Archives available at journals.mriindia.com

International Journal of Recent Advances in Engineering and Technology

ISSN: 2347 - 2812
Volume 14 Issue 01s, 2025

MOM CARE: LEVERAGING INTELLIGENT SYSTEMS FOR COMPREHENSIVE MONITORING AND SUPPORT DURING PREGNANCY

[1]Borhade Siddhi, [2]Doke Gayatri, [3]Bhujbal Pratiksha, [4]Prof. Shubhangi Said
[1 2 3 4] Artificial Intelligence and Data Science Engineering, JCOE'S, Kuran
Email: [1]siddhiborhade1907@gmail.com, [2]gaudoke007@gmail.com, [3]bhujbalpratiksha2453@gmail.com, [4]Shubhangi28587@gmail.com

Peer Review Information

Submission: 1 Sept 2025

Revision: 28 Sept 2025

Acceptance: 12 Oct 2025

Keywords

Maternal Health, Pregnancy Monitoring, AI, Cloud Computing, Emergency Alerts, Health Guidance, User Dashboard.

Abstract

Maternal healthcare is critical for ensuring the well-being of pregnant women and their unborn children. Mom Care is an intelligent monitoring and guidance system designed to provide personalized maternal healthcare through real-time health tracking, emergency alerts, and pregnancy guidance.
The system leverages cloud computing, user dashboards, and AI-based monitoring to ensure timely health insights. The user-friendly interface allows expecting mothers to track vital parameters, receive medical alerts, and access personalized recommendations. The proposed system integrates IoT-based health monitoring, AI-driven analysis, and a responsive user dashboard to enhance maternal healthcare accessibility and effectiveness.

INTRODUCTION

Pregnancy is a significant phase in a woman's life, requiring continuous medical supervision to ensure both maternal and fetal well-being. However, many pregnant women, especially in rural and underserved areas, lack access to regular medical checkups and timely healthcare interventions. Traditional maternal care relies heavily on periodic doctor visits, which may not always detect sudden complications such as hypertension, gestational diabetes, or fetal distress. To address these challenges, Mom Care introduces a smart, AI-powered maternal health monitoring system that continuously tracks vital health parameters and provides real- time alerts in case of anomalies. The system integrates IoT-based wearable devices, a cloud-based data storage system, and an AI-powered analytics engine to provide personalized pregnancy guidance and early detection of complications. The user-friendly dashboard allows expecting mothers to monitor their health status, receive AI-driven recommendations, and stay connected with healthcare providers.

LITERATUREREVIEW

1. Gupta et al., "IOT-Enabled Pregnancy Monitoring System," International Journal of Medical Informatics, 2023.

This study focuses on an IOT-based maternal healthcare system that continuously tracks key health parameters such as heart rate, blood pressure, and fetal movements. The system collects real-time physiological data using wearable devices and transmits it to a cloud platform for analysis. AI-driven algorithms detect health anomalies and trigger emergency alerts for medical intervention. The proposed system improves pregnancy monitoring providing continuous tracking and predictive insights, ensuring timely maternal healthcare support.

2. A. Sharma et al., "AI-Driven Maternal Health Monitoring System," IEEE, 2023.
This project presents an AI-based maternal healthcare system that continuously monitors vital health parameters of pregnant women using cloud-integrated analytics. The system collects user-inputted health data and wearable device readings to track pregnancy progress. AI models analyze the data to detect potential pregnancy risks such as hypertension, gestational diabetes, and fetal distress. When anomalies are detected, automated alerts notify users and healthcare providers, ensuring timely medical intervention. The system, developed using Python and cloud-based technologies, features a web and mobile-friendly dashboard for easy accessibility. This approach enhances maternal healthcare by providing real-time insights, reducing complications, and improvingaccessibility to medical support**.**

3. R. Patel et al., "Cloud-Based Healthcare Solutions for Maternal Care," International Journal of Healthcare Technology, 2022.
This paper explores the use of cloud computing in maternal healthcare for efficient storage, processing, and accessibility of health records. The study proposes a cloud-integrated maternal health system that allows pregnant women to log their health details, receive AI-generated recommendations, and access medical records remotely. The system enhances collaboration between patients and healthcare providers, offering a secure and scalable solution for pregnancy monitoring. The research highlights the benefits of cloud-based healthcare in improving maternal health outcomes and ensuring data security.

