Chapter 2
AI-Powered Insights Revolutionizing Pharmacy Operations

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ABSTRACT

The integration of digital technologies in healthcare is transforming pharmacy practices. This chapter explores the impact of AI-driven analytics, mobile technology, telemedicine, and personalized diabetic platforms on pharmacy services, highlighting benefits and challenges. It examines how mobile technology and IoT devices streamline medication management and enhance patient adherence. Emerging technologies like AR/VR/MR augment patient education and adherence. Lessons from COVID-19 emphasize the importance of digital health strategies and telemedicine for continuity of care. The chapter also explores 5G's role in advancing real-time communication, smartphones for early cancer detection, and intelligent decision support systems for diabetic patients. It underscores care coordination and the reliability of wireless body area networks for health monitoring. This analysis offers insights into the evolving digital health landscape, informing practitioners and stakeholders about the opportunities and challenges of these technologies.

INTRODUCTION

This rapid development and evolution of AI and other digital technologies have completely overturned various sectors, of which healthcare and pharmacy operations are at the very forefront. It is worth noting that AI-driven algorithms have been incorporated into pharmacy inventory management, meaning that it is

DOI: 10.4018/979-8-3693-9641-4.ch002

now possible to make giant strides forwards in terms of operational efficiency, cost reduction, and patient care. This chapter will tease out the complex implications of AI in managing pharmacy inventory. It reviews how the use of predictive analytics, machine learning, and digital innovation is making great impacts on this important area within health care (Bewaji Healthcare Solutions, 2024).

AI algorithms excel in processing large volumes of historical data covering trends in prescription patterns, seasonal demand fluctuations, and even patient demographics. These insights allow pharmacies to make appropriate forecasts of demand for medication, optimize their inventory levels, and ensure that at all times, essential medicines are in stock. In this regard, such an ability reduces the risk of stockouts and wastage, two critical components of sustaining appropriate patient care and augmenting the overall efficiency of operation of a pharmacy (Grata Software, 2024).

One of the most important advantages of AI in inventory management is the ability to anticipate surges in demand and pre-position stock proactively. This proactive approach helps not only avoid drug shortages but also minimizes risks in patient care, particularly for patients who rely on continuous medication therapy. AI-driven predictive analytics could also spot slow-moving items to enable pharmacies to refine their inventory strategy and align resource use accordingly.

The economic advantages of embedding AI in inventory management practices are huge. While optimum levels of inventories mean the least costs due to excess stock, like storage costs and the possibility of the decay of perishable items, correct demand forecasting reduces the need for costly emergency orders, thus economizing on all counts (A3Logics, 2024).

This chapter also discusses the role of emerging technologies, such as 5G, augmented reality, virtual reality, and mixed reality, in promoting further enhancements in pharmacy operations. These technologies help enhance patient education, improve adherence to their medication regimens, and communicate with them in a timely manner to advance better care conditions.

As unfolded by the COVID-19 pandemic, the accelerated implementation of digital health strategies has placed telemedicine at the critical juncture of guaranteeing continuity of care across unprecedented disruptions. The transformative promise of these digital health innovations is unmistakable in allowing for seamless coordination of care and reliable health monitoring in patients with complex health needs, including chronic conditions such as diabetes (Daniels, M, 2024).

The introduction of AI-driven algorithms and other digital technologies to optimize pharmacy inventories has reflected a paradigm shift in modern times. This chapter revisits such innovations for an in-depth review of their potential to facilitate enhanced operational efficiency, cost reduction, and, ultimately, improved patient outcomes in pharmacy practice.

Big Data Approaches to Improve Stereotactic Body Radiation Therapy (SBRT) Outcomes: Big Data for SBRT

Issam El Naqa, Michael T. Milano, Nitin Ohri, Vitali Moiseenko, Eduardo G. Moros, Joseph O. Deasy, Jimm Grimm, Jinyu Xue, Mary Marteland Randall K. Ten Haken
(2018). *Emerging Developments and Practices in Oncology (pp. 94-113).*
www.irma-international.org/chapter/big-data-approaches-to-improve-stereotactic-body-radiation-therapy-sbrt-outcomes/197646