



ASSESSMENT OF BARRIERS IN THE UTILIZATION OF HOSPITAL MANAGEMENT INFORMATION SYSTEM (HMIS) AMONG STAFF NURSES OF MGM HOSPITAL, CHHATRAPATI SAMBHAJINAGAR, MAHARASHTRA, INDIA

Bioinformatics

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ABSTRACT

Background: Hospital Management Information Systems (HMIS) are essential tools for improving healthcare quality, efficiency, and documentation accuracy. Despite their benefits, several barriers hinder effective utilization among nursing professionals, particularly in tertiary care settings. **Objective:** To assess the barriers in the utilization of HMIS among staff nurses working in a tertiary care hospital and to determine the association between selected demographic variables and perceived barrier levels. **Methods:** A descriptive study design was adopted. A total of 124 staff nurses at MGM Hospital, Chhatrapati Sambhajanagar were selected by convenient sampling. Data were collected using a structured 30-item barrier assessment 3-point Likert scale. The tool assessed technical, organizational, and individual-related barriers. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the data. Chi-square test was applied to determine the association between barrier levels and selected demographic variables. **Results:** The mean total barrier score was 32.02 (SD = 10.65), indicating a moderate level of perceived barriers in HIMS utilization. Among the participants, 35.5% reported moderate barriers, 31.5% reported high barriers, and the remaining experienced low barriers. A statistically significant association was found between gender and level of perceived barriers ($\chi^2 = 11.29$, $p = 0.023$), while other demographic variables showed no significant association. **Conclusion:** Staff nurses experience moderate barriers in the effective utilization of HIMS. Implementation of structured training programs, enhancement of system functionality, and strengthening institutional technical support are recommended to improve HIMS adoption and optimize healthcare delivery outcomes.

KEYWORDS

Hospital Management Information System, Barriers, Staff Nurses.

INTRODUCTION

The rapid advancement of information and communication technology (ICT) has significantly transformed healthcare delivery systems worldwide. Healthcare institutions are increasingly adopting digital technologies to improve operational efficiency, enhance patient safety, strengthen interprofessional communication, and ensure effective management of patient-related information. Among these technological advancements, the implementation of Hospital Information Management Systems (HIMS), also referred to as Hospital Management Information Systems (HMIS), has become a cornerstone of modern healthcare administration and clinical practice. HIMS is an integrated computerized system that facilitates the collection, storage, retrieval, and management of patient and hospital data to support clinical, administrative, and financial operations¹.

Globally, digital health initiatives have emphasized the role of electronic health information systems in improving quality of care and patient outcomes. Proper implementation of hospital information systems enhances documentation accuracy, reduces duplication of records, minimizes medical errors, and supports evidence-based clinical decision-making². Furthermore, electronic systems contribute to improved continuity of care, efficient data retrieval, streamlined billing processes, and effective resource utilization within healthcare organizations³.

In India, the healthcare sector is gradually transitioning from traditional paper-based documentation to electronic information management systems. National digital health initiatives have encouraged hospitals to adopt health information technologies to improve service quality and institutional performance⁴. Tertiary care hospitals, in particular, face increasing patient loads, growing demands for accurate documentation, and heightened expectations regarding patient safety and accountability. In such settings, HIMS

plays a vital role in organizing clinical workflows and maintaining systematic electronic records.

Nurses constitute the largest workforce in hospitals and play a pivotal role in patient care management. They are directly involved in patient assessment, medication administration, monitoring, documentation, reporting, and coordination with multidisciplinary teams. As frontline healthcare providers, nurses are among the primary end-users of HIMS. They routinely utilize the system for entering patient demographics, documenting nursing care plans, recording vital signs, updating medication administration records, reviewing laboratory reports, and preparing discharge summaries. Therefore, the effectiveness of HIMS implementation largely depends on the competency, acceptance, and active participation of nursing personnel⁵.

Despite the numerous advantages associated with HIMS, its effective utilization among nursing professionals remains a challenge in many healthcare settings. Several studies have identified barriers that hinder optimal adoption of electronic health information systems. Commonly reported barriers include inadequate computer literacy, insufficient training, poor system usability, technical issues, network interruptions, limited technical support, increased workload perception, time constraints, and resistance to technological change⁶. Organizational factors such as lack of administrative support, insufficient infrastructure, and inadequate staffing further contribute to reduced system utilization⁸.

