7'TH INTERNATIONAL CONFERENCE
ON HEALTH PRACTISE AND RESEARCH
"Transforming Healtcare with Technology for Better Quality of Life""
Journal homepage: https://ojs.universitastelogorejo.ac.id/index.php/ichpr

Development of Digital Communication Content Based on The Needs of Pregnant Women: A Qualitative Study

Ari Indra Susanti*, Anis Novitasari[b], Harridhil Silmi, Qorinah Estiningtyas Sakilah Adnani

[a]*Midwifery Study Program, Vocational School, Padjadjaran University, Sumedang, 45363, Indonesia*
[b]*Master of Midwifery, Faculty of Medicine, Padjadjaran University, Bandung, 40161, Indonesia*
[b]*Department of Public Health, Faculty of Medicine, Padjadjaran University, Bandung, 40161, Indonesia*
Coresponging Author : ari.indra@unpad.ac.id

ARTICLE INFO

Article history:
Received 24 November 2025
Accepted 12 December 2025

Keywords:
Digital Communication,
Content,
Pregnant Women

ABSTRACT

Pregnant women often find it difficult to access health services because their physical condition limits mobility and the distance to health facilities. The use of mobile health (mHealth) applications can help overcome these barriers by enabling real-time communication and access to pregnancy-related information. Therefore, this study aims to explore the content health education needed in communication digital to support effective maternal health monitoring. This research method uses a qualitative case study approach, conducted in July 2025 in the working areas of PKM Jatinangor, Sumedang Regency, and PKM Cisarua, West Bandung Regency. The sampling technique was purposive sampling. Data collection was conducted through Focus Group Discussions (FGDs) with 15 pregnant women using FGD guidelines. Data processing and analysis were carried out by compiling themes and sub-themes using nVivo software version 14. The Research identified two main themes: mental health education (7 sub themes) and health monitoring (2 sub themes). The study concluded that mental health education and health monitoring content for digital communication features based on the needs of pregnant women can increase their involvement in supporting ongoing care.

INTRODUCTION

The vulnerable physical condition of pregnant women, especially in the third trimester, makes it difficult to visit a midwife or community health center for a simple consultation if the distance from the village midwife to the home is far (Amalia, 2024). Midwives carry out their duties by monitoring the health of pregnant women by visiting each pregnant woman individually to inquire about their condition and conducting examinations if access to health facilities is quite far. This, of course, makes it difficult for midwives to monitor the health of all pregnant women in their work environment and requires a long time (Roesita, 2022). As one solution used to overcome long distances, an Android-based application is needed that functions as a tool to monitor the health of pregnant women (Oktarina

et al., 2025). Therefore, the role of pregnant women is needed to actively input examination data honestly so that the results of the data processing are valid and can conduct real-time chat consultations. Pregnant women can also obtain information on nutritional intake that is suitable for their condition. Thus, the midwife's task will be lighter and the condition of the fetus and pregnant woman will be well monitored (Ismanto & Amalia, 2024).

Pregnant women worldwide are increasingly using digital technologies such as SMS, email, instant messaging, pregnancy apps, social media, and the internet to access information about their pregnancies. However, there is limited information about how these technologies are used to enable midwives and pregnant women/community members to communicate with each other, and what impact this has on maternal and newborn health outcomes in Aotearoa New Zealand. This integrative literature review identified gaps in understanding how midwives and pregnant women/community members use communication technologies to communicate with each other, and how communication technologies are used within the continuity of midwifery care model (Wakelin et al., 2022).

The world of healthcare has changed significantly since the advent of smartphones. Smartphones have become widely known for facilitating the search for health information within mobile health (mHealth) systems, which are used to improve patients' quality of life, such as communication between doctors and patients. The benefits can include increased knowledge for pregnant women who utilize mHealth due to the availability of necessary information in mHealth applications. mHealth also provides information about the baby, so the impact of mHealth extends beyond the mother. mHealth is a promising solution for prenatal care compared to standard maternal care (Kusyanti et al., 2022)

Media in health promotion is one way to support the success of the learning process, making it more engaging and easier for the target audience to understand the material presented during antenatal care. E-health is the use of electronic means or digital technology to convey health-related information, resources, and services (Hartiningrum & Fitriani, 2021). Efforts to improve knowledge of childbirth information include health education and information dissemination through media and technology. This requires interpersonal communication that fosters interaction between individuals, health workers, and their social support systems (Widyaningrum et al., 2023). Therefore, this study aims to explore the content health education needed in communication digital to support effective maternal health monitoring.

