Research Article

Attitude and Practice of Healthcare Workers Towards the use of Health Management Information System (HMIS) in Mayo Hospital Lahore, Pakistan: A Cross-sectional Study

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Abstract

Background: Electronic-based HMIS is being installed in the public healthcare settings of Pakistan. To assess the efficiency of this system, the attitude and practice of healthcare workers towards its use should be assessed.

Objectives: To determine healthcare workers' attitudes and practices regarding patients' information compilation, analysis, and reporting.

Methods: A cross-sectional study was carried out in Mayo Hospital Lahore, Pakistan which included 131 healthcare workers from the departments of Medicine and Surgery. The data were collected from 1 June to 15 July 2024. A structured questionnaire was used to collect the data and later entered into STATA version 13 and Fischer's exact binary logistics regression analysis test was used to identify factors influencing the attitude and practice of healthcare workers towards the use of HMIS.

Results: The data were collected from 71 males and 60 females, and the overall levels of good attitude and good practice obtained are 48.09% and 42.75%, respectively. 'Attitude' is found to be influenced by the sex of the health worker while 'Practice' is influenced by the level of education and staff specialty.

Conclusion: For effective and robust implementation of HMIS, further training sessions should be conducted for healthcare workers to enhance their knowledge and skills in the use of this system. Moreover, further studies should be conducted to explore the reasons behind the poor attitude and practice of healthcare workers towards the use of HMIS.

Keywords | Attitude, Practice, Health Management Information System (HMIS),Healthcare workers

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Received: 20-09-2024 | **Accepted:** 30-01-2025

Introduction

The definition of Health Management Information System (HMIS) is: "A system in which health data is recorded, stored, retrieved and processed to improve decision-making"[1,2] The World Health Organization lists it as one of the six foundational elements of a health system.[3]

A 1999 research from the Institute of Medicine (USA) stated that avoidable medical errors used to claim the lives of between 44,000 and 98,000 persons annually in US hospitals.[4] Later on it was observed that inadequate management also plays a significant role in this high-index mortality rate. So, in 2009 'The Health Information Technology for Economic and Clinical Health-HITEC Act" was introduced. Its main goal was to accelerate the United States' adoption of electronic health and medical records along with related health information technologies. [5]

1990 saw the launch of HMIS in Pakistan as well. It was remotely based on paperwork, but with significant technological improvement, digital technology was used to restructure it. Currently, it is utilized by more than 90% of primary healthcare facilities.[6] Moreover, Punjab Information Technology Board(PITB) has joined hands with Primary and

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https://doi.org/10.21649/jspark.v3i4.720

2959-5940/

Secondary healthcare department to formulate a software for keeping electronic medical record of each patient. In Pakistan, tertiary care settings have also implemented electronic HMIS to improve upkeep and decision-making.

HMIS uplifts the efficacy of the healthcare system. Broadly, it improves the effectiveness of the healthcare system overall and creates excellent chances for the creation of baseline level statistics at the local and national levels, creating new opportunities for health and healthcare researchers, and ultimately advancing the practice of evidence-based medicine. [7]

The effective operation of Health Management Information Systems (HMIS) is fueled by healthcare professionals. The success of HMIS, as well as its function in efficient resource management and planning within the healthcare system, is greatly impacted by the attitudes and behaviors surrounding its adoption and use. Suboptimal HMIS deployment is the result of several issues that occur during the process, which also include the lack of leadership and commitment of healthcare workers reflecting their attitude and their poor skills reflecting their practice level for operating this system.[7] Leadership support, training, technology acceptance, and healthcare workers' ease of use are all significant factors affecting the success of HMIS.[8]

Even though HMIS is crucial for increasing healthcare efficiency, little is known about the barriers to its effective use, especially about the attitude and practice of healthcare professionals regarding the gathering, analyzing, and reporting of patient data at the tertiary care level. By examining the attitudes and behaviors of medical staff at Mayo Hospital in Lahore on the use of HMIS, this study seeks to close this gap. This study gives a fresh and thorough viewpoint by incorporating all pertinent healthcare professionals, giving management authorities crucial information to create plans that facilitate the successful adoption of HMIS.

This study will help develop focused interventions to increase HMIS adoption to improve healthcare delivery and resource management.

Methods

A cross-sectional study was conducted from 21 January 2024 to 10 July 2024.

The study targeted healthcare workers working in the Emergency and Out-patient department(OPD) of Medicine and Surgery in Mayo Hospital, Lahore.

Non-probability convenience sampling technique was used to select the participants, with a sample size of 131 healthcare workers included in the study. Sample size was determined using Epi info 7 with 95% confidence interval, 8% absolute precision with expected percentage of respondents with 'good practice' as 32%[9] using the appropriate formula.

