Assessing Value of an AI solution in Labor and Delivery Care: Insights from Usability Study

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ABSTRACT

Maternal morbidity and mortality rates in the United States remain alarmingly high, with approximately 700 women succumbing to pregnancy complications annually, while an additional 60,000 experience severe maternal morbidity. Prolonged labor exacerbates this crisis, highlighting an urgent need for intervention in childbirth procedures. Birthvue emerges as a promising solution, leveraging artificial intelligence (AI) to facilitate labor and delivery care. This comprehensive platform provides customized essential information to both pregnant women and healthcare professionals, offering real-time updates on labor progression and personalized support throughout the birthing process. Birthvue's AI algorithm analyzes vital patient data, empowering clinicians to make proactive interventions and optimize patient outcomes.

Collaborating with HITLAB, Birthvue underwent usability testing involving OB/GYNs from renowned hospitals, aiming to assess its value in obstetrics and gynecology. Interviews with five OB/GYNs provided diverse insights into labor and delivery care, emphasizing the importance of quality and safety. Participants, with expertise spanning 5 to 15 years, expressed dedication to aligning practices with recent guidelines and recognized the potential of technology in ensuring timely interventions.

The study employed deductive thematic analysis to identify recurring themes and insights, aiding in refining Birthvue for seamless integration into healthcare workflows. These findings underscore the platform's usability and effectiveness in addressing critical issues in pregnancy healthcare, emphasizing the role of innovative technologies in improving patient care coordination and outcomes.

WHAT IS BIRTHVUE?

Birthvue technology is a comprehensive software solution designed to support maternal patients and clinicians throughout the labor and delivery process. Utilizing predictive AI technology and a compassionate care design, Birthvue's interface empowers patients with information and control, while providing physicians with decision-support tools aimed to streamline clinical workflows.

Birthvue's Clinical Solution Model

Improve Decision Support

AI-based decision-support with risk assessments to better support physicians in real time

Improve Patient Outcomes

A surveillance tool providing actionable intelligence and the ability to triage patients, reducing the rise of complications

Improve Quality of Care

Optimize maternity departments with reduced and efficient patient labor times, minimizing labor strain.

Improve Patient Experience

Improved sense of trust and compliance with an interconnected and supportive digital tool kit aiding in informed consent.

OBJECTIVES

- Evaluate the usability and effectiveness of Birthvue in improving childbirth experiences and outcomes.
- Understand OB/GYNs' perspectives on the usability and acceptability of Birthvue in clinical settings.

STUDY METHODOLOGY

Study Participants:

- Five OB/GYNs from renowned hospitals across the country participated in the usability study. Participants brought diverse expertise to the research, with experience spanning from 5 to 15 years.
- The interviewed OB/GYNs had a background in various areas, including labor care, medical writing, healthcare consulting, academia, underserved patient care, and women's health tech-focused entrepreneurship.

Data Collection and Analysis:

- Interviews with these OB/GYNs were conducted online via the Microsoft Teams application and audio-recorded for precision. Subsequently, the interviews were transcribed to capture conversation details accurately for further analysis.
- For data analysis, a deductive thematic approach was adopted. This entailed identifying recurring themes, patterns, and key insights within participants' responses. Initial codes were developed based on predetermined topics from structured interviews, addressing aspects related to labor care and Birthvue technology.
- These codes were systematically organized to discern thematic patterns, with similar codes from all interviews iteratively reviewed and categorized. This process facilitated the identification of overarching themes and trends, providing valuable insights into the usability and effectiveness of Birthvue in addressing critical issues in pregnancy healthcare.

RESULTS

Summary of Insights

1. **Need for Advanced Technologies**
   o OB/GYNs recognize the necessity of advanced decision support technologies to enable proactive maternal care and improve patient outcomes.

1. **Data for Clinical Decisions**
   o Patient vitals, fetal status, dilation, and contractions play pivotal roles in clinical actions. However, capturing the comprehensive patient journey is essential for contextual understanding. Birthvue must furnish essential data for decision-making while eliminating irrelevant details.