METHODS

This research method uses a qualitative case study approach, which was conducted in July 2025 in the work areas of PKM Jatinangor, Sumedang Regency and PKM Cisarua, West Bandung Regency. The sampling technique was purposive sampling. Data collection was conducted through Focus Group Discussions (FGDs) with 15 pregnant women using FGD guidelines. The FGD results were recorded using a tape recorder, then transcribed. Data processing and analysis by compiling themes and sub-themes used nVivo software version 14. This study has received research ethics permission from Poltekkes Gorontalo with No. DP.04.03/KEPK/185/2025.

RESULT AND DISCUSSION

Result

The informants in the study were 15 pregnant women with characteristics including age, number of birth histories, trimester, and last education who underwent examinations in the work areas of PKM Jatinangor and PKM Cisarua (Table 1).

Table. 1 Informant Characteristics

Characteristics	Distribution
Age	
20-35	14
>35	1
Gravida	
Primigravida	5
Multigravida	10
Trimester	
Trimester 1	5
Trimester 2	2
Trimester 3	8
Education	
Primary School	4

Junior High School	2
Senior High School	3
Diploma III	1
Diploma IV	1
Bachelor's Degree	4

Table 1. shows that most pregnant women are aged 20-35 years (14 women), multiparity (10 women), and gestational age in the third trimester (8 women), as well as primary school education (4 women) and bachelor's degree (4 women). The results of the FGD with pregnant women obtained themes and sub-themes as a basis for creating educational materials included in the application-based digital communication feature (Table 2).

Table 2. Themes and Sub-Themes of Educational Materials in the Development of Application-Based Digital Communication Features

Educational Material Theme	Sub-Theme	Reference	Quatation
Mental Health	Physical	16	*"...addressing complaints, developments..."* (Informant J1)
	Psychological	2	*" ...sometimes I have trouble sleeping ... because of having negative thoughts..."* (Informant J2)
	Husband Education	2	*"...There is support from the husband, support not only during pregnancy but after several births... So there must also be education for husbands to understand the hormonal emotions of pregnant women..."*(Informant T1)
	Fetal Development	1	*"...baby development from trimester 1 to trimester 3."* (Informant T2)
	Baby Care	1	*".....what can be done for a newborn baby because many mothers are first-time pregnant and don't know how to care for a baby."* (Informant T3)
	Lifestyle changes	17	*"...Now I have more vaginal discharge so I need to change my underwear three to four times because it's uncomfortable.."* (Informant J3)
	Stunting prevention	17	*"I want to find out. What kind of food can make you give birth to a lot? Like any food, that's all.."* (Informant J4)
Health Monitoring	General	7	*"...If I went to the doctor, it was only once yesterday. Go to the community health center midwife and the midwife here..."* (Informant J2)

	Specific	6	*"...If there are any complaints, the community health center midwife will chat via WhatsApp.."* (Informant J5)

Table 2 shows the results of the qualitative data analysis of the FGD with pregnant women, there are 2 themes, namely the mental health education theme has 7 sub-themes and the health monitoring theme consists of 2 sub-themes, so there are 9 sub-themes.

