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From Technology Adoption to Sustainable Care: The Importance of Digital Health Competencies in Bahrain

Ali Ebrahim[1*]

Abstract

This study looks at Bahraini healthcare providers' digital health competencies and how they contribute to the development of sustainable healthcare. Healthcare is now more accessible, efficient, and of higher quality thanks to the integration of technology like telemedicine, electronic health records, artificial intelligence, and mobile health applications (Chen, Lehmann, and Malin, 2024; Iyengar et al., 2025; Mesko et al., 2025). However, the competencies of healthcare providers are necessary for effective utilization. A structured questionnaire based on established competency frameworks, such as ICT skills, communication, ethics, and data-driven decision-making, was used in a quantitative cross-sectional design (Nazeha et al., 2020; Ferreira et al., 2025). The results show moderate levels of competency, with significant deficiencies in sophisticated digital communication and analytical abilities. Workforce preparedness is still inconsistent in Bahrain despite the country's robust digital infrastructure (Alotaibi, Wilson, and Traynor, 2025). Enhancing healthcare quality, patient safety, and sustainability requires strengthening digital competencies through organized training and policy alignment. The report supports Bahrain Vision 2030 aligned workforce development policies.

Keywords: Digital health, Competencies, Telemedicine, Sustainability, Bahrain, Digital transformation

*Correspondence:
Ali Ebrahim
Brunel University London (PhD student)
United Kingdom

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1. Introduction

Artificial intelligence, telemedicine, and electronic health records are examples of technologies that have become essential to contemporary healthcare systems, improving clinical judgement and operational effectiveness (Giansanti, 2025; Andersson and Gonzalez, 2025).

With an emphasis on Bahrain, this systematic literature review summarizes the body of research on digital health capabilities and their contribution to the development of sustainable healthcare. Innovation and digital integration are highlighted as important forces behind healthcare development in national initiatives that are in line with Vision 2030 (Government of Bahrain, 2025). The need for a digitally proficient healthcare workforce has been further underscored by the quick development of digital health technology, especially in the wake of the COVID-19 pandemic (Iyengar and Jain, 2020; Rabbani, Alam, and Prybutok, 2025).

Evidence indicates that worker readiness is still uneven despite infrastructure improvements. Inadequate skills may limit the efficient use of technology, which could have an impact on patient safety and the standard of care (Navarro-Martínez et al., 2023). In order to find gaps and guide sustainable healthcare plans, it is crucial to assess and produce the present literature on digital health capabilities.

2. Methodology

In order to critically assess the body of research on digital health capabilities among healthcare providers, this study used a methodical literature review technique. The review adheres to accepted guidelines, guaranteeing methodological consistency, reproducibility, and transparency.

Search Strategy

A comprehensive search was conducted across major academic databases, including Scopus, PubMed, and Web of Science. Keywords included combinations of:

- Digital health competencies
- Healthcare workforce digital skills
- Telemedicine competencies
- Sustainable healthcare
- Bahrain healthcare digital transformation

Inclusion Criteria

- Peer-reviewed articles published between 2020 and 2026
- Studies focusing on healthcare professionals' digital competencies
- Research addressing digital health implementation or sustainability

Exclusion Criteria

- Non-peer-reviewed sources
- Studies unrelated to healthcare workforce competencies
- Articles lacking empirical or conceptual relevance
- Articles earlier than the year 2020

A total of **34 studies** were selected from the provided document and studied using thematic synthesis.

Analytical Framework

The review is structured around key competency domains adapted from recognized frameworks including:

- ICT and technical skills
- Digital communication
- Ethical and legal awareness
- Data-driven decision-making

3. Results

Several similar findings across regional and global contexts are shown by the synthesis of the chosen literature.

3.1 ICT and Technical Skills

According to the majority of research, healthcare workers exhibit sufficient competence with fundamental digital tools including telemedicine platforms and electronic health records (Iyengar et al., 2025; Alomar, 2024). Advanced technical skills, such as digital troubleshooting and system integration, are still scarce.

3.2 Digital Communication

One major gap was found in digital communication skills. Effective virtual patient involvement and interprofessional collaboration require more development, even when healthcare providers are conversant with fundamental communication tools (Alam et al., 2024).

3.3 Ethical and Legal Competencies

The literature extensively discusses ethical issues, especially those pertaining to patient confidentiality, cybersecurity, and data protection (Alhomidan et al., 2025). Numerous research point to a lack of knowledge about the legal frameworks governing digital health.

3.4 Data-Driven Decision-Making

Lack of proficiency in data analysis and interpretation is a recurrent topic. Healthcare providers frequently lack the skills necessary to successfully apply the vast amounts of health data generated by digital technologies for clinical decision-making (Gutiérrez et al., 2025).

3.5 Barriers to Competency Development

- Common barriers identified include:
- Limited training opportunities (Das, Kumar and Bhandari, 2025)
- Lack of structured competency frameworks (Smith et al., 2025)
- Variations in professional training and exposure (Sumner et al., 2025)

3.6 Bahrain Context

Research focused on Bahrain and the Gulf region shows significant investment in digital infrastructure, but it also reveals disparities in workforce preparedness (Alsubahi et al., 2024; Alotaibi, Wilson, and Traynor, 2025).

4. Discussion

The results show that digital health capabilities play a vital role in facilitating the transformation and sustainability of healthcare. The efficiency of digital health systems is largely dependent on the skills of medical professionals, even as technology infrastructure keeps developing.

The highlighted competency gaps are consistent with international research emphasizing the necessity of ongoing professional development and incorporating digital skills into healthcare education (Khurana et al., 2022; Aydınlar et al., 2024). Additionally, protecting data security, promoting ethical clinical practice, and guaranteeing patient safety all depend on digital competencies.

From a sustainability standpoint, digital health technologies improve access to care, lower healthcare costs, and apply resources more effectively (Lee et al., 2025; Timpel et al., 2021). However, without a skilled workforce that can successfully use digital tools, these advantages cannot be fully realized.

Therefore, a systems-based strategy is needed, incorporating:

- Educational reforms
- Workforce training programs
- Policy alignment

In Bahrain, where national strategies emphasize sustainable healthcare development, this kind of approach is very pertinent.

5. Limitations

This systematic review is subject to some limitations:

- The inclusion of studies published within a limited time frame (2020–2026)
- Potential publication bias due to reliance on peer-reviewed literature
- Limited availability of Bahrain-specific empirical studies

Longitudinal and primary data studies should be included in future study to offer more in-depth understanding of competency growth over time.

6. Conclusion

The development of sustainable healthcare systems and the effective use of healthcare technologies depend heavily on digital health competences. This comprehensive assessment of the literature shows that there are still large gaps in worker preparation despite advancements in technology.

- To close these gaps, we need:
- Programs for structured training
- Using competency frameworks in the classroom
- Well-established policy support

In Bahrain, attaining national healthcare objectives and guaranteeing long-term sustainability would need bolstering digital competencies. This study adds to the expanding corpus of research highlighting the significance of workforce development in the digital transformation of healthcare.

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