

## RESEARCH ARTICLE

# Determinants of missed nursing care in Jordanian hospitals during COVID-19 pandemic

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**Abstract**

**Aim:** The aim of the study was to examine the effect of perceived organizational support, accountability and nurses' characteristics on missed nursing care under the impact of COVID-19.

**Design:** A cross-sectional design was used to describe and predict nurses' characteristics.

**Methods:** A sample of 536 Registered Nurses participated in the study from eight hospitals in different health sectors in Jordan (three public hospitals, three private hospitals and two teaching hospitals).

**Results:** Communication problems had the highest impact on missed nursing care, compared with labour resources and material resources reasons. Higher patient: nurse ratio aggravated by COVID-19 pandemic, years of experience, satisfaction with the income, perception of accountability and organizational support were among the factors associated with the levels of missed nursing care.

**KEYWORDS**

accountability, COVID-19, missed nursing care, perceived organizational support

## 1 | INTRODUCTION

With the current heavy nursing workload due to the COVID-19 pandemic, long working hours and large numbers of severe cases, nurses are required to manage and reprioritize their work (Aquila et al., 2020). Nurses during COVID-19 have to provide a lot of complex tasks for a large number of patients, which increases the opportunity of a defect or deficiency in the provision of nursing care (Abu Mansour & Abu Shosha, 2022; Min et al., 2020; Uchmanowicz et al., 2020).

Missed Nursing Care (MNC) was defined as the inability to carry out all nursing tasks (Assaye et al., 2022). Kalisch and colleagues in 2009 have defined MNC as "any aspect of required patient care that is omitted (either in part or in whole) or delayed" (Kalisch, Landstrom,

& Hinshaw, 2009, p. 1510). It is expected that MNC may threaten patients' safety, lower nurses' satisfaction and commitment and increase the organizational costs due to readmissions and increase patients' length of stay in hospital (Kalisch et al., 2012; Labrague et al., 2020).

Studies indicated that MNC occurs in all departments, but they increase in closed and critical care units (Kalánková et al., 2022; Saber et al., 2021). Furthermore, MNC occurs at least once in every shift (Cho et al., 2021), and based on Kalisch's definition, the MNC may have occurred with most of the nurses. The side effects on patients could include medication errors, recurrent infections, patients' length of stay and increased incidents of patients falling down (Hessels et al., 2019). Furthermore, nurses who are unable to provide the required care may experience stress, anger, frequent

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absenteeism and burnout. As for the reasons of MNC, it certainly has nothing to do with the inability or desire of nurses to provide care, but rather has to do with many factors, including environmental factors such as nursing shortage (Harvey et al., 2017); patients' acuity (Al-Hamdan et al., 2019; Hessels et al., 2019) and poor use of human resources.

## 2 | BACKGROUND

Limited literature was found addressing MNC from nurses' personal/clinical factors, perceived accountability and perceived organizational support. However, some findings confirmed associations between MNC and nurses' sociodemographic characteristics and work-related environments including organizational support and nurses' accountability (Elayan & Ahmad, 2018; Kalánková et al., 2022; Mills & Duddle, 2021). Accountability is one of the important pillars on which health institutions are built, and accountability is usually linked to personal, ethical and legal dimensions and has a concrete impact on quality standards, decision-making and staff values (Srulovici & Drach-Zahavy, 2017). Therefore, understanding accountability and its implications for nurses may lead to improving work environments and providing them with the necessary ingredients to complete the tasks in the best way.

Aleksovska (2021) defined accountability as "Accountability mechanisms are universally present in the public sector. They are relationships between an actor and a forum, in which the actor has an obligation to justify his or her conduct to the forum." Hochwarter et al. (2007) defined accountability as the individual's perceived level of answerability. While accountability is defined by (Batey & Lewis, 1982, p. 10) as "the fulfillment of a formal obligation to disclose to relevant others the purposes, principles, procedures, relationships, results, income and expenditures for which you have authority." These different definitions gave various dimensions to accountability. Actually, these dimensions are classified into three important axes: (1) responsibility; they are the actions that the individual is entrusted with and must carry out, and therefore he commits himself first to perform it and then fulfil his obligation through his efforts and work (Tamvada, 2020), (2) transparency; is that all the actions and actions of the individual, right and wrong, are transparent and clear to all, and without concealing any shortcomings that occur during the work (Fox, 2007) and (3) answerability; The individual's acceptance of the judgement issued based on the values and instructions in place (Frederick et al., 2016). Further, Sorensen et al. (2009) emphasized that nurse accountability is driving nursing activities and decisions and affecting patients' health conditions. Accountability might shape nursing care practices, where high nursing accountability was negatively associated with MNC (Drach-Zahavy & Srulovici, 2019).

