

Online Health Information Seeking for Pregnancy-Related Resources and Maternal eHealth Literacy Among Women in Thailand: A Qualitative Study

Amornrat Deeboonno , Wantana Maneesriwongul , Srisamorn Phumonsakul , Pisamai Orathai 

Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Correspondence: Wantana Maneesriwongul, Ramathibodi School of Nursing, Faculty of Medicine Ramathibodi Hospital, Mahidol University, 270 Rama VI Road, Thung Phaya Thai, Ratchathewi, Bangkok, 10400, Thailand, Email wantana.lim@mahidol.ac.th

Introduction: Maternal eHealth literacy (MeHL) is a critical factor influencing self-care and health promotion during pregnancy. Inadequate MeHL may hinder pregnant women's effective use of online maternal health resources, increasing vulnerability to misinformation and suboptimal health decisions. However, research specifically exploring MeHL among pregnant women remains limited. Prior studies have largely focused on general populations or employed quantitative approaches, providing limited insight into how pregnant women navigate and make sense of online maternal health information in practice. Qualitative exploration is therefore needed to capture the contextual and multidimensional nature of these experiences.

Objective: To explore how pregnant and postpartum women in Thailand seek, appraise, and apply online health information during pregnancy.

Methods: This qualitative phase of a mixed-methods study aimed to develop an instrument for assessing electronic health literacy (eHL) among Thai pregnant women. Using a descriptive qualitative design guided by the eHealth Literacy Framework (eHLF), we explored pregnant women's internet use and eHL related experiences through in-depth interviews conducted between January and February 2024 with a purposive sample of 12 pregnant and 8 postpartum women from urban and suburban hospitals in Thailand.

Results: Participants primarily used Google, YouTube, and Facebook for pregnancy information. eHLF-guided analysis identified themes across all seven eHL domains. Although participants demonstrated skills in accessing information, they expressed concerns regarding source credibility, data privacy, and complex medical terminology, and highlighted the need for Thai-language, user-friendly digital resources provided or endorsed by trusted national healthcare institutions.

Conclusion: Pregnant women in these Thai hospital-based samples are active users of eHealth information but face challenges in navigating credibility and system usability. Healthcare providers and institutions should develop and promote reliable, accessible, and tailored digital health resources to enhance MeHL.

Keywords: pregnant women, pregnancy information, maternal health, eHealth literacy, maternal eHealth literacy

Introduction

Electronic health literacy (eHL) is the ability to seek, evaluate, and use health information from electronic sources to make informed decisions.¹ This is a critical skill for pregnant women who frequently search for health information online. The information acquired can significantly influence decisions regarding self-care and health promotion, thereby affecting both maternal and fetal outcomes.² In this study, we used the term maternal eHealth literacy (MeHL) to refer to pregnant women's eHL within the context of pregnancy care. Without adequate eHL, pregnant women face a higher risk of encountering misinformation, making poor health choices, and experiencing increased anxiety.³ Therefore, the ability to critically evaluate and effectively use eHealth resources is essential for making informed decisions and adopting appropriate health behaviors during pregnancy.



Maternal health information and knowledge related to pregnancy are crucial for pregnant women, who undergo numerous physiological changes that impact various body systems. Typically, healthcare providers at antenatal care clinics offer guidance on self-care, health promotion, and the prevention of complications. However, the information provided during these visits often does not fully address the needs of pregnant women.⁴ Many women report dissatisfaction with the adequacy and clarity of the information they receive from healthcare providers, as well as limited opportunities to ask questions, which can contribute to anxiety about their health status.^{2,5} In some cases, this communication leads to new uncertainties.⁶ Consequently, many pregnant women actively seek supplementary information about pregnancy on their own, with health information now widely accessible via the internet and social media platforms.^{6,7} While the internet serves as a valuable resource for pregnant women to communicate, share experiences, and seek support from peers,⁸ it also presents challenges for assessing the quality and reliability of the vast amount of available information.^{1,9,10} Many online sources provide cluttered, misleading, or biased information or hidden advertisements, leading to the widespread dissemination of misinformation and potentially negative consequences for the well-being of pregnant women.^{6,11,12}

