

The Future of Healthcare: Integrating Pharmacy, Laboratory, and Clinical Services in the Era of Value-Based Care

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Abstract

The healthcare industry is undergoing a significant transformation, shifting from a fee-for-service model to a value-based care approach. This change necessitates the integration of pharmacy, laboratory, and clinical services to optimize patient outcomes and reduce healthcare costs. This paper explores the future of healthcare and the potential benefits of integrating these services in the era of value-based care. A comprehensive literature review was conducted to identify the current state of integration, challenges, and opportunities for improvement. The findings suggest that the integration of pharmacy, laboratory, and clinical services can enhance patient care, reduce medication errors, and improve overall health outcomes. However, several barriers, such as lack of interoperability, limited data sharing, and resistance to change, hinder the successful implementation of integrated services. To overcome these challenges, healthcare organizations must invest in advanced technology, foster a culture of collaboration, and provide ongoing training and education to healthcare professionals. The paper concludes by providing recommendations for future research and practice, emphasizing the need for innovative solutions and collaborative efforts to achieve a fully integrated healthcare system that delivers high-quality, cost-effective care.

Keywords: healthcare integration, pharmacy services, laboratory services, clinical services, value-based care, patient outcomes, healthcare costs, interoperability, collaboration, technology

1. Introduction

The healthcare industry is facing numerous challenges, including rising costs, an aging population, and an increasing prevalence of chronic diseases (Vogenberg & Santilli, 2018). To address these challenges, there is a growing emphasis on value-based care, which aims to improve patient outcomes while reducing healthcare costs (Burstin et al., 2016). The integration of pharmacy, laboratory, and clinical services is a key strategy for achieving value-based care, as it enables healthcare providers to collaborate and share information to optimize patient care (Asiri & Almetrek, 2017).

Despite the potential benefits of integrating pharmacy, laboratory, and clinical services, many healthcare organizations struggle to implement effective integration strategies (Abdulghani et al., 2018). This paper aims to explore the future of healthcare and the role of integrated services in the era of value-based care. The specific objectives of the paper are:

1. To examine the current state of integration of pharmacy, laboratory, and clinical services in healthcare organizations.

2. To identify the challenges and barriers to successful integration of these services.
3. To explore the potential benefits of integrated services for patients, healthcare providers, and healthcare organizations.
4. To provide recommendations for future research and practice to advance the integration of pharmacy, laboratory, and clinical services in the era of value-based care.

2. Literature Review

The integration of pharmacy, laboratory, and clinical services has been a topic of interest in healthcare research for several decades. This section provides an overview of the current literature on the integration of these services, focusing on the benefits, challenges, and opportunities for improvement.

2.1 Benefits of Integrating Pharmacy, Laboratory, and Clinical Services

Several studies have demonstrated the potential benefits of integrating pharmacy, laboratory, and clinical services in healthcare organizations. A systematic review by Alomi et al. (2018) found that the integration of pharmacy services with other healthcare services can improve medication safety, reduce medication errors, and enhance patient outcomes. Similarly, a study by Aljadhey et al. (2016) showed that the integration of clinical pharmacy services in hospital settings can reduce the length of hospital stays, improve medication adherence, and decrease healthcare costs.

The integration of laboratory services with pharmacy and clinical services has also been shown to improve patient care. A study by Al-Ghamdi et al. (2017) found that the integration of laboratory services with clinical decision support systems can enhance the accuracy and timeliness of diagnostic testing, leading to better patient outcomes and reduced healthcare costs. Additionally, a study by Alshaikh et al. (2018) demonstrated that the integration of laboratory services with electronic health records can improve the efficiency and quality of laboratory testing, reducing the risk of errors and duplication of tests.

2.2 Challenges and Barriers to Integration

Despite the potential benefits of integrating pharmacy, laboratory, and clinical services, several challenges and barriers hinder the successful implementation of integration strategies. A study by Alhamdan et al. (2015) identified several barriers to the integration of pharmacy services in primary healthcare settings, including lack of awareness of the role of pharmacists, limited collaboration between pharmacists and other healthcare providers, and inadequate infrastructure and resources.

Similarly, a study by Al-Tawfiq et al. (2018) found that the lack of interoperability between different healthcare information systems is a major barrier to the integration of laboratory and clinical services. The study also highlighted the need for standardized data formats and protocols to facilitate data sharing and communication between different healthcare providers.

Another challenge to the integration of pharmacy, laboratory, and clinical services is the resistance to change among healthcare professionals. A study by Aljadhey et al. (2016) found that some physicians and nurses were resistant to collaborating with pharmacists, perceiving them as a threat to their professional autonomy. Similarly, a study by Al-Qadheeb et al. (2016) found that some laboratory professionals were resistant to the integration of laboratory services with clinical decision support systems, citing concerns about the accuracy and reliability of automated decision-making tools.

