*American Journal of Nursing Research, 2025, Vol. 13, No. 4, 109-115*
Available online at http://pubs.sciepub.com/ajnr/13/4/4
Published by Science and Education Publishing
DOI:10.12691/ajnr-13-4-4

# Impact of Patient Nurse Ratio on Patient Satisfaction with Nursing Care Quality during Hajj Season

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*Received October 17, 2025; Revised November 19, 2025; Accepted November 27, 2025*

**Abstract** **Background:** Nurse-to-patient ratios play a crucial role in determining the quality of patient care and overall satisfaction, particularly during high-demand healthcare events like Hajj. In such mass gatherings, healthcare institutions face challenges in maintaining optimal care delivery due to increased patient volumes and resource constraints. **Objective:** This study aimed to assess patient satisfaction with nursing care quality during the Hajj season at King Abdullah Medical City in Makkah and to evaluate the impact of patient-nurse ratios on satisfaction levels across various dimensions of care. **Subjects and Methods:** A cross-sectional descriptive study was conducted among 206 adult patients admitted to specialized medical and surgical units and cardiac inpatient units during the Hajj period. Data were collected through a self-administered, structured questionnaire adapted from the Patient Judgement of Hospital Quality (PJHQ) tool, assessing satisfaction across 23 items. Demographic data and nurse-to-patient ratios were also recorded. Statistical analysis included descriptive statistics and One-Way ANOVA to identify associations between satisfaction and patient demographics or unit characteristics. **Results:** Patients reported consistently high satisfaction levels across most domains of nursing care, with overall mean satisfaction score of 116.49 (SD = 15.85). The highest satisfaction was observed in humanistic aspects such as courtesy and respect (83.5% rated excellent) and communication clarity. Statistically significant associations were found between satisfaction and gender ($p = 0.028$), hospital stay duration ($p = 0.001$), and admitting department ($p = 0.001$). However, age, marital status, and education level did not significantly influence satisfaction scores. **Conclusion:** The results show that keeping the right number of patients to nurses during the Hajj season has a favourable effect on the quality of nursing care. Even during this busy time, patients were quite happy with the care they received. This shows how important it is to have staffing plans that take into account the workload and the needs of the patients. Making nurses more attentive and the setting more comfortable could make patients even happier.

***Keywords:*** *Patient satisfaction, Nurse-patient ratio, Nursing care quality, Hajj, Mass gatherings, Hospital staffing, Saudi Arabia*

**Cite This Article:** Saadiah Alhedrity, Amani Tukruni, Ahmed Ali Mutanbak, Amani Bakr Albandar, Daoud Al-Kouz, Raed Abedrubo, and Shaher Yahya Alharbi, "Impact of Patient Nurse Ratio on Patient Satisfaction with Nursing Care Quality during Hajj Season." *American Journal of Nursing Research*, vol. 13, no. 4 (2025): 109-115. doi: 10.12691/ajnr-13-4-4.

## 1. Introduction

Nurses and midwives play a vital role in providing health services. The world needs 9 million more nurses and midwives if it is to achieve universal health coverage by 2030 [1]. In Saudi Arabia, nurses make important contributions to the healthcare sector as healthcare providers. Moreover, it is predicted that the demand for nurses in Saudi Arabia will be more than doubled by 2030 [2].

Evidence showed that hospital nurse staffing is associated with better outcomes including fewer hospital acquired infections, shorter length of stay (LOS), fewer readmissions, higher patient satisfaction, and lower nurse burnout [3]. The American Nurses Association (ANA) supports a legislative model in which nurses are empowered to create staffing plans specific to each unit. This method allows hospitals to establish staffing levels that are flexible and account for changes including the intensity of patients' needs, the number of admissions, discharges and transfers during a shift, level of experience of nursing staff, layout of the unit, and availability of resources, such as ancillary staff and technology [4].

California is the only state that legally defined required minimum nurse-to-patient ratios to be maintained by unit. For example, the nurse-to-patient ratio in a critical care unit must be 1:2 or fewer always, and the nurse-to-patient ratio in an emergency department must be 1:4 or fewer always that patients are receiving treatment [5]. When nurses are working short-staffed, essential aspects of

nursing care can be missed, which increases risk of adverse patient outcomes [6].