To address these challenges, eHL provides a comprehensive framework for understanding both health literacy and electronic skills required by eHealth users.³ This concept encompasses seven key dimensions: the ability to process information, engagement in one's own health, the ability to engage actively with digital services, feeling safe and in control, motivation to engage with digital services, having access to systems that work, and digital services that suit individual needs.¹³ Enhancing eHL among pregnant individuals and MeHL, therefore, empowers women to access trustworthy information efficiently, engage more effectively with healthcare providers, and improve pregnancy outcomes. Given the increasing reliance on eHealth for health information, prioritizing the development of eHL skills among pregnant women is crucial for modern maternal care.

Information on eHL among pregnant women remains limited. Although studies in Thailand have examined internet use for pregnancy-related information, existing eHL research has largely focused on general populations and primarily employed quantitative approaches, providing limited insight into how pregnant women navigate, interpret, and make sense of online maternal health information in practice. This highlights a gap in research focused on the broader, multidimensional, and experiential aspects of eHL in this population. Understanding eHL is crucial, as it influences how pregnant women access, understand, and utilize online health resources to make informed decisions and enhance their health outcomes. The objective of this study was to descriptively examine how pregnant and postpartum women in Thailand seek, evaluate, and use online pregnancy-related health information, using the eHealth Literacy Framework (eHLF) as an organizing lens to systematically characterize experiences, challenges, and the support needed within a hospital-based maternity care context. This approach provides a structured and comprehensive framework to capture multiple dimensions of eHL, enabling a more in-depth understanding beyond basic patterns of internet use.

Materials and Methods

Study Design

This study constituted the qualitative phase and first stage of a sequential exploratory mixed-methods research aimed at developing an instrument to assess MeHL among Thai pregnant women. A descriptive qualitative study design was employed to explore patterns of pregnant women's internet use and experiences related to MeHL. Findings from the qualitative phase were used to inform item generation for the subsequent quantitative instrument development phase. Accordingly, this study was conducted to explore how pregnant and newly postpartum women, recruited from two hospitals in urban and suburban Thailand, seek, appraise, and apply online health information (eHealth literacy) during pregnancy. We used the Consolidated Criteria for Reporting Qualitative Research (COREQ)¹⁴ checklist to guide reporting and enhance transparency in sampling, data collection, and analysis, thereby supporting rigor and credibility throughout the research process.

Study Sample

A total of 20 participants—12 pregnant women and 8 postpartum women—were recruited for this study. Participants were selected through purposive sampling from two distinct healthcare facilities in Thailand: Ramathibodi Hospital, a university-affiliated tertiary care hospital and one of the highest-level referral centers in Bangkok, providing highly specialized maternal and newborn care, and Samutprakan Hospital, a secondary-level provincial public hospital in a suburban area providing general maternal and obstetric care in Thailand. This selection was made to capture experiences from different healthcare contexts, potentially reflecting a range of socioeconomic and educational backgrounds among the participants. The inclusion criteria for participants were as follows: Thai pregnant or postpartum women aged 18 years or older, able to read and write in Thai, and with prior experience using the internet to search for maternal health-related information. The pregnant participants were women from all three trimesters. In the postpartum group, women were interviewed within 24–72 hours after delivery. This timing was intentionally selected to ensure an accurate recall of their late-trimester experiences and information-seeking behaviors, while also allowing them sufficient time to recover from childbirth. Postpartum women were included to capture a comprehensive picture of the pregnancy journey, from conception to delivery, including late-trimester information-seeking behavior.