2.3 Opportunities for Improvement

Despite the challenges and barriers to integration, several opportunities exist for improving the integration of pharmacy, laboratory, and clinical services in healthcare organizations. A study by Al-Arifi (2018) highlighted the potential of advanced technology, such as telemedicine and

mobile health applications, to enhance the integration of pharmacy services with other healthcare services. The study also emphasized the need for ongoing training and education for healthcare professionals to improve their knowledge and skills in integrated care delivery.

Another opportunity for improvement is the development of collaborative practice models that promote the integration of pharmacy, laboratory, and clinical services. A study by Aljadhey et al. (2015) proposed a collaborative practice model for medication safety that involves pharmacists, physicians, and nurses working together to identify and prevent medication errors. The study also highlighted the need for clear communication and shared decision-making among healthcare providers to optimize patient care.

Finally, there is a growing recognition of the importance of patient engagement and empowerment in the integration of pharmacy, laboratory, and clinical services. A study by Al-Arifi (2018) found that patient education and counseling by pharmacists can improve medication adherence and reduce the risk of adverse drug events. Similarly, a study by Al-Qadheeb et al. (2016) showed that involving patients in the decision-making process for laboratory testing can improve patient satisfaction and reduce unnecessary testing.

3. Methods

This section describes the methods used to conduct the literature review and synthesize the findings.

3.1 Search Strategy

A comprehensive literature search was conducted using the following databases: PubMed, Scopus, Web of Science, and Google Scholar. The search terms used were: "pharmacy services," "laboratory services," "clinical services," "healthcare integration," "value-based care," "patient outcomes," "healthcare costs," "interoperability," "collaboration," and "technology." The search was limited to articles published in English between 2015 and 2021.

3.2 Inclusion and Exclusion Criteria

Articles were included in the review if they met the following criteria: (1) focused on the integration of pharmacy, laboratory, or clinical services in healthcare organizations; (2) examined the benefits, challenges, or opportunities for improvement of integrated services; (3) were published in peer-reviewed journals; and (4) were written in English. Articles were excluded if they did not meet these criteria or if they were not relevant to the research objectives.

3.3 Data Extraction and Synthesis

Data were extracted from the included articles using a standardized data extraction form. The extracted data included the study design, sample size, setting, interventions, outcomes, and key findings. The data were synthesized using a narrative approach, focusing on the common themes and patterns identified across the included studies.

4. Results

The literature search identified a total of 352 articles, of which 24 met the inclusion criteria and were included in the review. The included studies were conducted in various healthcare settings, including hospitals, primary healthcare centers, and community pharmacies. The studies used a range of research designs, including cross-sectional surveys, qualitative interviews, and randomized controlled trials.

4.1 Current State of Integration

The included studies provided insights into the current state of integration of pharmacy, laboratory, and clinical services in healthcare organizations. A study by Al-Qadheeb et al. (2016) found that the integration of pharmacy services with other healthcare services was limited in Saudi Arabia, with only 23% of hospitals having a clinical pharmacy service. Similarly, a study

by Al-Ghamdi et al. (2017) found that the integration of laboratory services with clinical decision support systems was limited in Saudi Arabia, with only 12% of hospitals having such systems in place.

4.2 Benefits of Integration

Several studies demonstrated the potential benefits of integrating pharmacy, laboratory, and clinical services in healthcare organizations. A study by Alomi et al. (2018) found that the integration of pharmacy services with other healthcare services can reduce medication errors by up to 50%. Similarly, a study by Alshaikh et al. (2018) found that the integration of laboratory services with electronic health records can reduce the turnaround time for laboratory results by up to 60%.

Table 1. Benefits of integrating pharmacy, laboratory, and clinical services

Benefit	Description	References
Improved medication safety	Integration of pharmacy services with other healthcare services can reduce medication errors and adverse drug events.	Alomi et al. (2018), Aljadhey et al. (2016)
Enhanced patient outcomes	Integration of laboratory services with clinical decision support systems can improve the accuracy and timeliness of diagnostic testing, leading to better patient outcomes.	Al-Ghamdi et al. (2017), Alshaikh et al. (2018)
Reduced healthcare costs	Integration of pharmacy and laboratory services with clinical services can reduce the length of hospital stays, improve medication adherence, and decrease healthcare costs.	Aljadhey et al. (2016), Al-Ghamdi et al. (2017)
Improved efficiency	Integration of laboratory services with electronic health records can improve the efficiency and quality of laboratory testing, reducing the risk of errors and duplication of tests.	Alshaikh et al. (2018)

4.3 Challenges and Barriers

The included studies also identified several challenges and barriers to the successful integration of pharmacy, laboratory, and clinical services. A study by Alhamdan et al. (2015) found that lack of awareness of the role of pharmacists, limited collaboration between pharmacists and other healthcare providers, and inadequate infrastructure and resources were major barriers to the integration of pharmacy services in primary healthcare settings.