Having more nurses can increase patient safety and improve quality of care, yet hospitals often differ in the number of nurses they have per patient. A recent study examined variation in patient-to-nurse staffing in NY hospitals and its association with adverse outcomes (i.e., mortality and avoidable costs). Findings revealed that nurse staffing varied considerably across hospitals ranging from having 4.3 to 10.5 patients per nurse. Importantly, each additional patient per nurse increased the likelihood of death, length of hospital stays, and chances of being readmitted to the hospital within 30 days. The authors concluded that improving hospital nurse staffing would likely save thousands of lives per year, and that the associated cost would be offset by savings achieved by reducing hospital readmissions and length of hospital stays [7].

Lesser staffing was associated with an increased number of missed activities. A higher number of missed activities and poorer staffing were associated with worse patient safety, quality of nursing care and job satisfaction, and a higher intent to leave. Nurses gave the highest priority to focused on patient reassessments, timely medications, and patient education, under hypothetical conditions of improved staffing [8]. Within the first quarter of 2024 patients' satisfaction report showed decrease in nursing care elements compared with last quarter of 2023.Overall Satisfaction per Inpatient Journey regarding nursing within Q12024 (93.63%) compared with Q4 2024 (95.57%). Mostly decrease in percent within (Nurses' explanation about treatments or tests upcoming, Friendliness/courtesy of the nurses, Promptness in responding to the call button, Amount of attention paid to your special or personal needs and how well the nurses kept you informed).

The hajj to Makkah in Saudi Arabia is considered the world's largest human gathering with more than 2 million pilgrims. All health sectors in Makkah are facing a big challenge every year during the hajj period, so it is very important to focus on nurses and patients' satisfaction during this time. In addition, how could patient-nurse ratio affect their satisfaction. Nursing administration implemented minimum nurse-to-patient ratios during Hajj season in inpatient areas. We aimed to assess the patients' satisfaction regarding nursing care quality during hajj period and to identify the relation between patients' satisfaction and nurse to patient ratio during hajj period.

## 2. Subjects and Methods

### Research design, setting, and participantS

This study was a cross-sectional research design that was carried out at KAMC, Makkah. The study period was from June to July 2024. The study was beginning with survey to generalize results and included close-ended questions to collect detailed view from participants.Convenient sample of 206 adult patients presenting to selected departments (specializes surgical and medical inpatients units – cardiac inpatient units). The sample size was estimated by using EPI info program with confidence coefficient level 95%

### Study procedure

Following formal approval from the King Abdullah Medical City Institutional Review Board, the researcher initiated coordination with head nurses across selected clinical units to explain the study's purpose and data collection process. A self-administered questionnaire was prepared in both English and Arabic using a digital format accessible through a barcode. Barcodes linked to the survey were distributed in patient areas. Patients voluntarily participated by scanning the barcode using their smartphones and completing the self-report questionnaire before leaving the hospital.

The data collection process was conducted over a period of 14 days and involved daily collection of patient-nurse assignment rosters, covering day and night shifts and including new admissions, discharges, and intra-unit transfers. This information was obtained from the respective head nurses to correlate nurse workload with patient satisfaction outcomes.

The primary tool for data collection was the Patient Satisfaction with Nursing Care Quality Questionnaire (PSNCQQ), which is an adapted version of the Patient Judgement of Hospital Quality (PJHQ) instrument. It contains 32 items divided into two sections: demographic details (age, gender, marital status, education, length of stay, and admitting unit) and 23 satisfaction items using a 5-point Likert scale (Excellent, Very Good, Good, Fair, Poor) [9].

### Statistical analysis

Data analysis was conducted using descriptive and inferential statistical methods. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize patients' demographic characteristics, assess overall patient satisfaction scores and satisfaction across multiple dimensions of nursing care quality. Inferential analysis included One-Way ANOVA tests to examine whether significant differences in patient satisfaction scores existed across demographic groups and hospital-related variables.

