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Utilization of the Sahabat Bumil Website and High-Risk Pregnancy Education to Support Pregnancy Risk Screening

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Abstract: Pregnancy risk screening in community settings may assist referral and education when it is linked to professional maternal care. This community service program described the use of the Sahabat Bumil Website and high-risk pregnancy education in Teratai Village, Tabongo District, Gorontalo Regency. The program was conducted from July to August 2026 and included village coordination, door-to-door website-assisted screening, maternal education, training of Posyandu implementers, health examinations, follow-up home visits, and Husband Preparedness education. Five pregnant women identified through village and cadre records completed website-assisted screening. The website classified three as low risk, one as moderate risk, and one as high risk. The variables, scoring algorithm, threshold values, guideline basis, and validation status underlying these classifications were not available in the program documentation; the labels were therefore treated as program-generated screening outputs rather than diagnostic categories. Four women completed both knowledge assessments; the reason the fifth participant did not complete the paired assessment was not recorded. Mean scores increased descriptively from 15 to 18. The source report did not preserve questionnaire specifications, individual risk-factor profiles, verified professional follow-up, or outcome measures for cadre capacity and family support. The program demonstrates the feasibility of combining digital screening activities, education, and home follow-up, but the small descriptive dataset does not establish effectiveness or diagnostic performance.

Keywords: community empowerment; high-risk pregnancy; pregnancy risk screening; pregnant women; Sahabat Bumil

1. Introduction

Problem identification during the Teratai Village KKN-PK program indicated that early detection of maternal conditions had not yet been optimized. In addition, there were limitations in educational media on high-risk pregnancy and in pregnant women's knowledge of risk factors, pregnancy danger signs, and the importance of routine antenatal examinations (Teratai Village KKN-PK Group, 2026). Strengthening family health literacy is important because the Maternal and Child Health (MCH) Handbook positions mothers, families, health cadres, and health professionals as partners in monitoring pregnancy and understanding maternal and child health information (Ministry of Health of the Republic of Indonesia, 2024b).

Maternal mortality remains a significant global public health challenge, particularly in low- and middle-income countries, where inadequate access to quality maternal health services and delayed recognition of pregnancy complications contribute to preventable maternal deaths. According to the World Health Organization (2025a), approximately 260,000 women died during pregnancy and childbirth in 2023, highlighting the continued importance of strengthening maternal healthcare services and implementing effective early detection strategies. Early identification of pregnancy-related complications is essential to facilitate timely intervention, appropriate referral, and continuous maternal monitoring. A systematic review conducted by Yunitasari et al. (2023) highlighted

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the importance of improving pregnant women's awareness of obstetric danger signs in developing countries. Therefore, community-based interventions that integrate pregnancy risk screening, maternal health education, and accessible healthcare information are essential components of efforts to improve maternal health and prevent avoidable pregnancy complications.

The Sahabat Bumil Website was used as a screening tool to help identify pregnancy conditions and risk factors. Digital technology can support documentation, communication, and early decision-making when implemented with consideration of access, user acceptance, privacy, and integration with health services. WHO emphasizes that digital interventions can strengthen health systems but should not replace functional health services or clinical assessment by qualified professionals (World Health Organization, 2019). This direction is also consistent with the global digital health strategy, which promotes human-centered, sustainable digital solutions integrated with health service systems (World Health Organization, 2025b).

The integration of digital health technologies into maternal healthcare has received increasing attention as an approach to improving antenatal care accessibility, maternal health monitoring, and communication between pregnant women and healthcare providers. Digital interventions, including mobile health applications and web-based screening platforms, have the potential to facilitate the identification of pregnancy-related risk factors and support informed decision-making. Rahman et al. (2022), through a systematic review and meta-analysis involving pregnant women in low- and middle-income countries, demonstrated that mobile health interventions may improve antenatal care utilization and access to skilled delivery services. Similarly, Mishra et al. (2023) reported that mobile health interventions were associated with increased attendance at antenatal care examinations. These findings provide a scientific foundation for integrating digital technology into community-based maternal healthcare programs. In this context, the Sahabat Bumil Website offers a practical approach to supporting pregnancy risk identification, facilitating health information delivery, and strengthening communication between pregnant women, health cadres, and healthcare professionals.

