

# Knowledge, Attitude And Practice (KAP) Study Of Hospital Management Information System (HMIS) Among Healthcare Professionals At A Tertiary Care Teaching Hospital In The State Of Jharkhand

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## Abstract

*Background:* Hospital Management Information Systems (HMIS) are critical for improving healthcare delivery, yet their effective utilization depends on healthcare professionals' knowledge, attitudes, and practices (KAP). *Objective:* To assess KAP regarding HMIS among healthcare professionals in a tertiary care teaching hospital in Jharkhand, India. *Methods:* A descriptive cross-sectional study was conducted among 400 healthcare professionals using a pre-tested questionnaire. *Data analysis* was performed with SPSS v22, applying descriptive statistics, Pearson correlation, and t-tests. *Results:* Of the respondents, 88.2% were aware of HMIS, but only 31.7% had formal training. Medium levels were recorded for knowledge (77.5%), attitude (86.5%), and practice (83.2%). Knowledge correlated positively with attitude ( $r = 0.145$ ,  $p = 0.004$ ). No significant differences in KAP were observed based on gender or age. *Conclusion:* Findings highlight the need for targeted HMIS training, improved usability, and supportive institutional policies to enhance system adoption.

**Keywords:** Hospital Management Information System, Knowledge Attitude Practice, Healthcare Professionals, Digital Health, Jharkhand

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## INTRODUCTION

Hospital Management Information Systems (HMIS) have become foundational to delivering safe, efficient, and accountable healthcare by integrating clinical, administrative, and financial workflows into a unified digital ecosystem [1]. Beyond mere digitization, effective HMIS adoption depends on how healthcare workers understand the system's functions, perceive its usefulness, and embed it in routine practice [2]. The knowledge-attitude-practice (KAP) lens is a pragmatic way to diagnose gaps in user capability and motivation, and to guide targeted interventions such as role-specific training and workflow redesign [3]. When implemented well, HMIS can reduce documentation errors, improve turnaround times, and strengthen continuity of care through interoperable records and decision-support tools [4]. However, real-world deployments often encounter uneven adoption, data-quality issues, and partial use driven by usability frictions, infrastructure constraints, and limited change-management support [5].

Evidence from technology acceptance and information systems success models shows that perceived usefulness, information quality, and organizational backing strongly predict sustained use [6]. Standardization and interoperability (e.g., consistent coding and messaging standards) are critical for safe data exchange across modules and facilities, preventing silos and duplicate entry [7]. Robust data governance covering privacy, security, role-based access, audit trails, and consent builds user trust and enables secondary uses such as quality improvement and public-health analytics [8]. In low- and middle-income contexts, intermittent connectivity, inconsistent training, and limited support frequently blunt the potential value of HMIS despite broadly positive user attitudes [9]. Interventions that combine infrastructure upgrades with on-the-job coaching, super-user networks, and responsive helpdesks demonstrate the best gains in both user satisfaction and routine data use [10]. Embedding structured user feedback loops (e.g., content accuracy, format, timeliness, ease of use) into iterative system improvement helps convert "minimal compliance" into meaningful, value-creating use [11]. Within hospitals, aligning HMIS design with local workflows triage, diagnostics, pharmacy, and billing reduces cognitive load and promotes consistent, protocol concordant data entry [12]. At the organizational

level, leadership commitment, clear accountability for data stewardship, and timely analytics that inform decisions are essential to sustain momentum after go-live [13].

This study applies the KAP framework in a tertiary-care teaching hospital to quantify user knowledge, attitudes, and practices; examine their interrelationships; and identify actionable levers for training, workflow optimization, and change management [14]. By closing KAP gaps and strengthening socio-technical fit, hospitals can realize the core promise of HMIS: reliable point-of-care information, transparent resource management, and continuous learning for safer and more equitable care [15]. Ultimately, maturing HMIS capabilities anchored in standards, governance, and user-centered improvement translate digital investment into measurable gains in clinical quality and operational performance [16]. The results of this work aim to inform a practical roadmap for HMIS strengthening that is sensitive to local constraints yet aligned with international best practices.

