Chapter LVI
Improving Clinical Practice through Mobile Medical Informatics

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ABSTRACT

This chapter introduces the use of mobile medical informatics as a means for improving clinical practice in Sudan. It argues that mobile medical informatics, combined with new techniques for discovering patterns in complex clinical situations, offers a potentially more substantive approach to understanding the nature of information systems in a variety of contexts. Furthermore, the author hopes that understanding the underlying assumptions and theoretical constructs through the use of the Chaos Theory will not only inform researchers of a better design for studying information systems, but also assist in the understanding of intricate relationships between different factors.

INTRODUCTION

Healthcare organisations are undergoing major transformations to improve the quality of health services. While emphasis tends to be made (especially in developing countries) on the acquisition of improved medical technology, part of this transformation is directed towards the management and use of rapidly growing repositories of digital health data. However, the heterogeneity associated with such types of data (variety of formats, lack of data standardisation, mismatch between data and proprietary software architectures and interfaces, etc) call for addressing the problems of system and information integration. Medical and healthcare applications and services are becoming knowledge intensive. Therefore, advanced information systems' technology is essential to produce, coordinate, deliver, and share such information. The migration from static "medical" decision support systems technologies (a.k.a medical informatics technologies) towards a new breed of more malleable software tools allow the users of medical information systems to work with data and methods of analysis within the context of a "teleportal hospital". These medical information systems can remain efficient and effective by continuously adopting and incorporating the emerging mobile technologies. Mobile computing is going a long way in reshaping the context of healthcare provision and its efficiency. The growing physical mobility of patients mandates the use of

mobile devices to access and provide health services at any time and any place. Example of such healthcare provisions range from car or sports-accidents through to research and cure of long-lasting diseases such as allergies, asthma, diabetes and cancer. The basic aim of this chapter is to investigate the potential of improving clinical practice in public hospitals in Sudan through the use of mobile medical informatics.

BACKGROUND

The health care sector in Sudan is being challenged by many organizational, institutional, technical and technological issues that endangered its ability to provide quality services (UNFPA website, UNCEF website, Ministry of Health website). Because public hospitals are competing with other government units for public funds, they failed to acquire appropriate medical technology and improve clinical practice through improved diagnosis and staff training and retention. The lack of a sound managing capacity has also reduced their ability to integrate backward (with community and rural hospitals) and coordinate forward (with educational institutions, industry and research community). The recent economic liberalization has also increased both the "financial" and "managerial" overheating of public hospitals who fail to run as self-sufficient units rather than "cost centers'. While the quality of the services provided by private clinics and hospitals (both inside and outside Sudan) tends to be high their paramountly high costs make them out of the reach of many patients.

The deterioration of the quality of health services and clinical practice due to the following:

1. The lack of financial resources on the side of public hospitals due to the fact that they compete for "limited" public funds with other institutions. Their failure to acquire funds has also been accompanied with a considerable difficulty in developing appropriate plans for the effective management of healthcare institutions at the primary and secondary health service provision spectrum. Such mis-management issue has resulted into a considerable failure to develop a matrix of priorities according to which tasks "especially at the two main entrants or gates of service provision for critically I and critically III patients": Accidents & Causality and Intensive Care Units (ICUs). Especially in public clinics

and hospitals the deterioration of service quality originates from the fact that there is a lack of medical supplies. Due to the privatization trends" patients are required to pay for basic inputs. Medical consultants, whose presence at this gate is paramountly important, are not prepared to be there because they are spending much time in their private clinics. Although the management of ICUs tends to scientific, there is a considerable difficulty regarding the development and adoption of the suitable management model. There are five ICU models: (a) open ICU model, (b) closed ICU model, (c) co-managed ICU model, (d) managed by an intensive model and (e) mixed model. Noticeably all ICUs across the country are managed using the open model and this reflects the fact that those clinics are not patient-centered to address patient service through innovative solutions. The acquisition of medical technology tend also to be affected by the inappropriate policy making where hospital decision makers tend to think and manage in medical orientations in a way that limits their ability to understand the determinants and processes of technology acquisition (including costs of technological infusion, diffusion, maintenance and training) that they fail to address the context of competition and market efficiency forms. Medical training of newly appointed medical staff (houseman-ship training programs) is negatively affected by economic trends that made specialists and consultants unavailable at attainable periods to train graduates as well as medical students. Moreover, clinical training of medical students has been negatively affected by the growing number of medical institutes and the mismatch between the number of patients, clinically-trainable beds, medical specialists and consultants (in different areas of expertise) and the number of students to be trained.

2. The lack of appropriate incident reporting systems, adverse drug events and order issuance and management protocols to address medical errors. It worth mentioning that this component depends upon intensive R&D and is fast moving.

The result of such issues is the deterioration of medication quality, error-inclusive clinical practice and the growing costs of health and medical services. Because the overall health sectors fails to develop

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