



Examining the Practices and Challenges of Information Technology in Health Supply Chain Management in Alsbah Children's Hospital, Juba, South Sudan

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Abstract

Background: This study was conducted to understand the practices and the challenges associated with information and communication technology in health supply chain management in Al Sabah children's hospital in Juba, South Sudan. The aim was to assess the practices of information technology adoption in the health supply chain management and also to identify the major challenges associated with the adoption of this technology in the Hospital.

Methods: An in-depth interview was conducted with the 8 health workers in the different units of Alsbah children's hospital viz. out-patient, pharmacy, EPI, Laboratory, state drug warehouse located within the hospital, and Admin and Finance department. Published articles were searched online to identify the relevant studies and the collected data were analysed narratively.

Results: It was observed that no Information and Communication technologies application are used in the hospital for communication between the staff and the patients, monitoring of the patients, and supervision is done in person which is very difficult for the hospital staff to manage with serve shortage of the skilled and qualified staff in the hospital. Lack of internet facility is the main challenge and patient information is recorded in the registers and all the information from different units is submitted to the hospital statistician on a weekly basis for summarization. The hard copies of the report are submitted to the county health department office on a weekly and monthly basis.

Conclusion: This study concluded that the management and the staff of the hospital face a lot of difficulties in performing their duties due to the lack of Information Communication Technologies in the hospital. A lot of time is spent attending to the patients, the decision is not made on time, and supervision of the patients is not adequately carried out. If provided new technologies, it will help the Physicians and the Nurses in performing their duties with ease and without wastage of time.

Keywords: Information and Communication Technology; Health Supply Chain Management; Children's; Hospital; Adoption

Abbreviations: ICT: Information and Communication Technology; WHO: World Health Organization; HSCM: Health Supply Chain Management.

Introduction

Information and communication technology (ICT) is a very important tool in healthcare facilities and it plays a very crucial role in improving the quality of health services along with patient satisfaction. Some previously carried studies discovered the importance of the adoption of the new information communication technologies (ICT) into the health supply chain management system for additional support [1]. This support includes electronic medical records which could reduce the time of the treatment steps. The World Health Organization (WHO) also discussed the benefits of the adoption and the role of ICT in improving the health care system and improving the data exchange which could lead to better cost-effectiveness in the firms [2]. It can help the physicians and Nurses in performing their daily duties with ease. They could easily access the data of the patients on a single platform and prescribe medications to the patients and this prescription could also be transacted through these technologies.

Using health care technologies could help in reducing medical errors, decrease treatment time, manage health teams, patients, and enhance the service quality and safety [3]. It's very important to provide high-quality health care services to the patients who need treatment or medical attention because this could affect the level of satisfaction. Health care services should be acceptable by the patients along with those who seek special medical attention, and should not affect the casual or regular behavioral choices. However the attitudinal of satisfaction in the health services depends on the presence of a strong, well structured, and oriented health management system [4]. A study conducted in Turkey observed that the level of satisfaction among the patients getting treatment at a private hospital was greater than those who got treated at the government hospitals. It was because the health staff or teams in private hospitals were well trained and up-to-date with the new health technologies [5]. Computer technology or software in hospitals could be utilized to examine the internal organs, complex surgeries, and transmit orders from other departments within or outside the hospital. It could also be used to order health commodities and view patients' records and profiles. The benefits associated with the use of electronic software in the healthcare system have added positive value to the patient's care. This is the reason that more and more healthcare centers are adopting the latest technology and taking steps to transform the way they operate [6]. This study assessed the practices of information technology adoption in the health supply chain management and also identified the

major challenges associated with information technology in the Hospital.

The Rationale of the Study

Alsabah Children's hospital is the only children's hospital in the Republic of South Sudan and is located in the capital city Juba, with an estimated population of 13.8 million (according to census 2008 with annual growth of 3%). In the absence of proper functional primary health care facilities in the country, children in the republic mostly depend on this national hospital for medical attention.

Alsabah children's hospital is funded by the national government through the national ministry of health with support from the UN agencies and implementing partners. Medical commodities, maintenance, and other essential activities are handled through the national ministry of health. Supplies are irregular with the frequent stock out of commodities and the lack of medical equipment along with information communication technologies in the hospital worsened the situation. These conditions force the patients to go and seek good medical care from private health facilities which are very expensive and difficult to afford due to the high poverty and current economic crisis. Most of the vulnerable patients lose their lives because they cannot afford advanced and modern health commodities [7]. The main aim of this study is to provide adequate information on the availability of new information and communication technologies in the hospital. We also assessed the practices and related challenges faced by the hospital staff in regards to the adoption of information and communication technologies and how they contribute to the performance of the hospital.

Research Objectives

- To assess the Practices of Information Technology adoption in the Health Supply Chain Management
- To identify the major challenges of Information Technology adoption in Health Supply Chain Management

Research Questions

- What kind of technologies are available that work for HSCM (Health Supply Chain Management).
- What is the role of the new technologies
- How these technologies improved the HSCM practices
- What are the major company-related (internal challenges) hindering the adoption of ICT in HSCM
- What are the major external challenges hindering the adoption of ICT in HSCM
- How the above barriers to the adoption of ICT in HSCM can be solved?