Recently, much attention is given to factors predicting the MNC in clinical areas. Perceived Organizational Support (POS) is one of the important predicting variables. It reflects nurses' perceptions of how much the organization values their efforts, fulfils staff needs

and keeps their well-being (Siegel et al., 2008). Staff nurses will show loyalty and faithfulness in an organization based on its culture and values offered to them. According to the "Theory of Organizational Support," employees build their ideas, perceptions and attitudes toward an organization based on the day-by-day interactions with persons who represent the organization like managers and head nurses (Eisenberger et al., 1986). The caring and supportive actions of nurse managers may lead to positive perceived organizational support from subordinates.

There are many reasons for missed nursing care. Factors related to nurses' characteristics have been highlighted in the literature. Srulovici and Drach-Zahavy (2017) reported that nurses' years of experience, employment status and workload are predicting MNC. However, age, gender and educational levels have no significant impact on missed nursing care (Min et al., 2020). The consequences of MNC could be greater than what we currently know or recognize. Missed nursing care is a complicated phenomenon and is associated with many factors (Min et al., 2020). Therefore, studying the organization's support, accountability and nurse characteristics could provide better understating of predictors of MNC which, in turn, may help to maintain patient safety, decrease health system costs and provide nurse manager with opportunities for enhancements.

Many studies provided evidence on the relationship between POS with nurses' work environment and organizational variables (Patrick & Laschinger, 2006; Wen et al., 2019). However, a scarcity of literature regarding nurses' perceived organizational support and MNC were found. In Jordan, this will be the first study predicting MNC from nurses' accountability, POS and personal/clinical variables.

Furthermore, the COVID-19 pandemic has adversely affected many aspects of daily life in Jordan. Many restrictions, curfews and partial shutdowns were reinforced to limit the transmission of the pandemic across the country. That is, the current stressful situation in Jordanian hospitals might affect the quality of provided care, and MNC may be aggravated. Therefore, the purpose of this study was to examine the relationship between missed nursing care and perceived organizational support, accountability and nurses' characteristics under the impact of COVID-19.

## 3 | METHODS

### 3.1 | Research design

A cross-sectional design was used to describe and predict nurses' characteristics such as the demographics and their intent to leave and patients to nurse ratio.

### 3.2 | Setting

In Jordan, there are a total of 31 public hospitals, 69 private hospitals, and two university hospitals. A random selection for the eight hospitals included in the study: three public hospitals, three private

hospitals and the two teaching hospitals. The selected sites are dispersed geographically across the north, middle and south of Jordan.

### 3.3 | Sample

A convenience sampling technique was used to select nurses with the following inclusion criteria: (1) at least a bachelor's degree in nursing; (2) a full-time contract; (3) at least 1 year of clinical experience; (4) providing direct patient care; and (5) willing to participate in the study. Nurses who are in managerial positions were excluded from the study. The data collection procedure was assigned to three researchers who are authors of this study. In each of the selected hospitals, the principal investigator has met with the director of nursing to explain the study purpose and methods. The online link of the study was given to the supervisor to be distributed to the nurses. Nurses who agreed to participate in the study provided their consent by clicking on the "Agree and Proceed" button, and then, they filled out the survey. Furthermore, participants were informed that data will be destroyed appropriately at the end of the study. Around 2200 nurses are working in all Jordanian hospitals, 850 questionnaires were distributed, 536 (63%) nurses returned a completed questionnaire.