## MATERIALS AND METHODS

A descriptive cross-sectional study design was utilized to assess the knowledge, attitude, Practice related to HMIS among healthcare professionals. The research was conducted during July 2024 to July 2025 at Rajendra Institute of Medical sciences (RIMS) in Ranchi, Jharkhand, India, a major tertiary care teaching hospital. The targeted population included healthcare professionals such as doctors, nurses, technical workers and those in administration who work at the tertiary care teaching hospital. The study protocol was reviewed and approved by the Institutional Ethics Committee of the hospital. All participants provided informed consent prior to involvement. All healthcare professionals with more than six months of experience at the institution with prior exposure to HMIS and providing informed consent to participate were included in the study while healthcare professionals who refused consent were excluded from the study. A total of 400 healthcare professionals were interviewed. A pre-tested self-administered questionnaire assessed knowledge, attitude, and practice. Responses were collected both in-person and online after obtaining informed consent. Data were analyzed using SPSS v22. Descriptive statistics summarized demographics and KAP scores. Pearson correlation tested the relationship between knowledge and attitude. Independent samples t-tests assessed the impact of gender and age. A  $p < 0.05$  was considered statistically significant.

A total of 400 healthcare professionals took part in the study, with an intentional stratified sample that ensured equal representation from administrative staff, nurses, technicians, and other roles, each comprising 25% of the participant pool. The age distribution was skewed toward younger professionals: the largest segment (51.7%) fell within the 30–39-year age group, followed by those aged 20–29 years (38.5%), and a smaller proportion (9.8%) were aged 40–49 years. Women constituted a notable majority (59%), while men made up 41% of participants. Education levels were varied but leaned toward foundational academic attainment; just over half of the respondents were either graduates or diploma holders (55.3%), with postgraduates representing a significant minority (23%).

Regarding awareness and training in Hospital Management Information Systems (HMIS), a substantial majority (88.2%) reported familiarity with HMIS. However, only 31.7% had received any formal training, highlighting a considerable gap between awareness and practical preparedness. Among those who did participate in training, the highest attendance rates were reported during the periods of 2016–2018 and 2020–2023, suggesting sporadic bursts of institutional capacity-building initiatives rather than ongoing, systematic efforts. This demographic landscape provides critical context for interpreting the overall readiness and engagement of healthcare professionals with respect to HMIS implementation and use (Table 1)

**Table 1. Demographic Characteristics of Respondents (N = 400)**

Variable	Category	n	%
Age (years)	20–29	154	38.5%

Variable	Category	n	%
	30-39	207	51.7%
	40-49	39	9.8%
Gender	Male	164	41%
	Female	236	59%
Education	Diploma	110	27.5%
	Graduate	111	27.8%
	Postgraduate	92	23%
	Other	87	21.7%
Profession	Admin staff	100	25%
	Nurse	100	25%
	Technician	100	25%
	Others	100	25%
HMIS Awareness	Yes	353	88.2%
	No	47	11.8%
HMIS Training	Received	127	31.7%
	Not received	273	68.3%

