INTRODUCTION

Pregnant women’s nutritional status is a contributing factor to fetal development. Malnutrition during pregnancy poses risks for low birth weight, perinatal mortality, and delayed child growth and development. Globally, the maternal mortality rate remains high, especially in low- and middle-income countries such as Indonesia.1 Despite care facilities and health professionals being equally distributed in the Special Region of Yogyakarta (DIY), the low birth weight prevalence in Kulon Progo regency experienced fluctuations between 2017-2021 by an average of 7.026%.2

Due to the COVID-19 pandemic, the World Health Organization (WHO) and the Ministry of Health published policies to limit direct contact to prevent case transmission.3,4 The COVID-19 pandemic affects the activities of pregnant women in Kalibawang District, Kulon Progo. Declining number of antenatal care (ANC) visits reported during March 2020. Pregnant women community outreach was abolished to reduce the risk of COVID-19 transmission, care assistance for pregnant women was not intensively carried out, and the stereotype was given for patients visiting the Primary Health Care (PHC/Puskesmas) terrifying pregnant women to get periodic pregnancy examination. A novel approach is required to improve pregnant women and infants’ health amid current disease outbreaks. One of the initiatives is introducing technology-based solutions for care delivery systems.

The health sector’s development of virtual care services for patients in the community remains limited. In the other area of healthcare, the utilization of IT-based applications has been massively carried out. Amid this pandemic, patients and families prefer to be engaged in digital services. Digital services in the health and education sectors have increased significantly.5-7 Implementing fast, reliable, and appropriate technology potential to support care delivery service. Primagravida, a web-based pregnancy monitoring system, is one of the IT-based solutions aimed at supporting maternal
and fetal care delivery. This system is integrated closely with PHC services. Using Primagravida, pregnant women can record and display their health history, receive feedback from midwives, and access educational content in text articles or videos. The study aimed to evaluate the usability and user satisfaction of using Primagravida.

**METHODS**

This research is a descriptive quantitative study with a cross-sectional design. The research was carried out between June - October 2021 in the working area of Kalibawang PHC, Kulon Progo. System usability and user satisfaction were measured in this study. The study received an ethical clearance letter from the Medical and Health Research Ethics Committee, Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada, with the letter KE/FK/1033/EC/2021.

Research participants were recruited using total sampling with inclusion criteria: pregnant women registered for antenatal care in Kalibawang PHC, willing to participate and have a personal smartphone with an Android operating system. Participants were recruited through public announcements from the PHC and midwives. Prior to participating in this research, research participants received a research procedure explanation and provision of informed consent. Once the participant's consent was retrieved, midwives and field assistants guided pregnant women through the registration and system feature introduction.

Midwives and field assistants facilitate discussions about the system utilization and pregnancy health topics through the WhatsApp group to maintain participant engagement. Since August 2021, as the government restriction was lifted, midwives and field assistants visited community centers to introduce Primagravida to research participants. Activities carried out during the visit were training on the use of the application and a general discussion session. Asynchronous assistance continued to be provided for the participants until the research's end.

System usability and user satisfaction questionnaire were distributed to the research participants. Both digital and printed versions of the questionnaire were provided for the evaluation. During the virtual supervision session, research participants access the evaluation directly from the Primagravida application. The paper-based evaluation was given to attending community center participants, guided by midwives and research assistants.

The usability of the Primagravida application in this study was evaluated using the Indonesian version of the System Usability Scale (SUS). SUS comprises 10 statement items with a Likert scale (5 strongly agree - 1 strongly disagree). The adapted SUS version has passed the cross-cultural adaptation and reliability test. The Cronbach's Alpha of the adapted version of SUS was 0.841. According to various studies, SUS is valid and reliable. Evaluation of user satisfaction in this research was adapted from End User Computing Satisfaction (EUCS). EUCS instrument has been validated and widely used to evaluate systems in various fields. The instrument has five dimensions: content, accuracy, format, ease of use, and timeliness.

Univariate analysis was conducted to summarize demographic data such as age, gender, education level, occupation, number of childbirth, and pregnancy status. The system Usability Scale (SUS) consists of 10 items (5 items each for favorable and unfavorable). The user satisfaction instrument consists of five domains: content, accuracy, format, ease of use, and timeliness. Those variables were also presented and analyzed using frequency distribution tables.

**RESULT**

Seventy-nine respondents participated in this research. Based on Table 1, the study discovered that the average age of the research participant was 29.02 years old. The majority of the research participants are high school graduates and unemployed. Pregnancy status varies among the participants, from the first time to the sixth time of pregnancy. Maximum of four childbirth identified from the participant. A detailed demographic profile of the research participants is provided in Table 1.

The average System Usability Scale score from this research was 73. The highest recorded SUS score was 100, while the lowest reported scale was 45 (Table 2). Thirty-six research participants acknowledged that the system’s usability was above the average score (Table 3).

Based on the End-User Computing Satisfaction (EUCS) evaluation, study participants were highly satisfied with the dimension of application content, followed by ease of use and timeliness (Table 4). Least satisfactory experience was discovered from the format of the application.

**DISCUSSION**

The majority of the respondents reported high system usability and user satisfaction. Features of the application support pregnant women in tracking their pregnancy health during the pandemic. The remote monitoring system allows participants to keep in touch with primary
The results of this study have limited transferability and generalizability because it was conducted in one remote location. Despite the Primagravida application being perceived as acceptable and easy to learn among users, a more in-depth evaluation is further recommended.
The SUS was originally developed as a simplified instrument for quick and shallow evaluation. Further study is recommended to employ rigorous and comprehensive system evaluation methods.

The current study has discovered that the end users appreciated Primagravida. The intended audience perceived that the system was instrumental in pregnancy monitoring. Nevertheless, usability problems were the major barrier identified in this study. Continuous system development, with users centered approach, is necessary. It was demonstrated that workable solutions for remote healthcare services potentially encourage users to improve their health.

CONCLUSION

This research evaluated a remote pregnancy monitoring application's usability and user satisfaction. Primagravida is highly usable based on the System Usability Scale, while application users reported satisfaction with content, accuracy, format, ease of use, and timeliness. Continuous system development is essential in expanding the application benefit for the greater population.

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CONFLICT OF INTERESTS

There is no conflict of interest, such as any financial, professional, or personal relationships that are relevant to the submitted work.

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