

## RESEARCH ARTICLE

# Patient safety, quality of care and missed nursing care at a cardiology department during the COVID-19 outbreak

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## Abstract

**Aim:** To evaluate missed nursing care and patient safety during the first wave of the COVID-19 pandemic at in-patient cardiology wards.

**Design:** A cross-sectional design with a comparative approach.

**Method:** Registered nurses and nurse assistants at a cardiology department were invited to answer the *MISSCARE Survey-Swedish version*, and questions on patient safety and quality of care during the COVID-19 pandemic. The data were compared with a reference sample.

**Results:** A total of 43 registered nurses and nurse assistants in the COVID-19 sample and 59 in the reference sample participated. The COVID-19 sample reported significantly more overtime hours and more absence from work due to illness in comparison with the reference sample. The patient safety and quality of care were perceived significantly worse, 76.7% ( $N = 33$ ) versus 94.7% ( $N = 54$ ), and 85.7% ( $N = 36$ ) versus 98.3% ( $N = 58$ ), respectively. The COVID-19 sample reported more missed nursing care in wound care and in basic nursing.

## KEYWORDS

cardiac nursing, nursing assessment, quality and safety, quality of care, questionnaire

## 1 | INTRODUCTION

At the end of 2019, a novel coronavirus resulted in an outbreak of coronavirus disease 2019 (COVID-19), which started in Wuhan, China. In March 2020, the World Health Organization (WHO) characterized COVID-19 as a pandemic (World Health Organization, 2020), and in line with other European countries, several regions in Sweden needed to expand their capacity for treating patients suffering from COVID-19.

The literature indicates that nurse staffing has a large impact on whether the required nursing care can be delivered

(Griffiths et al., 2018). Missed nursing care (MNC) is defined as any aspect of required patient care that is omitted (in part or in whole) or delayed (Kalisch et al., 2009). Moreover, MNC is associated with negative patient outcomes and is a threat to the quality of care and patient safety (Ball et al., 2014; Schubert et al., 2012).

In the disease outbreak in spring 2019, the patients with SARS-Cov-2 were a new patient group for the entire staff. To deliver care for a completely new group of patients challenged the healthcare professionals in their work with patient safety and quality of care.

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## 2 | BACKGROUND

Pandemics have enormous implications for healthcare systems, particularly the workforce (Carenzo et al., 2020; Ives et al., 2009; Seale et al., 2009), and at Karolinska University Hospital, novel approaches to staffing in hospital wards were needed to meet the expected increased acute care demand. Within a span of a few weeks, the request for beds in intensive care units (ICUs) and infectious disease wards increased by a factor of five (Ahlssohn, 2020). The medical and nursing workload, as well as patient dependency, was thought to increase in all departments with in-hospital adult beds at the hospital. Due to this, nursing staff (registered nurses [RNs] and nurse assistants [NAs]) were relocated to other units to fill the needs for care of COVID-19 patients. This implied that RNs were located where their competence was needed most, e.g. RNs at the cardiology department with ICU competence or volunteers were moved to the ICU. RNs working at outpatient units or on administrative tasks were relocated to in-patient units. Also, RNs from other departments such as childcare were moved to the cardiology department. In all, >600 nursing staff were re-distributed across the hospital. In a study from China, a total of 76% of the participants reported they had changed their regular job duties during the pandemic (Nie et al., 2020).

However, staffing was a challenge since many healthcare professionals themselves became infected with the novel acute respiratory syndrome coronavirus (SARS-Cov-2) (Ahlssohn, 2020). On the other hand, in regard to cardiovascular diseases, during the pandemic outbreak and peak there was a decline of up to 40% in patients with acute coronary syndromes (ACS) seeking medical care, which was not foreseen (Mohammad et al., 2020). Also, avoidance of seeking medical care during the COVID-19 pandemic has been seen internationally, specifically in patients suffering from stroke or ACS (Boukhris et al., 2020; Nguyen-Huynh et al., 2020). The reasons for this change in healthcare seeking behaviour are still unknown.