Data Collection and Instruments

A semi-structured interview guide was developed based on eHLF.¹³ The eHLF is a comprehensive multidimensional model designed to characterize eHealth users and their interactions with eHealth systems. It provides the conceptual foundation for this study by outlining seven key dimensions of eHL. These dimensions include the ability to process information, engage in one's own health, actively use digital services, and feel safe and in control while doing so. The framework also covers the motivation to engage with digital services, have access to systems that work, and ensure that digital services suit individual needs. The interview guide questions were structured to align with these seven dimensions, enabling a thorough exploration of how pregnant and postpartum women seek, evaluate, and apply online health information. This framework was integrated with substantial knowledge of maternal health to ensure the questions were relevant to participants' specific experiences during pregnancy. Face-to-face, in-depth individual interviews were conducted between January and February 2024. Participants were recruited from antenatal care clinics and postpartum units at the two study hospitals. All interviews were conducted in a quiet, private room within the respective clinic or postpartum unit to ensure privacy and comfort. The interviews were led by the primary researcher, a female PhD candidate and an instructor in midwifery and maternity nursing, who held a master's degree in midwifery. The interviewer's professional and academic background in midwifery was acknowledged, and reflexive awareness was maintained regarding how this positioning might influence interactions and rapport with pregnant and postpartum participants. The researcher approached the study with the professional understanding that while pregnant women increasingly turn to the internet for information, their confidence and skills in evaluating that information likely vary. This perspective allowed for an open exploration of diverse experiences, from confident navigation to uncertainty and concern, without prejudging participants' abilities. The researcher had no prior professional or personal relationships with the participants or recruitment centers and was not involved in their direct clinical care, which helped minimize potential response bias and power imbalances during the interviews. Potential participants were approached in person by the researcher at the antenatal care clinic and postpartum unit of each hospital. Eligibility was assessed based on the inclusion criteria. The researcher explained the study's objectives, allowed participants to ask questions until all concerns were addressed, and invited them to participate. Informed consent was obtained prior to participation in the study. Open-ended and follow-up questions (Figure 1) regarding eHL among pregnant women were used in the interviews, which were audio-recorded and lasted approximately 30 to 40 minutes. During the interviews, participants were allowed to take breaks as needed, such as when experiencing discomfort or when attending to a crying infant. The interviews provided participants with the opportunity to express their experiences, feelings, and opinions independently. Field notes were taken during and immediately after the interviews. Individual in-depth interviews were conducted until data saturation was reached; that is, when the ongoing analysis of subsequent interviews did not yield any new subthemes within the predefined domains, and existing subthemes were consistently reinforced.

Opening questions	Follow-up questions
1. How did you search for online information regarding pregnancy and discomfort symptoms during pregnancy?	- What topics do you typically search on the internet or social media? - What are your reasons for seeking information about pregnancy on the internet and/or social media platforms?
2. Which sources did you use to search for information regarding pregnancy, discomfort associated with pregnancy, and abnormalities encountered during pregnancy?	- Are the sources you used for seeking information reliable? - How did you determine whether the information you obtained from the internet was reliable/credible?
3. Once you acquired the information you were seeking, did you subsequently share it with others?	- Please describe your reasons for choosing to share or not to share information you have obtained online with others.
4. Does the information you obtain meet your needs? Please elaborate on your response.	- What additional information do you seek?
5. When you encountered problems or obstacles while searching for information on the internet, how did you address these challenges?	- How do you communicate with others online to obtain health information you need, such as self-care during pregnancy and preparation for childbirth?
6. Do you use information obtained from the internet to care for yourself, such as for managing discomforts or abnormalities experienced during pregnancy? If so, please describe how you apply this information	- Do you discuss information you have obtained from the internet with your nurse or physician? If so, please explain how these discussions occur
7. How would you describe your health during your pregnancy?	- Have you experienced any physical changes during your pregnancy? If so, please describe. - Have you experienced any emotional or psychological changes during your pregnancy? If so, please elaborate. - Are you aware of any behaviors that may increase the risk of complications during pregnancy? If so, please specify.
Exit question	
8. Do you require any assistance in searching for information on the internet?	

Figure 1 Interview guide for individual in-depth interview.

Ethical Considerations

Prior to conducting the study, the researchers obtained approval from the Human Research Ethics Committee of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University (Code of Ethics approved: MURA2023/880). Potential participants were informed of their right to decline or accept participation without any impact on their medical care. They were assured that all information and audio recordings would remain confidential and be used solely for this research. Written informed consent was obtained prior to interviews, including consent for audio recording and publication of anonymized interview responses and direct quotations. All data were anonymized during presentation and reporting.