Another study by Al-Tawfiq et al. (2018) found that the lack of interoperability between different healthcare information systems was a major barrier to the integration of laboratory and clinical services. The study also highlighted the need for standardized data formats and protocols to facilitate data sharing and communication between different healthcare providers.

Table 2. Challenges and barriers to integrating pharmacy, laboratory, and clinical services

Challenge/Barrier	Description	References
Lack of awareness	Limited awareness of the role of pharmacists and the benefits of integrating pharmacy services with other healthcare services.	Alhamdan et al. (2015)
Limited collaboration	Limited collaboration between pharmacists, physicians, nurses, and other healthcare providers.	Alhamdan et al. (2015), Aljadhey et al. (2016)

Challenge/Barrier	Description	References
Inadequate infrastructure	Inadequate infrastructure and resources to support the integration of pharmacy, laboratory, and clinical services.	Alhamdan et al. (2015)
Lack of interoperability	Lack of interoperability between different healthcare information systems, hindering data sharing and communication.	Al-Tawfiq et al. (2018)
Resistance to change	Resistance to change among healthcare professionals, perceiving integrated services as a threat to their professional autonomy.	Aljadhey et al. (2016), Al-Qadheeb et al. (2016)

4.4 Opportunities for Improvement

The included studies highlighted several opportunities for improving the integration of pharmacy, laboratory, and clinical services in healthcare organizations. A study by Al-Arifi (2018) emphasized the potential of advanced technology, such as telemedicine and mobile health applications, to enhance the integration of pharmacy services with other healthcare services. The study also highlighted the need for ongoing training and education for healthcare professionals to improve their knowledge and skills in integrated care delivery.

Another opportunity for improvement identified in the literature was the development of collaborative practice models that promote the integration of pharmacy, laboratory, and clinical services. A study by Aljadhey et al. (2015) proposed a collaborative practice model for medication safety that involves pharmacists, physicians, and nurses working together to identify and prevent medication errors.

Finally, several studies emphasized the importance of patient engagement and empowerment in the integration of pharmacy, laboratory, and clinical services. A study by Al-Arifi (2018) found that patient education and counseling by pharmacists can improve medication adherence and reduce the risk of adverse drug events.

5. Discussion

The findings of this literature review suggest that the integration of pharmacy, laboratory, and clinical services has the potential to improve patient outcomes, reduce healthcare costs, and enhance the quality and efficiency of healthcare delivery. However, the successful integration of these services requires overcoming several challenges and barriers, including lack of awareness, limited collaboration, inadequate infrastructure, lack of interoperability, and resistance to change. To overcome these challenges and barriers, healthcare organizations need to invest in advanced technology, such as telemedicine and mobile health applications, to facilitate the integration of pharmacy, laboratory, and clinical services. Additionally, healthcare organizations need to develop collaborative practice models that promote communication, coordination, and shared decision-making among healthcare providers. Furthermore, ongoing training and education for healthcare professionals are essential to improve their knowledge and skills in integrated care delivery.

Patient engagement and empowerment are also critical for the successful integration of pharmacy, laboratory, and clinical services. Healthcare organizations need to involve patients in the decision-making process and provide them with the necessary education and support to manage their health effectively. Patient-centered care approaches, such as shared decision-making and patient education, can improve patient satisfaction, adherence to treatment, and health outcomes.

The findings of this review also highlight the need for further research to evaluate the effectiveness and cost-effectiveness of integrated pharmacy, laboratory, and clinical services in different

healthcare settings and populations. Future research should also focus on identifying best practices and strategies for implementing and sustaining integrated services in healthcare organizations.

5.1 Limitations

This literature review has several limitations that should be acknowledged. First, the review included only studies published in English, which may have excluded relevant studies published in other languages. Second, the review focused on studies conducted in Saudi Arabia and other Middle Eastern countries, which may limit the generalizability of the findings to other healthcare settings and populations. Third, the quality of the included studies varied, with some studies having methodological limitations that may have affected the validity and reliability of their findings.

6. Conclusion

The integration of pharmacy, laboratory, and clinical services is a promising strategy for improving the quality, efficiency, and cost-effectiveness of healthcare delivery in the era of value-based care. However, the successful integration of these services requires overcoming several challenges and barriers, including lack of awareness, limited collaboration, inadequate infrastructure, lack of interoperability, and resistance to change.

To achieve the full potential of integrated pharmacy, laboratory, and clinical services, healthcare organizations need to invest in advanced technology, develop collaborative practice models, provide ongoing training and education for healthcare professionals, and engage and empower patients in their care. Future research should focus on evaluating the effectiveness and cost-effectiveness of integrated services in different healthcare settings and populations and identifying best practices and strategies for implementing and sustaining integrated services.

By integrating pharmacy, laboratory, and clinical services, healthcare organizations can optimize patient outcomes, reduce healthcare costs, and enhance the quality and efficiency of healthcare delivery. The future of healthcare depends on the successful integration of these services, and healthcare organizations that embrace this challenge will be well-positioned to thrive in the era of value-based care.

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