In the disease outbreak in spring 2019, the patients with SARS-Cov-2 were a new patient group for the entire staff. Caring for patients for which staff lack explicit competence and training presents challenges similar to caring for so-called “outliers” or “outlying hospital in-patients,” i.e. patients admitted wherever an unoccupied bed exists, due to unavailability of hospital beds within the wards designed to treat their condition (Stylianou et al., 2017). Outliers may be associated with worse outcomes such as increased trends in mortality and readmissions (La Regina et al., 2019).

The present study was designed to evaluate MNC and patient safety during the outbreak and first wave of the COVID-19 pandemic at the in-patient wards at the cardiology department. The following research question was addressed: first, were there more MNC reported during the outbreak and first wave of the COVID-19 pandemic, and secondly, did the pandemic affect the nursing staffs' perceptions of patient safety and quality of care?

## 3 | THE STUDY

### 3.1 | Design

This study is part of a larger project, MINUS-K, i.e. Missed Nursing care in Stockholm—Karolinska University Hospital. This was a cross-sectional study with a comparative approach since the findings were compared with a reference sample from the same department prior to the COVID-19 period.

### 3.2 | Method

The cardiology department comprised two highly specialized medical wards and two intensive coronary care units (ICCU) caring for the following patient groups: ACS, advanced heart failure and arrhythmia disease as well as other advanced heart diseases.

During the pandemic outbreak and peak of the first wave, the number of in-hospital beds at the four wards did not change, yielding 44 beds. One of the wards was converted to a “COVID-19 unit.” This meant that some patient groups normally cared for at the ward—i.e. imperative elective care that could not be delayed such as angiography with preparedness for percutaneous coronary intervention, pacemaker insertions and transcatheter aortic valve implantations—were moved to another ward in order to make beds available for patients suffering from COVID-19. Hence, at this ward nursing staff were called upon to care for the ordinary patient mix (both with and without COVID-19) as well as COVID-19 patients in a stable condition, i.e. in need of oxygen treatment, including optiflow treatment and non-invasive ventilation. In addition, one of the ICCU was reorganized (in order to open up COVID-19 beds in other wards at the hospital) which resulted in also caring for so-called “outliers.” These were patients that under normal circumstances would have been treated at the medical high dependency unit, i.e. patients with emergency medical conditions with an estimated hospital length of stay less than two days.

All patients were treated in single rooms.

### 3.3 | Study sample and reference sample

The study was conducted at the in-hospital wards in the cardiology department, which included approximately 105 RNs and 140 NAs. All RNs and NAs were asked to fill in the *MISSCARE Survey-Swedish version*© in relation to caring for COVID-19 patients, and a total of 43 chose to participate.

The reference sample was obtained from a baseline survey conducted in October 2019 where the RNs and NAs within the cardiology department were invited to participate, resulting in a reference sample of  $N = 59$ .

### 3.4 | Instrument

The *MISSCARE Survey-Swedish version*© was used to measure MNC. The development and psychometric testing of the *MISSCARE Survey-Swedish version*© have been described in a previous article (Nymark et al., 2020), and the results showed that the questionnaire was reliable and valid with good psychometric properties.

The *MISSCARE Survey* has three sections: a background section with questions on demographic data such as age and sex, and other details such as educational level, working role, hours of overtime, number of absent shifts due to illness the past three months, perception of whether the unit staffing is adequate, and satisfaction with the level of teamwork on the unit. Also, numbers of patients cared for and numbers of admissions and discharges during the last shift are asked for. Section A comprises 24 questions on elements of MNC, answered using a five-point Likert scale ranging from “always missed” to “never missed.” Section B comprises 17 questions on reasons for missed nursing care, answered with a four-point Likert scale ranging from “significant reason” to “not a reason for missed care.”