In busy clinical environments, nurses are required to manage multiple responsibilities simultaneously, including direct patient care and documentation tasks. The introduction of electronic documentation systems may initially increase perceived workload, particularly when adequate orientation and ongoing support are not provided. Some

nurses may experience anxiety or lack confidence in using computerized systems, especially when they have limited prior exposure to information technology. These factors may lead to partial utilization, delays in documentation, and reduced satisfaction with the system.

Within the healthcare landscape of Maharashtra, both public and private tertiary care institutions are expanding digital infrastructure to enhance service delivery. However, the effectiveness of these systems largely depends on user engagement and system usability at the ground level. The Marathwada region, including Chhatrapati Sambhajnagar, is witnessing steady growth in tertiary healthcare services. Mahatma Gandhi Mission Hospital is a prominent tertiary care teaching hospital that has implemented HIMS as part of its quality improvement and digital healthcare initiatives. Staff nurses working in this hospital are expected to utilize HIMS in their routine clinical activities to maintain electronic documentation and facilitate communication among healthcare professionals.

Although the system is operational, practical challenges may influence its effective utilization. Barriers experienced by nurses may vary according to institutional policies, availability of technological resources, workload patterns, and individual competency levels. Limited studies have specifically explored barriers in HIMS utilization among staff nurses in tertiary care hospitals of the Marathwada region. Therefore, generating context-specific evidence is essential for strengthening digital health practices and improving system performance at the institutional level.

The present study was undertaken to assess the barriers in utilization of Hospital Information Management System among staff nurses working at Mahatma Gandhi Mission Hospital, Chhatrapati Sambhajnagar, Maharashtra. The findings of the study may provide valuable insights for hospital administrators, nursing leaders, and policymakers to design targeted interventions aimed at improving system functionality, enhancing user competency, and optimizing healthcare delivery.

Objectives

1. To assess the level of barriers in HMIS utilization among staff nurses of MGM Hospital, Chhatrapati Sambhajnagar.
2. To determine the association between selected socio-demographic characteristics and the level of barriers in HMIS utilization.

RESEARCH METHODOLOGY

RESEARCH APPROACH

A quantitative, descriptive cross-sectional research design was employed.

SETTING OF THE STUDY

The study was conducted at MGM Hospital (Mahatma Gandhi Mission Hospital), Chhatrapati Sambhajnagar, Maharashtra, India a 1,000+ bedded tertiary care teaching hospital affiliated with MGM University of Health Sciences. The hospital serves the Marathwada region and runs advanced departments including critical care, oncology, orthopedics, nephrology, cardiology, and neurology, all of which utilize HMIS for clinical and administrative functions.

POPULATION OF THE STUDY

The target population comprised all staff nurses actively employed and using HMIS at MGM Hospital, Chhatrapati Sambhajnagar. A total of 124 staff nurses were selected using convenient sampling. Inclusion criteria: staff nurses currently using HMIS in their clinical units and willing to participate. Nurses on extended leave or those with less than one month of posting were excluded.

Data Collection Tool

A structured self-administered questionnaire consisting of two sections was used:

(a) Socio-demographic Profile: age, gender, educational qualification, clinical experience, duration of HIMS use, formal training in HIMS, and employment type.

(b) HMIS Barrier Assessment Scale: a 30-item scale rated on a 3-point Likert scale (0 = Not a barrier; 1 = Moderate barrier; 2 = Significant barrier). The total possible score ranged from 0 to 60, with higher scores indicating a greater degree of perceived barriers. The tool

covered domains including technical barriers (system speed, downtime, navigation), organizational barriers (policy clarity, IT support, double documentation), and personal barriers (computer literacy, attitude, workload).

Content validity was established through expert review by faculty in nursing informatics and medical informatics. Reliability was confirmed using Cronbach's alpha coefficient.

Data Collection Procedure

Prior institutional ethical clearance was obtained. Written informed consent was obtained from each participant. Tool was distributed across clinical departments and collected within 30–45 minutes. Confidentiality and anonymity of respondents were strictly maintained throughout.

Statistical Analysis

Data were entered and analyzed. Descriptive statistics including frequency, percentage, mean, standard deviation (SD), and median were calculated. Total barrier scores were categorized into three levels (Low, Moderate, High) using tertile distribution. Chi-square (χ^2) test was used to determine association between socio-demographic variables and barrier levels. Statistical significance was set at $p < .05$.