4. M. Singh et al., "Mobile Health Applications for Pregnancy Care," Journal of Digital Health, 2021.
This research discusses the role of mobile health (mHealth) applications in improving maternal care by offering personalized pregnancy guidance. The proposed system uses AI-based recommendations to provide trimester-specific advice on nutrition, exercise, and medical. The mobile app integrates symptom tracking and appointment scheduling features, ensuring better pregnancy . The study demonstrates that Health applications enhance maternal care accessibility, Particularly for women in remote areas with limited services.

5. N. Rao et al., "Machine Learning for Maternal Health Risk Prediction," ACM Transactions on Health Informatics, 2021.
This paper presents a machine learning-based system that predicts maternal health risks by analyzing historical pregnancy data and real-time health metrics. The system applies classification algorithms to identify potential complications such as preeclampsia, anemia, and gestational Hypertension. By using predictive analytics, the system help doctors and pregnant women take preventive measures early, reducing maternal mortality and complications. The research emphasizes the significance of AI-driven predictive healthcare solutions in maternal health monitoring.

6. K. Verma et al., "Emergency Alert Systems in Maternal Healthcare," IEEE International Conference on Smart Healthcare Technologies, 2020.
This study introduces an intelligent emergency alert system that detects maternal health risks based on real-time physiological monitoring. The system integrates AI models continuously assess health data and send automatic alerts to users and emergency responders when critical conditions as severe hypertension or abnormal fetal movements are detected. The system is designed to be integrated into existing healthcare applications, improving response times and ensuring timely medical intervention

OBJECTIVES
The primary objective of Mom Care is to develop an AI-driven maternal health monitoring system that continuously tracks vital health parameters and detects potential pregnancy-related risks in real time. The system aims to provide personalized pregnancy guidance by offering trimester-specific recommendations on nutrition, exercise, and medical care. By implementing a cloud-based health data storage system, Mom Care ensures secure and remote access to medical records, enabling both pregnant women and healthcare providers to monitor health trends effectively.

PROPOSED SYSTEM
The Mom Care system is designed to provide an intelligent maternal healthcare solution by integrating real-time health monitoring, AI-based analysis, and cloud computing. The system consists of multiple components that work together to enhance pregnancy care. First, IoT-enabled wearable devices continuously track vital maternal health parameters such as heart rate, blood pressure, oxygen levels, and fetal movements. This data is transmitted securely to a cloud-based storage system for real-time processing and historical analysis. The AI-driven analytics engine analyzes this data to detect abnormalities and predict potential

pregnancy complications. If any critical health issue is identified, an emergency alert system notifies the user and their registered healthcare provider for immediate action. Additionally .Mom Care offers a user-friendly dashboard that provides personalized health insights, pregnancy milestones, and trimester-specific recommendations on nutrition, exercise, and medical care. The system ensures continuous maternal health tracking, facilitates early detection of complications, and provides real-time pregnancy guidance, thereby improving accessibility and efficiency in maternal healthcare.

Figure 2

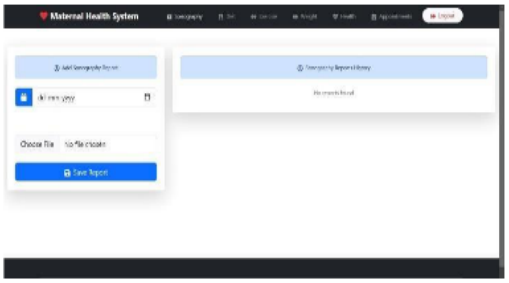

Figure 3

Figure 1

Figure 2

METHODOLOGY

Algorithm

The system's workflow is broken down into four key steps, as outlined below:

1. User Registration and Authentication:

The user initiates the system by registering and logging in with credentials, ensuring secure access and personalized health tracking. Users enter essential health details, which help in tailoring pregnancy guidance and monitoring.

