative consequence. Participant consent was presumed by survey completion, although, one university hospital required the participants to sign a printed consent form. All completed surveys were coded for analysing purposes and stored in the researcher's office on a password-protected laptop computer.

### 3. Findings

#### 3.1. Demographic characteristics of respondents

The demographic and work-related characteristics of the participants are summarised in [Table 1](#). A total of 672 RNs participated in this study about their perceptions of MNC (response rate: 68%). The mean age of the sample was 30.7 years. The sample included 251 males (37.4%) and 421 females (62.6%). The majority of responses came from bachelor's degree holders (n = 577, 85.9%) were working in public hospitals (n = 297, 44.2%). In terms of shift work, 57% of the participants worked in the morning shifts (n = 383). The mean number of patients cared for in the current, or the previous shift was 10.9, with an average of 3.9 admissions and 3.3 discharges during the shift.

The reasons for MNC are presented in [Table 2](#). The major reasons identified by nurses for MNC were: inadequate number of staff (n = 538, 80.1%), an inadequate number of assistive personnel (n = 518, 77.1%), unexpected rise in patient volume and/or acuity on the unit (n = 491, 73.1%), and physical and emotional exhaustion (n = 427, 63.5%). About 60% of the participants reported inadequate support from leadership as a reason for MNC. Nurses indicated that the unavailability of the supplies/equipment when needed was also a reason for MNC in their working unit (n = 358, 53.3%), followed by the shortage of medication (n = 355, 52.8%).

Communication was identified as a factor in MNC. Nurses reported under this element: unbalanced patient assignments (n = 484, 72%), inadequate supervision of nursing assistants (n = 424, 63.1%), lack of cues/reminders (n = 403, 60%), followed by inadequate hand-off from previous shift or sending unit, and other departments did not provide the care needed (e.g. physical therapy did not ambulate) (n = 361, 53.7%) were all factors in MNC.

Descriptive statistics identified the top three reasons of MNC across the three sectors. In the public sector, the major reason was unexpected rise in patient volume and/or acuity on the unit (72.7%). On the other hand, urgent patient situation (e.g. a patient's condition worsening) was the most common reason for missed care in private hospitals (87.2%). In the university sector, an inadequate number of staff was perceived as the most common reason for MNC (87.2%; [Table 3](#)).

Analysis of variance indicated that there were statistically significant differences in the mean scores of the labour resources (F = 4.8; p = 0.009), material resources (F = 88.0; p < 0.001), and communication (F = 21.0; p < 0.001) among different hospital sectors. Minor violations of the assumptions were observed for labour and material resources but not for communication, for consistency bootstrapped estimates were provided for the three outcomes. Labour resources were more important for RNs working in private hospitals, compared to those working in public (mean difference (md) = -1.2, CI -2.0, -0.3; p = 0.006) and university hospitals (md = -0.4, CI -1.2, 0.4; p = 0.317). Material resources were higher for nurses working in public hospitals than RNs working in private (md = -2.9, CI -3.3, -2.4; p < 0.001) but similar to university hospitals (md = 0.1, CI -0.4, 0.4; p = 0.959). Communication issues were more important for RNs working in university hospitals than those working in public (md = -0.9, CI -2.2, 0.4; p = 0.164) and private hospitals (md = -4.5, CI -5.9, -3.0; p < 0.001). The mean scores and F-ratios for all subscales for different hospital types are presented in [Table 4](#).