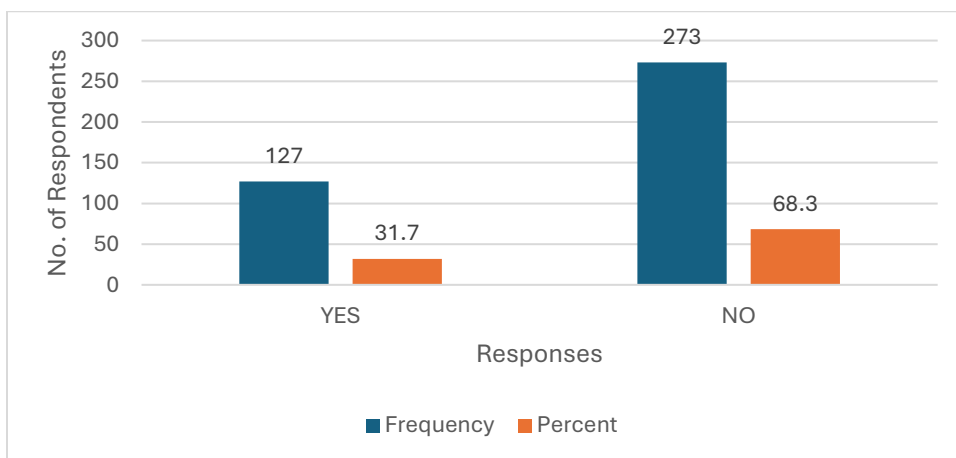


Figure 1: Training received related to HMIS by Respondents

When categorized by KAP levels, most respondents demonstrated medium levels of knowledge (77.5%), attitude (86.5%), and practice (83.2%). High knowledge was observed in 17.8% of participants, but only 3.5% showed a high attitude and 3.8% high practice. This suggests that while exposure exists, deeper engagement and application remain limited. (Table 2)

**Table 2. Knowledge, Attitude, and Practice (KAP) Levels towards HMIS**

Domain	Low (%)	Medium (%)	High (%)
Knowledge	4.7	77.5	17.8
Attitude	10.0	86.5	3.5
Practice	13.0	83.2	3.8

A significant positive but weak correlation was found between knowledge and attitude towards HMIS ( $r = 0.145$ ,  $p = 0.004$ ), indicating that higher knowledge is modestly associated with a better attitude.

Regarding demographic factors, gender had no significant effect on knowledge, attitude, or practice ( $p > 0.05$ ). Similarly, age differences were not statistically significant, with knowledge, attitude, and practice scores being comparable across groups. (Table 3)

**Table 3. Correlation and Effect of Demographics on KAP**

Test	Result
Correlation Knowledge ↔ Attitude	$r = 0.145$ , $p = 0.004$ (Significant)
Gender effect on KAP	No significant differences ( $p > 0.40$ )
Age effect on Knowledge	NS ( $p = 0.991$ )
Age effect on Attitude	NS ( $p = 0.146-0.586$ )
Age effect on Practice	NS ( $p = 0.561-0.735$ )

Overall, the findings highlight that while most professionals are aware of HMIS and use it at a moderate level, formal training and consistent practice are lacking, limiting full system utilization.

## DISCUSSION

This study assessed the knowledge, attitudes, and practices (KAP) of healthcare professionals toward Hospital Management Information Systems (HMIS) at a tertiary care teaching hospital in Jharkhand. The findings revealed overall moderate levels of knowledge, attitude, and practice among respondents, with the majority clustered in the medium range across all three domains. While nearly 88% of participants were aware of HMIS, only about one-third had received formal training, indicating a substantial gap between awareness and structured capacity-building.

These results are consistent with previous research in similar contexts. For example, Sharma et al. [17] reported that less than half of nursing staff in a North Indian hospital could correctly answer HMIS usage questions, underscoring persistent knowledge gaps despite system exposure. Likewise, Mahla et al. [18] found that while nurses were generally satisfied with HMIS, their responses reflected only moderate confidence in usage, emphasizing the importance of regular training and supportive infrastructure.

The moderate level of attitude observed in this study suggests cautious acceptance rather than strong endorsement. While participants did not display resistance to HMIS, neither did they exhibit high enthusiasm. Similar patterns have been noted in Türkiye and Indonesia, where healthcare staff acknowledged the usefulness of HMIS but expressed concerns about increased workload, technical constraints, or system complexity. Positive attitudes are often associated with demonstrable efficiency gains, ease of use, and reliable institutional support, suggesting that system design, usability, and leadership backing remain crucial drivers for improving acceptance.

With respect to practice, most respondents reported medium utilization, with only a small proportion demonstrating high engagement. This result points to inconsistent or partial use of available HMIS modules, likely influenced by limited training, inadequate technical support, or workflow mismatches. International evidence suggests that while HMIS adoption significantly reduces errors, streamlines reporting, and improves patient care, effective and consistent usage requires adequate user preparedness and continuous system optimization. Lack of uniform practice, as observed in this study, echoes experiences in Mumbai's public hospital pilot where system benefits were overshadowed by poor infrastructure, staff shortages, and reluctant users.

A notable finding of this study is the statistically significant but weak positive correlation between knowledge and attitude ( $r = 0.145$ ,  $p > 0.01$ ). This implies that while better knowledge is associated with more favorable attitudes, knowledge alone may not be sufficient to drive adoption. Previous studies have shown that improved perceptions of usefulness and ease of use, coupled with supportive organizational culture, are stronger determinants of long-term utilization. Thus, interventions must go beyond information dissemination to include motivation, incentives, and workflow integration.