Two study-specific questions were included using a five-point Likert scale, ranging from “very good” to “very poor.” These questions were: “How do you perceive the quality of care on the ward?” and “How do you perceive patient safety on the ward?”

### 3.5 | Data collection

For the COVID-19 sample, paper questionnaires including study information and contact information of the investigators were distributed to the selected in-patient wards. Nursing staff filled in the questionnaires anonymously, and thereafter, they were collected by the principal investigator. The data collection period continued for three weeks during May-June 2020.

A baseline survey was conducted during October 2019. The reference sample received an email at their work email address in which they were asked to participate. The email had an individual link to the *websurvey MISSCARE Survey-Swedish version*© and included study information and contact information of the investigators.

### 3.6 | Analysis

We classified MNC in the same manner as the instrument originator where the answering options in section A “occasionally,” “frequently” or “always” missed were classified as MNC (Kalisch et al., 2011). In section B, considered reasons for missed nursing care were classified as “significant” or “moderate.”

Furthermore, all variables in sections A and B were treated dichotomously (MNC/not MNC, respectively, reason for MNC/not reason for MNC). Like Professor Bragadottir and colleagues, we ranked the most frequently reported missed elements of MNC (Bragadóttir & Kalisch, 2018).

The study-specific question on perception of patient safety and the quality of care was categorized into three categories: good (including “very good” and “good”), neutral and poor (“poor” and “very poor”). The satisfaction with the level of teamwork was categorized into three categories: satisfied (including answering options “very satisfied” and “satisfied”), neutral and dissatisfied (including “dissatisfied” and “very dissatisfied”).

Chi-square tests and an independent samples median test were used to explore differences in background characteristics, satisfaction with the level of teamwork and perception of patient safety. Fisher's exact test was used to examine differences between samples concerning missed elements of care (section A) and reasons for MNC (section B). No imputation of missing data was conducted.

A Mann-Whitney U-test was used to compare the distribution of numbers of patients cared for, patient admissions, patient discharges and MNC to any extent. When analysing numbers of patient admissions and patient discharges per shift, we limited inclusion to RNs since only RNs perform these tasks in Sweden.

A two-tailed significance level was set at 0.05. The statistical software used was IBM SPSS Statistics version 25 (IBM, US, 2017).

## 4 | RESULTS

There were no significant differences between the COVID-19 and the reference sample concerning age, sex or professional role or the academic degree of RNs (Table 1). However, the COVID-19 sample reported significantly more overtime hours and more absence from work due to illness.

Adequacy of unit staffing, satisfaction with the level of teamwork, number of patients cared for per shift, patient admissions and discharges per shift are presented in Table 1.

There were significant differences between the COVID-19 and the reference sample concerning the perception of patient safety and quality of care. The nursing staff in the COVID-19 sample rated patient safety to be significantly lower in comparison with the reference sample (76.7% versus 94.7%,  $p = .016$ ). The nursing staff in the COVID-19 sample perceived the quality of care to be lower than those in the reference sample (85.7% versus 98.3%,  $p = .04$ ).

The items of MNC were ranked by the most frequently reported element of MNC in the COVID-19 sample, including missing data, and the results are presented in Table 2. In comparison with the reference sample ( $N = 59$ ), the COVID-19 sample ( $N = 43$ ) reported more MNC for the items “ambulation three times per day or as ordered” ( $p = .023$ ), “turning patient every two hours” ( $p = .003$ ), “response to call light is initiated within five minutes” ( $p = .06$ ) and “wound care” ( $p = .02$ ). In the COVID-19 sample, significantly less MNC was reported for the items “setting up meals for patients who feed themselves” ( $p = .007$ ) and “medications administered within 30 min before or after the scheduled time” ( $p = .05$ ) in comparison with the reference sample.

