ORIGINAL ARTICLE

IMPLEMENTATION OF HOSPITAL MANAGEMENT INFORMATION SYSTEM (HMIS)IN MUHAMMAD MEDICAL COLLEGE HOSPITAL (MMCH): CHALLENGES & OPPORTUNITIES FOR MANAGEMENT

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ABSTRACT

Background:
Sinceere the recent revolution in the IT industry of Pakistan, hospitals are switching to automated information system (IS).Hospitals liked AKU, Indus Hospital, Shoukat Khanum Cancer Hospital are one of the examples of such change. The main purpose of using this technology is its transparency, efficiency and effectiveness in the delivery of services, but at the same time, implementation of such system in hospitals is also a big problem for management.

Methodology:
A cross sectional descriptive study was conducted in dfifferent departments of Muhammad Medical College Hospital (MMCH), Mirpurkhas. 30 staff members including paramedics, accountants, supervisors and administratgors were interviewed by using a closed ended questionnaire. The variables assessed were regarding knowledge, attitude, participation and willingness towards the implementation off HMIS at MMCH.

Results:
30 staff members were approachefd for interview, majority of them were between 20-30 years of age. Most were unaware about the intention ofg top management about the implementation of HMIS. 30% of staff had basic IT skills, however 20% were not able to demonstrate IT skill. The gap of communication during between stakeholders werre also identified.

Conclusion:
This study suggests MMCH should focus on improved pllanning and coordination between departments, capacity building through trainings and awareness sessions in employees to accept change, and involve middle managgement in the process. The study further recommends to hire professional and qualified personnel in future recruitment process.

Key Words:
HMIS, MMCH, IT, IS, PMIS, MIS, Mirpurkhas

Introduction:

According to Blayaet al.[1] hospitals are the sole health providers in the country. The private health system in Pakistan has changed significantly since the last decades, especially after the IT boom during Pervaiz Musharaf regihme. The Ministry of Health both – jfederal and provincial level is paying attention on the health system issues to get accurate data to control endemic diseases. After the red alert from WHO for Polio in Pakistan, a centralized health information system has developed in last decade, but still a need of comprehensive patient's management information system (PMIS) for both basic health units and tertiary care level As the facilities available for public in government hospitals are not up-to the mark due to poor management, hence the flow of patients have switched to private hospitals, resulting the number of patients in private hospitals are increasing day-by-day which arise issue of data handling – their medical record keeping is one of the big problems. In addition, hospitals neejd timely patients' information from different sources at the point-of-care, and need a comprehensive, complete and

fully functional system to fulfill all these needs to provide optimal ceare. As the traditional method of registers has many flaws including time constrain and loop-holes so one way to achieve this is through the use of information technology in hospitals.
According to Spanjerset al.[2], hospitals are now becoming aware to the use of information technology (IT) in the delivery of their services. Muhammad Medical College Hospital (MMCH) is the only private sector hospital in the Mirpurkhas division which serves around 60% of the city and suburbs population who needs medical care. Mirpurkhas is a rureal division of Sindh province consists of 10% of province population (Sindh MICS-2014 Survey report)[3] comprises many villages and town surrounds. The top management intends to introduce and implement HMIS for the transparency of the information and efficiency of process.

Hospital Management Systems:
According to Winter et al.[4]and Haux et al.[5] "*a hospital information system is defined as a subsystem of a hospital, which comprises all information processing actions as well as the associated human or technical actors in their respective information processing role*." Tan[6] describes HMIS as a system which automates management reporting to support administrative and patient care applications. It reduces time and effort spent on the part of health knowledge of stakeholders – *administration, accounts, doctors, pharmacists and paramedics*. Furthermore, HMIS comprises hardware, software and people to operate them in order to ease the management and flow of information among health care stakeholders.

