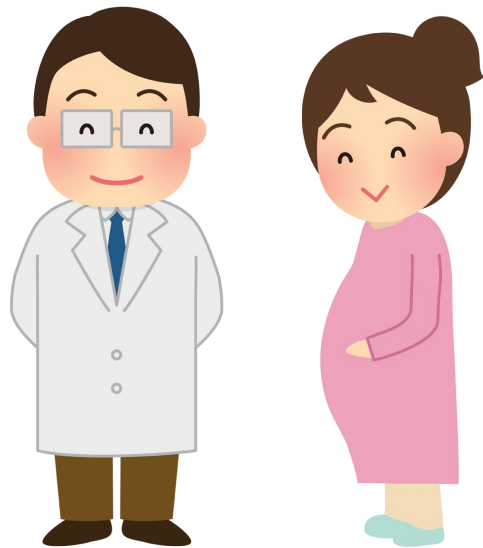


Angel in Disguise: Application-mediated Intervention for Mothers in Antepartum Care

Team4: Grizzly Coco Icebear

Challenges in Antepartum Care *산전관리

- Mothers in antepartum care have various types of biological data that should be monitored until (or even after) the delivery
 - Blood pressure, blood sugar, heart rate, ...
- Monitoring enables proper medical interventions that is crucial to minimizing the risk of the delivery.
 - Interventions may range from simple medication to emergent surgery
- However, there has been a major gap between the patients and doctors, resulting in poor data communication and delayed intervention



Gap 1: Imbalance in Resources and Attention

- Patients

- Desperate for the safety of the fetus and nervous about the potential emergency
- Young population → relatively active data collection and many questions
 - 30+ telephone counseling per day to the Antepartum Care Center

- Doctors

- Frequent emergencies and limit in resources
 - 3~4 delivery per day
- Cannot give enough feedback to non-severe conditions

→ An imbalance between patients' questions and doctors' feedback

Gap 2: Low Data Availability

- Absence of robust data collection methods
 - Most patients just take notes, and few others use a spreadsheet or third-party applications
 - Not sufficient for the quantity and heterogeneity of the data
 - The trend of blood pressure and weight
 - Frequency of fetal movement
 - Dietary records
 - Medication
- Constraints on physical time and space
 - Doctors can only treat patients at an appointment
 - No ways to monitor the data and make interventions in the everyday context

→ Data of patients are imperfectly reconstructed and has limited availability

Gap 3: Less appreciation on contextual data

- There are consolidated diagnosing logic with standard measurements
 - fetal movements, discharge, dizziness
 - ex) “less than 2 fetal movements for 20 minutes?” → Should be inspected
- Other context information without firm baseline study are excluded in the standard process but are still involved in doctors implicit decision
 - ex) Sleep deprivation → hormone imbalance? Abdominal pressure? Morning sickness?

→ Contextual and non-standard data are easily neglected or arbitrarily considered

Problem Statement

- An imbalance between patients' questions and doctors' feedback
- Data of patients are imperfectly reconstructed and has limited availability
- Contextual and non-standard data are easily neglected or arbitrarily considered

Problem: The data communication is poor between patients in antepartum care and their doctors and timely medical interventions cannot be made

Existing Solution: (1) Birth Care Center

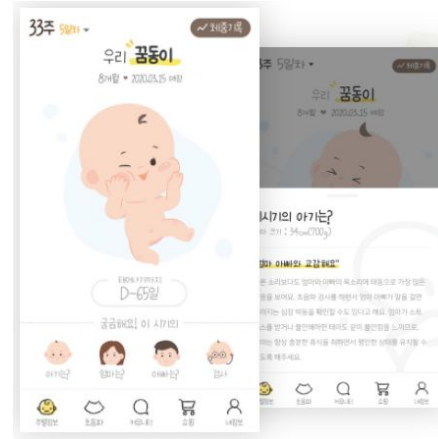
- The birth care center(BCC) is a sub-organization of the division of OB/GYN which serves as a “control tower” of the patients
 - Emergency Room with OB/GYN experts
- Agents in BCC takes charge in a telephone consultation
 - Patients verbally describe the situation and get the first-aid intervention
- However,
 - The capacity depends on the number of agents
 - Verbal communication is inefficient
 - It does not directly connect to doctors

Existing Solution: (2) Online Forum

- It is also feasible to operate on an online forum where patients and doctors can communicate with each other
- However,
 - The data collection is still supported poorly
 - Doctors cannot manage the number of questions patients ask
 - It explicitly makes patients to expect to receive feedback from doctors

Existing Solution: (3) Apps

- Many tracking apps are available on the market place
 - They support several tracking features dedicated to antepartum care.
 - e.g.) “마미톡”, “고위험 임신관리” application
- However, current applications have limitations, such as
 - Mainly focus on tracking
 - Lack of connection with doctors
 - Poor support for context information