Reasons for MNC were ranked from the most frequently reported reason to the least frequently reported and are presented in

TABLE 1 Characteristics of participants and background variables

Characteristic	COVID-19 sample (N = 43)	Reference sample (N = 59)	p
	N (%)	N (%)	
Age (years)			
Median (IQR)	36.7 (27–46)	39.9 (29–48)	.390
Range	20–64	20–64	
Sex			
Male	4 (9.3)	9 (15.3)	.549
Female	39 (90.7)	50 (90.7)	
Professional role			
Registered nurse	20 (46.5)	28 (47.5)	.543
Nurse assistant	23 (53.5)	31 (52.5)	
If you are a nurse, what is the highest degree			
No academic degree	0 (0.0)	1 (3.8)	.204
Bachelor	18 (90.0)	18 (69.2)	
Master 1-year	1 (5.0)	6 (23.1)	
Master 2-year	0 (0.0)	1 (3.8)	
Hours of overtime the past 3 months			
No overtime	14 (32.6)	15 (25.4)	.006
1–12 hr	18 (41.9)	35 (59.3)	
More than 12 hr	11 (25.6)	8 (13.6)	
Missing	-	1 (1.7)	
Number of absent days or shifts due to illness, injury etc. past 3 months			
No absent days	7 (16.3)	35 (59.3)	<.001
1 day or shift	5 (11.6)	5 (8.5)	
2–3 days or shifts	8 (18.6)	14 (23.7)	
3–6 days or shifts	5 (11.6)	4 (6.8)	
Over 6 days or shifts	18 (41.9)	1 (1.7)	
Adequate ward staffing more than 75% of time	42 (78.6)	57 (78.9)	.930
Number of patients cared for during the last shift			
Min-max	0–9	2–8	.403
Median (IQR)	5 (2–6)	5 (4–6)	
Patient admissions per shift			
Min-max	0–4	0–5	.509
Median (IQR)	2 (0–2)	1 (0–2)	
Patient discharge per shift			
Min-max	0–3	0–5	.031
Median (IQR)	0 (0–3)	1,5 (0–3)	
Satisfied with the level of teamwork	43 (72.1)	57 (86.0)	.349

Table 3. No significant differences were found between the samples concerning reasons for MNC.

## 5 | DISCUSSION

The main result of the study is that nursing staff rated patient safety as significantly lower during the COVID-19 pandemic, in comparison

with the baseline measure, which reflects ordinary care. There are several factors that influence patient safety, including, but not limited to, the culture of patient safety in the organization, communication between healthcare personnel and patients, working hours, level of staffing, teamwork, high patient turnover (Needleman et al., 2011; Nygren et al., 2013; Wami et al., 2016). In addition to these factors, there are also nursing-specific risk factors for patient safety, such as MNC, RN-to-patient ratio, nursing staff skill mix, academic degree

TABLE 2 Missed nursing care by rank <sup>a</sup>, numbers and valid percentages

Items in section A	COVID-19 sample N = 43			Reference sample N = 59		p-value <sup>b</sup>
	Rank <sup>a</sup>	N (%)	Missing, N	N (%)	Missing, N	
Turning patient every 2 hr	1	29 (76.3)	5	25 (43.9)	2	.003
Attend interdisciplinary care conference whenever held	2	17 (68.0)	18	29 (58.0)	9	
Ambulation 3 times per day or as ordered	3	26 (65.0)	3	23 (39.7)	1	.023
Mouth care	4	20 (52.6)	5	24 (41.4)	1	
Patient teaching	5	13 (43.3)	13	14 (25.9)	5	
Wound care	6	16 (43.2)	6	11 (19.6)	3	.020
IV/central line site care and assessments according to hospital policy	7	10 (35.7)	15	9 (18.4)	10	
PRN medication requests acted on within 15 min	8	7 (30.4)	20	8 (17.4)	13	
Patient bathing/skin care	9/10	11 (28.2)	4	11 (19.0)	1	
Feeding patient when the food is still warm	9/10	11 (28.2)	5	19 (33.3)	2	
Emotional support to patient and/or famil	11	10 (26.3)	5	14 (25.0)	3	
Assess effectiveness of medications	12	6 (25.0)	19	7 (14.9)	12	
Patient teaching about procedures, tests, and other diagnostic studies	13/14	8 (22.9)	8	6 (11.1)	5	
Patient assessments performed each shift	13/14	8 (22.9)	8	12 (21.1)	2	
Response to call light is initiated within 5 min	15/16	7 (18.4)	5	1 (1.8)	2	.006
Nursing staffs' hand washing	15/16	7 (18.4)	5	6 (10.2)	0	
Focused reassessments according to patient condition	17	6 (18.2)	10	9 (17.0)	6	
Monitoring intake/output	18	7 (17.1)	2	5 (8.6)	1	
Full documentation of all necessary data	19	6 (15.8)	5	3 (5.4)	3	
Assist with toileting needs within 5 min of request	20	5 (13.2)	5	7 (12.3)	2	
Medications administered within 15 min before or after scheduled time	21	3 (11.5)	17	16 (34.8)	13	.050
Bedside glucose monitoring as ordered	22	3 (7.7)	4	1 (1.7)	1	
Setting up meals for patients who feed themselves	23	1 (2.5)	3	12 (21.4)	3	.007
Vital signs assessed as ordered	24	0 (0.0)	1	1 (1.7)	1	