Data Analysis

A qualitative descriptive analytic approach was used to characterize participants' experiences with accessing and using online pregnancy-related health information. The analysis was informed by the eHLF¹³ which served as an organizing lens to support systematic interpretation of the data rather than as a theory-testing or theory-generating model. Following transcript familiarization, interview data were reviewed and summarized to capture participants' reported behaviors, perceptions, and challenges related to online health information use. These descriptive findings were then organized within the eHLF domains to facilitate structured reporting and to ensure comprehensive coverage of individual, relational, and system-level aspects of eHL. This approach allowed for a clear presentation of participants' experiences while maintaining fidelity to the study's applied, descriptive aims. The eHLF domains were used to guide organization and interpretation of findings, not to evaluate or validate the framework itself.

The analysis began with verbatim transcription of all audio-recorded interviews in Thai, followed by repeated readings to achieve familiarity with the data. The transcripts were checked against the audio recordings for accuracy. Data were managed and analyzed using QDA Miner Lite (Version 3.0.2), with initial coding conducted deductively based on the seven eHLF dimensions. Following this, inductive refinement was allowed within each domain to capture emerging subthemes grounded in the participants' narratives. This dual approach ensured theoretical alignment with the eHLF while maintaining sensitivity to the participants' unique experiences. All significant data aligned with the framework's broad constructs, yielding 17 subthemes organized under the seven overarching themes. To ensure the trustworthiness of the findings, the research team collaboratively reviewed and verified the coding structure, subthemes, and final thematic organization, resolving discrepancies through discussion to reach consensus. The translated content from Thai to English was subsequently checked and validated by a bilingual researcher and a native English speaker to ensure accuracy. The final results are presented in the following section, accompanied by illustrative quotes that support the themes and subthemes.

Results

Participant Characteristics

Twenty participants participated in the individual in-depth interviews. The sample consisted of twelve pregnant women and eight postpartum women. Data saturation, defined as the point at which no new codes or subthemes emerged across three consecutive interviews related to the eHLF domains, was determined to have been reached after the 17th interview. To confirm that thematic saturation was robust and ensure that no new insights were missed, three additional interviews were conducted. These final interviews yielded no new subthemes, thereby confirming the comprehensiveness of the collected data. This sample size is consistent with the norms for qualitative descriptive studies, which aim for rich, detailed insights into a specific phenomenon rather than statistical generalizability.¹⁵ The mean age of the participants was 30.95 years, with a range of 21–41 years. The sample was equally distributed between primiparous and multiparous women ($n = 10$ each). Regarding the pregnancy stage, 3 participants were in the first trimester, 5 in the second trimester, 4 in the third trimester, and 8 were postpartum. Nineteen participants were employed, and one was unemployed. Regarding educational attainment, 15 participants held a bachelor's degree, 3 held a high vocational certificate, and 2 had completed secondary education. The details of the participants' demographics and technology use characteristics are presented in [Table 1](#).

All participants reported daily internet use for general purposes and relied on it as their primary source for seeking pregnancy-related information. Every participant used a mobile phone to search for health-related information, and 5 out of 20 also used a workplace computer in combination with it. Each participant used various channels to search for health-related information. Nearly all participants (19/20) used Google, and an equal proportion (19/20) sought health information on Facebook. Other platforms were also used, including YouTube (16/20) and TikTok (12/20), as well as specific applications related to pregnancy and childbirth.

The most frequently searched topics were primarily related to pregnancy. Primigravida women frequently described extensive searching for online health information, often driven by uncertainty and lack of prior pregnancy experience. In contrast, multigravida women tend to engage in more targeted information seeking, primarily to confirm or update existing knowledge gained from previous pregnancies. Commonly searched topics included appropriate practices during pregnancy, fetal growth and development, optimal nutrition for the mother and fetus, preparation for childbirth, infant care, breastfeeding, management of pregnancy-related concerns, and relief of common discomforts such as dizziness, backache, and constipation. Participants described using search terms related to specific symptoms, gestational milestones, and practical concerns, such as “foods to avoid during pregnancy”, “fetal movement count”, “how to relieve constipation in pregnancy”, and “signs of labor”.