### 4. Discussion

MNC is a complex healthcare issue that has a significant impact on patient safety ([Albelbeisi, Shaqfa, Aiash, Kishta, & Alrejqeb, 2021](#); [Albsoul, FitzGerald, Hughes, & Alshyyab, 2021](#)). The aim

**Table 2**  
Descriptive statistics of the reasons for missed nursing care as perceived by respondents (n = 672).

Domain	Reason	Reason for MNC n (%)	Not a reason for MNC n (%)
Labour resources	Inadequate number of staff	538 (80.1)	134 (19.9)
	Unexpected rise in patient volume and/or acuity on the unit	491 (73.1)	181 (26.9)
	Inadequate number of assistive and/or clerical personnel (e.g. nursing assistants, technicians, unit secretaries etc.)	518 (77.1)	154 (22.9)
	Emotional or physical exhaustion	427 (63.5)	245 (36.5)
	Interruptions/Multitasking	449 (66.8)	223 (33.2)
Material resources	Inadequate support from leadership	404 (60.1)	268 (39.9)
	Medications were not available when needed	355 (52.8)	317 (47.2)
	Supplies/ equipment not available when needed	358 (53.3)	314 (46.7)
Communication	Supplies/ equipment not functioning properly when needed	348 (51.8)	324 (48.2)
	Inadequate hand-off from previous shift or sending unit	361 (53.7)	311 (46.3)
	Other departments did not provide the care needed (e.g. physical therapy did not ambulate)	361 (53.7)	311 (46.3)
	Lack of back up support from team members	355 (52.8)	317 (47.2)
	Tension or communication breakdowns with other ancillary /support departments	360 (53.6)	312 (46.4)
	Tension or communication breakdowns within the nursing team	355 (52.8)	317 (47.2)
	Tension or communication breakdowns with the medical staff	358 (53.3)	314 (46.7)
	Nursing assistant did not communicate that care was not provided	337 (50.1)	335 (49.9)
	Caregiver off unit or unavailable	351 (52.2)	321 (47.8)
	Inadequate supervision of nursing assistants	424 (63.1)	248 (36.9)
	Lack of cues/reminders	403 (60)	269 (40)
	Unbalanced patient assignments	484 (72)	188 (28)

**Table 3**  
Most reasons of missed nursing care by hospitals.

Sector	MNC	n (%)
Public	Unexpected rise in patient volume and/or acuity on the unit	216 (72.7)
	Inadequate number of assistive and/or clerical personnel (e.g. nursing assistants, technicians, unit secretaries etc.)	215 (72.4)
Private	Inadequate number of staff	213 (71.7)
	Urgent patient situations (e.g. a patient's condition worsening)	143 (87.2)
	Inadequate number of staff	141 (85.9)
University	Unexpected rise in patient volume and/or acuity on the unit	139 (84.8)
	Inadequate number of staff	184 (87.2)
	Inadequate number of assistive and/or clerical personnel (e.g. nursing assistants, techs, unit secretaries etc.)	172 (81.5)
	Urgent patient situations (e.g. a patient's condition worsening)	160 (75.8)

**Table 4**  
Comparison of the reasons of missed nursing care according to the type of hospitals (analysis of variance results).

N = 672 domain	Public hospitals (mean, ±SD)	Private hospitals (mean, ±SD)	University hospitals (mean, ±SD)	F	p value
Labour resources	17.2 ± 4.4	18.4 ± 4.5	18.0 ± 3.6	4.8	0.009
Material resources	8.3 ± 2.5	5.4 ± 2.6	8.3 ± 2.2	88.0	<0.001
Communication	29.4 ± 7.3	25.8 ± 6.5	30.3 ± 6.8	21.0	<0.001

of this study was to examine the reasons for MNC in a sample of Jordanian hospitals. We also examined the differences in reasons of MNC across various hospital types in the Jordanian health-care sector. We used the English version of the MISSCARE survey to collect the data and descriptive and inferential statistics to address the objectives. Findings from this study reveal that about 37% of the participants were male. According to the national human resources for health observatory annual report, the percentage of male nurses who practice nursing in Jordan was around 35% in 2017 (Higher Health Council, 2017). This is very different from Western Europe, USA, and Australia where numbers are around 5%–10% (Albsoul, FitzGerald, Finucane, & Borkoles, 2019; Kalisch et al., 2011; Zeleníková et al., 2020).