of RNs and outliers (Aiken et al., 2014; Ball et al., 2016; La Regina et al., 2019). However, we were unable to fully identify reasons that could explain this result.

In contrast with our research question, MNC did not increase substantially during the COVID-19 pandemic; only four of the 24 items of MNC were significantly higher and there were no significant

differences in the reasons for MNC. The elements of MNC differ from previous studies on MNC, where some of the most frequently reported elements are ambulating and turning patients, providing reassurance to the patient and family, patient teaching, medication administration on time, documentation and attending interdisciplinary rounds (Al-Kandari & Thomas, 2009; Ball et al., 2014; Kalisch

TABLE 3 Significant and moderate reasons for missed nursing care by rank<sup>a</sup>, numbers and valid percentages

Items in section B	COVID-19 sample, N = 43			Reference sample, N = 59	
	Rank	N (%)	Missing, N	N (%)	Missing, N
Unexpected rise in patient volume and/or acuity on the unit	1	32 (86.5)	6	40 (74,1)	5
Urgent patient situations (e.g. a patient's condition worsening)	2	25 (67.6)	6	38 (71,7)	6
Inadequate number of staff	3	25 (64.1)	4	32 (58,2)	4
Unbalanced patient assignments	4	21 (56.8)	6	27 (50,9)	6
Heavy admission and discharge activity	5	19 (55.9)	9	27 (51,9)	7
Lack of back-up support from team members	6	17 (45.9)	6	22 (40,7)	5
Nursing assistant did not communicate that care was not done	7	15 (42.9)	8	21 (39,6)	6
Tension or communication breakdowns within the nursing team	8	15 (40.5)	6	21 (39,6)	6
Tension or communication breakdowns with the medical staff	9	13 (37.1)	8	23 (44,2)	7
Inadequate hand-off from previous shift or sending unit	10	14 (36.8)	5	15 (28,3)	6
Caregiver off unit or unavailable	11/12	12 (34.3)	8	20 (39,2)	8
Supplies/equipment not available when needed	11/12	12 (34.3)	8	17 (34,0)	9
Tension or communication breakdowns with other support departments	13	12 (32.4)	6	19 (35,8)	6
Other departments did not provide the care needed	14	11 (30.6)	7	17 (32,7)	7
Inadequate number of assistive personnel (e.g. nursing assistants, techs, etc.)	15	9 (25.0)	7	17 (32,7)	7
Medications were not available when needed	16	6 (23.1)	17	18 (38,3)	12
Supplies/equipment not function properly	17	8 (22,9)	8	14 (28,0)	9

et al., 2012). However, this perception of more MNC does not alone explain the lower patient safety rating.