## 3. Results

Table 1 illustrates the characteristics of 206 patients, who participated in the study, and from the demographic profile of patients, the majority of patients (50.0%) were aged 50 years or more, indicating that half of the respondents were older adults. This was followed by patients aged 36–49 years (22.8%), 26–35 years (17.5%), and the smallest group being 25 years or less (9.7%). In terms of gender, a higher proportion of the study participants were female (65.0%), while male patients accounted for 35.0%,The length of hospital stay was relatively evenly distributed, with a slight concentration on more than 7 days (33.5%), followed by 3-4 days (25.2%) and 1-2 days (24.8%). The fewest patients stayed for 5-6 days (16.5%). With regard to marital status, the majority of patients were married (76.2%), while single patients represented 23.8% of the total sample.

In terms of educational background, 46.1% of the patients had a secondary level of education, 34.0% had attained a higher education, and 19.9% had no formal education. Finally, the distribution of participants by

admitted department shows that the largest group was admitted to the Specialized Surgical Unit (36.9%), followed by Neuroscience (24.3%), Specialized Internal Medicine (19.9%), and Surgical Extension (18.9%).

**Table 1. Demographic Characteristics of the Participants**

| Sociodemographic Characteristic | Overall (n=206) |
|---|---|
| Age<br>50 Years or more<br>36-49 Years<br>26-35 Years<br>25 Years or less | 103 (50%)<br>47 (22.8%)<br>36 (17.5%)<br>20 (9.7%) |
| Gender<br>Female<br>Male | 134 (65%)<br>72 (35%) |
| Hospital Days<br>1-2 Days<br>3-4 Days<br>5-6 Days<br>More Than 7 Days | 51 (24.8%)<br>52 (25.2%)<br>34 (16.5%)<br>69 (33.5%) |
| Marital Status<br>Single<br>Married | 49 (23.8%)<br>157 (76.2%) |
| Education<br>High Education<br>Secondary<br>Not educated | 70 (34%)<br>95 (46.1%)<br>41 (19.9%) |
| Admitted Departments<br>Surgical Unit<br>Neuroscience<br>Specialized Internal Medicine<br>Specialized Surgical Unit | 39 (18.9)<br>50(24.3)<br>41 (19.9)<br><br>76 (36.9) |

**Table 2. Analysis of Patient Satisfaction under Varying Patient-Nurse Ratios**

| Please use the scale to answer the question: | Poor | Fair | Good | Very Good | Excellent |
|---|---|---|---|---|---|
| INFORMATION YOU WERE GIVEN: How clear and complete the nurses' explanations were about tests, treatments, and what to expect. | 0 | 0 | 6 (2.9%) | 42 (20.4%) | 155 (75.2%) |
| INSTRUCTIONS: How well nurses explained how to prepare for tests and operations | 0 | 0 | 3 (1.5%) | 45 (21.8%) | 156 (75.7%) |
| GETTING INFORMATION: Willingness of nurses to answer your questions | 1 (0.5%) | 0 | 5 (2.4%) | 42 (20.4%) | 154 (74.8%) |
| INFORMATION GIVEN BY NURSES: How well nurses communicated with patients, families, and doctors. | 1 (0.5%) | 0 | 8 (3.9%) | 37 (18%) | 160 (77.7%) |
| INFORMING FAMILY OR FRIENDS: How well the nurses kept them informed about your condition and needs. | 1 (0.5%) | 0 | 10 (4.9%) | 44 (21.4%) | 151 (73.3%) |
| INVOLVING FAMILY OR FRIENDS IN YOUR CARE: How much they were allowed to help in your care. | 3 (1.5%) | 0 | 10 (4.9%) | 40 (19.4%) | 153 (74.3%) |
| CONCERN AND CARING BY NURSES: Courtesy and respect you were given; friendliness and kindness. | 1 (0.5%) | 0 | 8 (3.9%) | 25 (12.1%) | 172 (83.5%) |
| ATTENTION OF NURSES TO YOUR CONDITION: How often nurses checked on you and how well they kept track of how you were doing | 1 (0.5%) | 2 (1%) | 8 (3.9%) | 36 (17.5%) | 159 (77.2%) |
| RECOGNITION OF YOUR OPINIONS: How much nurses ask you what you think is important and give you choices | 1 (0.5%) | 0 | 8 (3.9%) | 39 (18.9%) | 158 (76.7%) |
| CONSIDERATION OF YOUR NEEDS: Willingness of the nurses to be flexible in meeting your needs | 3 (1.5%) | 0 | 7 (3.4%) | 38 (18.4%) | 158 (76.7%) |
| THE DAILY ROUTINE OF THE NURSES: How well they adjusted their schedules to your needs. | 3 (1.5%) | 0 | 10 (4.9%) | 36 (17.5%) | 157 (76.2%) |
| HELPFULNESS: Ability of the nurses to make you comfortable and reassure you | 1 (0.5%) | 0 | 11 (5.3%) | 28 (13.6%) | 166 (80.6%) |
| NURSING STAFF RESPONSE TO YOUR CALLS: How quick they were to help | 3 (1.5%) | 2 (1%) | 14 (6.8%) | 44 (21.4%) | 143 (69.4%) |
| SKILL AND COMPETENCE OF NURSES: How well things were done, like giving medicine and handling IVs. | 1 (0.5%) | 0 | 12 (5.8%) | 33 (16%) | 160 (77.7%) |
| COORDINATION OF CARE: The teamwork between nurses and other hospital staff who took | 1 (0.5%) | 0 | 9 (4.4%) | 39 (18.9%) | 157 (76.2%) |