### 3.4 | Instruments

#### 3.4.1 | Missed nursing care

Missed nursing care was measured using the MISSCARE survey (Kalisch & Williams, 2009). The survey consists of two parts. Part A (24 items) measures the MNC by asking the participants about how frequently they missed nursing activities using a five-point Likert scale; wherein: "never missed = 1," "rarely missed = 2," "occasionally missed = 3," "frequently missed = 4," "always missed = 5." Part B (17 items) asks nurses about the reasons of MNC by using a four-point Likert scale from "not a reason = 1" to "significant reason = 4." The reasons are distributed on three subcategories: communication reasons, labour resources reasons and material resources reasons. Construct validity was established and internal reliability, with coefficient alpha, was .93 (Dabney et al., 2019). In our study, Cronbach's alpha was .89. Cronbach's alpha for POS was .82 in this study.

#### 3.4.2 | Accountability

Accountability was measured using the Accountability Index-Individual Referent (Specht & Ramler, 1994). The measure consists of 11 items, nurses responded to each item on a four-point Likert scale; wherein: "definitely false = 1," "false = 2," "true = 3" and "definitely true = 4." The total possible score range between 11 and 44. The construct validity and Cronbach's alpha for the Accountability Index-Individual Referent instrument was .82 (Sorensen et al., 2009). In our study, Cronbach's alpha was .71.

#### 3.4.3 | Perceived organizational support

The perceived organizational support (POS) survey was used to evaluate the degree to which employees believe that their work organization values their contribution and cares about their well-being (Rhoades & Eisenberger, 2002). The POS scale is a 36-item, measured on a 7 points Likert scale (0 to 6). The higher the score, the more the organizational support. The possible range of scores is from 0 to 216. The construct validity of the scale was established (Kim et al., 2016). Internal reliability, with coefficient alphas was .84 (Biswas & Bhatnagar, 2013). In our study, Cronbach's alpha was .83. Cronbach's alpha for POS was .82 in this study.

### 3.5 | Ethical consideration

The study was reviewed and approved by the Institutional Review Board (IRB) of Zarqa University (Approval No. 14/2021). Ethical clearance was attained from relevant parties for this study. Data were collected between March 2021 and May 2021, Google Form was created and the link to the form was shared with nurse managers in each hospital, and then, they forwarded that link with nurses. The general aim, inclusion/exclusion criteria, voluntary and confidentiality information, potential risks/benefits and contact information were written on the first page of the online survey. Nurses who agreed to participate in the study provided their consent by clicking on the "Agree and Proceed" button, and then they filled out the survey. Furthermore, participants were informed that data will be destroyed appropriately at the end of the study.

### 3.6 | Data analysis

To analyse the data, the Statistical Package for Social Sciences (SPSS), version 25 was used (IBM, 2017). After cleaning the data for missing scores and extreme values, which were a few scores, the analysis was conducted. For the nurses' characteristics and for types and reasons for MNC items, means and standard deviations were used. Pearson correlations analysis was used to examine the correlation between MNC and main study variables. Multiple linear regression analysis was used to predict the MNC from the main study variables.

## 4 | RESULTS

### 4.1 | Nurses' characteristics

The nurses' characteristics are shown in Table 1. The total number of participated nurses was 536 of which 275 (51.3%) were female, 31.53 years of age (SD = 5.5), married 275 (51.3%), earned bachelor's degree in nursing 285 (53.2%) and worked in public hospitals 287 (53.5%).

The majority of nurses 333 (62.1%) worked with a nurse/patient ratio of >6 patients/nurse due to COVID-19 pandemic. Furthermore, around 58% of nurses delivered patient care by utilizing the “functional nursing” model of care, which meant that the nursing tasks are allocated from a centralized authority. Regarding the unit's capacity, 44.4% of nurses worked in units with more than 20 beds. The majority of participants 370 (69.0%) were reported there is no Electronic Health Records (EHRs) in their units, and 45% have an intention to leave the hospital within one year. Participants were also asked about their income satisfaction, the vast majority of them (87.9%) were not satisfied with their current income.