The RN-to-patient ratio, nursing staff skill mix and the academic degree of the RN remained the same during the first wave of the COVID-19 pandemic care as in ordinary care. The median RN-to-patient ratio of 1:5 was the same in both samples, and the adequacy of unit staffing was considered as good. One possible explanation for the absence of the anticipated increase in RN-to-patient ratio is the decrease in the number of healthcare seeking patients with ACS during the COVID-19 pandemic. This phenomenon has been reported internationally and locally where a 40% reduction in patients suffering from ST-elevation myocardial infarctions in the Region of Stockholm, Sweden, occurred (Mohammad et al., 2020). Regarding this, at the cardiology department there were fewer patients with

ACS than normal at the in-patient wards and the RNs were reporting the same RN-to-patient ratio, which may explain why the workload remained reasonable within these wards. Compared to international research, the ratio seems to be sufficient, or even to be better, since earlier research has reported academic degree and RN-to-patient ratio to be of importance for patient outcome. Where nurses have a bachelor's degree or higher, and an average of six patients, it lowers the 30-day mortality since admission (Aiken et al., 2014).

As the measured nursing-specific risk factors for patient safety cannot explain the lower patient safety rating, we believe that there may be other explanations for our results. For example, the patient population altered during the first wave of the pandemic. Patients with COVID-19 in a stable condition but in need of oxygen treatment were treated within the cardiology wards, and patients normally

treated at the high dependency unit were also treated within these wards. These patients may be seen as “outliers” because of the absence of hospital beds in an appropriate ward, i.e. an infection ward or at a high dependency unit, which could constitute a threat to patient safety and quality of care (La Regina et al., 2019). The nursing staff had less experience of these patients as their nursing needs were not addressed as part of the ordinary nursing tasks. Outliers have an increased risk of adverse outcomes (La Regina et al., 2019), and we believe it was positive from a patient safety perspective that the RN-to-patient ratio did not increase, as such an increase could possibly be an additional risk of patient safety. Moreover, as reported by Cai et al. (2020), to care for a completely new group of patients puts stress on the nursing staff, which correlates well with our results (Cai et al., 2020). The nursing staff might have perceived an increased workload with worsened work environment (Cheung et al., 2020) and an inadequacy due to less knowledge of the management of these outliers, in line with a study by Goulding et al. (2015). This could contribute to a sense of acuity on the ward.

Yet there were many concerns regarding the care during the outbreak and first wave of the pandemic when the nursing staff adjusted to new working environments in stressful situations. However, in a review of nurses’ experiences working in acute hospital settings during a pandemic, the results found that nursing staff, regardless of the circumstances, felt a great sense of professional duty to keep working (Fernandez et al., 2020). Still, the perceived lack of personal protective equipment (PPE) was a contributing factor to nurses’ concerns and fears (Liu et al., 2020). But even if nurses are fearful, they remain in the workplace and continue to provide care (Jones et al., 2017; Liu et al., 2020). Different types of PPE, and sometimes a lack of PPE, might place an additional strain on the nursing staff, causing nervousness and anxiety, both about getting infected themselves but also not transferring the disease to other patients—or their own families—as in line with other studies (Liu et al., 2020). Moreover, many nurses wanted to ensure that they were given the appropriate information to ensure patient safety and quality of care (Fernandez et al., 2020). The infectious disease COVID-19 was new, and modifications of policies and guidelines were updated rapidly with daily changes at the beginning of the pandemic outbreak which might have had an impact on the nursing staff’s perceptions of patient safety and quality of care.