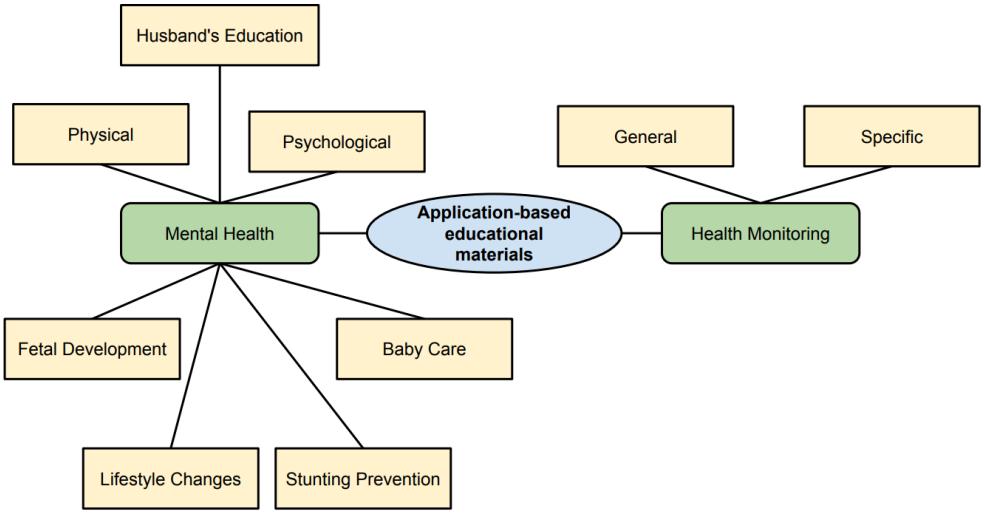

Figure 1 shows that mothers need educational materials that cover 2 themes in the green box and sub-themes depicted in the yellow box.

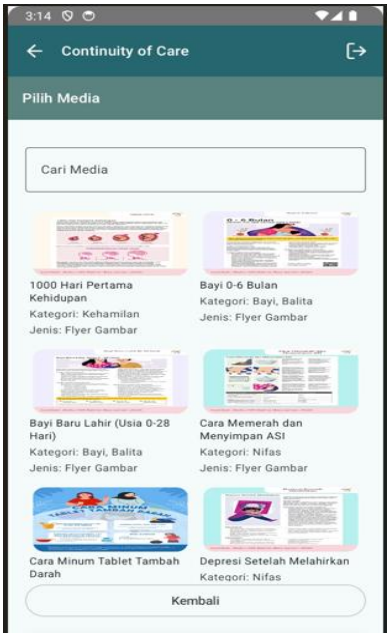

Figure 2. Educational Materials Based on the Continuity of Care (CoC) Application

Educational materials from the results of this research were made in the form of posters, and short videos which were included in the CoC application (Figure 2).

Discussion

The development of digital technology, particularly mobile health (mHealth), has been shown to improve the quality of antenatal care by strengthening communication and monitoring maternal health in real time. Providing text or voice messages via mHealth consistently increases maternal attendance at antenatal care (ANC) visits, facility services, and the presence of medical personnel during deliveries; these interventions have even been shown to reduce infant mortality (Ameyaw et al., 2024; Mishra et al., 2023). The results of this study highlight two main themes in developing digital communication content for pregnant women.

The results of this study, as shown in Table 2, found that pregnant women require digital-based mental health education materials that address psychological aspects of pregnancy. Mobile health applications offer psychological interventions that can improve self-management, pregnancy acceptance, and social support, although results related to anxiety, stress, and self-efficacy are still mixed (Sakamoto et al., 2022). However, pregnant women who use digital platforms to access mental health materials can reduce symptoms of depression, anxiety, and perinatal fear (Wang et al., 2025). Furthermore, support from a husband or family member is a protective factor against mental disorders in pregnant women (Antoniou et al., 2021). The existence of digital application-based psychological programs, such as e-mindfulness, integrated with applications, can reduce symptoms of health disorders in pregnant women and increase social support cost-effectively (Hassdenteufel et al., 2023).

Pregnant women also require health monitoring materials, divided into general monitoring with midwives and doctors, and additional pregnancy consultations through digital applications, as shown in Table 2. Health monitoring during pregnancy aims to record pregnancy visits, antenatal schedules (reminders), vital sign input (blood pressure, weight), and complaint recordings, so that midwives/doctors maintain easily accessible longitudinal records (Atkinson et al., 2023). In high-risk pregnancies, remote blood pressure and fetal monitoring can be used to prevent complications during pregnancy. Therefore, the application must support data input from the patient's device with threshold rules that can provide notifications to student midwives/doctors (Li et al., 2025; Rajkumar et al., 2025). Furthermore, application data must be easily transmitted, integrated, and easily downloaded to facilitate triage and clinical decisions, so that the role of telehealth is complementary and cannot replace essential services (Golden et al., 2024).