We found that the mean number of patients cared for by nurses was 10.9. This is different from other countries where there is a mandated nurse–patient ratio, such as in California in the USA and Victoria and Queensland in Australia (1:4), but perhaps similar to many other European and Asian countries. A high nurse-to-

patient ratio has profound impacts, including high levels of stress and mental burnout among nurses, resulting in increased errors and accidents (Rassin & Silner, 2007). Research on MNC has not yet addressed the fact that the results appear to be the same worldwide, despite differences in the number of nurses on duty to care for patients. In the Jordanian context, nurses may depend on family members that accompany the patients in providing some aspects of care such as ambulation and feeding (Al-Faouri et al., 2021). Further research is needed to examine the differences in MNC across countries where nurse–patient ratios differ.

This study revealed that inadequate staff was the most frequently perceived reason for missed care in the three studied healthcare sectors. This finding is line with previous studies (Cho, Kim, Yeon, You, & Lee, 2015; Hernández-Cruz, Moreno-Monsiváis, Cheverría-Rivera, & Díaz-Oviedo, 2017; Janatolmakan & Khatony, 2022; Kalisch, Landstrom, & Williams, 2009; Putra, Dewi, Rahmayanti, & Budiaty, 2021; Zeleníková, Gurková, Jarošová, & Midwifery, 2019). Perceived insufficient staff leads to heavy workloads

(Junttila, Koivu, Fagerström, Haatainen, & Nykänen, 2016). In fact, nursing shortages are a worldwide issue and it is increasing in Jordan as many nurses are leaving the profession itself or leaving to work outside Jordan (Mrayyan, 2007). Therefore, there is a pressing need to recognise the staffing levels required to provide safe nursing care (Twigg, Kutzer, Jacob, & Seaman, 2019). It has been documented that availability of adequate nursing staff is crucial to achieve patient safety and reduce MNC (Griffiths et al., 2020; Hammad, Guirguis, & Mosallam, 2021). One Saudi study suggested that there are several strategies to address the gap caused by the shortage of nurses, including the implementation of overtime and floating policies (Muabbar & Alsharqi, 2021). Therefore, reducing the potential for missed care occurrence.

The findings revealed that labour resources were more important for nurses working in private hospitals compared with nurses working in university and public hospitals. It is anticipated that nurses in private hospitals are required to offer additional non-nursing procedures for patients, which may add to their workload and, therefore, missed care. One study found that nursing deficiency is one of the main factors leading to nursing burnout in the Jordanian private hospitals (Mrayyan, 2007). Nurses in public hospitals have superior practice environments due to high levels of job security in these hospitals (Mrayyan, Al-Rawashdeh, & Al-Omari, 2021). Public hospitals are able to offer contingent rewards to nursing staff including status, promotions and better salary (Abdelhafiz, Alloubani, & Almatari, 2016). However, it must be noted that the data for this study were collected during the second wave of the COVID-19 pandemic, whereby the Jordanian government rented private hospitals to treat COVID patients, which may have led to increases in the nursing workload in private hospitals. A recent study found that the current pandemic crisis can potentially influence the delivery of quality nursing care, leading to MNC. This study revealed that nurse staffing as a factor leading to the occurrence of the MNC as a significant concern. Especially given the increasing the rate of nurse turnover and intention to quit (Labrague, de Los Santos, & Fronda, 2022).

In this context, it is important to consider the effect of patient acuity in staffing decisions (Lake et al., 2020). Intense acuity of the patient is related to increased nurse workload and undermines care quality (Qureshi, Purdy, & Neumann, 2018). Therefore, staffing methods should consider individual patient variation with or as a replacement for minimum staffing levels relied on patient volume (Griffiths et al., 2020; Hammad et al., 2021).

