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# An Investigation into the Frequency and Demographic Characteristics of Hospital Readmissions in Various Departments of Vali-Asr Hospital, Fasa, Iran

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## Abstract

**Background & Objectives:** This study aimed to investigate the frequency and demographic characteristics of patient readmissions across various departments of Vali-Asr Hospital in Fasa, Fars Province, Iran.

**Materials & Methods:** This descriptive cross-sectional study was conducted using a census sample comprising 1,599 patients who experienced hospital readmissions. Demographic and clinical information was extracted from the Hospital Information System (HIS) for the period spanning 2020 to 2023. Data were analyzed using descriptive statistics and independent *t*-tests, Chi-square tests, one-way analysis and Pearson correlation coefficients.

**Results:** Of the study population, 352 individuals (22%) were under 30 years of age, 642 (40%) were aged between 30 and 60 years, and 605 (38%) were over 60 years old. Readmission rates for gynecological, cardiac, and internal medicine conditions were higher among women, whereas men exhibited higher readmission rates for respiratory and surgical conditions. Gender differences were significant ($P<0.01$), with women more frequently readmitted for gynecological/cardiac conditions and men for respiratory/surgical issues. Additionally, a positive and statistically significant correlation was found between age and the number of readmissions ($r = 0.08$, $P = 0.001$).

**Conclusion:** Targeted interventions for elderly patients and high-readmission departments (internal medicine/gynecology) are urgently needed. Additionally, given the elevated rate of readmissions identified in this study particularly among older adults raising awareness about the importance of follow-up care, enhancing the attentiveness of healthcare providers to the medical and psychosocial needs of patients, and informing hospital administrators of the financial consequences of readmissions may be instrumental in reducing their occurrence.

**Keywords:** Aging population, preventable readmission's, Iran healthcare

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## Introduction

Hospitals are among the most critical institutions within the healthcare delivery system, integrating diagnostic, therapeutic, preventive, educational, and research functions to deliver high-quality care while ensuring the safety and comfort of both patients and staff (1). On one hand, the growing demand for healthcare

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services, and on the other, the limitations in available resources, the increasing specialization of medical care, and the high costs resulting from inefficient utilization of hospital capacity have collectively contributed to rising healthcare expenditures (2). Consequently, hospital administrators and national health authorities must place greater emphasis on optimizing bed occupancy, enhancing clinical effectiveness, and improving cost efficiency. Furthermore, increased investment should be directed toward evaluating key performance indicators within hospital wards—particularly readmission and mortality rates (3, 4).

Identifying patients at high risk of readmission, along with the underlying contributing factors, represents a crucial initial step toward implementing targeted interventions and improving clinical outcomes. Hospital readmission is widely recognized as a quality indicator across the continuum of care (5, 6). It refers to a patient's return to the hospital due to incomplete or inadequate treatment and may occur multiple times (7). Readmissions not only diminish the quality of life for patients and their families but also impose substantial financial burdens on healthcare systems (8).

By investigating and anticipating the factors associated with readmission—such as prioritizing nursing care, allocating additional time to high-risk patients, ensuring early detection of complications related to diseases or procedures, evaluating new therapeutic protocols, optimizing human resource deployment, monitoring bed utilization rates, and improving the quality of both nursing and medical services—better outcomes can be achieved for at-risk patient populations (9).

Numerous variables have been identified as influential in hospital readmissions, including length of stay, type of admission (acute, inpatient, or outpatient), presence of comorbidities, and the number of emergency department visits in the preceding six months. In this context, Calvillo (2013) emphasized that a comprehensive understanding of the factors contributing to readmissions facilitates the identification of unmet therapeutic, educational, and psychosocial needs—ultimately helping to reduce readmission rates, decrease healthcare costs, and enhance overall quality of care. He further advocated for large-scale studies across diverse national health systems (10).

In a study conducted by Arab et al. (2012) investigating the causes of hospital readmissions across medical universities in Tehran, higher rates of readmission were reported in surgical wards, orthopedics, and infectious disease departments for both male and female patients compared to other units (11). Etemadi et al. (2015), in their study of factors influencing readmission among patients with type 2 diabetes in hospitals across Kermanshah, identified significant associations between readmission and variables such as gender, education level, occupation, number of children, and smoking status (12). According to Tazhibi et al., the primary causes of readmission could be categorized into three domains: patient-related factors, clinical factors, and hospital-related factors (13). Vahdat et al. (2020) found that a portion of readmissions was attributable to disease relapse (14). Similarly, Jahani et al., in their study at Bojnurd Hospital, found a significant correlation between post-discharge dependency in older adults and the likelihood of readmission (15).