Methods

An in-depth interview was conducted guided by the research questions to gather information from 8 individuals (staff) in Alsbah Children's Hospital. The participants recruited for this study included hospital staff who were on daily duties. Participants were informed about the purpose of the research before the exercise along with the study information provided by the researcher and the hospital administrator. The educational background of the participants' was Secondary and University leavers, Participants were personally approached for their acceptance to participate in the study. An adequate environment and time were allocated and they were allowed to speak freely about their ideas regarding the study. The main purpose was to get the real picture of practices and the challenges of information and communication technology in health supply chain management in the Alsbah children's hospital. Interviews were successfully conducted and the estimated time for each participant was around 30 - 35 min. A topic guide was used to conduct the interviews. The hierarchy followed in the interview was that first, the researchers introduced themselves, and then the participants introduced

themselves. Thereafter, they were immediately asked 6 questions one after the other and participants shared their ideas about the research questions. All the interviews were registered and written. All texts were anonymized. Field notes were also kept during the interviews. Substantive content analysis with some elements of grounded theory was used to analyze the data. Data collection, coding, and analysis were interconnected processes. The analysis of data was completed immediately after the interview. A modified version similar to the three-step coding and analysis approach (open coding, axial coding, and selective coding) introduced by Strauss and Corbin was used. Each transcript was read at least twice and core concepts were identified. Codes were assigned for the selected texts. This was further developed by adding sub-themes which were followed by the detailed coding. A preliminary coding scheme was developed after identifying the major themes. The relationships and differences between codes were identified. Coding was done and cross-checked twice, and detailed discussions were conducted where mismatch was found to achieve consensus Table 1.

Study design	Country and setting	Population	Total n	Description intervention
In-depth interview	R. SS/Juba Alsbah Children Hospital	Hospital staff who were on daily duties (Medical Officers, Pharmacist, Nurses, and others	8	All the targeted participants were interviewed in the hospital and responded accordingly to the designed questions and no participants declined from participation in the study

Table 1: Characteristics of the study included.

Results

We carried out 8 semi-structured interviews with a total of 8 respondents of which one was a medical officer, one nurse, one Statistician, one lab technician, one logistician, one hospital administrator, one pharmacist, and one EPI vaccinator. The interviewed people were enthusiastic and concerned about the study and its outcomes. The main key areas identified were lack of ICT new technologies, training, and the severe shortage of qualified and trained human health personnel to fulfill these gaps in the hospital.

Lack of New ICT in the Hospital

We found that no information and communication technology was used in any of the departments in the hospital. Communication among the staff and patients was done face-to-face. Improvised paper-based hard copies were used for ordering, and transactions of the medication. Prescriptions were done manually and the computers were neither used for diagnosis for the patient records. A routine check was not performed.

Are Technologies Available that Work for HSCM in this Hospital?

Only one hematology analyzer machine and three microscopes were found functional. One Chemistry analyzer was non-functional and all of these were found in the hospital lab. Three desktop computers were available in the statistics office of which two were functional, and one non-functional. Apart from the aforementioned technologies, no other technologies were available in the hospital. Lack of essential medical equipment and ICT technologies was the main problem in the hospital.

Views About the Role of the Mentioned New Technologies

According to the lab technician, the main roles of the available technologies were: hematology analyzers run tests on blood samples for white cell blood count, reticulocyte

analysis, and coagulation tests and helped in identifying blood cells speed and accuracy. There was no idea about the role and use of computers in the outpatient department and the lab. According to the hospital statistician, computers were used for storing all the hospital data from all the units and sent to the next level if the internet facilities were available but presently they were using hard copies for archiving and submitting to the next level due to lack of internet and the DHIS2 was not installed. Only one person was trained on how to use the computer and the rest didn't attend the training.

Views About How These Technologies Improved the HSCM Practices

According to one of the Medical Officers who was employed in the hospital and also works in a private clinic that is well equipped with the new technologies, he said the benefits of adopting and using the new technologies are were many but not limited to the following:

1. Enables health practitioners to access all the necessary tools including nursing tools online and medical references
2. They also reduced the time for diagnosis and errors
3. Patients' records, treatment, supervision, and scheduling of the patient doses have improved effectively significantly improved
4. They helped a lot in performing complex surgeries and reduced the cost. Storing and archiving of the data has significantly improved.

Views About the Major Company-Related (Internal Challenges) Hindering the Adoption of ICT in HSCM

According to the medical officer and hospital administrator, the main challenges were green pasture and the turnover of the trained and qualified staff due to the lack of motivation and low payment. This created a huge gap in the hospital and a severe shortage of staff. Lack of training also was another challenge as no essential training was being conducted at least to keep the employees updated on the new changes.

Views about the major external challenges hindering the adoption of ICT in HSCM. According to the hospital administrator, the main external challenge hindering the adoption of the new technologies was the lack of funding. No direct funding were given from the government to purchase the required advanced technologies, and there was minimal support from the implementing partners with limited areas to support.