Regarding material resources, the lack of supplies/equipment when needed was reported by nurses as a significant reason for MNC. This is consistent with several studies that found the unavailability of equipment is the reason for MNC (Janatolmakan & Khatony, 2022; Putra et al., 2021; Rivaz, Momennasab, Yektatalab, Ebadi, & JCDR, 2017). In addition, lack of equipment for diagnostic and treatment purposes leads to the transfer or referral of patients to a different facility (Dehghan-Nayeri et al., 2018). Also, nurses in public hospitals perceived material resources as more important than those working in private and university hospitals. In fact, private hospitals are equipped with more modern equipment than public hospitals (Al-Balushi & Khan, 2017).

Unbalanced patient assignment was among the most frequent communication reason for MNC. This is in line with previous research (Albsoul et al., 2019). Unbalanced nurse–patient assignment means that patients who need more complex care may be assigned to one nurse in a shift, compared to the workloads assigned to other nurses in the shift. These imbalances can result in higher working pressures and MNC, reducing quality healthcare and increasing healthcare expenses (Blackman et al., 2015). This emphasised that utilising traditional approaches of creating assignments such as nurse–patient ratio, without considering objective data may result in an unbalanced nurse workload, therefore MNC.

The intensity of nursing care is different based on the specific needs of patients. Preferably, assignments should consider variations in any patient-related procedures, including medical condition, psychosocial status, care transitions, and plans of nursing care (Meyer, Fraser, & Emeny, 2020). We found that lack of reminders was among the highest reported communication reasons for MNC. A cross-sectional study revealed that electronic care reminders resulted in a statistically significant decrease in MNC (Ronald & Kalisch, 2014).

Our study revealed that inadequate handover from the previous shift as one of the most frequent communication reasons for MNC. Handover is a complex process (Alberta David, Idang Neji, & Jane, 2018). Promoting nursing handover quality is a crucial obligation to enhance continuity of care (Alberta David et al., 2018) and quality healthcare and patient safety (Bergs et al., 2018; O'Connell, Ockerby, & Hawkins, 2014). In the Jordanian healthcare context, there are variations in the handover tools used across different hospitals. They mainly rely on voiced communication or separate day-to-day documentation sheets (Dalky, Al-Jaradeen, & AbuAlRub, 2020). One study found that poor handover in medical and surgical wards leads to nursing duties left undone by the nurse, which may add to the job list for the current shift (Ernst, McComb, & Ley, 2018). About 30% of patients experienced delayed care orders due to handover issues (Drach-Zahavy & Hadid, 2015).

One possible solution for mitigating handover issues in acute care hospitals would be minimising transfers of patients (Friesen, White, Byers, & nurses, 2008). This could be achieved by a change of facility design, such as acuity adaptable room, which reduces the number of patient transfers and medication errors in a significant manner (Hendrich, Fay, & Sorrells, 2004). Furthermore, utilising standardised methods of the nursing report such as situation, background, assessment, and recommendation (SBAR) will improve nursing communication (Shahid & Thomas, 2018). It has been revealed that The SBAR handover tool has not been used in Jordanian hospitals (Dalky et al., 2020). SBAR utilisation among nurses in healthcare positively impacts communication between nurses and increases job satisfaction (Dalky et al., 2020). There is a need for the inclusion of nurse handover in the training curriculum of nursing students to allow them to attain skills that will improve handover and communication (Alberta David et al., 2018).

Communication issues were also significant reasons for MNC in university hospitals, compared with public and private hospitals. University hospitals have variations of healthcare professionals, residents, medical and nursing students, and interns, which may negatively impact the effectiveness of communication among healthcare professionals. One study examining physicians' experience of communication with nurses in tertiary hospitals revealed that a strong hierarchical environment undermines communication in these hospitals (Park, Park, & Yu, 2018). One possible way to improve communication in university hospitals is to improve medical students' attitudes towards nurses (Barrere & Ellis, 2002). Nursing managers should implement interventions to mitigate the impact of the hierarchical culture on healthcare organisations' communication (Park et al., 2018), therefore, reducing MNC.