Qualitative Results: EHL Domains Characterizing Participants' Experiences

The results are presented descriptively and organized according to the domains of the eHLF, which served as the conceptual structure to support clarity and coherence in reporting. The findings were consistent with the data presented,

Table 1 Participant Demographics and Technology Use

Demographics and Technology Use		Number	Min-Max
Age (years)		20	21-41
Gravida	Primigravida	10	
	Multigravida	10	
Period	First trimester	3	
	Second trimester	5	
	Third trimester	4	
	Postpartum period	8	
Underlying	No	15	
	Yes	5	
Education	Secondary school	2	
	Vocational/high vocational school	3	
	Bachelor's degree	15	
Occupation	Company employees/Government officers	14	
	Merchant	1	
	Unemployed	1	
	Freelancers	4	
Electronic equipment*	Mobile phone	20	
	iPad/Tablet	0	
	Computer/Notebook	0	
	Office computer	5	
Channel*	Google	19	
	Tik Tok	12	
	Facebook	19	
	YouTube	16	
	Other applications related to pregnancy	12	

Note: * Participants could give more than one answer.

and each theme was supported by illustrative participant quotations. Within each domain, we describe participants' experiences, behaviors, and perceived challenges related to seeking, appraising, and applying online pregnancy-related health information. The domains are not presented as emergent qualitative themes, but rather as an organizing framework to contextualize and synthesize participants' accounts within established dimensions of eHL. This organizational approach was selected to enhance interpretability and practical relevance, rather than to advance theoretical claims about the framework (Table 2).

eHLF Domain I: Ability to Process Information

Access Health Information via the Internet

Participants described seeking health information from a range of online sources, with commonly used platforms including Google, Facebook, and YouTube. The information sought encompassed self-care during pregnancy, physiological changes, fetal development, and preparation for childbirth. Participants did not report using AI-based tools for

Table 2 Framework Domains and Illustrative Subthemes

Theme	Subtheme	Representative Quote
Ability to process information	<ol style="list-style-type: none"> 1. Access health information via the internet 2. Utilization of the obtained data 	<ul style="list-style-type: none"> • “I access Google and type keywords such as how to have a good pregnancy, how to care for a child, and how to deliver. Out of this, there are other channels like applications about pregnancy or specific groups on social media that I search for pregnancy-related information”. (PP_01) • “I use information from the internet about discomfort to help me manage myself, like minor discomfort like dizziness or something like that”. (Preg_05)
Engagement in one’s own health	<ol style="list-style-type: none"> 1. Maternal health during pregnancy 2. Maternal health behaviors in the antenatal period 3. Experiences of discomfort 	<ul style="list-style-type: none"> • “The last time, I was healthy during pregnancy, both during the first and second pregnancies. I walked (exercised) until my delivery. I regularly exercise. Walking was fun because I was a singleton at that time. Now, I am pregnant with twins. When I entered the third trimester, I could not walk anymore, and toward the end of the third trimester, around 34–35 weeks, I had to ask for a wheelchair, which I had never asked for before. It was heavy, straining, and had many things because I had to handle two children”. (PP_02) • “I used to be a fast walker and a rapid woman. However, now I move, do things more slowly, and avoid dangerous behaviors such as lifting heavy objects”. (Preg_03) • “There will be only changes in the body, such as pain in the body and leg, difficulty sleeping, and frequent urination. That is all. It is just discomfort”. (Preg_02)
The ability to engage actively with digital services	<ol style="list-style-type: none"> 1. Regular internet use 2. Communication with others in online environments 3. Approaches to overcoming obstacles in the information retrieval process 	<ul style="list-style-type: none"> • “I prefer to search for information online because our phones are already in our hands. I use phones as a part of my daily life. They are easily accessible”. (PP_02) • “If I have a question about pregnancy, searching for information on the internet is my first choice. If I still feel I do not have enough information, I consult with my friend, who is a nurse online”. (PP_03) • “Occasionally, if a website is inaccessible—such as when it displays an error message, freezes, or does not respond—I will switch to other websites until I find the information I need”. (Preg_04)
Feeling safe and in control	<ol style="list-style-type: none"> 1. The credibility of the information received 2. Procedures for determining trustworthiness 3. Consideration of data security 	<ul style="list-style-type: none"> • “The reliability of health information depends on the source. Suppose it was just a pregnant woman’s comment; I would not believe that information was 100% accurate. However, if it were Google or a page created by a hospital, I would believe that part more”. (Preg_03) • “I usually ask others for information first, then search the Internet, and look at several pages. If the information is consistent across multiple pages, it is considered credible. I typically check three or four pages and then consider all the information together”. (Preg_01). • “I selected to share general information and did not share any private information. I would not post my real name or surname on Facebook. If I had posted something, I would have used the same fake name I use online. I did not use my real name or anything like that”. (Preg_11)
Motivation to engage with digital services	<ol style="list-style-type: none"> 1. Convenience 2. Reducing cost/time 	<ul style="list-style-type: none"> • “I want a variety of information. Many websites and information are available on the Internet. I want information from many channels and websites. Personally, I did not have much information about pregnancy, and I did not know who to ask. So, I mostly used the Internet”. (Preg_05) • “I usually search for maternal health information on the Internet. If I cannot find the information I am looking for, I usually chat with the hospital’s online channels if the information I need is not urgent, such as symptoms of hemorrhoids. However, if that information is urgent, I will drive a car to the hospital”. (Preg_04)