Developing integrated digital communication content will support the need for information on how to address complaints, psychological issues, physical activity, nutrition, fetal development, breastfeeding preparation, and infant care (Till et al., 2023). Pregnant women currently live in a digital information environment, presenting challenges such as exposure to invalid information, lack of information, inaccurate narratives, difficult language, commercial advertisements, or less trusted platforms that influence health decision-making (Li et al., 2025; Wilhelm et al., 2025). Despite these challenges, healthcare professionals remain a trusted source of professional information (Vogels-Broeke et al., 2022). Pregnant women assess the quality of information based on several aspects, such as ease of understanding (not using medical language), conciseness, and an engaging, proactive, and interactive presentation (Li et al., 2025). Although healthcare professionals serve as a source of validation, digital information sources remain frequently used. This presents an opportunity for midwives to develop strategies to strengthen maternal health literacy, particularly among mothers with low literacy levels (Ningrum et al., 2024; Vogels-Broeke et al., 2022). Previous studies have shown that the use of apps as clinical communication tools has shown positive effects in supporting behavior change, and it is important to emphasize that content creation must also be tailored to maternal preferences (Li et al., 2025; Lu et al., 2021).

Figure 2 shows media formats for digital communication materials for pregnant women.

Multimedia content (text, audio, video) is popular due to its concise, easy-to-digest presentation, such as videos or graphics that eliminate the need to read lengthy text (Leziak et al., 2021; Raab et al., 2023). Illustrative content, such as images of fetal size, is considered engaging and motivating to read (Leziak et al., 2021). Studies on digital communication content in the CoC application have implications for midwifery education, including its use as an experiential learning medium for midwifery students in communicating, providing education, and fostering empathy with pregnant women (Foster et al., 2021; O'Connor et al., 2023; Susanti et al., 2022). For midwifery services, the integration of the application with primary care services can strengthen continuity of care (Nigussie et al., 2021; Wali, 2023). In addition, the most important thing that pregnant women need is to get access to information that is reliable, easy to understand, and according to the mother's preferences so that it increases involvement in health decision-making and supports a positive pregnancy experience (Brammall et al., 2024; Gilano et al., 2024).

CONCLUSION

The study concluded that developing digital communication content based on the needs of pregnant women is essential for strengthening maternal health monitoring and engagement. The core needs identified through Focus Group Discussions centered on two main themes, Mental Health Education and Health Monitoring. Specifically, the content must address the psychological aspects and the need for husband/partner education to ensure comprehensive support. Furthermore, the inclusion of robust health monitoring features (general check-up reminders and specific complaint consultation channels) is vital. This digital content, delivered through accessible and multimedia formats, serves to increase the pregnant women's involvement in their care, improve their health literacy, and support a positive pregnancy experience, ultimately strengthening the Continuity of Care (CoC) model in primary health services.

ACKNOWLEDGEMENT

The authors would like to thank the Community Health Centre Jatinangor, Sumedang Regency and the Community Health Centre Cisarua, West Bandung Regency for their valuable contribution and support during the study, particularly in the development of the mobile application. The authors also express their gratitude to the Directorate of Research, Downstreaming, and Community Service (DRHPM) of Padjadjaran University, Indonesia for the financial support provided for this research.

REFERENCES

Amalia, N. (2024). Strategi Bidan Desa dalam Meningkatkan Kapatuhan Ibu Hamil terhadap Kunjungan Antenatal Care di Pustu Bulo, Kecamatan Bungin, Kabupaten Enrekang: Rural Midwife Strategies To Improve Pregnant Mothers' Compliance With Antenatal Care. *Media Keperawatan: Politeknik Kesehatan Makassar*, *15*(2), 159-168.

Ameyaw, E. K., Amoah, P. A., & Ezezika, O. (2024). Effectiveness of mHealth apps for maternal health care delivery: systematic review of systematic reviews. *Journal of Medical Internet Research*, *26*, e49510. https://doi.org/DOI: 10.2196/49510.

Antoniou, E., Stamoulou, P., Tzanoulinou, M.-D., & Orovou, E. (2021). Perinatal mental health; the role and the effect of the partner: a systematic review. Healthcare,

Atkinson, J., Hastie, R., Walker, S., Lindquist, A., & Tong, S. (2023). Telehealth in antenatal care: recent insights and advances. *BMC medicine*, *21*(1), 332.

