

## Research Paper

## Nurses' Perceptions of the Quality of Nursing Care in Patients With COVID-19: A Cross-sectional Study

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## ABSTRACT

**Background and Objective:** Providing high-quality care is a critical priority in healthcare systems. Nurses' perceptions of care quality are shaped by their caregiving experiences, particularly in complex conditions like COVID-19. This study aimed to evaluate nurses' perceptions of nursing care quality for COVID-19 patients and identify factors associated with these perceptions.

**Materials & Methods:** In this descriptive cross-sectional study, 204 nurses from COVID-19 care units at Mazandaran University of Medical Sciences were recruited via convenience sampling. Data were collected using demographic and nursing care quality perception questionnaires. Descriptive statistics were calculated, and multivariate regression analysis identified predictors of care quality dimensions, using SPSS software, version 26. The significance level was set at 0.05.

**Results:** The overall mean quality of nursing care score was  $77.3 \pm 12.41$ . Among care dimensions, responsibility and rigor scored highest ( $19.11 \pm 3.20$ ). Multivariate regression showed that female gender (Wilks'  $\Lambda = 0.928$ ,  $F_{3,200} = 2.67$ ,  $P = 0.047$ ) and greater COVID-19 patient contact hours (Wilks'  $\Lambda = 0.802$ ,  $F_{3,200} = 4.12$ ,  $P = 0.038$ ) were significantly associated with higher perceived care quality.

**Conclusion:** Nurses demonstrated a favorable perception of COVID-19 care quality. These findings suggest targeted support and training may enhance nursing care quality and staff satisfaction during pandemics, informing healthcare planning and policy in critical care settings.

**Keywords:** Nursing Care, Patients, Quality of care, Nurses, COVID-19

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## Introduction

**E**nsuring and enhancing the quality of nursing care stands as a critical and ongoing challenge for healthcare systems globally, demanding continuous commitment and innovation to meet the evolving needs of patients [1]. The nurses' professional expertise and experience are critical predictors of high-quality care [2]. Nurses are the primary agents of care quality; therefore, their perception of care quality should be taken seriously. Emerging studies have shown that both job satisfaction and nurses' intention to leave the profession influence their perceptions of care quality [3]. Nurses may consider leaving their positions to seek more favorable environments when they perceive that their current working conditions fail to support professional standards [4]. Nurses' insights into care quality and improvement strategies evolve through ongoing bedside practice. These perceptions reliably indicate actual care delivered. Assessing care quality via nurses' views thereby evaluates treatment success and patient care standards [5].

During times of crisis, it is essential to understand how changes in providing healthcare impact healthcare professionals. As COVID-19, the acute respiratory syndrome, has fluctuated across countries, medical resources have remained uncertain, and healthcare priorities, policies and procedures have rapidly changed [6]. Because of the pandemic, nurses in hospital environments frequently worked extended hours and managed exceptionally high patient volumes, with limited chances for rest or recuperation [7]. In addition to facing these challenges, healthcare providers often struggle to balance their responsibilities toward patients, their families, and themselves. This dynamic, stressful, and uncertain environment can lead to situations where ethical values or obligations are compromised [6]. Healthcare workers may face situations where external factors like resource constraints, new health policies, or care models prevent them from acting in line with their core ethical beliefs. They often recognize ethical conflicts but feel powerless to maintain ethical standards due to these pressures. This results in a compromise of their professional integrity [8]. When such circumstances are repeated frequently, they can result in "moral injury", exacerbating emotional distress, burnout, and frustration, and ultimately leading to workforce attrition [9].

Since the onset of COVID-19 in 2019, a major transformation has occurred in providing healthcare for professionals working in this field, significantly altering

routine care practices [10, 11]. The intense workload in high-risk environments has even affected nursing care for non-COVID-19 patients [12, 13]. Healthcare workers have played a vital role in facilitating these changes and reported a wide range of experiences [14, 15]. Investigations into the care of patients with COVID-19 have highlighted the challenges in this area. Research conducted in Iran has shown that nurses caring for COVID-19 patients experience issues such as stress, anxiety, and lack of organizational support—factors that may affect the quality of care they provide [16]. Similarly, a study in Turkey reported that nurses caring for COVID-19 patients face problems such as burnout and social support deprivation [17]. COVID-19-related stressors negatively influence nurses' psychological well-being, potentially compromising care quality. Consequently, this may affect the quality of nursing care.