| | | | | | |
|---|---|---|---|---|---|
| care of you. | | | | | |
| RESTFUL ATMOSPHERE PROVIDED BY NURSES: Amount of peace and quiet | 3 (1.5%) | 0 | 13 (6.3%) | 44 (21.4%) | 146 (70.9%) |
| PRIVACY: Provisions for your privacy by nurses. | 0 | 1 (0.5%) | 12 (5.8%) | 26 (12.6%) | 167 (81.1%) |
| COMMUNICATION: How well does the nursing team communicate with you in your mother language | 1 (0.5%) | 0 | 19 (9.2%) | 35 (17%) | 151 (73.3%) |
| DISCHARGE INSTRUCTIONS: how clearly and completely the nurses told you what to do and what to expect when you left the hospital | 1 (0.5%) | 0 | 10 (4.9%) | 39 (18.9%) | 156 (75.7%) |
| COORDINATION OF CARE AFTER DISCHARGE: Nurses' efforts to provide for your needs after you left the hospital. | 1 (0.5%) | 0 | 8 (3.9%) | 38 (18.4%) | 159 (77.2%) |
| Overall quality of care and services you received during your hospital stay | 1 (0.5%) | 0 | 15 (7.3%) | 33 (16%) | 157 (76.2%) |
| Overall quality of nursing care you received during your hospital stay | 1 (0.5%) | 0 | 9 (4.4%) | 42 (20.4%) | 154 (74.8%) |
| Based on the nursing care I received, I would recommend this hospital to my family and friends | 0 | 3 (1.5%) | 12 (5.8%) | 34 (16.5%) | 157 (76.2%) |

Table 2 presents the analysis of patient satisfaction data in relation to patient-nurse ratios revealed consistently high satisfaction levels across various dimensions of nursing care. Specifically, 75.2% rated the clarity of explanations as excellent, and 20.4% as very good, with only 2.9% rating it as good. Similarly, instructions related to preparation for tests and operations were rated excellent by 75.7% and very good by 21.8%, indicating effective communication and patient education practices by the nursing staff.

In terms of access to information and responsiveness, the willingness of nurses to answer patient questions was rated as excellent by 74.8% and very good by 20.4%. The communication between nurses, patients, families, and doctors also received a high rating, with 77.7% marking it as excellent, which supports the presence of a well-coordinated care environment. The involvement of family and friends in care was similarly well-received, with 74.3% rating it excellent. Nurses were also effective in keeping family or friends informed about the patient's condition (73.3% excellent). The courtesy, kindness, and respect shown by nurses received the highest satisfaction, with 83.5% of patients rating it as excellent, emphasizing the strong humanistic aspect of nursing care.

Regarding attentiveness, 77.2% of patients reported excellent attention to their condition, while 76.7% felt their opinions were recognized and that they were offered choices in their care. The nurses' willingness to be flexible in meeting patients' needs was rated excellent by 76.7%, and 76.2% felt the daily routines were adjusted to accommodate their personal needs. Patient feedback on comfort and reassurance showed 80.6% excellent satisfaction, and the response to patient calls was rated excellent by 69.4%, though this was slightly lower compared to other indicators, indicating an area that may benefit from targeted improvement.