Bianco et al. (2012), in a study of hospitals in southern Italy, highlighted the urgent need for interventions to prevent potentially avoidable readmissions (16). Chen et al. (2025) identified fever and infection as the most common symptoms leading to readmission (17). Likewise, Robert et al. (2017), in a Canadian study, reported that the strongest predictors of readmission were disease severity and prior hospitalization (18). Tatiana et al. (2025) found that the use of immunosuppressive medications significantly increased the risk of readmission (19).

Hospital readmission is widely regarded as one of the clearest indicators of suboptimal treatment and poor-quality care. Despite its multifactorial nature, readmission is frequently used as a benchmark for assessing hospital performance. It not only compromises the well-being of patients and their families but also imposes a considerable financial strain on healthcare systems. Therefore, preventing unnecessary readmissions can profoundly enhance patient quality of life while promoting the financial sustainability of healthcare services.

Given the critical significance of this issue and the relative paucity of research in this area, the present study was undertaken to investigate the prevalence and underlying causes of hospital readmissions across different departments of Vali-e-Asr Hospital in Fasa. It is hoped that the findings from this investigation—through an examination of the frequency and contributing factors of readmissions—will offer valuable insights for reducing avoidable readmissions, lowering healthcare costs, and ultimately improving the quality of patient care.

## Materials and Methods

This study employed a descriptive cross-sectional design to examine the frequency and demographic characteristics of patient readmissions across various departments of Vali-e-Asr Hospital in Fasa, Iran. A census sampling method was used, whereby all relevant data on hospitalized patients from the beginning of Farvardin 1399 (March 2020) to the end of Esfand 1402 (March 2024) were reviewed. The admission criteria in this study were hospitalization of the patient with the primary diagnosed problem and disease-related complications. For example, a Myocardial infarction (MI) patient is admitted to the cardiac ward due to recurrent cardiac complications. While the exclusion criterion was incomplete patient records or missing data. Data were retrieved from the Hospital Information System (HIS).

Hospital Information Systems are electronic platforms that collect, organize, store, and retrieve patients' financial, administrative, and clinical data using computerized technologies, thereby making critical information readily accessible to healthcare decision-makers at any time and from any location. In the present study, relevant variables—including age, gender, marital status, number of hospital visits, and the departments in which patients were admitted—were extracted from the HIS and subsequently analyzed (20).

Upon receiving ethical clearance and coordinating with the hospital administration, the researcher obtained the required data from the HIS officer at Vali-e-Asr Hospital. In compliance with ethical guidelines, the study was approved by the Research Ethics Committee of Fasa University of Medical Sciences, under the code IR.FUMS.REC.1399.218**.**

All statistical analyses were conducted using SPSS software, version 22. Descriptive statistics, including frequency distributions, means, and standard deviations, were utilized to summarize the data. To examine relationships between variables, Pearson and Spearman correlation coefficients were applied, depending on data normality. Additionally, the independent t-test was employed to assess differences between groups. A p-value of less than 0.05 was considered statistically significant in all analyses.

## Results

In this study, 58.1% of participants were female, while 41.9% were male. Among all participants, 89.7% were married, and 39.6% were between 30 and 60 years of age. The mean number of hospital visits was 1.4 ± 0.8, with a minimum of 1 visit and a maximum of 7 visits recorded. The mean age of the patients was 50.3 ± 21.3 years (Table 1).

Regarding departmental distribution, the highest frequency of readmissions occurred in the internal medicine (24%) and gynecology (23%) departments, whereas the lowest frequency was observed in the respiratory department (4%) (Table 2).

**Table 1.** Frequency distribution of the study population's demographic characteristics

| Variables | Terms | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Gender | Female | 935 | 58.1 |
| | Male | 664 | 41.9 |
| Marital Status | Single | 168 | 9.3 |
| | Married | 1307 | 89.7 |
| Number of visits | 1 | 7 | 1.4±0.8 |
| Age | 5 | 95 | 50.3±21.3 |
| | **Terms** | **Frequency (n)** | **Mean ± SD** |
| Number of visits | Single | 168 | 1.41±0.3 |
| | Married | 1307 | 1.45±0.9 |
| | Female | 644 | 1.35±0.7 |
| | Male | 935 | 1.47±0.3 |
| | 30> | 352 | 1.31±0.2 |
| | 30-60 | 642 | 1.38±0.3 |
| | 60< | 605 | 1.47±0.7 |

