CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187

Available online at: http://www.iajps.com *Review Article*

THE IMPACT OF TECHNOLOGY ON HEALTH CARE, ADVANTAGE AND EXPECTED COMPLICATIONS

Shoroug Essamuldeen Ibrahim,
Wahhaj Hani Rajab .
Ahmed Majed Alghamdi .
Mohammed Yasser Saeed Sulaimani.
Saeed Ahmed Alzahrani,
Reem Muttealah Almobdi,
Khadejah Mohmmed Alasmari.
Fadia Turki Alkozai.
Norah Ebrahem Asiri

Article Received: October 2022 **Accepted:** November 2022 **Published:** December 2022

Abstract:
This review aims to review the benefits and effects of health information technology on health care system. Therefore, a Literature search was performed in the following databases: Cochrane library; PubMed; MEDLINE; CINAHL, for all relevant articles published up to 2022. To better understand why physicians and nurses utilize a certain health information or communication technology (e.g., CPOE, pager, email), we will employ a specialized interview approach called as think-aloud in conjunction with shadowing to examine their communication practices. During the course of action, the think-aloud technique entails asking participants what they are thinking and feeling as they communicate about patient care. This strategy reveals the difficult-to-obtain meanings underlying acts and will provide us deeper insight into communication strategies and workplace relationships.

Corresponding author:
Shoroug Essamuldeen Ibrahim,

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Please cite this article in press Shoroug Essamuldeen Ibrahim et al, ***The Impact Of Technology On Health Care, Advantage And Expected Complications.,*** *Indo Am. J. P. Sci, 2022; 09(12).*

INTRODUCTION:

As community demand for quality health care services and the cost of providing these services continue to rise, a growing amount of focus is being placed on the potential of health information technology (HIT) to reduce health care spending and improve the efficiency, quality, and safety of medical care. The provision of safe and effective healthcare remains a continuing challenge for clinicians, especially in light of the growing awareness of medical error [1]. The desire of many health care systems to improve consistency and safety in patient care has prompted substantial investment in the development of evidence-based clinical guidelines [2] over the past several decades. However, the effective dissemination of these guidelines has remained a difficult task, and HIT has been proposed as a means to effectively implement these guidelines in practice [3].

Despite the fact that more information and communication technology (ICT) will be deployed in the next decade than ever before, these advancements do pose risks to patients, leading some to dub this the "dangerous decade" for health information technology [4]. Poor communication between physicians and nurses is widely recognized as one of the most common causes of adverse events in hospitalized patients [5] and a major underlying cause of all sentinel events [6]. HIT is frequently marketed as offering potential solutions to problems uncovered by root cause analyses, including a variety of communication channels that physicians and nurses are rapidly adopting: the electronic medical record, computerized provider order entry, email, and pagers. While there is no doubt that the increasing use of ICT will alter how nurses and physicians communicate, there is already evidence that communication technologies can paradoxically contribute to an increase, not a decrease, in communication problems. Consequently, it is crucial to comprehend how communication technology is utilized in health care and when it is most likely to achieve the goals of improved communication and safer care [7,8].

Recent healthcare reform in the United States has impacted technology, innovation, and the delivery of care in numerous ways. The medical device industry constitutes a significant portion of the healthcare system. As of 2019, the industry consists of 859 companies in the United States with a total revenue of $41.3 billion [9].

As the use of newer communication technologies increases, physicians and nurses who once frequently met at the point of care delivery to discuss a patient face-to-face are now increasingly separated by location and time and use a variety of technologies to transmit their conversations [10]. This modification may improve communication efficiency, but it may also increase message ambiguity and contribute to an increase in adverse events, particularly in complex situations [11]. Communication practices that consist solely of sending messages through a single medium, such as a pager, disregard the fact that a message sent via pager will differ from the same message sent verbally, because content conforms to the medium in which it is presented [12].

DISCUSSION:

Communication practices and work connections constitute the context within which communication technology exists. The use of rich media as well as the location and accessibility of computers influence communication patterns. Media richness is defined as a property of a communication medium that enhances the capacity of information transmitted via that channel to alter understanding [13]. Based on a medium's potential for immediate feedback, amount of cues and channels employed, personalisation, and language diversity, media are classified as rich or less rich [13]. Physician and nurse communication practices might or might not take into account the variety of available media. The theory of media richness proposes that while communicating about complicated, ambiguous matters, individuals should utilize rich media such as face-to-face conversations and telephones. Rich media reduce ambiguity by allowing communicators to overcome varying frames of reference and by facilitating the processing of complicated communications. Less rich media provide fewer clues, limit feedback, and tend to be impersonal, but they are good for digesting messages and conventional information [13]. Computer applications (e.g., physician and nursing notes on electronic medical records (EMRs), computerized provider order entry (CPOE), and electronic text) fall on the poorer end of the spectrum; computer applications are impersonal when there is limited opportunity to personalize the documentation or utilize a variety of language options.

The position and accessibility of computers affect communication patterns by interfering with the development of distributed cognition [14], the notion that knowledge regarding a patient's condition and treatment is dispersed among the physicians and nurses (and other professions) providing care [15]. When physicians and nurses are distributed to multiple distant places to use communication technologies instead of being co-located, opportunities for

exchanging knowledge from varying perspectives are limited [16], making it possible for a message's content to be misconstrued.