The emergence of COVID-19 and the significant changes in healthcare delivery may have lasting effects on nurses' perceptions, influencing them even after the pandemic has ended. Given that nurses have the most direct and prolonged contact with hospitalized COVID-19 patients, understanding their perception of care during this period may help improve patient outcomes. However, few studies have examined nurses' multidimensional perceptions of COVID-19 care quality using validated scales like EPAECQC, during peak pandemic waves. Considering the uncertainty surrounding various aspects of the disease and nurses' direct involvement in COVID-19 patient care, this study was designed to explore nurses' perceptions of the quality of nursing care provided to patients with COVID-19.

## Materials and Methods

### Design and setting

This descriptive cross-sectional study included 204 participants. Participants were selected using a convenience sampling method. The research setting consisted of inpatient COVID-19 units in educational hospitals affiliated with [Mazandaran University of Medical Sciences](#) in the year 2020 (3 hospitals including [Imam Khomeini Hospital](#), [Razi Hospital](#) and [Boo'Ali Sina Hospital](#) in Sari).

### Inclusion and exclusion criteria

Inclusion criteria were: willingness to participate in the study, having at least an associate degree in nursing, and working in inpatient COVID-19 units and having more than six months of work experience. Exclusion criteria included incomplete questionnaire responses.

## Data collection tools

Data were collected using a demographic questionnaire and The scale of perception of nursing activities that contribute to nursing care quality (EPAECQC). The demographic questionnaire included variables such as age, gender, marital status, education level, place of residence, income level, work experience, monthly working hours, shift type, and level of close contact with COVID-19 patients. The EPAECQC consists of 25 items covering 7 dimensions, measured on a 4-point Likert scale: Never (1), rarely (2), often (3), and always (4). The dimensions include: patient satisfaction (items 1–3), health promotion (items 4–6), prevention of complications (items 7–9), well-being and self-care (items 14–16, and 18), functional readaptation (items 20–23), Nursing Care Organization (items 13 and 19), responsibility and rigor (items 10–12 and 17). The total score ranges from 25 to 100, with higher scores indicating higher perceived quality of nursing care. This questionnaire reflects the breadth of nursing activities and care quality. The reliability of the instrument was confirmed in a study by Ferreira Pereira da Silva Martins et al. with a Cronbach's  $\alpha$  coefficient of 0.94 [18]. In this study, we conducted face and content validity, which was confirmed. Two of the three validity stages were implemented. The reliability of this questionnaire was measured with a Cronbach's  $\alpha$  coefficient of 0.93. The validity and reliability of this questionnaire were also assessed in a study conducted in Tehran [19].

## Data analysis

Data analysis was conducted using SPSS software version 26. Variables were described by percentage, mean, and standard deviation. In the nursing care quality questionnaire, the different dimensions consisted of varying numbers of items, leading to different potential total scores. To ensure comparability across all dimensions, the raw scores for each dimension were standardized and converted to a scale ranging from 0 to 100. Normality was assessed using skewness and kurtosis statistics. For all seven dimensions of nursing care quality, the absolute values of both skewness and kurtosis were below the threshold of 1; therefore, the assumption of normality was met for all variables. Comparison of mean nursing care quality scores across groups was performed using independent samples t-test and one-way ANOVA. Pearson correlation coefficients were calculated to assess the relationships between questionnaire dimensions. Finally, data were analyzed using Multivariate Regression Analysis. Model fit and goodness-of-fit were assessed through multiple diagnostic procedures, including ex-

amination of Q-Q plots for normality of standardized residuals, analysis of skewness and kurtosis statistics, variance inflation factors (all variance inflation factors (VIF) <5) to evaluate multicollinearity, and residual-versus-predicted value scatterplots to verify linearity assumptions. The significance level was set at 0.05.

