

Socialization and Implementation of a Midwifery Education Chatbot at the Rantauprapat City Community Health Center

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ABSTRACT

Improving the quality of maternal healthcare requires an innovative, technology-based approach, particularly in providing midwifery education. This community service project aimed to introduce and train pregnant women at the Rantauprapat City Community Health Center (Puskesmas) in the use of an educational chatbot based on the Recurrent Neural Network (RNN) algorithm. This chatbot was designed to provide fast, relevant, and accessible pregnancy health information. The activity involved coordination with partner health centers, outreach, hands-on training on the use of the chatbot, and evaluation of its effectiveness. The evaluation results showed that more than 90% of participants felt the chatbot helped them understand their pregnancy status, with the majority of questions related to early symptoms, diet, and safe activities during pregnancy. Furthermore, health workers stated that the chatbot could ease the burden of answering repetitive questions from patients. The implementation of this technology has significantly contributed to improving digital-based midwifery literacy and strengthening the role of community health centers as primary health care centers that are adaptive to technological developments. Going forward, the development of additional features and the expansion of local content are expected to strengthen the use of the chatbot on a broader scale.

Keywords: chatbot, midwifery, pregnant women, RNN, digital education.

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INTRODUCTION

In today's digital era, the use of information and communication technology has become an integral part of various sectors of life, including healthcare. Technological innovation has not only impacted healthcare facility management systems but has also penetrated aspects of direct public services, such as health education. One group of people who are in dire need of accessible, informative, and reliable education is pregnant women. Pregnancy is a crucial period and requires careful monitoring and understanding of various health aspects, from diet and physical activity to pregnancy symptoms and signs of complications. Lack of access to accurate and relevant information can increase the risk of errors in decision-making by pregnant women, resulting in health problems for both the mother and the fetus.

On the other hand, community health centers (Puskesmas), as first-level health facilities, have a significant responsibility to provide promotive and preventive services, including midwifery education. However, the reality on the ground shows that direct education is often suboptimal. Limited medical personnel, high workloads, limited service time, and large patient volumes present challenges. As a result, many pregnant women receive only cursory information during routine check-ups, without the opportunity to ask questions or explore further information. Furthermore, some pregnant women also face geographic and economic barriers to regularly accessing healthcare.

In response to these issues, the use of artificial intelligence (AI)-based chatbot technology presents an innovative and efficient alternative solution. Chatbots are automated conversational applications that can answer user questions in real-time, without requiring direct interaction with healthcare professionals. In the field of obstetrics, chatbots have great potential as educational tools that can provide accurate, personalized information that can be accessed anytime and anywhere. One approach used in developing chatbots that can understand the context of conversations and provide relevant responses is the Recurrent Neural Network (RNN) algorithm. RNNs have the advantage of processing sequential data and remembering information from previous conversations, making interactions between users and chatbots feel more natural and meaningful.

This community service program was conducted at the Rantauprapat City Community Health Center (Puskesmas) with the aim of improving midwifery literacy through outreach and training on the use of RNN-based educational chatbots. This activity involved pregnant women as the primary target group and healthcare workers as supporting partners. Through a participatory approach, participants were given an understanding of the benefits of chatbot technology, how to use it, and how it can help them access appropriate health information. It is hoped that through this program, pregnant women will not only be recipients of information but also agents of change, able to utilize technology to more independently maintain their own and their fetus' health. Furthermore, the chatbot can also be a supporting tool for healthcare workers in providing continuous educational services that are not limited by time and place.

With the growing need for efficient, flexible, and technology-based healthcare services, the implementation of this midwifery education chatbot is expected to make a tangible contribution to strengthening the digital primary healthcare system. Going

forward, this program also has the potential to be expanded across various regions and other health sectors as part of the technology-based healthcare transformation.