Interestingly, socio-demographic factors such as age and gender did not have a significant impact on KAP scores. This suggests that barriers to effective HMIS use are organizational rather than individual. Previous literature corroborates this observation: studies in Ethiopia [19], India, and Indonesia [20] have all demonstrated that systemic enablers such as infrastructure, training continuity, system quality, and supportive leadership outweigh demographic predictors in determining engagement with digital health systems.

The findings highlight an urgent need for ongoing, structured training programs tailored to different staff categories, ensuring not only knowledge acquisition but also practical proficiency. User feedback mechanisms should be institutionalized to continuously refine HMIS modules and align them with workflow realities. Further, leadership commitment is necessary to foster a culture of digital acceptance, incentivize usage, and integrate HMIS indicators into routine performance monitoring.

Taken together, this study confirms that healthcare professionals in Jharkhand are moderately prepared for HMIS usage. However, gaps in training and limited conversion of awareness into effective practice remain critical bottlenecks. These findings align with domestic and international literature emphasizing that technology success depends as much on human and organizational factors as on system design. Addressing capacity gaps, improving usability, and building supportive institutional environments will be key to ensuring that HMIS reaches its full potential in improving healthcare delivery.

## CONCLUSION

Moderate knowledge, attitude, and practice levels toward HMIS underscore the need for regular, role-specific training and improved system usability. Institutional commitment to digital health capacity building will be crucial for maximizing HMIS benefits in healthcare delivery.

**Limitation:** Self-reported data may be subject to social desirability bias. The cross-sectional design limits causality. Future research should incorporate qualitative methods to explore contextual barriers and enablers.

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**Conflicts of interest:** Not declared