Early detection cannot rely on screening alone. Pregnant women’s understanding must also be strengthened so that screening information can be followed by appropriate care-seeking behavior, regular antenatal attendance, and recognition of danger signs. WHO recommends health-promotion approaches that involve women, families, and communities in improving maternal and newborn health (World Health Organization, 2015). A meta-analysis showed that antenatal education programs can contribute to outcomes related to pregnancy preparedness and experience (Hong et al., 2021). Partner support is also important: male involvement has been associated with increased utilization of maternal health services (Yargawa & Leonardi-Bee, 2015), while another systematic review found that partner involvement in ANC was associated with increased use of skilled birth attendants, facility-based delivery, and postnatal visits (Suandi et al., 2020).

Maternal health literacy is another important determinant of women's ability to recognize pregnancy-related risks and make appropriate healthcare decisions. Adequate knowledge of obstetric danger signs enables pregnant women to identify potentially serious conditions and seek timely medical assistance. Meldgaard et al. (2022), in a systematic review of health literacy among women during the prenatal period, identified maternal health literacy as a multidimensional concept involving access to information, understanding of health-related knowledge, interaction with healthcare professionals, and informed decision-making. Furthermore, Kolantung et al. (2021) reported an association between pregnant women's knowledge of pregnancy danger signs and adherence to antenatal care examinations. These findings emphasize the importance of structured maternal health education in strengthening awareness, promoting preventive behavior, and encouraging appropriate utilization of maternal healthcare services.

This community service program aimed to support the early detection of pregnancy risks through the Sahabat Bumil Website and to improve pregnant women’s knowledge of high-risk pregnancy. The program also sought to strengthen the capacity of Posyandu implementers so that screening and monitoring could continue after the KKN-PK program ended. Health cadres/community health workers play an important role in extending the reach of community-based education and services; systematic reviews have shown that community health worker interventions can improve knowledge and ANC utilization (Scharff et al., 2022), may reduce inequities in maternal and newborn health service utilization (Blanchard et al., 2019), and can support the implementation of community-based maternal and newborn interventions (Nishimwe et al., 2021). Continued monitoring is also consistent with evidence that continuity of midwifery care is an important component of maternal care experiences and outcomes (Sandall et al., 2016).

2. Materials and Methods

The program was implemented in Teratai Village, Tabongo District, Gorontalo Regency, from July to August 2026 as part of the Health Profession Community Service Program of Universitas Negeri Gorontalo. It used a single-group descriptive program-evaluation design with website-assisted screening and an immediate pre-test-post-test knowledge assessment. Village government and health-cadre records were used to identify pregnant residents for household visits. Five pregnant women were approached and completed screening. The source documentation did not specify whether these five represented all eligible pregnant women in the village, nor did it retain inclusion and exclusion criteria beyond pregnancy and residence. Four women completed both knowledge assessments; the reason the fifth screened woman did not complete the paired evaluation was not documented.

Screening was conducted door to door on July 17-18, 2026. Program personnel entered pregnancy-related information into the Sahabat Bumil Website, which returned low-, moderate-, or high-risk labels and follow-up suggestions. The available report did not describe the input variables, weighting, calculation procedure, threshold values, source guideline, developer testing, or external validation of the classification algorithm. Publicly accessible institutional descriptions of the activity likewise did not provide this technical information. Accordingly, the website output was used only as a program-generated screening label and not as a diagnosis or validated prediction of pregnancy complications. Screening results were explained to participants, and women with identified concerns were advised to obtain assessment from qualified maternal-health professionals.

High-risk pregnancy education addressed risk factors, pregnancy danger signs, antenatal care, nutrition, and actions to take when symptoms or danger signs occurred. Knowledge was measured immediately before and after education. The available dataset contained only total scores for four paired participants, ranging from 12 to 18 at pre-test and from 16 to 20 at post-test. The source report did not retain the number of questionnaire items, response format, item scoring, theoretical score range, item-level results, development process, expert review, pilot testing, or validity and reliability evidence. For this reason, the scores are presented as raw program scores without categorical interpretation. Posyandu implementers also received orientation on accessing the website, entering data, conducting screening, interpreting the displayed output, and using the results to organize monitoring; no competency test or structured evaluation of cadre performance was conducted.