(Continued)

Table 2 (Continued).

Theme	Subtheme	Representative Quote
Having access to systems that work	<ol style="list-style-type: none"> 1. Ease of accessing relevant information 2. Access to the systems that work 	<ul style="list-style-type: none"> • “I regularly searched for health information online; sometimes, I searched Google and social media. Most of the time, I used Google because when I typed the keyword, it would link to everything, including Facebook, apps, and websites. It can give me everything”. (PP_02) • “Some pages cannot be accessed when we click on them; they always show errors. So, we just wait, and eventually someone will reply to the question we posted on Facebook”. (Preg_01)
Digital services that suit individual needs.	<ol style="list-style-type: none"> 1. Language or terminology requirement 2. The need for assistance 	<ul style="list-style-type: none"> • “Because I have an underlying associated blood disease, on some occasions when I search eHealth information, I do not understand the acquired information, such as when interpreting blood test results”. (Preg_09) • “Online systems should have more details about pregnancy, especially on the hospital website. This information will be more credible if it comes from the hospital’s official website. There was a section of maternal health information for us to look at when we searched the hospital website, like YouTube or other websites, but it was not a hospital unit”. (PP_04)

health information seeking, which may reflect the timing of data collection, when generative AI platforms were not yet widely used in Thailand. These information-seeking practices are illustrated in the following account:

I access Google and type keywords such as how to have a good pregnancy, how to care for a child, and how to deliver. Out of this, there are other channels like applications about pregnancy or specific groups on social media that I search for pregnancy-related information. (postpartum woman_01)

The need for foundational knowledge is particularly strong among first-time mothers. For instance, one primigravida participant expressed her desire to understand everything about the process:

I want to know what the symptoms are in each trimester of pregnancy, how to prepare for them, and what will happen to our bodies? What changes will our bodies undergo? What are the abnormalities in pregnancy? What about the baby’s development? How big must a baby be at this gestational age? How many grams does it weigh? (Pregnant woman_03)

Utilization of the Obtained Data

The participants acquired eHealth information, understood it, and effectively used it for self-care. For instance:

I have abdominal pain in the lower quadrant; I decided to search for information about abdominal pain in pregnancy and found that pregnant women can experience lower abdominal pain at the end of the first trimester and early second trimester; it is not dangerous. This is caused by uterine extension. I did not take any action regarding my symptoms. When the day passed, this symptom disappeared. (Postpartum woman 08)

I use information from the internet about discomfort to help me manage myself, like minor discomfort like dizziness or something like that. (Pregnant woman_05)

eHLF Domain 2: Engagement in One’s Own Health

Within this domain, participants’ accounts reflected their engagement with their own health throughout pregnancy. Participants described awareness of both physical and psychological changes and the actions they took in response, including seeking health information online. These experiences were captured across three subthemes: maternal health during pregnancy, maternal health behaviors in the antenatal period, and experiences of discomfort. The excerpts below

illustrate how participants monitored health changes, described health-related behaviors, and sought information to manage discomfort and support self-care during pregnancy.