## REFERENCES

- [1] Chen RF, Hsiao JL. An Investigation on Physicians' Acceptance of Hospital Information systems: a Case Study. *International Journal of Medical Informatics* [Internet]. 2012 [cited 2025 Apr];81(12):810–20. Available from: <https://doi.org/10.1016/j.ijmedinf.2012.01.011>
- [2] Sony M, Antony J, Tortorella GL. Critical Success Factors for Successful Implementation of Healthcare 4.0: a Literature Review and Future Research Agenda. *International Journal of Environmental Research and Public Health* [Internet]. 2023 Mar [cited 2025 Feb];20(5):4669. Available from: <https://doi.org/10.3390/ijerph20054669>
- [3] The Importance of HIMS Implementation in the New Normal [Internet]. *Instahms.com*. 2021 [cited 2025 Jul]. Available from: <https://www.instahms.com/blog/the-importance-of-hims-implementation-in-the-new-normal>
- [4] Fonet | What Is a Hospital Information Management System (HIMS)? What Are the advantages? [Internet]. *Fonetbt.com*. Fonet Information Technologies Inc.; 2024 [cited 2025 May]. Available from: <https://www.fonetbt.com/en/what-is-a-hospital-information-management-system-hims-benefits-and-applications/>
- [5] Epizitone A, P MS, E AI. A Systematic Literature Review of Health Information Systems for Healthcare. *Healthcare* [Internet]. 2023 [cited 2025 Jan];11(7):959. Available from: <https://doi.org/10.3390/healthcare11070959>
- [6] Baker. Understanding the Role of Health Information Management in Healthcare [Internet]. <https://www.baker.edu>. Baker College; 2025 [cited 2025 Jun]. Available from: <https://www.baker.edu/about/get-to-know-us/blog/role-health-information-managers-in-healthcare>
- [7] Cardoso IR, Ramos, Andraz G. The Implementation of Healthcare Information systems: the Role of Commitment and Usage in Benefits Achievement. In: 13th Iberian Conference on Information Systems and Technologies (CISTI) [Internet]. Piscataway, NJ, USA: IEEE; 2018 [cited 2025 Apr]. p. 1–6. Available from: <https://doi.org/10.23919/CISTI.2018.8399205>
- [8] Zeng X, Reynolds R, Sharp M. Redefining the Roles of Health Information Management Professionals in Health Information Technology. *Perspectives in Health Information Management / AHIMA, American Health Information Management Association*. 2009 Sep;6:1f.
- [9] Meiyana NS, Susanto T, Rokhmah D, Yunanto RA, Rahmawati I. Analysis of Hospital Management Information System Satisfaction Using the end-user Computing Satisfaction method: a cross-sectional Study. *Jurnal Keperawatan Padjadjaran* [Internet]. 2023 Jan 31 [cited 2024 Dec];11(1):4–11. Available from: <https://doi.org/10.24198/jkp.v11i1.2099>
- [10] PW, Hidayanto AN, Pinem AA, Hapsari IC, Sandhyaduhita PI, Budi I. Acceptance Model of a Hospital Information System. *International Journal of Medical Informatics* [Internet]. 2017 [cited 2024 Dec];99:11–28. Available from: <https://www.sciencedirect.com/science/article/pii/S1386505616302726>
- [11] Vantissaha D, Azizah AH, Arifin S. Assessing Hospital Management Information Systems Success Using Human Organization and Technology Fit Model. *Applied Information System and Management (AISM)* [Internet]. 2022 Apr 18 [cited 2025 Apr];5(1):37–44. Available from: <https://doi.org/10.15408/aism.v5i1.24738>
- [12] Febrita H, Martunis M, Syahrizal D, Abdat M, Bakhtiar B. Analysis of Hospital Information Management System Using Human Organization Fit Model [Jurnal Administrasi Kesehatan Indonesia [Internet]. 2021 Mar 25 [cited 2021 Aug 15];9(1):23. Available from: <https://doi.org/10.20473/jaki.v9i1.2021.23-32>
- [13] Türkmen İ, Özkara B. Evaluation of Hospital Information Management System with Information Systems Success Model. *Bilişim Teknolojileri Dergisi* [Internet]. 2021 [cited 2025 May];14(4):403–10. Available from: <https://doi.org/10.17671/gazibtd.830213>
- [14] H BN, Knaup P. *Hospital Information Systems* [Internet]. <https://www.iospress.com>. IOS Press; 2020 [cited 2025 May]. Available from: <https://doi.org/10.3233/SHTI200675>
- [15] Sinha R, Sinha A. Knowledge, Attitude and Practice of Health Information System. *Journal of Health Management* [Internet]. 2015 Dec [cited 2025 Jan];17(4):425–37. Available from: <https://doi.org/10.1177/0972063415606268>
- [16] Li P, Tao W, Chen M, Zhou B, Xu W. A Study on Building Data Warehouse of Hospital Information System. *Chinese Medical Journal (English Edition)* [Internet]. 2011 [cited 2025 Feb];124(15):2324–6. Available from: [https://med.wanfangdata.com.cn/Paper/Detail?id=PeriodicalPaper\\_zhcmj201115022](https://med.wanfangdata.com.cn/Paper/Detail?id=PeriodicalPaper_zhcmj201115022)
- [17] Sharma P, Dhaliwal A, Sharma S, Narayana YL. Knowledge and Attitude regarding Use of Hospital Information System among Nursing Personnel in a Tertiary Care Hospital in North India. *Journal of Postgraduate Medicine, Education and Research* [Internet]. 2020 Mar
- [18] Mahla M, Talati S, Gupta AK, Agarwal R, Tripathi S, Bhattacharya S. The Acceptance Level of Hospital Information Management System (HIMS) among the Nursing Officials Working in a Teaching Hospital. *Journal of Education and Health Promotion* [Internet]. 2021
- [19] Gebremariam K. Assessment of Health Management Information System Implementation in Ayder Referral hospital, mekelle, Ethiopia. *International Journal of Intelligent Information Systems* [Internet]. 2014 Oct [cited 2025 Mar];3(4):34.
- [20] Livinus V, Adhikara MFA, Kusumapradja R. Hospital Management Information System Usefulness in the Health Services Industry at Indonesia: Mandatory or Voluntary? *JMMR (Jurnal Medicoeticolegal Dan Manajemen Rumah Sakit)* [Internet]. 2021 Apr 17 [cited 2023 Apr 13];10(1):LAYOUTING.