**Table 2.** Frequency distribution of the number of hospitalizations in different Wards in the study population

| Ward | Frequency | Frequency (%) |
|---|---|---|
| Gynecological | 365 | 23 |
| Cardiology | 196 | 12 |
| Pulmonology | 59 | 4 |
| Internal | 391 | 24 |
| Surgery | 172 | 11 |
| Other | 416 | 26 |

**Table 3.** Distribution of different Wards by Demographic Characteristics

| Variables | Group | Gynecological | Cardiology | Pulmonology | Internal | Surgery | Other | (P-value) |
|---|---|---|---|---|---|---|---|---|
| Gender | Female | 325(88.8) | 100(51.2) | 29(49.2) | 196(50.1) | 62(36.1) | 224(53.8) | P<0.01 |
| | Male | 41(11.2) | 96(48.8) | 30(50.8) | 195(49.9) | 110(63.9) | 192(46.2) | |
| Marital Status | Single | 24(7.4) | 2(1.1) | 2(3.5) | 48(13.5) | 49(30.8) | 43(10.8) | P<0.01 |
| | Married | 302(92.6) | 175(98.9) | 55(96.5) | 308(86.5) | 110(69.2) | 357(89.3) | |
| Age | 30> | 147(40.3) | 1(5.2) | 2(3.4) | 60(15.3) | 67(39.1) | 75(18.1) | P<0.01 |
| | 30-60 | 163(44.7) | 66(33.8) | 14(23.7) | 189(48.4) | 68(39.8) | 142(34.1) | |
| | 60< | 55(15.1) | 129(65.2) | 43(72.9) | 142(36.3) | 37(21.1) | 199(47.8) | |

In this study, the frequency of hospitalizations due to gynecological, cardiac, and internal medicine conditions was higher among women than among men. Conversely, men exhibited a higher frequency of readmissions for respiratory and surgical conditions compared to women. A statistically significant difference was observed between male and female patients with respect to the department of admission ($P < 0.01$). Furthermore, hospitalizations related to gynecological, surgical, and internal medicine conditions were more common among patients aged 30 to 60 years than those in other age groups. In contrast, respiratory and cardiac conditions were more prevalent among individuals over 60 years of age. A statistically significant difference was also found among the different age groups in terms of the department of admission ($P < 0.01$) (Table 3).

The results of the correlation coefficient analysis revealed a statistically significant positive relationship between age and the number of visits ($r = 0.08$, $P = 0.001$).

**Table 4.** Correlation Analysis of Age, Gender, Marital Status and number of visits

| Variables | | Number of visits |
|---|---|---|
| Age | Pearson Correlation | 0.08 |
| | Sig. (2-tailed) | 0.001 |
| Gender | Pearson Correlation | 0.09 |
| | Sig. (2-tailed) | 0.06 |
| Marital Status | Pearson Correlation | 0.34 |
| | Sig. (2-tailed) | 0.12 |

However, no significant correlation was found between the number of visits and either gender ($r = 0.001$, $P = 0.09$) or marital status ($r = 0.34$, $P = 0.12$) (Table 4).

## Discussion

The aim of this study was to examine the frequency and demographic characteristics of patient readmissions across various departments of Vali-e-Asr Hospital in Fasa. The findings indicated that the internal medicine and gynecology departments had the highest rates of readmission, whereas the respiratory department had the lowest. These results are consistent with those of Arab et al. (2011), whose study titled *"An Investigation into the Causes of Patient Readmission in Hospitals Affiliated with Tehran University of Medical Sciences"* identified internal medicine as the department with the highest rate of readmissions (11). Similarly, Qaffarian et al. (2002) reported that internal medicine was the most common diagnosis category for both primary and secondary readmissions, which supports the findings of the present study (20). Furthermore, Tazehdari et al. (2011), in their study *"Causes of Patient Readmission at Al-Zahra Hospital in Isfahan,"* also found that the internal medicine and surgical departments had the highest frequency of readmissions, which is consistent with the current findings (13).

In the present study, the average number of visits was higher among married individuals compared to their single counterparts, and higher among men than women. Tazehdari et al. (2011) similarly reported that men had a higher frequency of readmissions than women, which aligns with the present findings (13). The highest average number of visits was recorded among individuals aged over 60 years. A statistically significant difference was observed between age groups in terms of the department of admission ($P < 0.01$). In the study conducted by Tazehdari et al., the majority of readmissions occurred among individuals aged over 60, further corroborating the results of this study (13). Likewise, Qaffarian et al. (2002) reported the highest readmission rates among patients aged 61 to 70, which corresponds with the present study's findings (20).