RESULT:

Socio-Demographic Characteristics

A total of 124 staff nurses working at MGM Hospital, participated in this study. The majority of participants were young nurses aged 20–25 years ($n = 71$, 57.3%), followed by 26–30 years ($n = 29$, 23.4%), reflecting the predominantly young nursing workforce at the hospital. Most respondents were female ($n = 85$, 68.5%), consistent with the gender distribution characteristic of the nursing profession in Maharashtra.

Regarding educational qualification, 44.4% ($n = 55$) held a Basic B.Sc Nursing degree and 41.1% ($n = 51$) had a Diploma (RNGNM/RNANM). In terms of clinical experience, 42.7% ($n = 53$) had 1–5 years of experience, while 36.3% ($n = 45$) had less than one year. Nearly half of the participants ($n = 56$, 45.2%) had less than six months of experience using HIMS at MGM Hospital, and 33.9% ($n = 42$) had never received formal HIMS training. The majority were employed on a contract basis ($n = 79$, 63.7%).

Demographic details are presented in Table 1.

Table 1 Frequency and Percentage Distribution of Socio-Demographic Characteristics of Staff Nurses of (N = 124)

Variable	Category	Frequency	Percentage
Age (years)	20–25	71	57.3
	26–30	29	23.4
	31–35	12	9.7
	≥36	12	9.7
Gender	Female	85	68.5
	Male	38	30.6
	Other	1	0.8
Educational Qualification	Basic B.Sc Nursing	55	44.4
	Diploma (RNGNM/RNANM)	51	41.1
	M.Sc Nursing	10	8.1
	Post Basic B.Sc Nursing	8	6.5
Clinical Experience	<1 year	45	36.3
	1–5 years	53	42.7
	6–10 years	16	12.9
	>10 years	10	8.1
HIMS Experience	<6 months	56	45.2
	6 months–1 year	32	25.8
	1–3 years	20	16.1
	>3 years	16	12.9
Formal HIMS Training	Yes	82	66.1
	No	42	33.9
Employment Type	Contract-based	79	63.7
	Permanent	45	36.3

Descriptive Statistics of HMIS Barrier Scores

The total HMIS barrier score ranged from 0 to 60 ($M = 32.02$, $SD =$

10.65, Median = 31.50). This mean score approximately 53% of the maximum possible score indicates that staff nurses at MGM Hospital, perceived a moderate level of barriers in HMIS utilization.

Table 2 presents the descriptive statistics.

Table 2 Descriptive Statistics of Total Barrier Scores Among Staff Nurses (N = 124)

Variable	Minimum	Maximum	Mean (M)	SD	Median
Total Barrier Score	0	60	32.02	10.65	31.50

Level of Barriers

Barrier levels were categorized into three groups using tertile distribution. The majority of nurses (n = 44, 35.5%) fell in the moderate barrier category, followed by low (n = 41, 33.1%) and high (n = 39, 31.5%) categories. The near-equal distribution across all three levels, with slight predominance of moderate barriers, underscores the pervasive nature of HMIS-related challenges among MGM Hospital nursing staff.

Distribution is depicted in Table 3.

Table 3 Distribution of Level of Barriers in HMIS Utilization Among Staff Nurses of MGM Hospital (N = 124)

Level of Barriers	Frequency	Percentage
Low	41	33.1
Moderate	44	35.5
High	39	31.5

Association Between Socio-Demographic Variables and Level of Barriers

Chi-square test was applied to examine associations between socio-demographic variables and HMIS barrier levels. Results are presented in Tables 4–8.

Table 4 Association Between Age and Level of Barriers in HMIS Utilization (N = 124)

Age (Years)	Low	Moderate	High	χ^2	df	p-value
20–25	20	25	26	3.73	6	.714
26–30	13	10	6			
31–35	4	4	4			
≥36	4	5	3			

Note. No statistically significant association ($p > .05$).

Table 5 Association Between Gender and Level of Barriers in HMIS Utilization (N = 124)

Gender	Low	Moderate	High	χ^2	df	p-value
Female	35	29	21			
Male	6	14	18			
Other	0	1	0	11.29	4	.023*

Note. *Statistically significant at $p < .05$. Male nurses reported higher barrier levels relative to female nurses.