3. **Nurse-Centric Suitability**
   o Birthvue currently aligns more with nurses who closely monitor fewer patients and undertake the initial interventions.

4. **Virtual Doula Potential**
   o OBGYNs highly valued Birthvue's potential as a virtual Doula. They suggested further improving patient education features to explain administered interventions and medications.

5. **Enhancing Birthvue for Clinicians**
   o Birthvue will add value for OB/GYNs if it incorporates AI-driven clinical decision support, signaling abnormal observations, and suggesting ACOG-aligned actions.

6. **Integration in Clinical Settings**
   o It is crucial that Birthvue integrates with diverse EMR systems and can be customized according to different clinical settings. Adding an extra monitor might hinder adoption, as OB/GYNs prefer a consolidated information interface over multiple monitors for data gathering.

7. **Enhanced Collaboration**
   o Improving Birthvue's capacity for team collaboration across medical staff beyond OB/GYNs is crucial for efficient care delivery.

8. **Need for Clinical & Usability Evidence**
   o Prioritizing clinical evidence generation is essential for demonstrating Birthvue's effectiveness and value in maternal healthcare delivery.

Key Insights and Recommendations

1. **Current Practice**
   - **Insights:** Current practice aligns with ACOG guidelines but lacks advanced decision support technologies and a comprehensive information system, leading to gaps in care delivery.
   - **Recommendations:** Develop AI-powered tools aligned with ACOG guidelines for decision support. Create accessible patient education resources and integrate analysis functionalities for fetal heart rate patterns and labor progression curves to provide timely alerts.
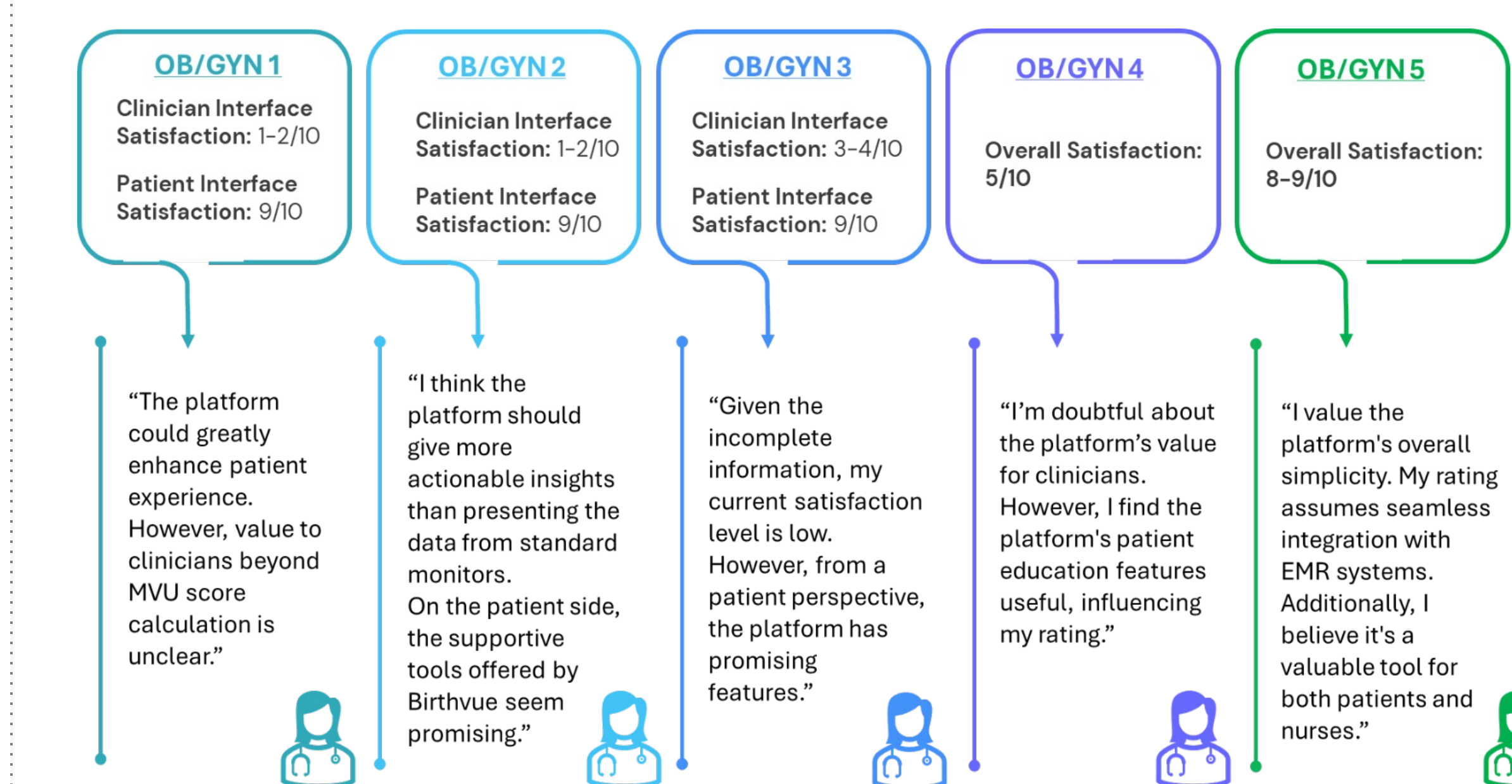
2. **Usability of the Platform**
   - **Insights:** Platform layout lacks scalability; clinicians are uncertain about its value compared to traditional monitors, and integration with EMR systems faces challenges due to varying setups.
   - **Recommendations:** Implement scalable layout for Birthvue, ensuring actionable insights within spatial limitations. Optimize integration with existing dashboards, adapting to diverse workflows. Prioritize continuous MVU score calculation and filter out irrelevant details for enhanced usefulness.

