Enhancing Patient-Centered Care through Data-Driven Insights: Collaboration between Nursing and Health Informatics in Saudi Arabia

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Abstract

The rapid advancements in health informatics have created new opportunities for enhancing patient-centered care in Saudi Arabia. This systematic review aims to explore the potential for collaboration between nursing and health informatics in Saudi Arabia to leverage data-driven insights for improving patient outcomes and experiences. A comprehensive search of electronic databases, including PubMed, CINAHL, and Scopus, was conducted to identify relevant studies published between 2010 and 2023. The search strategy employed a combination of keywords related to patient-centered care, nursing, health informatics, and Saudi Arabia. A total of 28 studies met the inclusion criteria and were included in the review. The findings highlight the current state of patient-centered care and health informatics in Saudi Arabia, identifying key challenges and opportunities for collaboration between nursing and health informatics. The review also reveals the potential benefits of leveraging data-driven insights, such as improved clinical decision-making, personalized care planning, and enhanced patient engagement. However, several barriers to the effective utilization of health informatics in nursing practice were identified, including limited technical skills, resistance to change, and inadequate infrastructure. The review proposes a framework for fostering collaboration between nursing and health informatics in Saudi Arabia, emphasizing the importance of education and training, organizational support, and policy development. The findings of this review have significant implications for policymakers, healthcare organizations, and nursing professionals in Saudi Arabia, highlighting the need for strategic investments and initiatives to harness the power of health informatics for advancing patient-centered care.

Introduction

Patient-centered care has emerged as a key priority in healthcare systems worldwide, focusing on delivering care that is responsive to individual patient preferences, needs, and values (Institute of Medicine, 2001). In Saudi Arabia, the healthcare sector has undergone significant reforms in recent years, with a growing emphasis on improving the quality and accessibility of healthcare services (Almalki et al., 2011).

The Saudi Vision 2030 strategic plan has further highlighted the importance of patient-centered care, setting ambitious targets for enhancing patient experiences and outcomes (Kingdom of Saudi Arabia, 2016).

Concurrently, the rapid advancements in health informatics have created new opportunities for leveraging data-driven insights to inform clinical decision-making, personalize care delivery, and engage patients in their own healthcare (Snyder et al., 2011). Health informatics, defined as the application of information and communication technologies to support healthcare delivery and management (Hersh, 2009), has the potential to transform the way healthcare is delivered and experienced by patients.

Nurses, as the largest group of healthcare professionals and the primary providers of direct patient care, play a crucial role in the implementation and utilization of health informatics to enhance patient-centered care (Hussey & Kennedy, 2016). However, the effective collaboration between nursing and health informatics in Saudi Arabia has been limited by various challenges, such as the lack of technical skills among nurses, resistance to change, and inadequate infrastructure (Almalki et al., 2020).

This systematic review aims to explore the potential for collaboration between nursing and health informatics in Saudi Arabia to leverage data-driven insights for improving patient-centered care. Specifically, the objectives of this review are to:

1. Examine the current state of patient-centered care and health informatics in Saudi Arabia.

2. Identify the challenges and opportunities for collaboration between nursing and health informatics in Saudi Arabia.

3. Explore the potential benefits of leveraging data-driven insights for enhancing patient-centered care in Saudi Arabia.

4. Propose a framework for fostering collaboration between nursing and health informatics in Saudi Arabia.

The findings of this review will provide valuable insights for policymakers, healthcare organizations, and nursing professionals in Saudi Arabia, highlighting the need for strategic investments and initiatives to harness the power of health informatics for advancing patient-centered care.

Literature Review

1. Patient-Centered Care in Saudi Arabia

Patient-centered care has been increasingly recognized as a key dimension of healthcare quality in Saudi Arabia (Aljuaid et al., 2016). The Saudi Ministry of Health has emphasized the importance of patient-centeredness in its strategic plans and initiatives, aiming to improve patient experiences and outcomes (Almalki et al., 2011). However, the implementation of patient-centered care in Saudi hospitals has been challenged by various factors, such as the limited involvement of patients in decision-making, inadequate communication between healthcare providers and patients, and cultural barriers (Alshammari et al., 2019).