Follow-up activities comprised maternal health examinations, home visits on August 3, 10, and 24, 2026, and Husband Preparedness education on August 12, 2026. Data were summarized with frequencies, percentages, observed ranges, and means. No inferential analysis, diagnostic-accuracy analysis, comparison group, or longitudinal outcome assessment was used. Participant photographs and digital information required separate safeguards. The program report documented coordination with local authorities but did not provide an ethics-review number, a standardized informed-consent record, specific photographic-consent documentation, or details on data storage, access control, retention, and deletion. The manuscript uses de-identified program results, and these documentation gaps are reported as limitations rather than assumed procedures.

3. Results

Five pregnant women completed website-assisted screening. Three received a low-risk label, one a moderate-risk label, and one a high-risk label (Table 1). Available records described participants only as pregnant residents of Teratai Village; age, gestational age, parity, antenatal-care history, medical and obstetric history, and other sociodemographic characteristics were not preserved in the dataset used for this manuscript.

Table 1. Distribution of pregnancy risk screening results using the Sahabat Bumil Website

Risk category	n	Percentage
Low	3	60%
Moderate	1	20%
High	1	20%
Total	5	100%

The screening output was available after approximately 10 minutes per participant. The program report did not preserve the specific risk factors entered for the women assigned moderate- and high-risk labels. It recorded that participants with concerns were advised to seek professional assessment, but it did not document whether

referral was completed, the professional findings, or subsequent clinical management. These labels therefore describe only the website output observed during the activity.

Four of the five screened women completed both knowledge assessments. The reason for non-completion by the fifth participant was not documented. Among the four paired participants, pre-test scores ranged from 12 to 18 and post-test scores from 16 to 20. The mean increased from 15 to 18, and each participant had a higher post-test score (Table 2). These are raw program scores because the instrument specifications and psychometric properties were unavailable.

Figure 1. Pregnancy screening and education during a home visit using a digital device.
Source: Teratai Village KKN-PK Documentation, 2026.

The paired scores were P1, 18 to 20; P2, 14 to 18; P3, 16 to 18; and P4, 12 to 16. No measures of dispersion or inferential tests were calculated because the evaluation included only four paired observations.

Table 2. Pre-test and post-test results of high-risk pregnancy education

Participant	Pre-test	Post-test	Change
P1	18	20	+2
P2	14	18	+4
P3	16	18	+2
P4	12	16	+4
Mean	15	18	+3

Program records confirmed that Posyandu implementers attended website orientation and practiced data entry and interpretation. No pre-training or post-training competence score, observation checklist, or independent-use assessment was available. Cadre participation is therefore reported as an implemented activity rather than evidence of strengthened capacity.

Figure 2. Education/training activities with participants and relevant stakeholders in Teratai Village.
Source: Teratai Village KKN-PK Documentation, 2026.

Home visits were conducted on August 3, 10, and 24, 2026, and included review of maternal conditions and reminders about professional follow-up. Maternal health examinations were also conducted as part of monitoring. The available documentation did not provide participant-level clinical findings, changes in risk status, completed referral records, or pregnancy outcomes.

Figure 3. Maternal health examination as part of follow-up monitoring.
Source: Teratai Village KKN-PK Documentation, 2026.

Husband Preparedness education was conducted on August 12, 2026, to discuss practical family roles during pregnancy. No instrument measured partner knowledge, behavior, preparedness, or support before and after the activity. Family engagement is therefore described as a program component, not as a demonstrated improvement in family support.

Figure 4. Family education and support during a home visit as part of the Husband Preparedness program.
Source: Teratai Village KKN-PK Documentation, 2026.

The documented outputs comprised five website-assisted screening encounters, four paired knowledge assessments, orientation of Posyandu implementers, three follow-up visit dates, maternal examinations, and Husband Preparedness education. The program dataset did not support conclusions about diagnostic performance, sustained knowledge, cadre competence, family-support outcomes, antenatal-care adherence, or maternal and neonatal clinical outcomes.