IMPLEMENTATION METHOD

This community service activity was implemented using a participatory and collaborative approach, involving lecturers, students, healthcare workers, and pregnant women as the primary target groups. The implementation method was designed to ensure that the activity was not merely a one-way outreach program but also provided a space for interaction, hands-on training, and active guidance on the use of chatbot technology. The stages of the community service activity include:

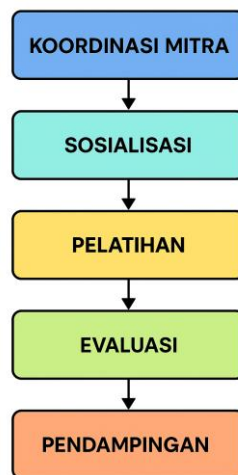


Figure 1. Implementation Method

1. Partner Preparation and Coordination

The initial step was to coordinate with the Rantauprapat City Community Health Center (Puskesmas), the implementation partner. The implementation team conducted initial observations to determine needs, field conditions, and the readiness of facilities and participants. This stage also included the development of an activity schedule, task allocation, and preparation of training materials.

2. Preparation of Socialization Materials

The material compiled includes:

- a. Basic introduction to pregnancy health.
- b. Utilization of digital technology in midwifery education.
- c. Functions and workings of Recurrent Neural Network (RNN) based chatbots.
- d. A practical guide to using chatbots independently.

The material is presented in the form of presentations, simulation videos, leaflets, and concise modules that are easy for pregnant women to understand.

3. Implementation of Socialization and Training

The core activities were carried out in the Rantauprapat City Health Center hall using the following methods:

- a. Socialization Session: Introduction to the chatbot concept and live demonstration.
- b. Training Session: Participants are trained directly to use the chatbot via smartphone with guidance from a facilitator.
- c. Conversation Simulation: Participants try out various questions about pregnancy and get responses from the chatbot.

Each participant was guided to understand how chatbots can help them access accurate obstetric information that is appropriate to their pregnancy condition.

4. Initial Evaluation and Mentoring

Following the training, a questionnaire was used to assess participants' understanding of the material, ease of use of the chatbot, and perceived benefits. Furthermore, online support (via WhatsApp Group) was provided for the first two weeks to assist participants with any difficulties or further questions.

5. Monitoring and Documentation

All activities were documented in photos, videos, and field notes. Monitoring was conducted to assess the effectiveness of the activities and provide input for further chatbot development. The number of participant interactions with the chatbot was also monitored to determine the frequency and types of questions most frequently asked.

RESULTS AND DISCUSSION

The community service activity held at the Rantauprapat City Community Health Center successfully engaged 35 pregnant women as active participants and five healthcare workers as supporting partners. The activity took place in an interactive atmosphere, with participants enthusiastically participating during the socialization and training sessions on using a Recurrent Neural Network (RNN)-based midwifery education chatbot.

1. Participant Response to Chatbot

Based on the evaluation results conducted via questionnaire, the majority of participants found the chatbot very helpful. The following table shows a breakdown of participant satisfaction across five key aspects:

Table 1. Participant Response to Chatbot

Aspect	Very satisfied (%)	Satisfied (%)	Enough (%)	Not enough (%)
Ease of Use	60	30	8	2
Response Speed	55	35	7	3
Relevance of Answers	50	40	7	3
Language Readability	58	32	8	2
Convenience of Access	62	28	7	3

- a. Ease of use was rated as very satisfied by 60% of respondents.

- b. The chatbot response speed was rated as very good by 55% of participants.
- c. The relevance of the answers showed that 50% of participants felt that the information provided was appropriate to their pregnancy condition.
- d. Language readability scored highly, with 58% stating they were very satisfied.
- e. Convenience of access ranked highest with 62% feeling very satisfied, as the chatbot can be accessed at any time.

These findings indicate that chatbots provide a positive experience, with information that is easy to understand, quickly accessible, and relevant.