## 4.2 | Nurses' perceptions of MNC during COVID-19 pandemic

During the last 24 h, nurses were asked to report their perceived missed nursing care activities. As presented in Table 2, the most frequent types of MNC were “Attend interdisciplinary care conferences whenever held” ( $M = 2.9$ ,  $SD = 1.1$ ), “Full documentation of all necessary data” ( $M = 2.8$ ,  $SD = 1.1$ ), followed by “Response to call light is provided within five minutes” ( $M = 2.4$ ,  $SD = 0.8$ ). However, the least reported types of MNC were “Skin/wound care” ( $M = 2.0$ ,  $SD = 1.0$ ), “Feeding patient when the food is still warm” ( $M = 1.9$ ,  $SD = 0.9$ ) and “Medications administered within 30 minutes before or after scheduled time” ( $M = 1.8$ ,  $SD = 0.5$ ).

## 4.3 | Reasons of MNC during COVID-19 pandemic

As shown in Table 3, communication reasons had the highest mean ( $M = 2.8$ ,  $SD = 0.3$ ) and responsible for the most prevalent reasons for MNC; followed by labour resources reasons ( $M = 2.7$ ,  $SD = 0.5$ ) and material resources reasons ( $M = 2.6$ ,  $SD = 0.6$ ).

Specifically, by examining the communication reasons, “Lack of back up support from team members” ( $M = 3.1$ ,  $SD = 0.7$ ) and “Tension or communication breakdowns within the nursing team” ( $M = 3.1$ ,  $SD = 0.6$ ) had the highest means. However, nurses reported that “Other departments did not provide the care needed” ( $M = 2.5$ ,  $SD = 1.0$ ), and “Caregiver off unit or unavailable” ( $M = 2.5$ ,  $SD = 1.0$ ), had the least importance in their MNC. Further, the data revealed that the major reason for MNC concerning labour resources were “Urgent patient situations (e.g. a patient's condition worsening)” and “Inadequate number of assistive and/or clerical personnel.” For the material resources subcategory, the main reasons for MNC were “Medications were not available when needed” and “Supplies/equipment not functioning properly when needed.”

## 4.4 | Perceived organizational support

The means score for the POS in this study was 122.46 ( $SD = 22.87$ ), with a range of scores between 50 and 193. From the 36 items on

TABLE 1 Nurses' background variables ( $N = 536$ )

Variable	Mean (SD)
Age	31.53 (5.5)
Total years of experience	7.51 (5.1)
Hours of work/shift	11.09 (1.6)
Number of COVID-19 patients in the unit	6.51 (2.7)
	Frequency (%)
Gender	
Male	261 (48.7)
Female	275 (51.3)
Workplace	
Public hospital	287 (53.5)
University hospital	177 (33.0)
Private hospital	72 (13.4)
Marital status	
Married	275 (51.3)
Not married	261 (48.7)
Educational level	
Diploma	110 (20.5)
Bachelor	285 (53.2)
Postgraduate	141 (26.3)
Patients to nurse ratio due to COVID-19	
≤2 patients/nurse	31 (5.8)
3–6 patients/nurse	172 (32.1)
>6 patients/nurse	333 (62.1)
Delivery care model	
Functional nursing	310 (57.8)
Team nursing	181 (33.8)
Total patient care	45 (8.4)
Unit's bed capacity	
≤10 beds	118 (22.0)
11–20 beds	180 (33.6)
>20 beds	238 (44.4)
Presence of electronic health records (EHRs)	
Yes	166 (31.0)
No	370 (69.0)
Intention to leave	
No plans to leave	103 (19.2)
Within 6 months	192 (35.8)
Within 1 year	241 (45.0)
Income satisfaction	
Satisfy	65 (12.1)
Not satisfy	471 (87.9)

the scale, the highest score ( $M = 4.10$ ,  $SD = 1.15$ ) was for the item “-----would understand a long absence due to my illness”. The lowest score ( $M = 2.93$ ,  $SD = 1.88$ ) was for the item “-----would fail to understand my absence due to a personal problem.”