In a study by Ziai et al. (2010) titled *"An Investigation into the Frequency of Readmission and Its Associated Factors in Cardiovascular Patients at Selected Hospitals in Mashhad,"* a significant association was found between age and readmission frequency, consistent with the findings of this study (21). In the present research, hospital admissions across different departments were more common among married individuals than among single individuals. This difference was statistically significant ($P < 0.01$). Etemadi et al. (2015), in their study *"Factors Affecting Readmission in Diabetic Patients in Kermanshah,"* also reported higher readmission rates among married individuals, which supports our findings (12). In this study, admissions for gynecological and cardiovascular/internal medical conditions were more frequent among women, whereas respiratory and surgical admissions were more common among men. A statistically significant difference was observed between male and female patients regarding the department of admission ($P < 0.01$). In line

with this, Mirkin et al. (2017) reported that cardiovascular admissions were more frequent among women than men, which is consistent with our findings (21).

Hospitalizations due to gynecological, surgical, and internal medical conditions were more prevalent among individuals aged 30 to 60 years. In contrast, respiratory and cardiovascular conditions were more common among those aged over 60. A statistically significant difference was found among age groups with respect to the department of admission ($P < 0.01$). These findings are supported by Hosseini et al. (2016), whose study *"Causes of Readmission in the Inpatient Wards of the Oil Industry Hospital in Tehran"* found that the majority of readmitted patients were aged over 60 (22). The results of a study by Bianco et al. (2012) in Italy showed that readmissions of patients in the surgical ward were higher than in other wards**,** which is not consistent with the present study (16). The results of a study by Faradonbeh et al. (2025) showed that most of the re-hospitalization cases (30%) were related to the ophthalmology ward, followed by emergency and urology wards. The most common reason for re-hospitalization was disease recurrence (58.33%), which is not consistent with the present study (23).

The correlation analysis revealed a significant positive relationship between age and the number of visits. However, no significant correlations were found between the number of visits and either gender or marital status. Samuel et al. (2022) also reported that the number of visits and readmissions was higher among older adults, and identified a significant association between age and readmission frequency, which is consistent with the present study (22). Similarly, Qaffarian et al. (2002) found that individuals aged 61 to 70 had the highest frequency of readmissions. In the current study, the highest average number of visits was likewise observed among individuals aged over 60 years (20). A comparison of the findings of the present study with those of similar investigations conducted by other researchers supports the conclusion that limited health awareness and increasing age are key factors contributing to the risk of patient readmission. However, it is important to consider cultural differences, lifestyle habits, and adherence to healthcare standards across different countries. Such variations may account for discrepancies observed between the results of international studies and those conducted in Iran.

**Limitation**

A key limitation of the present study was the unavailability of data regarding the specific reasons for patient readmission, as this information was not recorded in the HIS of Vali-e-Asr Hospital in Fasa. It is recommended that the relevant authorities take appropriate measures to upgrade the HIS software to ensure comprehensive documentation of all essential data during hospital visits. Future studies should aim to investigate the underlying causes of patient readmission more explicitly. Moreover, comorbidities or socioeconomic factors (*known readmission predictors*) were unavailable in the HIS data. Prospective studies with structured follow-up are recommended to investigate the reasons for readmission. A fundamental limitation of cross-sectional studies is their inability to establish temporal relationships between exposure and outcome variables, which constrains causal inferences. Moreover, the cross-sectional design may not account for potential changes in participants' attitudes and behaviors over time. Future research would benefit from longitudinal or cohort studies with larger sample sizes and the inclusion of additional psychological, social, cultural, and spiritual variables to provide a more comprehensive understanding of these relationships. It is also recommended to conduct qualitative studies in order to gain in-depth insight into the factors affecting patient readmission.

**Strengths**

One of the major strengths of this study was

its large sample size. Additionally, this research represents the first study of its kind conducted in the southern region of the Fars Province.

## Conclusion

This study found that the internal medicine and gynecology departments had the highest rates of patient readmission, while the respiratory department had the lowest. The highest average number of visits was recorded among individuals aged over 60 years. Given the elevated readmission rate observed—particularly among the elderly—it would be beneficial to increase patient awareness regarding the importance of follow-up care, enhance healthcare staff's attentiveness to patients' medical and health-related needs, and inform hospital administrators about the economic burden associated with patient readmissions.

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## Conflict of Interest

The authors declare that they have no conflicts of interest to disclose.

## Code of Ethics

The ethical code is IR.FUMS.REC.1399.218

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## Ethical Consideration

This article does not contain any studies with animals performed by any of the authors.

## Authors Contribution

M.B. and N.A. conceptualized the study. R.H., M.H., and M.K. performed the study. N.A., M.B., M.K., and A.T. wrote the draft.

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