The impact of health information and communication technologies on communication is also influenced by the hierarchy and stability of a health care team's work relationships. Physicians and nurses must collaborate to resolve patient care issues requiring the input of multiple specialties [17]. In these scenarios, communication must support consensus formation, which can be challenging for a variety of reasons, but we have identified two in our theoretical model. First, the hierarchical nature of the interaction between physicians and nurses might impede consensus formation if nurses remain silent about a patient care issue for fear of being embarrassed or reprimanded by physicians [18]; nurses' silence may lead to unfavorable outcomes [19]. Thus, collaborative rather than hierarchical interactions are encouraged to ensure that all perspectives on a complicated subject are considered and that consensus is reached. Second, team stability may be particularly pertinent to the relationship between communication technology and communication [20]. Stability on a team is characterized by the same persons working on collaborative tasks [20]. Stability on a team is essential because it enables the establishment of the relationships required to permit the understanding of diverse perspectives [21]. Individuals whose communication increases become more similar as they share more of their beliefs and information [22]. Stable physician presence on the health care team makes it easier for clinicians to discover common ground (shared knowledge) and construct a shared reality [23, 24].

Type and capabilities of HIT/HIS Included research addressed the following key system types: clinical decision assistance for providers, computerized order input for providers, and electronic health records. Typically, clinical decision support systems were incorporated into electronic health record systems or computerized provider order input systems. However, a clinical decision support system with extensive functionality is compatible with electronic health record systems and computerized provider order input [25]. Two studies [26,27] evaluated the interventions of stand-alone decision support systems with limited data interoperability, in which clinicians were forced to manually update system-generated data into an electronic health record. Two investigations lacked adequate depth in their descriptions of the evaluated systems, and clinician interaction with the systems was not documented [25]. The efficiency of computerized provider order input systems was evaluated in three studies [25,28,29]. These order entry systems were automatically linked to patients' health records or clinical decision support systems in order to provide evidence-based recommendations on drug administration and other services, such as reminders for follow-up therapy and preventive care. In most instances, electronic health record systems are linked to clinical and administrative systems, and patient records can be automatically updated. Only one study compared the effectiveness of an independent patient records system to a paper-based system [30]. Clinicians made extensive use of electronic health records systems with reminders to test patients for diabetes mellitus, deep vein thrombosis, latent TB infections, and adverse drug responses [25,26]. In addition, it was commonly believed that electronic health record systems could generate a specialized report or health summary to assist clinical personnel in providing medical care [31].

Challenges facing HIT:

Numerous of these pressures exist in the market for low-risk devices such as examination gloves, resulting in a highly competitive sector. In contrast, the market for high-risk gadgets is devoid of these factors, allowing manufacturers to charge greater rates for their goods and maintain substantial profits.

The majority of high-risk devices are distributed by a small number of manufacturers. For instance, five companies control 90 percent of the market for hip and knee implants [31]. In addition, lack of price transparency hinders hospitals' ability to negotiate with suppliers. Frequently, device manufacturers include a secrecy clause in the purchasing deal with hospitals, preventing hospitals from disclosing prices to physicians, patients, and insurance [32]. Consequently, it becomes impossible to detect pricing disparities between hospitals, which is a substantial hindrance to price negotiations. It should be highlighted that the public's need for price transparency is growing, which may potentially alter the bargaining and pricing environment [33].

New technical developments have emerged as a result of the current emphasis on cost-cutting without sacrificing patient care quality. The medical device business has become more and more interested in frugal innovation, which entails developing simpler goods with reduced unit costs. Reverse innovation, a subtype of frugal innovation, has the potential to reduce healthcare expenditures. The expression refers to designing simpler versions of currently available

medical equipment, with the belief that these simpler versions will significantly cut production and operation costs [34]. Siemens, for instance, produced a fetal heart rate monitor that relies on inexpensive microphones as opposed to pricey and specialist ultrasound technology. This reverse innovation not only reduces production costs, but also eliminates the additional expense of specialist staff to run the gadget. Frequently, these "reverse innovations" originate in nations with little resources [34].

In recent years, deinstitutionalization and innovations that cut expensive inpatient treatment have also emerged. These advances are mostly focused on remote patient monitoring [34]. One such innovation, electronic consultations (eConsults), which lowers the need for in-person specialty consultation, proved that high-quality treatment may be offered to patients at cheaper cost. Orthopedics, dermatology, endocrinology, and gastrointestinal are studied specialties. On average, e-Consults was $84 less per patient per month, saving Medicaid roughly $578,592 annually [35]. When applied to the appropriate patient demographic and conditions, such innovations could become a part of mainstream medical practices and help the Affordable Treatment Act (ACA) achieve its goal of providing high-quality care at a cheaper cost [35].

As a result of value-based healthcare reforms, the medical device business has endured significant changes. These reforms have influenced device development at several phases, particularly funding for prototype and the market approval procedure. Increased restrictions around premarket approval and postmarked surveillance have increased the safety of gadgets entering the market, but will certainly lengthen the time to market, which is undesirable for entrepreneurs and manufacturers [35].

CONCLUSION:

The perceptions of the impact of information technology in healthcare mediate the association between the use of nursing care reminders and missing nursing care. The findings are advantageous to the evolution of healthcare technology in that designers of healthcare information technology systems must keep in mind that perceptions of the technology's effects will influence its utilization. Frequently, information technology platforms are not intended to accommodate nurses' workflow. Systems with redundant or irrelevant reminders can be disregarded. The designers of the system must investigate which reminders nurses find most helpful and which reminders produce the highest quality outcomes. As the concepts of quality assurance and quality management move to the forefront of the health care agenda, there is a need for additional studies that link HIT/HIS with business processes such as workflow redesign, organisational change, and project management, as well as economic evaluation. Additional funding may also be required for such endeavors.

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