Even though the care for patients with COVID-19 has developed during the pandemic and knowledge around how to treat and nurse these patients has increased, they may still be seen as outliers in the medical and surgical wards. Also, the nursing staff’s concerns about increased workload, their limited experience of the patient group, an unsuitable ward environment and the characteristics of the patients may give them low priority for nursing care, in line with Goulding et al. (Goulding et al., 2012). However, at the participating cardiology wards in this study, patients with COVID-19 were observed with remote monitoring systems. Nursing staff at the cardiology department are used to monitoring patients through a continuous electrocardiographic monitoring system and this is one of the most common technologies used in acute care today (Fållun et al., 2020). This way to

monitor patients is in line with the recommendations for the patients with COVID-19 in order to reduce the risk of exposure for the staff, where patients with mild to moderate symptoms are recommended to be treated in isolated rooms and managed with symptomatic and supportive care, providing complete bed rest, promoting sleep and monitoring vital signs through a remote monitoring system to reduce the risk of exposure for the staff (Sharma et al., 2020). Therefore, managing patients with COVID-19 should be within the competence of cardiology wards, but there is a need for expanded guidelines and more knowledge for this specific group of patients. We should be prepared to care for these patients for a long time into the future.

## 5.1 | Limitations

This study has some limitations that need to be mentioned. First, it had a small sample and a power calculation was not conducted, which increases the risk of both type I and type II errors (Banerjee et al., 2009). The low response rate (18%) is a major limitation. Other COVID-19 studies report response rates from 30% (Nie et al., 2020). However, the two samples were recruited from the same wards where the answers from the reference sample were collected six months before the pandemic. Therefore, the strength is that the participants’ perceptions were captured just at the time of the pandemic outbreak and peak of the first wave.

The nursing staff may have different perceptions of patient safety, quality of care, MNC and its reasons. However, as reported by Ball et al. (Ball et al., 2014) a strong relationship was found between the perception of patient safety and actual MNC. Research has also shown that MNC is associated with increased odds of patients dying in hospital following common surgical procedures (Ball et al., 2018). Whether or not this is applicable for medical conditions is yet to be investigated, but the perception of patient safety noted by RNs could be used as a quality indicator for patient care.

Moreover, the study-specific questions on patient safety and quality of care were posed as overall questions, without any further explanation. The nursing staffs’ perceptions of the content of these concepts have not been investigated. The data collection in the COVID-19 sample was collected over three weeks in the end of the first peak in May–June. However, the peak in admission of COVID-19 patients was in April at the hospital. Thus, if they had filled in the questionnaires one month earlier, the nursing staff might have had a different view of MNC, patient safety and quality of care. To conduct the data collection earlier was impossible, since the pressure on the nursing staff was high with an increased number of patients with COVID-19, more overtime hours and absent shifts.

It would have been preferable to measure nursing-sensitive indicators, for instance, occurrence of pressure injuries or inpatient falls, and evaluation of nutritional status, related to the pandemic outbreak and first wave in relation to MNC, but the hospital’s quality measurements that were normally performed were suspended during this period. During a crisis, to entirely understand the care process and the affected quality of care and patient safety these measurements

are becoming more important (Austin & Kachalia, 2020). But fully understandably, the focus was on the patients' needs, the extension of staffing, PPE and its utilization, the number of beds and therefore to measure nursing-sensitive indicators were not possible during this period.

## 5.2 | Conclusion

We identified that the nursing staffs' perceptions concerning missed nursing care were about the same compared to before the outbreak and first wave of the COVID-19 pandemic. However, patient safety and quality of care were perceived significantly lower. Since we could not identify all potential reasons for this perception based on risk factors such as RN-to-patient ratio, nursing staff, skill mix and the academic degree of RN, we believe that this new patient group may be part of the explanation. There is a need for more knowledge and expanded guidelines for this specific group of patients.

## ACKNOWLEDGEMENT

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## CONFLICT OF INTEREST

None.

## ETHICAL APPROVAL

The study was approved by the National Ethical Review Authority (reference number 2019-04080) and followed the principles outlined in the "Declaration of Helsinki" from 1964 and its later amendments. The participants were given written information about the study as an introductory text to the survey, where voluntariness was emphasized, and confidentiality guaranteed. The participants consented to participation by answering the questionnaire. The researchers had access only to unidentified data.

## DATA AVAILABILITY STATEMENT

The ethical approval for the present study does not allow us to share data.

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