## Results

According to the findings, the mean age of participants was  $35.15 \pm 6.94$  years. Participant demographics including age, work experience, and monthly working hours are presented in Table 1. Table 1 also summarizes the comparison of nursing care quality scores across different demographic and occupational groups. Bivariate analyses revealed significant differences in outcome scores based on gender and work shift arrangements. As shown in Table 1, gender differences were significant ( $P=0.014$ ). Similarly, healthcare workers with rotational shifts obtained significantly higher scores ( $78.1 \pm 11.9$ ) than those with fixed shifts ( $72.3 \pm 14.6$ ,  $P=0.024$ ). No significant differences were found by marital status, education level, having children, employment status, place of residence, or income level (all  $P>0.05$ ). However, a trend toward significance was noted for duration of contact with COVID-19 ( $P=0.094$ ), with the more than 8 hours' group showing the highest mean scores ( $83 \pm 9.7$ ).

Figure 1 provides a graphical representation of the mean scores across the different dimensions of nursing care quality (to facilitate comparison, the scores were calculated on a 0 to 100 scale). The mean score for quality nursing care was  $77.3 \pm 12.41$ . Among the dimensions of nursing care quality, responsibility and rigor had the highest mean score ( $79.6 \pm 13.3$ ), followed by Nursing Care Organization ( $78.5 \pm 15.6$ ), patient satisfaction ( $78.1 \pm 13.8$ ) and well-being and self-care ( $77.3 \pm 16.2$ ). Responsibility/rigor and organization scored highest, indicating sustained professional standards despite pandemic pressures.

The dimension with the lowest score was health promotion ( $74.4 \pm 15.2$ ), followed by functional readaptation ( $8.93 \pm 1.82$ ) and prevention of complications ( $75.1 \pm 15.8$ ).

The heatmap in Figure 2 displays the correlation matrix among different dimensions of nursing care quality. Significant positive correlations were found between all pairs of dimensions, with correlation coefficients ranging from 0.418 to 0.815. The strongest correlations were observed between Responsibility and Rigor with Well-being and Self-care ( $r=0.815$ ), and Prevention of

**Table 1.** Frequency of nurses' demographic and occupational variables and comparison of total score of nursing care quality

Variables		No. (%)	Mean±SD	Test Statistic	P
Gender	Female	150(73.5)	78.7±11.3	2.503 <sup>a</sup>	0.014
	Male	54(26.5)	73.3±14.4		
Marital status	Married	156(76.5)	77±12.7	-0.513 <sup>a</sup>	0.608
	Single	48(23.5)	78±11.1		
Education level	Bachelor	157(77)	78±12.4	1.415 <sup>a</sup>	0.159
	Master	47(23)	75.1±12.1		
Has children	Yes	115(56.4)	76.5±12.4	-1.001 <sup>a</sup>	0.318
	No	89(43.6)	78.3±12.4		
Employment status	Permanent	114(55.9)	76.8±14	0.381 <sup>b</sup>	0.822
	Contractual	24(11.8)	76.5±10.3		
	Temporary	11(5.4)	76.1±7.49		
	Project-based	35(17.1)	78.4±10.6		
	Outsourced	20(9.8)	79.9±10		
Place of residence	Urban	188(92.2)	77.4±12.3	0.5 <sup>a</sup>	0.618
	Rural	16(7.8)	75.8±14		
Work shift	Fixed	27(13.2)	72.3±14.6	-2.275 <sup>a</sup>	0.024
	Rotational	177(86.8)	78.1±11.9		
Income level	Low	37(18.2)	77.4±13.9	0.619 <sup>b</sup>	0.539
	Moderate	140(68.6)	77.8±11.9		
	High	27(13.2)	74.9±13		
Duration of contact with COVID-19	1-2 hours	36(17.7)	76.1±11.7	2.011 <sup>b</sup>	0.094
	2-4 hours	20(9.8)	76.6±16.6		
	4-6 hours	28(13.7)	77.6±11		
	6-8 hours	90(44.1)	76±12.6		
	More than 8 hours	30(14.7)	83±9.72		

Sd: Standard deviation.