Given that the data collection for this study was performed during the pandemic, there was paramount attention towards the emotional and physical exhaustion experienced by healthcare providers to meet challenging demands during the COVID-19 pandemic. Of the participants, about 64% reported that emotional and physical exhaustion as a reason for MNC. A previous study was performed in China with nurses and physicians offering care during the COVID-19 pandemic. It was revealed that they feel exhausted as a result of operating in these new and unknown circumstances, as well as intense workload and the caution from being infected or infecting others (Liu et al., 2020).

Another important reason for MNC, especially in light of the current limited resources, was inadequate support from the leadership. About 60% of the participants perceived inadequate support from leadership as an important reason that led to the occurrence of MNC. Though, under limited resources, nurses can be motivated to diminish MNC. This can be achieved by creating and executing interventions of proactive leadership of head nurses (Srulovici & Yanovich, 2022).

#### 4.1. Strengths and limitations

Our findings demonstrate the necessity to consider these reasons when trying to address missed care in various hospital types. Therefore, minimise negative patient outcomes and improving patient safety. The strengths of this study comprise the large sample size and involvement of nurses from different sectors and geographical areas in Jordan. Furthermore, we have utilised a validated questionnaire which permits comparison with other previous studies. The limitations are the use of a cross-sectional study design. Using cross-sectional research hinders the ability to infer causal relationships as all data are gathered simultaneously (Palese, Simon, & Sermeus, 2021). In addition, the use of a convenience sample restricts the generalisability of the findings.

The MISSCARE Survey is based on self-reporting, leading to response bias. Additional studies should accompany self-report data from other sources, such as observation and medical records, and consider patient perspectives about MNC. Also, social desirability bias may be present since participants might be inclined to respond in a way that will be regarded positively by others (Horiuchi, Markovich, & Yamamoto, 2020). Another potential limitation for this study was that assessing MNC during the COVID-19 pandemic may impact the findings (Cengia et al., 2022). There were no elements in the survey indicating the provision of care for patients with infectious diseases. There may be other causes not included in the second part of the survey (von Vogelsang, Göransson, Falk, & Nymark, 2021).

#### 5. Conclusion

This study provides baseline data for the reasons of missed nursing care in medical and surgical wards in Jordanian hospitals. While these findings are specific to Jordanian hospitals, it reinforces the global impact of these issues regardless of variations in culture, resources and health system structures. Findings from this study emphasise the significance of ensuring the availability of sufficient staffing and equipment resources to reduce the instances of missed care. We found variations in the perceptions of nurses working in various hospital sectors regarding the reasons of MNC in their work contexts. It is recommended that the nursing managers support high workload units with adequate staff and material resources to minimise nursing care left undone. Furthermore, using leadership rounds and talking with staff to resolve their problem could help mitigate MNC (Alasmari et al., 2021). It has been demonstrated that despite the passion of nurse managers to support nursing staff to provide fundamental nursing care, clear approaches to accomplish this are not always obvious. Additional research regarding leadership to enhance fundamental care provision is essential to promoting the nursing practice and patient health-care results (Mudd et al., 2022).

#### Authorship contribution statement

RA contributed to research design, data analysis, interpretation of the results, and manuscript write-up. LJ contributed to data analysis, interpretation of the results, manuscript writing up and

review. MA, JH, GF contributed significantly to the interpretation of the results, manuscript write-up, and review.

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#### Ethical statement

This material is the authors' own original work, which has not been previously published and not currently being considered for publication elsewhere. The paper reflects the authors' own research and analysis in a truthful and complete manner. The paper properly credits the meaningful contributions of co-authors and co-researchers. The results are appropriately placed in the context of prior and existing research. All sources used are properly disclosed (correct citation). All authors have been personally and actively involved in substantial work leading to the paper, and will take public responsibility for its content.

#### Conflict of interest

None.

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