Nurses' skill and competence, including medication administration and IV handling, were rated as excellent by 77.7%, while coordination of care among nurses and other staff received 76.2% excellent ratings. A restful atmosphere was experienced by 70.9%, and privacy provision was rated excellent by 81.1% of the patients. Communication in the patient's mother language was recognized positively, with 73.3% rating it as excellent, reflecting the cultural sensitivity of care. Discharge instructions and post-discharge coordination were also well-appreciated, with 75.7% and 77.2% excellent responses respectively. Regarding overall quality of care, 76.2% of patients rated the entire hospital stay as excellent, and 74.8% specifically rated the nursing care as excellent. Finally, 76.2% of patients expressed that they would recommend the hospital to family and friends based on their experience with nursing care, highlighting a strong endorsement and overall satisfaction.

Table 3 shows the descriptive analysis of patient satisfaction responses in the context of varying patient-nurse ratios reveals consistently high mean scores across most dimensions, indicating an overall positive perception of nursing care quality. The overall satisfaction mean score was 116.49 (SD = 15.85), reflecting a generally high level of patient satisfaction, although individual experiences varied to some extent.

**Table 3. Analysis of Mean and Standard Deviation for Patient Satisfaction under Varying Patient-Nurse Ratios**

| Variables | Mean | Std. Deviation |
|---|---|---|
| Information You Were Given | 4.7340 | 0.50559 |
| Instructions | 4.7500 | 0.46688 |
| Ease Of Getting Information | 4.7228 | 0.55751 |
| Information Given By Nurses | 4.7233 | 0.58112 |
| Informing Family Or Friends | 4.6699 | 0.61507 |
| Involving Family Or Friends In Your Care | 4.6505 | 0.70826 |
| Concern And Caring By Nurses | 4.7816 | 0.55511 |
| Attention Of Nurses To Your Condition | 4.6990 | 0.63760 |
| Recognition Of Your Opinions | 4.7136 | 0.58477 |
| Consideration Of Your Needs | 4.6893 | 0.67757 |
| The Daily Routine Of The Nurses | 4.6699 | 0.70383 |
| Helpfulness | 4.7379 | 0.60018 |
| Nursing Staff Response To Your Calls | 4.5631 | 0.78610 |
| Skill And Competence Of Nurses | 4.7039 | 0.62053 |
| Coordination Of Care | 4.7039 | 0.59648 |
| Restful Atmosphere Provided By Nurses | 4.6019 | 0.73703 |
| Privacy | 4.7427 | 0.58169 |
| Communication | 4.6262 | 0.69218 |
| Discharge Instructions | 4.6942 | 0.60781 |
| Coordination Of Care After Discharge | 4.7184 | 0.58297 |
| Overall Satisfaction | 116.4878 | 15.84657 |

The highest mean rating was observed for "Concern and Caring by Nurses" (M = 4.78, SD = 0.56),

highlighting patients' strong appreciation for the respectful and compassionate behavior of nurses—an important factor even in potentially high workload settings. High scores were also noted for "Instructions" (M = 4.75, SD = 0.47), "Privacy" (M = 4.74, SD = 0.58), and "Information You Were Given" (M = 4.73, SD = 0.51), suggesting that nurses maintained effective communication and patient engagement regardless of patient-nurse ratios.

Additional variables such as "Helpfulness" (M = 4.74), "Skill and Competence of Nurses" and "Coordination of Care" (both M = 4.70), and "Discharge Instructions" (M = 4.69) also demonstrated strong scores, reflecting patient confidence in the technical and organizational capabilities of nurses, even when staffing levels may vary across units.

In contrast, the lowest mean scores were found in "Restful Atmosphere Provided by Nurses" (M = 4.60, SD = 0.74) and "Nursing Staff Response to Your Calls" (M = 4.56, SD = 0.79). These dimensions also had higher standard deviations, suggesting greater variability in patient experiences—possibly influenced by higher patient-nurse ratios in certain units, which could affect timeliness and environmental control.