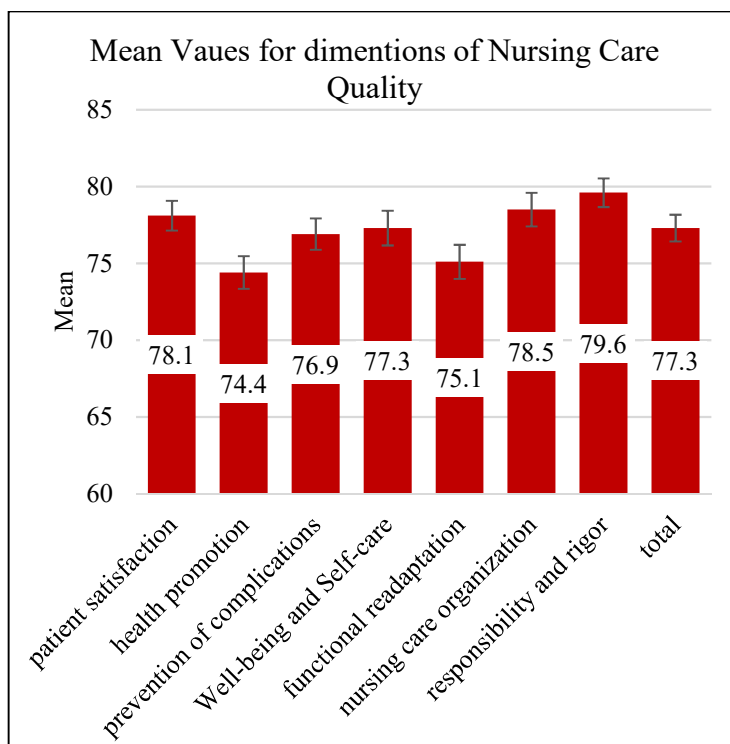
<sup>a</sup>Independent sample t-test; <sup>b</sup>one way ANOVA test.

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Complications with Responsibility and Rigor ( $r=0.707$ ). All correlations were statistically significant at  $P<0.001$ , indicating a strong interrelationship among the quality dimensions.

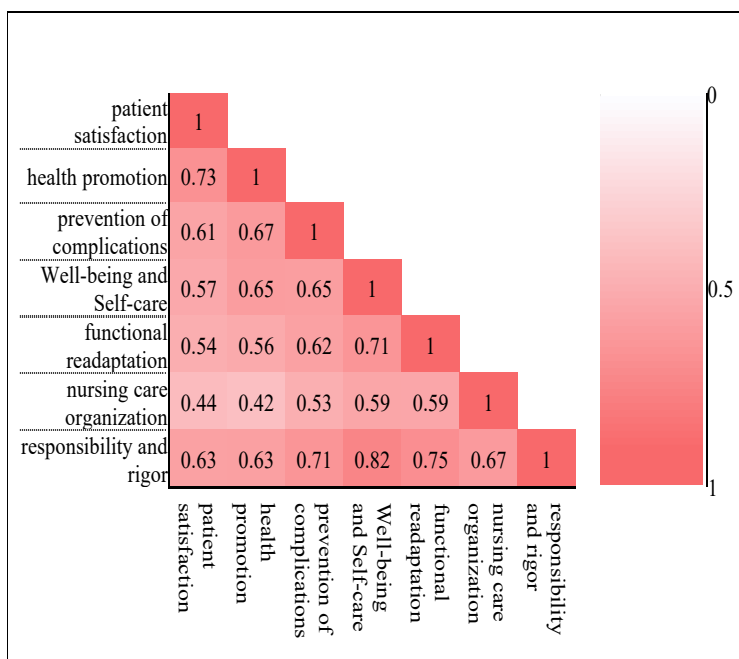
To examine the relationship between the study variables and dimensions of nursing care quality, multivari-

ate regression analysis was employed. Initially, the association between each independent variable and the care quality dimensions was assessed individually. Variables with significant associations were then entered into a multiple model.