All the healthcare workers with a minimum experience of 1 year and who have been granted access to the portal of HMIS were included. Non paramedic healthcare workers and undergraduate medical students were excluded. Moreover, healthcare workers working in departments other than Medicine and Surgery were excluded due to no installation of electronic based HMIS in those departments till then.

Attitude and practice of healthcare workers towards the use of HMIS was assessed through self-administered questionnaire[9] with 14 questions.

Among the demographic variables, information about gender, age, education level and staff specialty was obtained from the participants.

4 questions for the assessment of attitude of healthcare workers towards the use of HMIS and 10 questions for the assessment of practice of healthcare workers towards the use of HMIS.

All "yes "answers from the various sections (attitude and practice) were scored one (1) point whilst "no' answers were scored zero (0) points. Respondents' with score more than 2.51±1.04 were assigned "good attitude" and respondents' with score more than 5.22±3.22were labelled as having "good practice'.

"In data analysis, the data collected from the implemented questionnaire were physically checked in order to identify any missing or misplaced answer in order to maximize the reliability of data. The data collected were then put in STATA version 13 for data analysis. Socio-demographic variables like the educational level, the number of years worked and sex were expressed in frequency and percentages. Responses of the participants under attitude and practice section were presented using mean and standard deviations. Each “yes” answer in the sections attitude and practice had been score one (1) point while “no’ answer had been assigned zero (0) points. The respondents with the total score greater or equal to the mean score of 2. 51±1. 04were categorized as having “good attitude while the respondents with the score equal to or greater than 5. 22±3.22 are labelled as having "good practice".The responses and the various recoded binary variables for attitude and practice were presented in frequencies and percentages and presented in tables including the minimum and maximum scores, the average and standard deviations of the binary variables. Fisher’s exact Binary logistic regression analysis test with 95%confidence interval and p value of less than 0. 05 was used to ascertain correlates of the dependent variable (attitude and practice levels) by the independent variable (socio-demographic) in the logistic

regression model. To assess statistical significance in this study, a probability value of (= 0. 05) was used or a lesser value.

Results

The respondents' average age was 29.2 ± 5.4 years. The majority of respondents (54.2%) were male, and the majority's highest educational level was an FCPS part 1 degree (35.12%), with 0.76 % minority earning M. Phil degrees while 71.76% belonging to the community of doctors. Table 1 shows that over 25% of respondents have worked for less than five years.

75.57% of respondents said it is their responsibility to report to the next level using HMIS, and 68.70% of them said it is time-consuming to prepare reports and submit them to the next level.75.57% agree that hard-copy submission adds to their workload while 32.06% consider report preparation to be time-wasting.. With a mean score of 2.51 ±1.04 out of 4, the overall attitude score was adjusted to be unsatisfactory among 68 respondents (51.91%).

Of the respondents, 58.02% had practiced HMIS at least once, 47.33% had access credentials to the web database, and 55.73% had used the reporting platform during the last three months. The majority (67.18%) said they analyze their data for making decisions, however only slightly less than half (49.62%) have confirmed the establishment of data validation teams at the setting. A mean score of 5.22± 3.22 out of 10 was adjusted for 75 respondents (57.25%), indicating poor overall practice. Table 2 indicates that the lowest possible score was 0.

Table 1: *Respondents' Socio-demographics characteristics*

Socio-demographics	(n=131)	
	Frequency	**Percentage**
Sex		
Female	60	45.8
Male	71	54.2
Highest Education Level		
M.Phil	1	0.76
BSN	6	4.58
Batchelors	5	3.81
FCPS 1	46	35.12
FCPS 2	4	3.05
M.Phil	11	8.40
MBBS	40	30.53
MRCS	1	0.76
Ph.D	1	0.76
Intermediate	16	12.21
Staff Specialty		
Doctor	94	71.76
Nurse	6	4.58
Pharmacist	6	4.58
Data Entry Operators	9	6.87
Lab Technicians	16	12.21
No of years worked		
<5 years	99	75.57
5-10 years	17	12.98
>10 years	15	11.45

Table 2: *Health workers' Attitudes and Practice Towards Health Information Management System*

Variables	n=131(%)
Attitude towards the use of HMIS	"YES"Answer
Reporting to the next level is my duty	99(75.57)
Report preparation and submission are very tedious	90(68.70)
Hard copy reports submission must not be added to my existing workload	99(75.57)
Report preparation is time-wasting	42(32.06)
Mean Score	
Minimum Score	**Mean ± Standard Deviation 2.51±1.04**
Maximum Score	0
Overall Attitude Level	4
Good Attitude	63(48.09)
Poor Attitude	68(51.91)
The practice of HMIS	
Ever practice on HMIS	76(58.02)
Have HMIS account	62(47.33)
Access HMIS every month	53(40.46)
Have setup of Data Validation Team at the setting	65(49.62)
Validation of HMIS data is done every month	60(45.80)
Have entered reports for the last three months	73(55.73)
Endorsement of collated facility reports is done	69(52.67)
Analyse all my data for decision making	88(67.18)
Have charts from data analysis	62(47.33)
Supervision of collation of all data is done	77(58.78)
Mean Score	**Mean ± Standard Deviation 5.22±3.22**
Minimum Score	0
Maximum Score	10
Overall Practice Level	
Good Practice	56(42.75)
Poor Practice	75(57.25)