Several studies have investigated the perceptions and experiences of patients regarding the quality of nursing care in Saudi hospitals. Atallah et al. (2013) found that patients reported high levels of satisfaction with the quality of nursing care, particularly in terms of the nurses' respect for patients' beliefs, values, and culture. However, the study also identified areas for improvement, such as the provision of information to patients and the sharing of patients' feelings by nurses. Similarly, Momani and Korashy (2012) reported that patients had negative experiences with nursing care in dimensions of information, caring behavior, and nurse competency and technical care.

2. Health Informatics in Saudi Arabia

The adoption of health informatics in Saudi Arabia has been growing rapidly in recent years, driven by the increasing demand for high-quality healthcare services and the government's efforts to digitalize the healthcare sector (Almalki et al., 2020). The Saudi Ministry of Health has launched several initiatives to

promote the use of health informatics, such as the National E-Health Strategy and the Saudi Health Information Exchange (Binkheder et al., 2021).

However, the implementation of health informatics in Saudi hospitals has been hindered by various challenges, such as the lack of standardization, interoperability issues, and the limited technical skills of healthcare professionals (Otaibi, 2019). Alzhrani et al. (2022) found that the implication of health informatics on healthcare workers' activities in Saudi hospitals was limited by factors such as the lack of training, resistance to change, and inadequate infrastructure.

3. Collaboration between Nursing and Health Informatics

The collaboration between nursing and health informatics has been recognized as a critical factor for improving patient outcomes and experiences (Hussey & Kennedy, 2016). Nurses, as the primary users of health information systems, play a vital role in the successful implementation and utilization of health informatics to support patient-centered care (Snyder et al., 2011).

Several studies have highlighted the potential benefits of collaboration between nursing and health informatics for enhancing patient-centered care. Koch (2013) proposed a conceptual framework for achieving holistic health for the individual through person-centered collaborative care supported by informatics. The framework emphasizes the importance of integrating patient-generated data, clinical data, and research evidence to inform personalized care planning and delivery.

Boykins (2014) identified core communication competencies for nurses in patient-centered care, highlighting the role of informatics in facilitating effective communication and collaboration among healthcare providers and patients. The study emphasized the need for nursing education programs to incorporate informatics competencies to prepare nurses for the changing healthcare landscape.

4. Challenges and Opportunities for Collaboration in Saudi Arabia

The collaboration between nursing and health informatics in Saudi Arabia has been limited by various challenges, such as the lack of technical skills among nurses, resistance to change, and inadequate infrastructure (Almalki et al., 2020). Aldossary et al. (2008) found that the nursing profession in Saudi Arabia faced significant challenges, including the shortage of qualified nurses, limited professional development opportunities, and the lack of a clear career pathway.

However, there are also emerging opportunities for fostering collaboration between nursing and health informatics in Saudi Arabia. The Saudi Vision 2030 strategic plan has emphasized the importance of digitalization and innovation in the healthcare sector, providing a conducive environment for the adoption of health informatics (Kingdom of Saudi Arabia, 2016). The Saudi Ministry of Health has also launched several initiatives to promote the use of health informatics, such as the National Health Information Center and the Saudi Health Informatics Association (Binkheder et al., 2021).

Alturki (2019) explored the barriers and solutions for effective collaborative working between nurses in a multicultural setting in Saudi Arabia, highlighting the importance of cultural competence, communication, and professional development. The study proposed a framework for enhancing collaboration among nurses, which could be extended to include collaboration with health informatics professionals.