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Figure 1. Mean score of nursing care quality by dimension (scores were calculated on a scale from 0 to 100)



All Correlations are significant at the 0.01 level (2-tailed).

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Figure 2. Correlation matrix heatmap for nursing care quality dimensions

**Table 2.** Multivariate test statistics for the effects of study variables on nursing care quality dimensions

Variables	Wilks' Lambda	Pillai's Trace	F	P	Partial Eta Squared
Gender	0.928	0.072	2.082	0.047	0.072
Education level	0.97	0.03	0.83	0.563	0.03
Work shift	0.965	0.035	0.994	0.437	0.035
Duration of contact with COVID-19	0.802	0.213	1.54	0.038	0.053
Monthly working hours	0.948	0.052	1.469	0.180	0.052

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Multivariate analysis demonstrated that both sex and contact hours with COVID-19 patients had statistically significant effects on the combined scores of nursing care quality dimensions. Specifically, sex was associated with overall differences in care quality (Wilks' Lambdas=0.928, Pillai's traces=0.072,  $P=0.047$ ), indicating that male and female nurses exhibited different performance profiles across the measured dimensions. Similarly, increased contact hours with COVID-19 patients were linked to significant differences in care quality (Wilks' Lambdas=0.802, Pillai's traces=0.213,  $P=0.038$ ), suggesting that the level of exposure to COVID-19 was an important factor. Education level, work shift, and monthly working hours showed no significant multivariate associations with care quality dimensions (Table 2). The magnitude of the effects for sex and COVID-19 exposure was moderate, while other variables had small and nonsignificant impacts.

A more detailed multivariate analysis, controlling for other variables, is presented in Table 3, which shows the regression coefficients and significance levels for the relationships between each factor and the dimensions of the quality of nursing care. In the multivariate analysis, nurses' gender showed a significant association with all dimensions of nursing care quality, even after controlling for other variables. In all dimensions, female nurses had higher quality of care scores compared to male nurses. Education level was significantly associated only with patient satisfaction, such that even after controlling for other variables, patient satisfaction among nurses with a bachelor's degree was significantly higher than among those with a master's degree. In examining the relationship between work shift and various dimensions of nursing care quality, after adjusting for other factors, work shift was significantly associated only with health promotion. Specifically, health promotion scores were significantly lower among nurses with fixed shifts compared to those with rotating shifts. Moreover, after controlling for other variables, monthly working hours were

significantly associated with certain dimensions of nursing care quality. Accordingly, patient satisfaction, nursing care organization, and accountability and rigor were significantly higher among nurses with longer monthly working hours. Finally, after adjusting for other factors, the duration of exposure to COVID-19 was significantly related to some aspects of nursing care quality. Patient satisfaction among nurses who spent 6 to 8 hours per shift in COVID-19 wards was significantly lower than among those who spent more than 8 hours. Well-being and self-care were significantly lower among nurses who spent less than 6 hours per shift in COVID-19 units compared to those with more than 8 hours of exposure. Additionally, nursing care organization was significantly lower among nurses with 2 to 4 hours of contact with COVID-19 patients than those with over 8 hours. However, health promotion, prevention of complications, Functional readaptation, and accountability and rigor showed no significant association with the duration of contact with COVID-19 patients.

Comprehensive diagnostic analyses confirmed the adequacy of the multivariate regression model. Normality assumptions were met based on Q-Q plots and analyses of skewness and kurtosis of the standardized residuals across all dimensions. Multicollinearity was not problematic, as all VIF were below 5. Linearity between predictors and outcomes was supported by residuals versus predicted values plots. Adjusted R-squared values representing explained variance by the model were as follows: Patient satisfaction, 12.2%; health promotion, 7.0%; prevention of complications, 2.8%; well-being and self-care, 7.1%; functional readaptation, 2.4%; nursing care organization, 6.2%; and responsibility and rigor, 6.6%. These results indicate that the model provides a reasonable fit and moderate explanatory power for the variables studied.