TABLE 2 Nurses' perceptions of missed nursing care (N = 536)

Types of missed nursing care	Mean (SD)
Attend interdisciplinary care conferences whenever held	2.9 (1.1)
Full documentation of all necessary data	2.8 (1.1)
Response to call light is provided within five minutes	2.4 (0.8)
Ambulation three times per day or as ordered	2.6 (0.7)
Ensuring discharge planning	2.5 (1.1)
Patient teaching	2.4 (1.2)
Hand washing	2.4 (0.9)
Bedside glucose monitoring as ordered	2.4 (0.8)
Mouth care	2.4 (0.7)
Patient assessments performed each shift	2.4 (0.8)
IV site care and assessment according to hospital policy	2.4 (1.1)
PRN medication requests acted on within five minutes	2.2 (0.7)
Assist with toileting needs within five minutes of request	2.2 (0.7)
Emotional Support to patient and/or family	2.2 (0.8)
Turning patient every two hours	2.2 (0.7)
Setting up meals for patients who feed themselves	2.2 (1.0)
Monitoring intake/output	2.1 (0.7)
Vital signs assessed as ordered	2.1 (0.6)
Patient bathing/skin care	2.1 (0.7)
Assess effectiveness of medications	2.1 (0.8)
Focused reassessment according to patient	2.0 (0.9)
Skin/wound care	2.0 (1.0)
Feeding patient when the food is still warm	1.9 (0.9)
Medications administered within 30min before or after scheduled time	1.8 (0.5)

#### 4.5 | Accountability

The mean score for the Accountability Index in this study was 25.51 (SD = 5.66), with a range of scores between 13 and 42. From the 11 items on the scale, the highest score (M = 2.50, SD = 1.04) was for the item "I am actively involved in monitoring standards of care for the patients on the unit." The lowest score (M = 2.07, SD = 0.96) was for the item "I am accountable for acquiring the knowledge and skills required to care for the patients on this unit."

#### 4.6 | Correlations between study variables

Table 4 presents bivariate analyses using the Pearson  $r$  correlation to examine the relationships between MNC with accountability, POS and the main nurses' characteristics. MNC has shown to have a statistically significant negative relationship with accountability ( $r = -.587$ ;  $p < .01$ ) and POS ( $r = -.495$ ;  $p < .01$ ), and a statistically significant level of  $p < .001$  for the variables of age, total years of

experience, number of COVID-19 patients in the unit, patient to nurse ratio, intention to leave within 6 months and the income satisfaction.

#### 4.7 | Predictors of missed nursing care during COVID-19

All the variables that showed statistically significant correlation with the MNC were used in the multiple linear regression (Table 5). The results showed that at least one or more predictors had a statistically significant association with MNC  $F(26,509) = 11.38$ ,  $p < .001$ . Predictors of MNC of Jordanian nurses during COVID-19 were ranked in order of significance, accountability and POS were the highest significant predictors. However, nurses' intention to leave within 6 months and income satisfaction (not satisfied) were the lowest significant predictors. Together, these variables accounted for 36.8% of the variance in missed nursing care.

### 5 | DISCUSSION

This study showed that the most frequently perceived MNC among Jordanian nurses taking into consideration COVID-19 pandemic were "attend interdisciplinary care conferences whenever held," "full documentation of all necessary data," "response to call light is provided within five minutes," "ambulation three times per day or as ordered," and "ensuring discharge planning." The results are consistent with studies from different countries (Hessels et al., 2019; Kalisch & Williams, 2009; Kim & Bae, 2018), as nurses reported that they are occasionally missing some aspect of nursing care such as ambulating patients and documenting all patients' data. These results could be justified by the following interpretations: (1) in relation to the COVID-19 pandemic and how nurses perceived that clinical/physiologic needs were given the highest priority in nurses' care. Examples are administering medication, feeding patients and taking vital signs as it may contribute to the wellness of COVID-19 patients, while some other tasks which took less priority were "missed." (2) The vast majority of the sample were bachelor's degree nurses, that is they may perceive some tasks should be done by nurses with diplomas as the functional nursing model of care is the major model in the target hospitals in this study. It is practised by assigning the daily tasks among nurses as per qualifications and competencies. For example, Registered Nurses handle the medication administration for all patients in the unit and licensed practical nurses to handle the patient ambulation task. This may also affect the perception of the priority of such tasks and getting them "missed."