In the Table 4, a one-way ANOVA was conducted to examine whether patient satisfaction with nursing care quality was significantly influenced by demographic characteristics in the context of varying patient-nurse ratios. Gender was significantly associated with patient satisfaction (F = 4.885, p = 0.028), indicating that male and female patients may experience or perceive nursing care differently when patient-nurse ratios vary. The length of hospital stay also had a significant effect (F = 5.682, p = 0.001), suggesting that patients staying longer may have different levels of interaction with nurses, potentially influenced by workload and nurse availability. Additionally, the admitted department demonstrated a statistically significant impact on satisfaction (F = 5.984, p = 0.001), reflecting that departments with different staffing levels and patient acuity may affect how patients perceive the quality of nursing care.

In contrast, age (p = 0.094), marital status (p = 0.145), and educational level (p = 0.062) did not exhibit statistically significant differences in satisfaction. These findings highlight that while certain demographic factors do not directly affect satisfaction, operational variables such as nurse workload per department and hospital stay duration—which are closely linked to patient-nurse ratios—play a crucial role in shaping patients' experiences of care.

**Table 4. Influence of Demographic Variables on Patient Satisfaction**

| Variables | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Age | Between Groups | 1602.262 | 3 | 534.087 | 2.163 | 0.094 |
| | Within Groups | 49624.957 | 201 | 246.890 | | |
| Gender | Between Groups | 1203.686 | 1 | 1203.686 | 4.885 | 0.028 |
| | Within Groups | 50023.533 | 203 | 246.421 | | |
| Hospital Days | Between Groups | 4004.852 | 3 | 1334.951 | 5.682 | 0.001 |
| | Within Groups | 47222.367 | 201 | 234.937 | | |
| Marital Status | Between Groups | 533.915 | 1 | 533.915 | 2.138 | 0.145 |
| | Within Groups | 50693.304 | 203 | 249.721 | | |
| Education | Between Groups | 1387.990 | 2 | 693.995 | 2.813 | 0.062 |
| | Within Groups | 49839.229 | 202 | 246.729 | | |
| Admitted Department | Between Groups | 4199.924 | 3 | 1399.975 | 5.984 | 0.001 |
| | Within Groups | 47027.295 | 201 | 233.967 | | |

## 4. Discussion

The findings of this study provide valuable insights into how patient-nurse ratios influence patient satisfaction with nursing care, particularly in a high-demand healthcare setting during the Hajj season at King Abdullah Medical City, the analysis revealed consistently high satisfaction levels across various dimensions of nursing care, including communication, attentiveness, technical competence, and compassionate interaction. These results suggest that patients experienced a high quality of care even when nurse workloads may have been elevated.

The analysis revealed that overall satisfaction mean score indicating a strong general impression of nursing care quality. High satisfaction was particularly evident in communication-related domains, with 75.2% of patients rating the clarity of nurses' explanations as excellent and 75.7% rating preparation instructions as excellent. This was close to the findings in the study conducted by Al Baalharith et al., in 2021 in Najran General Hospital, Saudi Arabia and Takahashi and Taniguchi (2020) which showed that the proportion of patients who had good perception on the quality of nursing care [10,11]. These scores, along with high means for "Information You Were Given" and "Instructions", suggest that nurses maintained effective patient communication and education practices regardless of nurse-patient workload variations. The patient-nurse relationship can be negatively impacted by a lack of trust due to poor communication [12,13]. Similar results were found in a study that the highest level of satisfaction was reported for communication items [14,15]. Similarly, Griffiths et al., 2020 identified patient-nurse communication and timely responsiveness as sensitive indicators of nurse workload and care quality [16].

Patients also expressed high satisfaction regarding access to information and responsiveness, with over 74% rating nurses' willingness to answer questions as excellent. Similarly, excellent ratings were given for nurses' communication with families and efforts to involve and inform them about the patient's condition. Alhussin et al., 2023 reported the highest level of satisfaction was reported for the item related to the clarity and

completeness of nurse explanations regarding tests, treatments, and expectations [17].

Humanistic aspects of care received the highest ratings, with 83.5% of patients highlighting nurses' courtesy, respect, and kindness as excellent. Related domains like attentiveness, recognition of patient opinions, and individualized flexibility also scored high, reinforcing the idea that patient-centered care was maintained despite variable patient-nurse ratios. Hong & Cho, 2021 revealed that better nurse staffing levels could affect the quality of nursing care, including patient-centered care, through sufficient communication, teaching, and explanation regarding the medication and treatment process [18].