2. Types of Frequently Asked Questions

Analysis of participant interactions with the chatbot showed that the majority of questions related to common complaints during pregnancy, particularly in the first trimester. The resulting pie chart illustrates this:

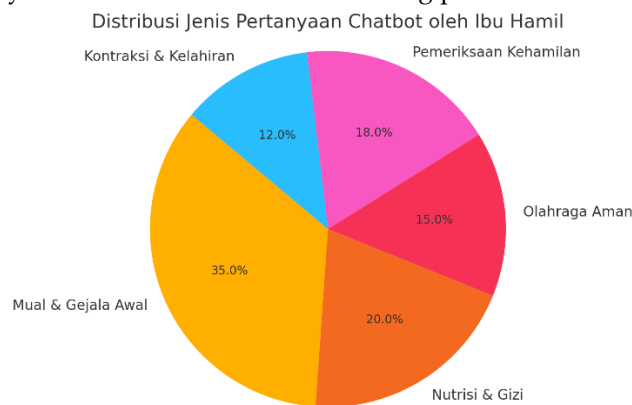


Figure 2. Types of Frequently Asked Questions

- a. 35% of questions related to nausea and early pregnancy symptoms.
- b. 20% about nutrition and nutrition.
- c. 18% regarding pregnancy check-ups.
- d. The rest relates to safe exercise and contractions leading up to labor.

This data shows the most pressing information needs experienced by pregnant women and highlights priority areas that need continued improvement in the chatbot.

3. Comparison Before and After Training

The training results showed significant improvements in participant understanding and satisfaction. The comparison graph of satisfaction levels shows that:

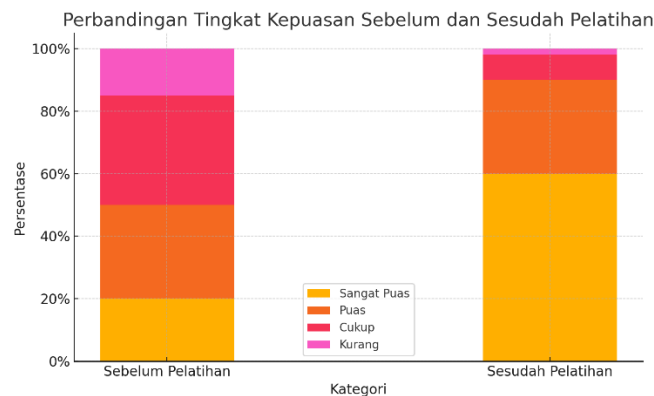


Figure 3. Comparison Before and After Training

a. Before the training, only 20% of participants stated that they were very satisfied with access to midwifery information.

b. After training and use of the chatbot, that figure increased to 60%.

In contrast, the “less satisfied” category decreased drastically from 15% to only 2%, indicating the program’s effectiveness in addressing the limitations of conventional midwifery education.

4. Additional Benefits for Healthcare Workers

Healthcare workers assisting with this activity stated that the chatbot reduced the number of repetitive questions typically asked by patients. This allowed them to focus more on clinical examinations, while general education could be handled automatically and efficiently by the chatbot.

5. Development Constraints and Notes

Several technical challenges were encountered during the mentoring, such as limited internet connection and participants' devices not supporting it. However, these issues did not significantly impact the overall program implementation. Going forward, developing local content and adding a text-to-speech feature are potential areas for further development to reach users with limited literacy skills.

CONCLUSION

This community service activity has successfully demonstrated that the use of chatbot technology based on the Recurrent Neural Network (RNN) algorithm can be an effective and efficient solution in increasing access to midwifery education for pregnant women at the Rantauprapat City Community Health Center. Through outreach and training on the use of the chatbot, pregnant women gained easier, faster, and more personalized access to pregnancy health information, without relying entirely on face-to-face consultations with health workers. The chatbot was proven to be able to answer common questions with a high level of relevance, and provided convenience because it could be accessed anytime through digital devices. Evaluation results showed that the majority of participants were very satisfied with various aspects of the chatbot's use,

such as ease of navigation, response speed, and language readability. Furthermore, a significant increase in satisfaction levels before and after the training was an indicator of the success of this activity. Health workers also welcomed the presence of the chatbot because it reduced their burden of answering repetitive questions, allowing them to focus more time on clinical medical services. Overall, this activity had a positive impact on both pregnant women as direct beneficiaries and the community health center as the service provider. Chatbots serve not only as information sources but also as a means of empowering communities to independently manage their pregnancy health. In the future, the development of additional features such as integration with electronic medical records, local language adaptation, and text-to-speech support will further enhance the effectiveness of this technology. With the right approach, chatbot technology has the potential to become a crucial part of the transformation of primary healthcare services to become more digital, inclusive, and sustainable.

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