Furthermore, this study showed that the reasons of MNC were mainly due to "communication reasons," followed by "labor resources reasons" then "material resources reasons." These findings are consistent with many global studies (Blackman et al., 2015; Elayan & Ahmad, 2017; Pan & Lin, 2021; Tou et al., 2020) as they found that

Reasons of missed nursing care	Mean (SD)
Communication reasons	2.8 (0.3)
Lack of back up support from team members	3.1 (0.7)
Tension or communication breakdowns within the nursing team	3.1 (0.6)
Unbalanced patient assignments	3.0 (0.7)
Tension or communication breakdowns with the medical staff	3.0 (0.7)
Tension or communication breakdowns with other support teams	2.9 (0.8)
Inadequate hand-off from previous shift or sending unit	2.7 (1.1)
Assistive personnel did not communicate that care was not provided	2.7 (0.9)
Other departments did not provide the care needed	2.5 (1.0)
Caregiver off unit or unavailable	2.5 (1.0)
Labour resources reasons	2.7 (0.5)
Urgent patient situations (e.g. a patient's condition worsening)	2.9 (0.9)
Inadequate number of assistive and/or clerical personnel	2.8 (1.0)
Inadequate number of staff	2.7 (0.9)
Unexpected rise in patient volume and/or acuity on the unit	2.6 (0.9)
Heavy admission and discharge activity	2.6 (0.9)
Material resources reasons	2.6 (0.6)
Medications were not available when needed	2.7 (0.9)
Supplies/equipment not functioning properly when needed	2.6 (1.0)
Supplies/equipment not available when needed	2.5 (0.9)

TABLE 3 Nurses' perceptions of reasons of missed nursing care (N = 536)

TABLE 4 Correlations between MNC and main study variables (N = 536)

Variables	Pearson correlation	p value
Nurses' accountability	-.30	<.001
Perceived organizational support (POS)	-.30	<.001
Age	.13	.02
Total years of experience	.31	<.001
Number of COVID-19 patients in the unit	-.25	<.001
Patient to nurse ratio (>6 patients/nurse)	-.20	<.001
Intention to leave within 6 months	-.24	<.001
Income satisfaction (not satisfy)	-.23	<.001

health professional communication and resource allocation were identified as predictors of why MNC was being occurred. However, other studies found that the labour-related resource is the most prevalent reason for MNC (Al-Faouri et al., 2021; Chegini et al., 2020; da Silva et al., 2021; Kalisch, Landstrom, & Williams, 2009; Saqer & AbuAlRub, 2018). However, another qualitative study conducted in Iran has shown a different reason for MNC (Janatolmakan & Khatony, 2022). The authors of the Iranian study found that the MNC was due to "failure to pay attention to all patient needs," "non-observance of hygienic principles" and "non-observance of patient-related safety standards."

In Jordan, like in many countries, the COVID-19 pandemic has forced several organizational and managerial changes. For example,

many nurses and nurse managers have been called to work in remote and isolated areas. Nurses suddenly find themselves working with new nurses, managers and administrators, which may negatively affect their communication. On the other hand, nurses did not perceive the material resources as reasons for MNC because the Jordanian government has collaborated with the ministry of health to supply all clinical settings with necessary equipment and resources.

The results indicated that nurses' accountability and POS are significantly associated with and predicting MNC, supporting previous findings (Drach-Zahavy & Srulovici, 2019; Labrague & De los Santos, 2020; Min et al., 2020) and indicate that MNC is affected by personal and organizational factors. On a personal level, accountability guides nurses' actions and decisions (Cziraki et al., 2018). That is, a higher level of accountability might lead nurses to a higher level of professional development and mature practices. Similarly, organizational support is related to nurses' quality of care and contributes to caring behaviours (Pahlevan Sharif et al., 2018). Clinical supportive environments and maintaining a context of healthy rapport are important to decrease nurses' errors and keep patients safe.

Furthermore, it is found in this study that some nurses' demographics may contribute to predicting MNC. It was indicated that lower MNC is associated with more experienced and elder nurses, this result is consistent with the study of Saqer and AbuAlRub (2018). As nurses become more experienced and older, they acquired more managerial and clinical skills. That is, they become more able to work with critical cases, organize their work, manage time and complete the work efficiently.