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Key Solution

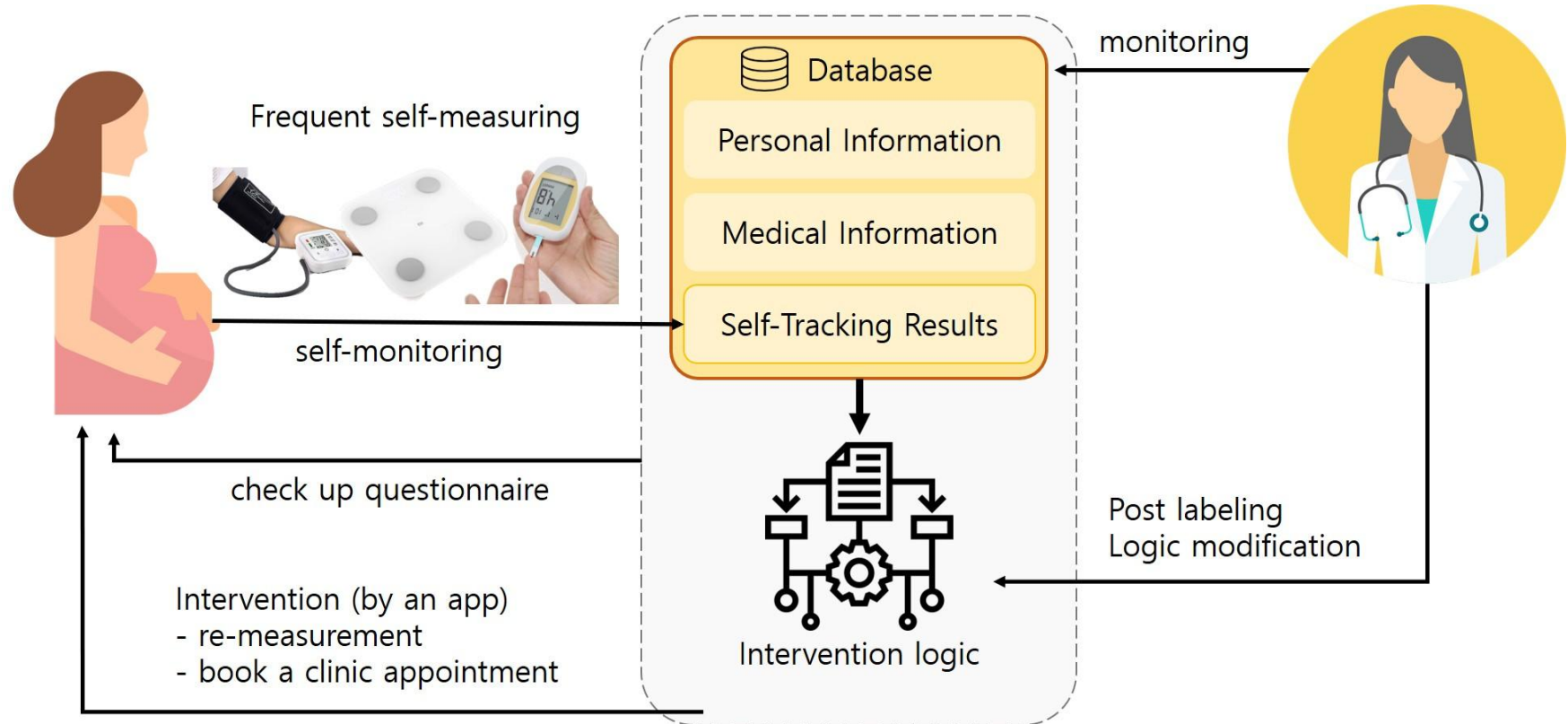
- Application-mediated communication
 - For patients, this application
 - provides a systematic self-tracking method to the patients.
 - provides a method to learn what to do and solve their curiosities.
 - provides an illusion that doctors keep monitoring their status and solving their curiosities.
 - For doctors, this application
 - establishes a database about the status of their patients and their curiosities.
 - enables them to easily observe the organized data of their patients.
 - provides a method to manage their patients and intervene with them online.

Usage Scenario

A patient who is tracking her blood pressure

1. While measuring her blood pressure, high blood pressure is detected.
2. The application notifies the patient to check blood pressure again.
3. The patient follows the instruction and measures her blood pressure once again.
4. At this time, blood pressure stays in a normal range.
5. The application notifies that the result is okay, but be aware of it.
6. The next day, the patient measures her blood pressure, and high blood pressure is detected.
7. Because high blood pressure is detected for two consecutive days, the application notifies the patient to visit a hospital.
8. While monitoring patient's data, the doctor finds out that the patient had a high blood pressure issue.
9. During the outpatient care, the doctor confirmed that the patient has a high blood pressure issue.
10. After the outpatient care, the doctor modifies the response logic to alarm the patient to directly contact the doctor when high blood pressure is detected again.

System Overview



Expected challenges, solution ideas

- How can we systemically mediate queries and interventions between patients and doctors?
 - Because the patients are often curious about their status, they make massive and diverse queries(self-tracking data, questions, ...) and want responses directly.
 - However, the number of patients outnumber that doctors, replying to them one by one is inefficient. Providing doctors too much abstraction of the queries will also result in another inefficiency, or even missing out on important pieces of information.
 - How can we satisfy the patients, while alleviating doctors' efforts?
- Solution ideas
 - Through design study, organize various conditions, situations, and needs of the patients.
 - Design a flexible condition-specifier that helps doctors to figure out their patients' conditions, and modify the response logic to handle them properly.

Evaluation

- Design a user study
 - Through the domain expert we contacted, recruit participants.
 - Ask participants to use our application for self-tracking and making questions.
 - Ask the domain expert to observe the data and manage the response logic.
- Make qualitative assessments
 - Usability
 - Usefulness
 - Satisfaction

Project Schedule

[illegible]