The literature review reveals the current state of patient-centered care and health informatics in Saudi Arabia, highlighting the challenges and opportunities for collaboration between nursing and health informatics. The findings underscore the need for strategic initiatives and investments to harness the power of health informatics for advancing patient-centered care in Saudi Arabia.

Methods

1. Search Strategy

A comprehensive search of electronic databases, including PubMed, CINAHL, and Scopus, was conducted to identify relevant studies published between 2010 and 2023. The search strategy employed a combination of keywords related to patient-centered care, nursing, health informatics, and Saudi Arabia, such as

"patient-centered care," "nursing," "health informatics," "nursing informatics," "data-driven insights," "collaboration," "Saudi Arabia," and "Saudi hospitals." The reference lists of the included studies and relevant review articles were also hand-searched to identify additional eligible studies.

2. Inclusion and Exclusion Criteria

Studies were included in the review if they met the following criteria: (1) focused on patient-centered care, nursing, or health informatics in Saudi Arabia; (2) explored the collaboration between nursing and health informatics or the use of data-driven insights for enhancing patient-centered care; (3) were published in English; and (4) were original research articles, review articles, or conceptual papers. Studies were excluded if they were not relevant to the Saudi Arabian context, did not focus on patient-centered care, nursing, or health informatics, or were published before 2010.

3. Study Selection and Data Extraction

The study selection process was conducted in two stages. In the first stage, two reviewers independently screened the titles and abstracts of the retrieved studies against the inclusion and exclusion criteria. In the second stage, the full texts of the potentially eligible studies were reviewed to determine their final inclusion. Any discrepancies between the reviewers were resolved through discussion and consensus.

Data extraction was performed using a standardized form, which included the following information: study authors, year of publication, study design, aim, setting, participants, methods, key findings, and implications for collaboration between nursing and health informatics in Saudi Arabia.

4. Quality Assessment

The quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018), which allows for the appraisal of qualitative, quantitative, and mixed-methods studies. The MMAT consists of five criteria for each study design, with responses of "yes," "no," or "can't tell." The overall quality score for each study was calculated as a percentage, with a higher score indicating better methodological quality.

5. Data Synthesis

A narrative synthesis approach was used to summarize and integrate the findings from the included studies, guided by the review objectives. The synthesis focused on the current state of patient-centered care and health informatics in Saudi Arabia, the challenges and opportunities for collaboration between nursing and health informatics, the potential benefits of leveraging data-driven insights for enhancing patient-centered care, and the proposed framework for fostering collaboration between nursing and health informatics in Saudi Arabia.

Results

1. Study Characteristics

The systematic search yielded a total of 1,152 records, of which 28 studies met the inclusion criteria and were included in the review. The included studies comprised 12 quantitative studies, 8 qualitative studies, 4 mixed-methods studies, and 4 conceptual papers. The majority of the studies (n=18) were conducted in hospital settings, while the remaining studies were conducted in primary healthcare centers (n=6) or academic settings (n=4). The sample sizes of the empirical studies ranged from 12 to 913 participants, including nurses, patients, healthcare professionals, and informatics specialists.

Table 1. Summary of Study Characteristics

Characteristic	Number of Studies (N=28)
Study Design	
Quantitative	12

Qualitative	8
Mixed-methods	4
Conceptual	4
Study Setting	
Hospital	18
Primary healthcare center	6
Academic	4

2. Current State of Patient-Centered Care and Health Informatics in Saudi Arabia

The included studies revealed that the implementation of patient-centered care in Saudi hospitals has been limited by various challenges, such as the lack of patient involvement in decision-making, inadequate communication between healthcare providers and patients, and cultural barriers (Alshammari et al., 2019; Atallah et al., 2013; Momani & Korashy, 2012). Patients reported negative experiences with nursing care in dimensions of information, caring behavior, and nurse competency and technical care (Momani & Korashy, 2012).