Views About how the Above Barriers to the Adoption Of ICT in HSCM can be Removed

1. The central government should decentralize the health care system and allocate adequate resources to the states so that it can allow the authorities to handle their affairs.
2. The government should establish additional children's hospitals in the 9 other states other 9 states and 2 administrative areas to reduce the burden of on Alsbah children hospital
3. Government and the implementing partners should equip Alsbah children hospital with up to date and advanced new technologies to reduce the heavy load and working hours on the staff, and improve the efficacy and quality of the services
4. Regular training of the health workers in their specialization areas should be conducted to improve their competencies to be able to operate the new advanced information and communication technologies.
5. The motivation of the staff should be done through increasing their salaries, training and regular supervision and feedback on their performances.
6. Provision of adequate internet facilities.

Discussion

On inspecting the health technologies available in the hospital, we found that only one hematology machine was available along with 3 microscopes and all these were functional. The main challenge was the non-availability of the essential basic health technologies in the hospital. Three desktop computers were available but were not in use due to the lack of internet connectivity and persons to operate them.

It was also found that there was a lack of knowledge regarding the role that new technologies could play. Only two participants of this study were able to respond adequately (Lab technician and the medical officer). On the other hand, most of the participants could not answer adequately about how these technologies improved the HSCM practices. Most of them answered that they did not know because they had never seen those technologies. Only the medical officer and the lab technician were able to respond adequately. Regarding the views about the major external challenges hindering the adoption of ICT in HSCM, only the hospital administrator and medical officer responded and the response was no direct funding from the national government to support the hospital and the support from the partners was insufficient to close the gaps. On the views about the major company-related internal challenges hindering the adoption of ICT in HSCM, the hospital and the medical officer mentioned the main challenge as green pasture and less number of the trained and qualified staff due to the lack of motivation

and low payment. . Among the proposed solutions for how the above barriers to the adoption of ICT in HSCM can be removed, hospital staff suggested allocation of adequate resources including financial and new technologies, building additional children's hospital, training and motivation, and regular supervision along with the implementation of good policies for staff retention.

Recommendations

- The central government should decentralize the health care system and allocate adequate resources to the states and allow the authorities to handle their affairs.
- The government should establish additional children's hospitals in the 9 other states and 2 administrative areas to reduce the burden on the Alsbah children hospital
- Government and the implementing partners should equip Alsbah children hospital with updated and advanced new technologies to reduce the heavy load and working hours on the staff, and improve the efficacy and quality of the services
- Regular training of the health workers in their specialization areas to improve their competencies and ability to operate the new advanced information and communication technologies.
- Motivation of staff through increment in their salaries, training and regular supervision and feedback on their performances.
- Provision of internet facilities.

Conclusion

The lack of adoption of new technologies in the hospital is the most key findings. Moreover, the absence of the knowledge on use of the new technologies and lack of staff motivation remains the main challenge. The benefits of adopting and using advanced new technologies were highly recognized by the health workers in the hospital. Among the key benefits, health technologies could reduce the working load, remove the huge burden, help in performing complex surgeries, and could also improve communication among the staff. In short, there is a great need to urgently support the hospital with the necessary essential new technologies to achieve the desired level of services and increase the efficiency and capacity of the hospital. However, World Health Organization (WHO) also discussed the benefits of the adoption and the role of ICT in improving the health care

system and improving the data exchange which could lead to better cost-effectiveness in the firms [6]. This study will inform and guide the countrywide, and the stakeholders on the crucial need of the new technologies in the national hospitals, and their role in improving the health services delivery and health of the patients.

References

1. Natsis C, Chrysanthopoulos S, Stamouli M (2020) Health Professionals' Attitudes towards Digital Transformation through the Use of Hospital Information Systems : The Case of a General Oncology Hospital of Attica, pp: 321-335.
2. Klercker AFT, Zetraeus S (1998) Dilemmas in introducing world wide web-based information technology in primary care: A focus group study. *Family Practice* 15(3): 205-210.
3. Brettenthaler R, Cortenbergh D, Salzberg R, Hill MD, Region CH (2003) Open letter to health ministers at Framework Convention on Tobacco Control. *BMJ* 326(7398): 1085.
4. Ekanayake S, Ahmad F, Mckenzie K (2012) Qualitative cross-sectional study of the perceived causes of depression in South Asian origin women in Toronto. *BMJ* 2(1): 1-8.
5. Tengilimoglu D, Kisa A, Dziegielewski SF (1999) Patient Satisfaction in Turkey : Differences between Public and Private Hospitals. *J Community Health* 24(1): 73-91.
6. Integrating health services.
7. Karsh BT, Holden R, Escoto K, Alper S, Scanlon M, et al. (2009) Do beliefs about hospital technologies predict nurses' perceptions of quality of care? A study of task-technology fit in two pediatric hospitals. *International Journal of Human-Computer Interaction* 25(5): 374-389.
8. Khan HU, Ahmad S, Abdollahian M (2013) Supply chain technology acceptance, adoption, and possible challenges: A case study of service organizations of Saudi Arabia. *Proceedings of the 2013 10th International Conference on ITNG*, pp: 590-595.