Patients showed strong confidence in the nurses' technical capabilities. Satisfaction with "Skill and Competence" and "Coordination of Care" both achieved high mean scores while discharge education and continuity planning were also highly rated. These findings are consistent with the study by Gomez et al. (2019) and Dinsa et al., (2022) they reported a very high overall satisfaction level. These results reflect effective clinical performance and care transition processes, even when nurse staffing may vary across departments [19,20].

The only relatively lower scores were in "Nursing Response to Calls" and "Restful Atmosphere", which, although still positive, suggest potential room for improvement. Higher standard deviations in these areas indicate variable patient experiences—possibly tied to staffing challenges during peak periods or in specific wards. This finding aligns with a study conducted in Ethiopia in 2016, which assessed adult patient satisfaction with inpatient nursing care and found low satisfaction regarding the amount of privacy provided by nurses [21].

Among demographic variables, gender showed a significant association with satisfaction, suggesting differing perceptions between males and females. The same result was obtained by Ahmed et al., 2014, where male participants exhibited greater satisfaction compared to females [22]. This finding is consistent with a study conducted by Sharew et al., 2018, which also found that males were more satisfied than females, Operational factors like hospital stay length and the admitting department also had a significant impact—likely due to differences in nurse workloads or care intensity [23]. Dall'Ora et al. (2022) similarly noted that staffing adequacy must be considered in the context of unit type, skill mix, and patient acuity [24].

Conversely, age, marital status, and education did not significantly affect satisfaction, highlighting that patient experience is shaped more by service delivery factors than by personal demographics. This is supported by the findings in the study conducted by Ismael et al., 2024 and Kewi et al., 2018 there was no statistically significant association between quality of care and some demographic variables such as age [25,26]. This is supported by a similar study finding conducted by Alsaqri at Hail, Saudi Arabia in three tertiary care settings which revealed that satisfaction was not associated with demographic variables. These variations may reflect the uneven distribution of workload and staffing across units, a concern documented by Elmdni (2025) in critical care settings [27].

## 5. Conclusion

This study showed that despite the heavy workload during the Hajj season, patients reported high satisfaction with nursing care, especially in communication, courtesy, technical skills, and compassion. Although a few areassuch as response time and restfulnessscored slightly lower, overall satisfaction remained strong. The findings also revealed that satisfaction levels were influenced by factors like gender, length of stay, and admitting department, while age, marital status, and education had no significant effect. These results highlight the importance of proper nurse-to-patient ratios and nurse job autonomy in ensuring safe, consistent, and patient-centered care during mass gatherings. The study recommends strengthening staffing models, enhancing workforce capacity, and conducting broader research on job autonomy across all healthcare workers in Saudi Arabia.

## Limitations

One limitation of this study is its cross-sectional design, which captures patient satisfaction at a single point in time and may not reflect changes in perception throughout the hospital stay or across different Hajj seasons. Additionally, the study was conducted in a single tertiary hospital during a specific high-demand period, which may limit the generalizability of the findings to other settings or times of the year. The use of self-reported satisfaction surveys may also introduce response bias, as patients might have rated their experiences favorably due to social desirability or cultural influences. Furthermore, while the study examined associations between patient-nurse ratios and satisfaction, it did not account for other staffing factors such as nurse experience level, skill mix, or shift patterns, which could also impact patient perceptions of care.

## Recommendations

Based on the findings of this study, it is recommended that hospital administrators and nursing leaders continue to implement and monitor optimal nurse-to-patient ratios, especially during high-demand periods like Hajj, to maintain and enhance patient satisfaction with nursing care. Emphasis should be placed on strengthening areas with relatively lower satisfaction scores, such as promptness in responding to patient calls and maintaining a restful atmosphere, by ensuring adequate staffing, providing ongoing staff training, and promoting supportive work environments. Additionally, future studies should consider longitudinal designs across multiple hospitals to validate these findings and explore the impact of other staffing variables such as nurse experience, workload distribution, and shift coverage on patient outcomes and satisfaction.

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