**Table 3.** Results of multivariate regression analysis to simultaneously identify demographic and occupational variables associated with dimensions of nursing care quality

Variables	Patient Satisfaction		Health Promotion		Prevention of Complications		Well-being and Self-Care		Functional Readaptation		Nursing Care Organization		Responsibility and Rigor	
	$\beta \pm SD$	P	$\beta \pm SD$	P	$\beta \pm SD$	P	$\beta \pm SD$	P	$\beta \pm SD$	P	$\beta \pm SD$	P	$\beta \pm SD$	P
Gender														
Female	6.56±2.13	0.002	7.69±2.41	0.002	6.38±2.37	0.008	6.29±2.57	0.015	6.51±2.56	0.012	7.41±2.48	0.003	6.47±2.12	0.003
Male	Reference													
Education level														
Bachelor	4.53±2.22	0.042	3.17±2.51	0.208	2.65±2.47	0.285	0.98±2.68	0.715	0.1±2.67	0.97	1.47±2.59	0.571	1.49±2.21	0.501
Master	Reference													
Work shift														
Fixed	-4.99±2.82	0.079	-7.55±3.2	0.019	-5.21±3.14	0.099	-4.02±3.42	0.241	-5.54±3.41	0.106	-4.78±3.3	0.149	-5.02±2.82	0.076
Rotational	Reference													
Duration of contact with COVID-19 (h)														
1-2	-0.15±3.28	0.963	-3.08±3.71	0.408	-1.44±3.65	0.695	-10.58±3.97	0.008	-4.29±3.96	0.279	-5.66±3.83	0.141	-3.87±3.27	0.239
2-4	-5.59±3.75	0.137	-1.3±4.24	0.759	-1.93±4.17	0.643	-12.1±4.53	0.008	-5.99±4.52	0.186	-8.72±4.37	0.048	-4.85±3.74	0.196
4-6	-6.35±3.4	0.063	-4.61±3.85	0.233	-3.95±3.78	0.297	-9.97±4.11	0.016	-6.84±4.1	0.097	-6.21±3.97	0.119	-2.55±3.39	0.452
6-8	-6.65±2.79	0.018	-4.3±3.16	0.174	-1.93±3.1	0.535	-10.04±3.37	0.003	-4.98±3.37	0.141	-2.41±3.26	0.461	-4.44±2.78	0.112
Monthly working hours														
More than 8 hours	Reference													
0-3 hours	0.03±0.01	0.013	0.02±0.02	0.218	0.02±0.02	0.196	0.02±0.02	0.149	0.01±0.02	0.432	0.03±0.02	0.034	0.03±0.01	0.048

$\beta$ : Regression coefficient; SD: Standard deviation.

## Discussion

The aim of this study was to determine nurses' perception of the quality of nursing care for patients with COVID-19. Consistent with Ebrahimi et al. and Gholjeh et al. studies [20, 21], participants demonstrated favorable perceptions despite pandemic pressures, suggesting Iranian nurses' resilience and adaptation capacity during COVID-19 waves. Obregón-Gutiérrez et al., in a study on 225 nurses in Spain, also concluded that nurses' perception of care quality was at a good level [22]. Another study on 394 nurses providing direct nursing care to patients during the COVID-19 pandemic indicated that 93.4% of the nurses reported very good/good quality of nursing care for overall in unit [7]. These findings could implicate high resilience among nurses caring for COVID-19 patients. Research has established a significant positive association between resilience and nurses' work performance [23]. Resilience adaptively buffers the stress and anxiety stemming from the COVID-19 crisis [24].