Table 6 Association Between Educational Qualification and Level of Barriers in HMIS Utilization (N = 124)

Educational Qualification	Low	Moderate	High	χ^2	df	p-value
Basic B.Sc Nursing	11	22	22			
Diploma (RNGNM/RNANM)	23	14	14			
M.Sc Nursing	4	5	1			
Post Basic B.Sc	3	3	2	10.22	6	.116

Note. No statistically significant association ($p > .05$).

Table 7 Association Between Formal HIMS Training and Level of Barriers in HMIS Utilization (N = 124)

Formal HIMS Training	Low	Moderate	High	χ^2	df	p-value
Yes	33	25	24			
No	8	19	15	5.84	2	.054

Note. Result approached but did not reach statistical significance ($p = .054$).

Table 8 Association Between Employment Type and Level of Barriers in HMIS Utilization (N = 124)

Employment Type	Low	Moderate	High	χ^2	df	p-value
Contract-based	26	27	26			
Permanent	15	17	13	0.25	2	.881

Note. No statistically significant association ($p > .05$).

Among all variables examined, gender was the only variable showing a statistically significant association with the level of barriers ($\chi^2 = 11.29$, $df = 4$, $p = .023$). Male nurses at MGM Hospital reported relatively higher barrier levels compared to their female counterparts. Age ($p = .714$), educational qualification ($p = .116$), employment type ($p = .881$), and formal HIMS training ($p = .054$) did not show statistically significant associations, though training status showed a trend approaching significance.

DISCUSSION:

The findings of this study conducted at MGM Hospital, Chhatrapati Sambhajnagar, a major tertiary care institution in the Marathwada region of Maharashtra, reveal that the majority of staff nurses experience a moderate level of barriers in HMIS utilization, with a mean barrier score of 32.02 out of 60. This result is consistent with findings from comparable tertiary care settings across India, where moderate to high HMIS barriers among nursing staff have been consistently reported.

The high proportion of young nurses (57.3% aged 20–25 years) and those with less than six months of HIMS experience (45.2%) it contribute substantially to perceived barriers. Novice users face steeper learning curves, reduced confidence in navigation, and greater time demands during documentation, all of which inflate barrier perception. As nurses gain experience with the system, barrier levels are expected to diminish, provided adequate mentorship and ongoing system support are in place.

Despite 66.1% of respondents having received formal HIMS training, barriers persist, a finding that highlights possible shortcomings of existing training programs at MGM Hospital. Training may be insufficient in duration, may lack hands-on practical components, or may not address real-world workflow challenges encountered in clinical units such as the ICU, emergency wards, and general wards. This finding calls for a structured, competency-based, unit-specific HIMS orientation program.

The statistically significant association between gender and barrier levels ($p = .023$), with male nurses reporting higher barriers, is an interesting finding that may reflect differential prior IT exposure, role-based differences in documentation responsibilities, or variation in technology self-efficacy between male and female nursing staff at MGM Hospital. This warrants further investigation through qualitative inquiry.

The near-significance of the training variable ($p = .054$) suggests that lack of formal HIMS training trends toward higher barrier levels a finding that, while not reaching statistical significance in this sample, carries practical importance and supports the case for mandatory structured HIMS induction for all new nursing recruits at MGM Hospital.

LIMITATIONS

The study used convenient sampling at a single institution (MGM Hospital, Chhatrapati Sambhajnagar), limiting generalizability to other hospitals in Maharashtra. Self-reported responses are subject to response bias. Future multi-centre studies across Marathwada and Maharashtra are recommended.

CONCLUSION:

Staff nurses at MGM Hospital, experience a moderate level of barriers in the utilization of HMIS. Technical, organizational, and personal factors collectively contribute to these challenges. Gender was the only socio-demographic variable significantly associated with barrier levels. Given the pivotal role of nursing staff in HMIS-based documentation and patient data management, targeted interventions including structured hands-on training programs, improved IT infrastructure, streamlined documentation protocols, and enhanced administrative support are essential to optimize HIMS implementation at MGM Hospital and similar tertiary care institutions across Maharashtra.

DECLARATION:

Ethical Clearance: Institutional ethical clearance was obtained prior to data collection.

Informed Consent: Written informed consent was obtained from all participating staff nurses.

Conflict of Interest: no conflict of interest.

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