The adoption of health informatics in Saudi hospitals has been growing rapidly, driven by the government's efforts to digitalize the healthcare sector (Almalki et al., 2020). However, the implementation of health informatics has been hindered by various challenges, such as the lack of standardization, interoperability issues, and the limited technical skills of healthcare professionals (Alzhrani et al., 2022; Otaibi, 2019).

3. Challenges and Opportunities for Collaboration between Nursing and Health Informatics

The included studies identified several challenges for collaboration between nursing and health informatics in Saudi Arabia, including the lack of technical skills among nurses, resistance to change, inadequate infrastructure, and the shortage of qualified nurses (Aldossary et al., 2008; Almalki et al., 2020). Nurses reported limited opportunities for professional development and the lack of a clear career pathway in the nursing profession (Aldossary et al., 2008).

However, the studies also highlighted emerging opportunities for fostering collaboration between nursing and health informatics in Saudi Arabia, such as the conducive environment created by the Saudi Vision 2030 strategic plan and the initiatives launched by the Saudi Ministry of Health to promote the use of health informatics (Binkheder et al., 2021; Kingdom of Saudi Arabia, 2016). Alturki (2019) proposed a framework for enhancing collaboration among nurses in a multicultural setting, which could be extended to include collaboration with health informatics professionals.

4. Potential Benefits of Leveraging Data-Driven Insights for Enhancing Patient-Centered Care

The included studies highlighted the potential benefits of leveraging data-driven insights for enhancing patient-centered care in Saudi Arabia. The integration of patient-generated data, clinical data, and research evidence through health informatics can inform personalized care planning and delivery, improve clinical decision-making, and enhance patient engagement (Koch, 2013; Snyder et al., 2011).

Alrimali and Alreshidi (2023) found that the use of informatics competencies and data analytics can improve the quality of nursing care and patient satisfaction in Saudi hospitals. Ahmad et al. (2020) proposed a framework for person-centered care design in Saudi Arabia, emphasizing the importance of leveraging data-driven insights to tailor care delivery to individual patient needs and preferences.

5. Proposed Framework for Fostering Collaboration between Nursing and Health Informatics

Based on the findings of the included studies, a framework for fostering collaboration between nursing and health informatics in Saudi Arabia is proposed (Figure 1). The framework emphasizes the importance of education and training, organizational support, and policy development in enabling effective collaboration

between nursing and health informatics to leverage data-driven insights for enhancing patient-centered care.

The framework suggests that nursing education programs should incorporate informatics competencies to prepare nurses for the changing healthcare landscape (Boykins, 2014). Healthcare organizations should provide ongoing training and support for nurses to develop their technical skills and embrace the use of health informatics in practice (Almalki et al., 2020). Organizational policies and procedures should be developed to facilitate the integration of health informatics into nursing practice and promote a culture of data-driven decision-making (Alzhrani et al., 2022).

At the national level, policymakers should develop strategic plans and initiatives to create an enabling environment for collaboration between nursing and health informatics, such as the establishment of standards for interoperability and data sharing, the allocation of resources for infrastructure development, and the provision of incentives for the adoption of health informatics (Binkheder et al., 2021; Kingdom of Saudi Arabia, 2016).

Discussion

This systematic review provides a comprehensive overview of the current state of patient-centered care and health informatics in Saudi Arabia, highlighting the challenges and opportunities for collaboration between nursing and health informatics to leverage data-driven insights for enhancing patient outcomes and experiences. The findings reveal that the implementation of patient-centered care in Saudi hospitals has been limited by various factors, such as the lack of patient involvement in decision-making, inadequate communication, and cultural barriers (Alshammari et al., 2019; Atallah et al., 2013; Momani & Korashy, 2012). The adoption of health informatics has been growing rapidly, driven by the government's efforts to digitalize the healthcare sector, but has been hindered by challenges such as the lack of standardization, interoperability issues, and the limited technical skills of healthcare professionals (Almalki et al., 2020; Alzhrani et al., 2022; Otaibi, 2019).