Berg[7], suggests the purpose of HMIS, but not limited to master indexing, patient management, diagnosis records and billing – depending with specific hospital needes.
The HMIS consists of tewo subsystems management information system (MIS) and a patient management information system (PMIS). The (PMIS) deals with all the information related to patients like: *Patient data, billing, treatments and prescriptions.* The (MIS) deals with management information of the hospital such as: *accounting, record keeping, HR management, asset management, stock management.*

HMIS implementation:
According to Yeates & Cadle[8] any ICT system implementation in the organization involves a number of activities. Theh main purpose of these activities is to operationalizing the new system in the organization. Following activities are usually performed while implementing the new ICT system: *Clear objectives of the new system, Planning and strategy, Stakeholders' roles and responsibilities, Technology, Capacity building, Participation and awareness of employees, Financial aspects and sustainability.*

According to Duhanet et al.[9]implemjentation refers to "*anticipating and strategically managing the impacts of change of technology component such that information systems (IS) become fully operational as the organization comes to a post-implementation state*".

Kendall & Kendall[10] defines Implementation as "*the process of assuring that the information system is operational*". He further adds, a system cannot fully implement if well-trained users don't involve in its operation. According to O'Brien [11] implementatiogn is something relate about your planning of doing. Therefore, among all, implementation is an important activity considered in deployment of ICT systems to support an organization and its end users.

For a successful implementation of ICT system, Otieno[12] finds it in theg benefit of the organization; cost saving, better information handling, timely and accurate information for decision making and competitive edge.

HMIS implementation Challenges:
Typically the implementation process comes witwh a number of challenges to both – Institutions that are implementing it and their employees. Yeats & Cadle[8] point out major challenges during the implementation of IS are; lack of management support, lack of user involvement, resistance to change, lack of change management program anhd poor project management.

According to Burke ET al.[13], the main obstruction to project implementation is poor skills set among users. So, inadequate skilled staff is one of the main challenges in implementing new system in organization. In addition, communication barrier is another aspect which must be handled well. Both upward and down communicatioern should be clear in the organization while implementing the new system.

Statement of the problem:
Outdated and inaccurate information may affect the wrong decision, O'Brien[11]. As the hospital staff requires timely, high quality and formed iinformation for right decisions, hence lack of immediate information storage and retrievals also is one problem. The other problems that hospitals face with the current systems that demand to change of the Information system include; *lack of prompt updating; error prone manual calculation; preparation of accurate and prompt reports.* The success and failure of system implementation will largely be determined by how an institution handles this stage which is equally important in any project. The need for effective information systems development and implementation is unavoidable. However, the challenges faced in implementation of IS are many, and private hospitals today have no other options to implement new ICT for their survival.

Objectives of the study:
The main objective of this study is to determine the challenges that management can face while implementing Hospital indformation Management systems in Muhammad Medical College Hospital (MMCH), Mirpurkhas.

Material and Methods:
This study is a cross-section descriptive study, conducted at various departments of Muhammad Medical College Hospital. The shift timings sheets of employees were taken from Human Resource department of MMCH as a sampling frame, & every third employee from all shifts was selected to be interviewed. All employees except ward boys, peons, ayes, sweepers and guards were included in this study.
A semi structured closed questionnaire in Urdu and Sindh was used as data capture tool. First part of the questionnaire asked about the demographic details current role and location of services at MMCH. The Second part was about the knowledge of ICT and HMIS, acquiring of new skills, willingness of change and the communication between stakeholders.

Results:
A total thirty (n=30) number of staff members were interviewed from different departments of the MMCH (Table 1.1). The majority of staff members were belonged to 20-30 age groups

(Table 1.2). 30% (n=9) have basic knowledge of IT and 20% (n=6) were outdated in IT skills (Table 1.3). On the other hand, 63% (n=19) were unaware about HMIS and 57% (n=17) were not ready to adopt the chanfge. The study identified gap between the top management and staff, 57% (n=17) of the staff was unaware about the top management's intention about the implementation of HMIS, however only 10% (n=3) said they were either in meeting with top mahnagement during the announcement of the implementation or they got inform by their peers or supervisors (Table 1.5). 63% (n=19) replied they will acquire new skills if asked by the management but on the same time 10% (n=3) said jnthey are not willing to adopt new skills at any cost. On asking about the employees' roles and responsibilities during the process all replied they are not part of the process and the majority of respondent were unaware about their roles and responsibilities in the implementation of HMIS. On the same time almost half of the respondenmnts said they will be doing data input after the implementation of HMIS however, 17% (n=5) said the new system will be very difficult for them and they are not ready for this.