Contrary to the findings of the present study, Lavoie-Tremblay et al. in Canada, in a study involving 1,705 nurses, found that nurses caring for COVID-19 patients reported higher chronic fatigue, lower job satisfaction, lower perceived care quality, and greater intention to leave their current position [25]. Which could be due to younger and educationally diverse sample of nurses (Table 1) in the present study compared to a lower percentage of graduate level nurses in the study mentioned previously. A study in 2019 reported that more educated nurses and better patient experiences of hospital care had a direct relationship. Nurses with a bachelor's degree or higher education are generally better equipped to coordinate healthcare effectively. They tend to have stronger communication skills, sharper critical thinking abilities, and are more prepared to provide holistic, autonomous, evidence-based care. This approach is essential for effectively addressing patients' needs and ensuring the delivery of high-quality care [26].

According to the findings, in the multivariate analysis, nurses' gender—after controlling for other variables—was significantly associated with all dimensions of nursing care quality. In all aspects, female nurses reported higher quality of care than their male counterparts. In contrast to the current findings, the study by Katebi et al. on 63 nurses at Shohadah Qaen Hospital found no significant relationship between nurses' and patients' demographic characteristics (age, gender, clinical experience, residence, occupation, etc.) and quality of care scores [27]. However, the study by Khaki et al. (2018),

which involved 210 nurses employed in educational hospitals affiliated with Shahid Beheshti University of Medical Sciences, also indicated a significant relationship between quality of nursing care and gender, in a way that the quality of nursing care was reported to be higher among female nurses compared to male nurses [28]. Professions evolve in social contexts shaped by stereotypes that influence perceptions and limit development. Nursing has long been tied to gender roles from its origins and broader societal divides. These views frame nurses through male-female distinctions and expectations of women's caregiving roles. Such perceptions shape nurses' self-concepts and career choices [29].

Our findings also revealed that education level was significantly associated only with patient satisfaction. Even after adjusting for other factors, patient satisfaction was significantly higher among nurses with bachelor's degrees compared to those with master's degrees. In contrast, Alrasheedi et al. In Saudi Arabia reported that nursing education level and years of experience were significant predictors of patient satisfaction and health outcomes in a government hospital. Nurses with higher education levels and more experience had higher patient satisfaction and better outcomes, including fewer safety incidents, infections, and falls [30]. This discrepancy might be due to the higher proportion of bachelor-level nurses (77%) in the current study, which may have influenced the results. Moreover, in Alrasheedi's study, both years of experience and level of education were examined, whereas in the present study, years of work experience were not assessed.

This study has certain limitations, primarily its cross-sectional design, which constrains the extent to which causal inferences can be made, and the limited generalizability due to regional sampling bias. Data were collected from nurses working in specific healthcare settings, which may not represent broader populations. Another limitation was the reliance on self-reported questionnaires, which may be influenced by social desirability bias, particularly given the sensitive context of COVID-19 care. Additionally, data collection occurred during a specific wave of the COVID-19 pandemic, potentially affecting responses due to fluctuating workload and stress levels. Although nurses completed questionnaires while providing care under heavy workload, sufficient time was allocated to minimize response bias. Future longitudinal designs could address these constraints for more robust inferences.

## Conclusion

The findings of this study indicate a favorable level of nursing care quality for patients with COVID-19. Assessing nursing care quality among hospitalized patients offers critical insights for healthcare administrators to develop and implement targeted strategies that enhance patient satisfaction, improve working conditions for healthcare staff, and recognize the essential contributions of healthcare workers, particularly during crises like the COVID-19 pandemic. These results underscore the importance of ongoing quality monitoring and support for nursing staff to maintain high standards of care in challenging environments. Future research should explore longitudinal changes in care quality perceptions and investigate interventions that effectively sustain and improve nursing care during and beyond pandemic conditions.

## Ethical Considerations

### Compliance with ethical guidelines

Before obtaining informed consent, the overall aims of the study were explained to participants, and they were assured of the confidentiality of their information. This study was approved by the Ethics Committee of the Vice Chancellor for Research and Technology at [Mazandaran University of Medical Sciences](#), Sari, Iran (Code: IR.MAZUMS.REC.1399.597).

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### Authors' contributions

All authors contributed equally to the conception and study design, data collection and analysis, interpretation of the results, and manuscript drafting. All authors approved the submission of the final version of the manuscript.

### Conflict of interest

The authors declared no conflict of interest.

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