A Fischer's exact Binary logistic regression analysis test was used in the multivariate analysis to evaluate the impact of respondents' sociodemographic characteristics on their atti-

tude and level of practice of health information management system, as shown in Table 3.

It reveals that among the respondents ,doctors have better attitude than other healthcare workers. High education level and staff speciality also significantly impacts the attitude, with non-doctor staff having 0.236 times the odds of having good attitude.

Practice level is affected by the sex with females having 0.37 times the adds of having good practice. Moreover, participants with higher education level, more experience and having the speciality of doctor have high good practice score.

Discussion

The study reports subpar attitude and practice levels of healthcare workers towards the use of HMIS.Only 48% of healthcare workers have good attitude, with females having more good attitude score, and only 42% of the participants show good practice which is influenced by their level of education and staff speciality.

According to the study, healthcare workers that have a positive or good attitude towards using HMIS scored poorly. Comparatively speaking, the current finding is lower than studies from Tanzania, the Amhara Regional state of Northern Ethiopia, and the state of Enugu in Nigeria, which found that the respective rates of positive attitude were 86%,[10]98.7%[11] and 63.8%.[12] Nevertheless, the study's good attitude score is rather higher than those of cross-sectional studies conducted in Ghana and Kuwait, which found that the study's participants had good attitudes at 41.8% and 26.9%[13] respectively.

A rather positive attitude regarding the use of HMIS is indicated by the mean attitude score of 2.51(±1.04).Given that the average score is only marginally above the midpoint, it also implies a significant presence of negative perceptions. The overall attitude levels also show this ambivalence, with 48.09% of respondents expressing a good attitude while 51.92% displaying a poor attitude. The variable analysis reveals several specific concerns. A sizable fraction of respondents said they thought it was time-consuming and laborious to prepare and submit reports on patient's clinical performance. The additional stress of submitting patient data in hard form, which many believe shouldn't be added to their already heavy schedule, is probably what exacerbates these perceptions which is in accordance with a study conducted in Tanzania, emphasizing manual data collection overburdens healthcare workers.[14] Moreover, poor data quality in terms of timeliness and dependability is also a result of paper-based system.[15]

The slightly greater number of respondents who had a negative attitude indicates that, despite widespread acceptance

Table 3: *Factors Influencing Attitude and Practice Levels of HMIS Among Health workers*

Variables	Attitude Level					Practice Level				
	Good	Poor	Fischer's exact p value	Crude odd ratio (95%CI)	Adjusted Odd ratio	Good	Poor	Fischer's exact p value	Crude Odd Ratio(95% Confidence Interval)	Adjusted Odd Ratio
Sex										
Male	28	43	0.401	1(Ref)0.66 (0.34 -1.26)	0.66(0.34 -1.26)	42	29	0.003	1(Ref)0.39 (0.21-0.73)	0.373 (0.19-0.72)
Female	35	25				28	32			
Age Group										
<30 years	47	49	0.552	1(Ref)1.31 (0.53-3.24)	1.31(0.53 -3.24)	51	45	0.238	1(Ref)0.64 (0.33-1.23)	0.67 (0.34-1.30)
30 years and above	16	19				19	16			
Highest education level										
Intermediate	10	6	0.000	1(Ref)0.29 (0.18-0.46)	0.26(0.16 -0.42)	15	1	0.000	1(Ref)0.25 (0.14-0.46)	0.25 (0.14-0.46)
Graduate	28	23				23	28			
Postgraduate	25	29				32	32			
Staff Speciality										
Doctor	40	54	0.000	1(Ref)0.29 (0.18-0.46)	0.26(0.16 -0.42)	39	55	0.000	1(Ref)3.85 (1.22-12.1)	4.28 (1.43-12.8)
Nurse	4	2				4	2			
Pharmacist	2	4				6	0			
Data Entry Operator	5	4				8	1			
Lab Technicians	12	4				13	3			
No of years worked										
<5 years	49	50	0.037	1(Ref)0.54 (0.33-0.87)	0.49(0.24 -0.83)	51	48	0.043	1(Ref) 0.14 (0.06-0.30)	0.16 (0.07-0.37)
5-10 years	6	11				7	10			
>10 years	8	7				12	3			

and probably even endorsement of HMIS, a sizable segment of the workforce is nevertheless unsatisfied. Due to the perceived time-consuming and tedious nature of data submission for those who are less accustomed to this modality, this discontent may arise from the ability and speed required while using the keyboard and screen, which depends on individual experience and expertise.[7] Furthermore, a lack of healthcare personnel and an increase in patient load may also be to blame for the low morale of healthcare personnel, which is influencing the caliber of data collection.[16]