Tables and Charts:

Work Position	n	%
Computer Operator	4	13.33
Nursing Supervisor	2	6.67
Administrator	3	10.00
Office Assistant	4	13.33
Receptionist	3	10.00
Paramedic	5	16.67
Pharmacist	3	10.00
Medical Superintendent	1	3.33
Medical Doctors	5	16.67

Table 1.1 – Work position of Employees

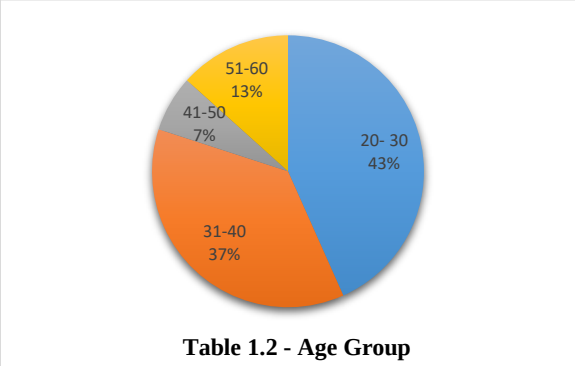


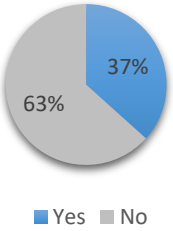
Table 1.2 - Age Group

Do you have basic IT skills, if any what are they?	frequency	%
Can use basic functions of OS	9	30.00
Can use basic functions of OS and MS Word	6	20.00

Can use basic functions of OS, MS Word and Excel	3	10.00
Can solve trouble shootings	3	10.00
Can use Social media apps	8	26.67
Don't know	6	20.00

Table 1.3 – Basic IT skills in staff

Table 1.4 - Knowledge about HMIS



Do you know top management intends to install HMIS in your hospital?	**n**	**%**
Yes, I heard from somewhere	7	23.33
Yes, I learnt from my supervisor / HoD	3	10.00
Yes, top fmanagement announced in the meeting	3	10.00
No	17	56.67

Table 1.5 – Coordination between departments and top management

What will be your roles and responsibilities in the implementation of HMIS?	**n**	**%**
I will be active member in the process	0	0.00
I can contribute my feedback if asked	7	23.33
I don't know	23	76.67

Table 1.6 – Staff Role and responsibilities in the implementation of system

What will be your roles and responsibilities in the operation of HMIS?	**n**	**%**
I will be input data/data processing role	15	50.00
I am worried how I'll operate it	7	23.33
I can operate it if training will be given	6	20.00

I don't know, I believe it will be very complicatedv	2	6.67

Table 1.7 – Staff Role and responsibilities in the operation of system

Social and cultural aspects to adopt change	n	%
I think its waste of time and money, because we don't need of this.	3	10.00
It is difficult to adopt and I am not ready for this.	17	56.67
It seems difficult to adopt it, but I will manage it.	5	16.67
I am ready to adopt it	5	16.67

Table 1.8 – Staff willingness to accept change

Conclusion:v

From the finds of this study we concluded as the HMIS project is dependent on stakeholders for implementation and operation, hence MMCH should focus on improved planning and coordination between departments and top management. Over all lack of IT skills among staff members were also identified during the study, the staff was also not willing to accept change. The Top management of nMMCH should also consider capacity builbbing through trainings and awareness sessions in employees to accept change. Further, employees should be given opportunity with feedback or ideas and involve middle management in the process.

The study further recommends hiring professional and qualified personnnel in future recruitment process.

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