4. Discussion

These findings show that screening can help rapidly map risk levels among a limited number of participants. Based on field experience documented in the report, the screening process required approximately 10 minutes to obtain results. The website also provided risk classifications and follow-up recommendations. These implementation findings support the use of technology as an aid for early decision-making; however, in accordance with WHO guidance, digital technology should be positioned as a means of strengthening health service systems rather than as a substitute for health professionals or clinical examinations (World Health Organization, 2019; World Health Organization, 2025b).

Nevertheless, digital screening results do not replace clinical assessment by health professionals. The website is more appropriately positioned as a tool for early detection and education that can support health cadres and community members in recognizing risks. Pregnant women classified as having moderate or high risk still require assessment and follow-up in accordance with ANC standards. This emphasis is consistent with WHO recommendations regarding the role of ANC in screening, diagnosis, prevention, and communication (World Health Organization, 2016) and with Indonesia's Integrated Antenatal Care Guidelines (Ministry of Health of the Republic of Indonesia, 2020).

The increase in scores among all participants indicates an immediate improvement in knowledge following the education session. The material focused on risk factors, danger signs, the importance of routine antenatal examinations, and actions to take when conditions requiring health services arise. The direction of these findings is consistent with the role of antenatal education in improving maternal preparedness and understanding (Hong et al., 2021), as well as with maternal health-promotion recommendations that emphasize strengthening the capacity of women and families to recognize health service needs (World Health Organization, 2015). The 2024 edition of the MCH Handbook also identifies maternal and family understanding of pregnancy information as an important component of health monitoring (Ministry of Health of the Republic of Indonesia, 2024b). Because only four

participants were evaluated and there was no comparison group, the increase in scores in this program should be interpreted as a descriptive program evaluation rather than causal evidence of intervention effectiveness.

Training for Posyandu implementers was an important component for program sustainability. Health cadres were trained to access the website, enter data, conduct screening, and use screening results to support monitoring. Their involvement is relevant because they are close to the community and can support home visits, education, and referral links to formal health services. Evidence syntheses indicate that community health workers can improve knowledge and ANC uptake (Scharff et al., 2022), reach groups experiencing inequitable access (Blanchard et al., 2019), and support community-based maternal and newborn interventions (Nishimwe et al., 2021). WHO also highlights the potential of community health workers to extend access to services and address community health needs (World Health Organization, 2021).

Monitoring of pregnant women through home visits was conducted after the screening and education activities. This approach enabled students and health cadres to monitor changes in maternal conditions, review previously identified risk factors, and remind participants about follow-up examinations. Husband Preparedness education further expanded family support for pregnant women. Partner involvement in maternal health has been associated with greater utilization of health services and increased support during pregnancy (Yargawa & Leonardi-Bee, 2015; Suandi et al., 2020). From a service perspective, continuity of relationships and follow-up throughout pregnancy is also an element that supports the maternal care experience (Sandall et al., 2016)

The program demonstrates that a combination of simple technology, education, and mentoring can be implemented in a village setting. The program's strength lies in integrating early detection, knowledge improvement, health cadre empowerment, and family involvement, consistent with maternal health-promotion approaches based on individuals, families, and communities (World Health Organization, 2015). The program is also relevant to priorities for strengthening maternal health services in Indonesia (Ministry of Health of the Republic of Indonesia, 2024a; Ministry of Health of the Republic of Indonesia, 2025). However, the number of participants was very limited, knowledge was evaluated only immediately after the education session, and the article did not assess behavioral changes, ANC adherence, or clinical outcomes. Therefore, the findings should be interpreted as evidence of implementation feasibility and short-term changes in knowledge.

5. Conclusions

The program documented the use of the Sahabat Bumil Website with five pregnant women and an immediate increase in raw knowledge scores among four women who completed both assessments. Cadre orientation, home visits, maternal examinations, and Husband Preparedness education were implemented as accompanying activities. Because the website algorithm, instrument properties, participant risk profiles, referral completion, and longer-term outcomes were not documented, the findings demonstrate program implementation only. They do not establish effective early detection, diagnostic performance, strengthened cadre capacity, enhanced family support, or prevention of pregnancy complications.

Conflict of Interest

No conflicts of interest

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