The results of this study demonstrated poor Practice level of HMIS(42.75%) among healthcare workers. It is, nevertheless, comparatively greater than a cross sectional study that was carried out in Kuwait and the Amhara Regional state of Northern Ethiopia, which found that the corresponding percentages of good practices were 35.8%[13] and 28.3%[11] It is, however, less than the cross sectional study that was carried out in Tanzania and the East Gojjam zone, which found that excellent practices were practiced at a level of 92%[10] and 53.3%[17] respectively.

According to the study, a sizable percentage of respondents use HMIS on a regular basis. Particularly ,76 participants (58.02%) provided accurate responses, demonstrating a solid grasp and application of HMIS. Nevertheless, when evaluating more specialized or even more difficult areas of HMIS practice, this falls to 62(47.33%).

Maintaining the correctness and dependability of HMIS requires regular data validation. According to this study, 45.80% of respondents say that data is validated monthly, and 49.62% of respondents say their setting has a team dedicated to data validation. Although there is certainly opportunity for improvement, this shows that most of the respondents understand the significance of routine data validation.

Over the previous three months, the frequency of report submission was noted, and 55.73% of respondents consistently entered reports.Additionally, 52.67% of participants expressed support for the aggregated facility reports, demonstrating a good adherence to procedural compliance in report filling and thus ensuring good data quality as prior research has also demonstrated that the collation procedure is the main factor influencing the accuracy of data transfer.[18]

Making decisions using HMIS data is essential since it improves the effectiveness of the healthcare system and eventually leads to the practice of evidence -based medicine[7]. Health systems should use data to inform decisions at all levels in order to raise the standard of care given.[19] In this survey, 47.33% of participants use all of their data to help them make decisions, and 58.78% of them have data analysis charts. This shows that even if the majority use their data analytically, over half of the respondents might not be fully leveraging their HMIS data for informed decision making.

Consistent monitoring is a useful strategy to guarantee data quality.[20] The study demonstrated how much of this is done in this context, demonstrating a knowledge of the significance of supervision in the data collection.

Conclusively, in this study, a sizable percentage of the population engages in poor practice (52.75%),which highlights the need for focused interventions to enhance HMIS management.

Fisher's exact binary logistics regression test revealed that sex of the health worker significantly influences the attitude towards the HMIS utilization while practice is influenced by the factors like the level of education and staff speciality revealing that respondents who have completed their postgraduation and are doctors practice HMIS in much needed way among all the respondents which can be due to their better experience and skills in healthcare and technology use as a result of attending more training workshops. This explores the need of further implications like training targeted specifically at respondents with lack of knowledge and skills to use the HMIS aptly"as one potential contributing reason to healthcare personnel' insufficient skills for routine data collection could be a lack of training[21,22] which significantly affects the accuracy of data.[23,24] This result is in line with a Nigerian study that suggested staff specialization has an impact on effective data management practices..[25]

The study was novel in this clinical setting and is all-inclusive including all healthcare workers and paramedical, nursing, administrative and other non-clinical staff of the hospital. However, it is bounded by certain limitations. The study was only focused on the departments of Medicine and Surgery and did not include other departments of the hospital. Moreover, healthcare staff at other public hospitals and primary and secondary healthcare units with different working conditions should also be assessed in this context. Also, the sample size is not large enough, so the study is not generalizable. In the future, studies should be conducted with a larger sample size including other departments besides Medicine and Surgery and should also inculcate primary and secondary healthcare settings.

Conclusion

This study assessed the attitude and practice of healthcare workers towards the use of HMIS. Even though healthcare workers are 'engines' for the efficient working of the machinery of HMIS, but they still lack the utmost attitude and practice required for streamlining of this system. This study provides a view to the management authorities and necessi-

tates the need for conducting further training sessions for healthcare workers to efficiently utilize the HMIS. Moreover, it also highlights the necessity of expediting the electronic based HMIS deployment process in order to reduce the perceived workload for healthcare workers.

Conflict of Interest: Authors do not have conflict of interest.

Source of Funding: No funding was obtained for this study.

Ethical approval: Obtained from IRB of King Edward Medical University.

Authors Contribution:

NU: Involved in conceptualization of study

TS, UF, SIG: Involved in data collection

TS, SGA: Involved in manuscript writing

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