3. **Usability of the Platform**
   - **Insights:** Visual indicators help understand patient status but need clinical context. User satisfaction varies due to simplicity but lacks critical information.
   - **Recommendations:** Use color-coded scheme, improve patient education, integrate critical data and AI, refine platform, tailor to nurses' needs, and enhance patient features.

User Satisfaction

OB/GYN 1
Clinician Interface Satisfaction: 1-2/10
Patient Interface Satisfaction: 9/10

"The platform could greatly enhance patient experience. However, value to clinicians beyond MVU score calculation is unclear."

OB/GYN 2
Clinician Interface Satisfaction: 1-2/10
Patient Interface Satisfaction: 9/10

"I think the platform should give more actionable insights than presenting the data from standard monitors. On the patient side, the supportive tools offered by Birthvue seem promising."

OB/GYN 3
Clinician Interface Satisfaction: 3-4/10
Patient Interface Satisfaction: 9/10

"Given the incomplete information, my current satisfaction level is low. However, from a patient perspective, the platform has promising features."

OB/GYN 4
Overall Satisfaction: 5/10

"I'm doubtful about the platform's value for clinicians. However, I find the platform's patient education features useful, influencing my rating."

OB/GYN 5
Overall Satisfaction: 8-9/10

"I value the platform's overall simplicity. My rating assumes seamless integration with EMR systems. Additionally, I believe it's a valuable tool for both patients and nurses."

CONCLUSIONS

- Our interviews with OB/GYNs provided invaluable insights into the challenges prevailing in current labor and delivery practices.
- OB/GYNs recognized Birthvue's potential as a vital aid for nurses closely monitoring patients and managing initial interventions.
- There was widespread enthusiasm for Birthvue's role as a virtual doula, empowering patients throughout their labor journey.
- The platform's true value for clinicians lies in its ability to comprehensively analyze the patient's labor journey and offer AI-driven recommendations for subsequent interventions.
- Feedback reiterated the need for aligning Birthvue's AI algorithms with ACOG guidelines and emphasized the essentiality of robust clinical evidence to validate its value propositions.
- Focusing on these aspects could position Birthvue as a pivotal tool for optimizing labor and delivery care.
- This optimization could foster improved patient outcomes and augment the capabilities of medical professionals.

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