

# Use of Artificial Intelligence and Digital Tools in Maternal Healthcare Nursing: A Narrative Review

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## Abstract

Maternal health nursing is concerned with the care of mothers during the pregnancy phase and health services revolving around it and it still remains a global priority, with persistent challenges in reducing the maternal morbidity and mortality, distinctly in low income and middle-income countries (LMICs) <sup>(2,3)</sup>. Artificial intelligence (AI) and digital health technologies are progressively being unified into healthcare systems to improve consequences and outcomes. To review the applications, benefits, challenges, and future implications of AI and digital tools in maternal health nursing. A narrative review of literature published between 2015 and 2025 was conducted using databases such as PubMed, Google Scholar, and WHO repositories. Keywords included "AI in maternal health," "digital nursing tools," and "telehealth in pregnancy". <sup>(1,14)</sup> AI-led clinical decision systems, telemedicine, mobile health (mHealth), wearable technologies, and electronic health records (EHRs) crucially strengthen maternal care by improving early diagnosis, monitoring, and patient engagement <sup>(6,10,15)</sup>. However, challenges such as data privacy, ethical concerns, and infrastructural limitations persist <sup>(18,19)</sup>. AI and digital tools have hefty potential to transform maternal health nursing, provided ethical, technical, and educational barriers are tackled properly.

**Keywords:** Artificial Intelligence, Maternal Health, Nursing, Telemedicine, mHealth, Digital Health

## Introduction

Maternal healthcare is a critical element of global health systems, with sustained gaps in maternal outcomes across different geographical regions. <sup>(2,3)</sup>

Nurses play an essential role in distributing adequate antenatal, intranatal, and postnatal care. The integration of artificial intelligence (AI) and digital health tools brings new opportunities to intensify care delivery and patient outcomes. <sup>(1,4)</sup>

AI refers to computational systems competent of delivering performance of tasks requiring human intelligence, such as learning and decision-making. <sup>(4,6)</sup>

Digital health tools—including telemedicine, mobile applications, and wearable devices—complement AI by improving accessibility, affordability and continuity of care. <sup>(10,14)</sup>

## Methods

This narrative review included peer-reviewed articles, systematic reviews, and reports from global organizations such as WHO and UNFPA published between 2015 and 2025. Databases searched included PubMed, Scopus, and Google Scholar.

### Inclusion criteria:

- Studies focusing on AI or digital tools in maternal healthcare
- Articles relevant to nursing practice
- English-language publications

### Exclusion criteria:

- Non-peer-reviewed sources
- Studies unrelated to maternal or nursing care

A thematic synthesis approach was used to analyse findings.

## Results

### 1. Clinical Decision Support Systems (CDSS)

AI-powered CDSS assist nurses in identifying high-risk pregnancies through analysis of clinical data, enabling timely interventions that can prove to have significant impacts on healthcare revolving mothers provide and improved outcomes<sup>(6,7)</sup>.

### 2. Telemedicine and Remote Monitoring

Telehealth services help distributing competent remote antenatal and postnatal consultations, especially by focusing on rural populations<sup>(10,12)</sup>.

Remote monitoring tools allow continuous tracking of maternal and foetal health parameters<sup>(9,11)</sup>.

### 3. Mobile Health (mHealth) Applications

mHealth applications support health education, appointment adherence, and symptom monitoring among pregnant women<sup>(15,16)</sup>.

### 4. Wearable Technologies

Nowadays electronic wearables facilitate continuous monitoring of vital parameters, improving early detection of complications.<sup>(8)</sup>

### 5. Electronic Health Records (EHRs)

EHRs amplify documentation, communication, and continuity of care among healthcare providers.<sup>(7,14)</sup>

### 6. Predictive Analytics

AI-based predictive models help identify risks such as pre-eclampsia and preterm birth and other complications early and aids in effective preventive care and management of patients.<sup>(5,13)</sup>

## Discussion

The integration of AI and digital tools into maternal healthcare nursing has demonstrated significant improvements in

efficiency, accuracy, and accessibility of care.<sup>(1,6)</sup>

Telemedicine has emerged as central strategy for overcoming geographical barriers and hurdles, while mHealth tools strengthens patient engagement.<sup>(10,15)</sup>

However, challenges remain, including underprivileged and limited infrastructure in LMICs, lack of digital knowledge and literacy, concerns regarding data privacy and algorithmic biases.<sup>(18,19)</sup>

Ethical considerations must be addressed to ensure responsible AI implementation.

## Implications for Nursing Practice

- Enhances evidence-based decision-making
- Improves early detection of complications
- Strengthens patient education and engagement
- Expands access to care in underserved areas
- Requires digital competency training for nurses

## Limitations

This review is limited by its narrative design and potential selection bias. Additionally, rapid technological advancements may outdate some findings.

## Conclusion

AI and digital technologies are revolutionising maternal health care and nursing by improving clinical outcomes and healthcare delivery systems.<sup>(1,6)</sup>

Strategic implementation, ethical governance, and capacity building are essential to maximize their benefits.

It is safe to say that with proper conditioning of digital tools and AI we can commit to deliver quality healthcare services to people expanding the reach to geographically remote and deprived regions globally.<sup>(18,19)</sup>

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