Brammall, B. R., Hayman, M. J., & Harrison, C. L. (2024). Pregnancy mobile app use: A survey of health information practices and quality awareness among pregnant women in Australia. *Women's Health*, *20*, 17455057241281236.

Foster, W., Sweet, L., & Graham, K. (2021). Midwifery students experience of continuity of care: A mixed methods study. *Midwifery*, *98*, 102966.

Gilano, G., Zeleke, E. A., Dekker, A., & Fijten, R. (2024). Contextual success and pitfalls of mHealth service for maternal and child health in Africa: An Intervention, Context, Actors, Mechanism, and Outcome (ICAMO) framework guided systematic review of qualitative evidence. *BMC pregnancy and childbirth*, *24*(1), 690.

Golden, B. N., Elrefaay, S., McLemore, M. R., Alspaugh, A., Baltzell, K., & Franck, L. S. (2024). Midwives' experience of telehealth and remote care: a systematic mixed methods review. *BMJ*

open, *14*(3), e082060.

Hartiningrum, C. Y., & Fitriani, S. (2021). Efektivitas Penggunaan Catatan Kehamilan Digital Sebagai Media Komunikasi Dalam Pelayanan Kebidanan. *Jurnal BIMTAS: Jurnal Kebidanan Umtas*, *5*(2), 91-96.

Hassdenteufel, K., Müller, M., Abele, H., Brucker, S. Y., Graf, J., Zipfel, S., Bauer, A., Jakubowski, P., Pauluschke-Fröhlich, J., & Wallwiener, M. (2023). Using an electronic mindfulness-based intervention (eMBI) to improve maternal mental health during pregnancy: results from a randomized controlled trial. *Psychiatry Research*, *330*, 115599.

Ismanto, B., & Amalia, N. (2024). Analisa Pemanfaatan Media Edukasi, Komunikasi dan Monitoring Kesehatan Ibu Hamil Berbasis Android untuk Meningkatkan Kualitas Kesehatan Ibu dan Bayi. *JURNAL FASILKOM*, *14*(3), 735-742.

Kusyanti, T., Wirakusumah, F. F., Rinawan, F. R., Muhith, A., Purbasari, A., Mawardi, F., Puspitasari, I. W., Faza, A., & Stellata, A. G. (2022). Technology-based (Mhealth) and Standard/Traditional maternal care for pregnant woman: a systematic literature review. Healthcare,

Leziak, K., Birch, E., Jackson, J., Strohbach, A., Niznik, C., & Yee, L. M. (2021). Identifying mobile health technology experiences and preferences of low-income pregnant women with diabetes. *Journal of Diabetes Science and Technology*, *15*(5), 1018-1026.

Li, B., Jin, N., Wang, Y., Hou, X., Meng, J., & Zhang, Y. (2025). Perinatal Women's Perception of Maternal Health Information Quality on Digital Media: Scoping Review. *Journal of Medical Internet Research*, *27*, e67620.

Lu, Y., Zhang, Z., Min, K., Luo, X., & He, Z. (2021). Pregnancy-related information seeking in online health communities: A qualitative study. International Conference on Information,

Mishra, M., Parida, D., Murmu, J., Singh, D., Rehman, T., Kshatri, J. S., & Pati, S. (2023). Effectiveness of mHealth interventions for monitoring antenatal care among pregnant women in low-and middle-income countries: a systematic review and meta-analysis. Healthcare,

Nigussie, Z. Y., Zemicheal, N. F., Tiruneh, G. T., Bayou, Y. T., Teklu, G. A., Kibret, E. S., Eifler, K., Hodsdon, S. E., Altaye, D. E., & Rosenblum, L. (2021). Using mHealth to improve timeliness and quality of maternal and newborn health in the primary health care system in Ethiopia. *Global Health: Science and Practice*, *9*(3), 668-681.

Ningrum, E. W., Lusmilasari, L., Huriyati, E., Marthias, T., & Hasanbasri, M. (2024). Improving maternal health literacy among low-income pregnant women: A systematic review. *Narra J*, *4*(2), e886.