2. Health Data Collection:

Manual Input: Users can log health parameters such as weight, symptoms, and blood pressure manually. Sensor Integration: If integrated with wearable devices, the system fetches real-time physiological data such as heart rate, oxygen levels, and fetal movements**.**

3. AI-Based Health Analysis:

Data Processing: AI and machine learning models analyze collected data to detect abnormalities and predict potential pregnancy risks.

- **Risk Assessment:** The system evaluates health trends and flags potential complications like gestational diabetes or hypertension for early intervention**.**

4. Personalized Recommendations and Alert System:

Emergency Alerts: If the system detects abnormal readings, automatic notifications are sent to the user and their registered healthcare provider**.**

- **Customized Guidance:** The system provides trimester-specific recommendations, including diet plans, exercise routines, and medical checkup reminders**.**
- **Continuous Monitoring:** The AI engine continuously tracks user inputs and health trends, updating recommendation dynamically for better maternal care.

CONCLUSION

In conclusion, the "Mom Care" system represents a significant advancement in the field of maternal health by integrating intelligent technologies for real-time monitoring and personalized guidance. The system effectively

empowers pregnant women to track their health metrics, receive timely alerts, and access tailored recommendations that enhance their well-being throughout pregnancy. By leveraging cloud computing, data analytics, and user-friendly interfaces, "Mom Care" ensures that expectant mothers can make informed decisions about their health, reducing risks and improving outcomes. This project has the potential to revolutionize maternal care by offering a comprehensive, accessible, and data-driven approach to managing pregnancy health.

REFERENCES

A. Kumar, P. Reddy, "Maternal Health Monitoring Systems: A Review of Technologies," International Journal of Health Informatics, Vol. 14, Issue 2, 2024, pp. 58-65.

J. M. Patel, R. S. Gupta, "Cloud Computing for Healthcare: Opportunities and Challenges," International Journal of Cloud Computing, Vol. 6, Issue 3, 2023, pp. 225-231.

S. B. Johnson, M. L. White, "Advances in Pregnancy Monitoring Using Wearable Devices," International Journal of Medical Devices and Sensors, Vol. 10, Issue 1, 2024, pp.35-40.

S. Chatterjee, R. Prakash, "Real-Time Data Analytics in Maternal Health," Journal of Healthcare Systems and Technology, Vol. 19, Issue 4, 2022, pp. 210-215.

A. Thompson, D. Miller, "AI-Based Solutions for Predictive Healthcare in Pregnancy," International Journal of AI and Healthcare, Vol. 8, Issue 2, 2023, pp. 112-118.

M. Srinivasan, T. R. Murthy, "Integrating Intelligent Monitoring for Pregnant Women: Challenges and Solutions," Proceedings of the International Conference on Maternal Health Technology, 2024, pp. 72-78.

R. J. Dawson, L. P. Harris, "Smart Pregnancy Management Systems Using Cloud and Mobile Technologies," International Journal of Telemedicine and e- Health, Vol. 22, Issue 3, 2024, pp. 54-60.

P. Verma, N. Kapoor, "Intelligent Guidance Systems for Maternal Health: A Review of Current Approaches, "International Journal of Smart Health Systems, Vol. 5, Issue 1, 2023, pp. 98-104.

H. Patel, V. Kumar, "Wearable Sensors for Maternal Health Monitoring: Current Trends and Future Directions, "International Journal of Sensors and Health, Vol. 11, Issue 2, 2023, pp. 182-188.