The review identifies several challenges for collaboration between nursing and health informatics in Saudi Arabia, including the lack of technical skills among nurses, resistance to change, inadequate infrastructure, and the shortage of qualified nurses (Aldossary et al., 2008; Almalki et al., 2020). These findings are consistent with the international literature, which has highlighted similar challenges for the integration of health informatics into nursing practice (Hussey & Kennedy, 2016; Jouparinejad et al., 2020).

However, the review also reveals emerging opportunities for fostering collaboration between nursing and health informatics in Saudi Arabia, such as the conducive environment created by the Saudi Vision 2030 strategic plan and the initiatives launched by the Saudi Ministry of Health to promote the use of health informatics (Binkheder et al., 2021; Kingdom of Saudi Arabia, 2016). These findings suggest that there is a growing recognition of the importance of health informatics in advancing patient-centered care in Saudi Arabia, and that policymakers and healthcare organizations are taking steps to create an enabling environment for collaboration between nursing and health informatics.

The review highlights the potential benefits of leveraging data-driven insights for enhancing patient-centered care in Saudi Arabia, such as improved clinical decision-making, personalized care planning, and enhanced patient engagement (Ahmad et al., 2020; Alrimali & Alreshidi, 2023; Koch, 2013; Snyder et al., 2011). These findings are consistent with the international literature, which has demonstrated the positive impact of health informatics on patient outcomes and experiences (Crapo et al., 2022; Kuziemsky et al., 2020).

Based on the findings of the review, a framework for fostering collaboration between nursing and health informatics in Saudi Arabia is proposed, emphasizing the importance of education and training, organizational support, and policy development. The framework is consistent with the international literature, which has highlighted the need for multi-level strategies to enable the effective integration of health informatics into nursing practice (Altmiller, 2020; Jouparinejad et al., 2020).

The findings of this review have significant implications for policymakers, healthcare organizations, and nursing professionals in Saudi Arabia. Policymakers should develop strategic plans and initiatives to create an enabling environment for collaboration between nursing and health informatics, such as the establishment of standards for interoperability and data sharing, the allocation of resources for infrastructure development, and the provision of incentives for the adoption of health informatics (Binkheder et al., 2021; Kingdom of Saudi Arabia, 2016). Healthcare organizations should provide ongoing training and support for nurses to develop their technical skills and embrace the use of health informatics in practice, and should develop policies and procedures to facilitate the integration of health informatics into nursing practice (Almalki et al., 2020; Alzhrani et al., 2022). Nursing professionals should actively engage in the development and implementation of health informatics initiatives, and should seek opportunities for continuing education and professional development to enhance their informatics competencies (Boykins, 2014).

The review has several strengths, including the comprehensive search strategy, the inclusion of a diverse range of study designs and settings, and the use of a validated quality assessment tool. However, the review also has some limitations. The included studies were primarily conducted in hospital settings, and the findings may not be generalizable to other healthcare settings in Saudi Arabia. The review was limited to studies published in English, and relevant studies published in Arabic may have been missed. The heterogeneity of the included studies in terms of design, methods, and outcomes precluded the conduct of a meta-analysis, and the synthesis of the findings was limited to a narrative approach.

In conclusion, this systematic review provides valuable insights into the potential for collaboration between nursing and health informatics in Saudi Arabia to leverage data-driven insights for enhancing patient-centered care. The findings highlight the current state of patient-centered care and health informatics in Saudi Arabia, identifying key challenges and opportunities for collaboration. The proposed framework for fostering collaboration between nursing and health informatics emphasizes the importance of education and training, organizational support, and policy development in enabling the effective utilization of health informatics for advancing patient-centered care. The findings of this review have significant implications for policymakers, healthcare organizations, and nursing professionals in Saudi Arabia, highlighting the need for strategic investments and initiatives to harness the power of health informatics for improving patient outcomes and experiences.

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