TABLE 5 Predictors of missed nursing care (N = 536)

Predictor	B	SEB	Beta	t
Accountability	0.011	0.003	0.125	3.268***
Perceived organizational support	0.079	0.031	0.124	3.177***
Age	-0.019	0.005	-0.207	-3.543***
Total years of experience	-0.030	0.006	-0.311	-4.736***
Number of COVID-19 patients in the unit	0.022	0.007	0.119	2.975**
Patient to nurse ratio (>6 patients/nurse)	0.298	0.099	0.279	3.015**
Intention to leave within 6 months	0.081	0.044	0.078	1.851*
Income satisfaction (not satisfy)	0.041	0.045	0.037	0.905*
Model summary: $R = 0.606$ , $R^2 = 0.368$ , $Adj R^2 = 0.335$ , $F = 11.380$ ***				

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

This study suggests that an increased level of MNC was predicted by the increased number of COVID-19 patients in the unit and with a patient/nurse ratio of more than six patients. This result is consistent with the study of von Vogelsang et al. (2021), the more workload the nurses have to do with a limited time, the more tasks get "missed." As of the nursing care delivery model, the current study results shows that it was not a predictor for MNC, while the findings of Havaei et al. (2019) suggested that "nurses working in a team-based mode reported a greater number of nursing tasks left undone compared with those working in a total patient care." In a team-based model, breach of communication-related to the direct patient care may result in missing some nursing tasks among the team members assigned to the care for a group of patients, while adopting total patient care by a nurse enhances the continuity of care and thus MNC is likely to happen. In the current study, and since the COVID-19 pandemic started, the direction in moving from the common functional nursing model toward total patient care can be the reason for not finding the delivery care model as a predictor for MNC.

Another factor that has contributed significantly to predicting MNC was the nurses' intention to leave the healthcare organization within six months. The same result was reported by the study of Tschannen et al. (2010), as they found that "Units with higher rates of missed care, and absenteeism had more staff with the intention to leave." Intention to leave the job may lead to decreasing the sense of accountability among nurses and thus missing more care tasks. Furthermore, in the current study, nurses' dissatisfaction with their income has predicted MNC level which goes against the findings of Haftu et al. (2019) as they found that the satisfaction with payment was not significantly associated with MNC level. Dissatisfaction with the income may lead to the intention to leave and the resulted decreased sense of accountability and thus increasing the MNC among nurses.

## 5.1 | Limitations

There are some limitations to be considered in this study. First, the sampling method was convenience. Second, the international

generalizability of the results is limited as only Jordanian nurses have participated. Third, data were collected online which decrease the control on data collection procedure. Furthermore, the response rate of 63% is not high, but the sample size (536) is considered adequate to meet the objectives of the study.

## 5.2 | Implications

Healthcare organizations should be committed to creating a supportive environment that enables nurses to meet their needs and achieve their goals. Nursing management in the different healthcare settings needs to investigate the impact of the factors discussed in the current study and their impact on MNC. Moreover, they are also invited to work on enhancing the nurses' perception of accountability and the perception of organizational support in order to reduce the levels of missed nursing care. They may need to create a blame-free environment and establish a system to follow and control the MNC. It is highly suggested to review the adopted nursing care delivery model at the practice setting and how the COVID-19 pandemic may change it in a way that it may affect the occurrence rates of MNC and thus the quality of care provided.

Future research is recommended to understand the daily emerging issues and factors that contribute to MNC. Importantly, research on strategies and interventions to reduce MNC is needed.

## 6 | CONCLUSION

The study shows that different personal and organizational factors in Jordan may lead to an increase in MNC. More experienced nurses, dissatisfaction with the income and intention to leave the current job may result in higher chances towards an increase in the incidence of MNC. Moreover, increased workload by increasing the patient: nurse ratio above 6 patients, which was aggravated by the COVID-19 pandemic may also lead to increased MNC levels. Increasing the organizational support to nurses to perform their jobs may result in a reduction in MNC, thus increasing the overall quality of care provided to patients.

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## CONFLICT OF INTEREST

The authors have no conflicts of interest to declare that are relevant to the content of this article.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

## ETHICS STATEMENT

The study was reviewed and approved by the Institutional Review Board (IRB) of Zarqa University (Approval No. 14/2021).

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