O'Connor, S., Wang, Y., Cooke, S., Ali, A., Kennedy, S., Lee, J. J., & Booth, R. G. (2023). Designing and delivering digital learning (e-Learning) interventions in nursing and midwifery education: A systematic review of theories. *Nurse education in practice*, *69*, 103635.

Oktarina, E. S., Alamsyah, G., Nurhalissa, R., & Satria, R. F. (2025). Transformasi Perawatan Kesehatan Ibu Hamil dengan IoT: Solusi Cerdas untuk Pemantauan Real-Time di Daerah Terpencil. *Jurnal Algoritma*, *22*(1), 458-467.

Raab, R., Geyer, K., Zagar, S., & Hauner, H. (2023). App-supported lifestyle interventions in pregnancy to manage gestational weight gain and prevent gestational diabetes: scoping review. *Journal of Medical Internet Research*, *25*, e48853.

Rajkumar, T., Hennessy, A., & Makris, A. (2025). Remote Blood Pressure Monitoring in Pregnancies at Risk of Developing Preeclampsia. *Current Hypertension Reports*, *27*(1), 15.

Roesita, J. P. (2022). *Studi Fenomenologi: Ibu Hamil dalam Pemanfaatan Pelayanan Antenatal Care pada Masa Pandemi di Wilayah Kota Surabaya* STIKes Hang Tuah Surabaya].

Sakamoto, J. L., Carandang, R. R., Kharel, M., Shibanuma, A., Yarotskaya, E., Basargina, M., & Jimba, M. (2022). Effects of mHealth on the psychosocial health of pregnant women and mothers: a systematic review. *BMJ open*, *12*(2), e056807. https://doi.org/doi: 10.1136/bmjopen-2021-056807.

Susanti, A. I., Ali, M., Hernawan, A. H., Rinawan, F. R., Purnama, W. G., Puspitasari, I. W., & Stellata, A. G. (2022). Midwifery Continuity of Care in Indonesia: Initiation of Mobile Health Development Integrating Midwives' Competency and Service Needs. *International journal of environmental research and public health*, *19*(21), 13893.

Till, S., Mkhize, M., Farao, J., Shandu, L. D., Muthelo, L., Coleman, T. L., Mbombi, M., Bopape, M., Klingberg, S., & van Heerden, A. (2023). Digital health technologies for maternal and child health in Africa and other low-and middle-income countries: cross-disciplinary scoping review with stakeholder consultation. *Journal of Medical Internet Research*, *25*, e42161.

Vogels-Broeke, M., Daemers, D., Budé, L., de Vries, R., & Nieuwenhuijze, M. (2022). Sources of information used by women during pregnancy and the perceived quality. *BMC pregnancy and childbirth*, *22*(1), 109.

Wakelin, K., Judith McAra-Couper, J., Fleming, T., & Erlam, G. (2022). Exploring the ways communication technology is used by midwives and pregnant women/people: An integrative review. *New Zealand College of Midwives Journal*(58).

Wali, R. (2023). Integration of telehealth in routine perinatal care: A model of care for primary healthcare clinics in saudi arabia. *Cureus*, *15*(10).

Wang, Y., Hu, S., Song, D., Pu, C., He, J., Yang, Y., Ding, Y., & Shan, C. (2025). The effect of digital health intervention on perinatal negative emotions: A meta-analysis. *Journal of affective disorders*, 120003. https://doi.org/https://doi.org/10.1016/j.jad.2025.120003

Widyaningrum, A. G., Hubeis, A. V. S., Sarwoprasodjo, S., & Matindas, K. (2023). Komunikasi kesehatan persalinan dalam media sosial: Kajian literatur sistematik. *Jurnal Ilmu Komunikasi*, *21*(3), 348-368.

Wilhelm, E., Vivilaki, V., Calleja-Agius, J., Petelos, E., Tzeli, M., Giaxi, P., Triantiafyllou, E., Asimaki, E., Alevizou, F., & Purnat, T. D. (2025). Effects of the Modern Digital Information Environment on Maternal Health Care Professionals, the Role of Midwives, and the People in Their Care: Scoping Review. *Journal of Medical Internet Research*, *27*, e70108.