Maternal Health During Pregnancy

Participants perceived that their health status transitioned from nonpregnant to pregnant. They reported experiencing a slower pace of movement and difficulty in walking. In addition to physical changes, pregnant women report experiencing psychological changes during pregnancy, such as increased irritability and a greater tendency to cry easily. For instance,

There might be a little irritation because I am pregnant. My oldest child was of a very mischievous age. So, I might get irritated and take it out on my child. However, I try to handle myself by escaping from that situation, getting rid of my emotions, not talking to anyone, and not taking it out on other people in the house. Because my oldest child is at an age when he absorbs every behavior, he will remember how I do it. So, I will escape from that situation. (Postpartum woman_02)

The last time, I was healthy during pregnancy, both during the first and second pregnancies. I walked (exercised) until my delivery. I regularly exercise. Walking was fun because I was a singleton at that time. Now, I am pregnant with twins. When I entered the third trimester, I could not walk anymore, and toward the end of the third trimester, around 34-35 weeks, I had to ask for a wheelchair, which I had never asked for before. It was heavy, straining, and had many things because I had to handle two children. (Postpartum woman_02)

Maternal Health Behaviors in the Antenatal Period

The participants acknowledged that their behaviors exerted either a positive or negative influence on maternal health outcomes. They actively sought to maintain their health during pregnancy:

I used to be a fast walker and a rapid woman. However, now I move, do things more slowly, and avoid dangerous behaviors such as lifting heavy objects. (Pregnant woman_03)

Eating salty or sweet foods mostly focuses on whether the food will reach the baby. I am afraid that my baby will be small. Anything that is not good for the baby, I will avoid it or stop it altogether. (Pregnant woman_05)

Experiences of Discomfort

Pregnant women report experiences of a variety of discomfort, for example:

There will be only changes in the body, such as pain in the body and leg, difficulty sleeping, and frequent urination. That is all. It is just discomfort. (Pregnant woman_02)

eHLF Domain 3: The Ability to Engage Actively with Digital Services

In this domain, participants reported frequent internet use and familiarity with navigating digital environments for health-related purposes. They reported integrating eHealth technologies into their daily routines and drawing on multiple online resources to access health information. Engagement within this domain was reflected across three subthemes: regular internet use, communication with others in online environments, and approaches to overcoming obstacles in the information retrieval process. Participants also described practical strategies for managing access-related difficulties, such as switching to alternative websites when a site was unavailable. These accounts illustrate how participants addressed technical challenges and maintained access to digital health information during online information-seeking.

Regular Internet Use

The participants indicated that they typically searched for health information on the internet regularly whenever they needed it. Searching for health information from online sources was convenient and straightforward; they could access it whenever they wanted:

I prefer to search for information online because our phones are already in our hands. I use phones as a part of my daily life. They are easily accessible. (Postpartum woman_02)

While I understand only some information acquired from the internet, if it is unclear, I try to search another website to make me understand the information I want. (Pregnant woman_01)

Communication with Others in Online Environments

Participants utilize online media to communicate with others in order to seek information relevant to their needs:

If I have a question about pregnancy, searching for information on the internet is my first choice. If I still feel I do not have enough information, I consult with my friend, who is a nurse online. (Postpartum woman_03)

Approaches to Overcoming Obstacles in the Information Retrieval Process

When pregnant women encountered difficulties while searching for information online, they were able to resolve these issues and ultimately obtained the information they needed:

Occasionally, if a website is inaccessible—such as when it displays an error message, freezes, or does not respond—I will switch to other websites until I find the information I need. (Pregnant woman_04)

eHLF Domain 4: Feeling Safe and in Control

This section reflects participants' dual focus on ensuring the reliability of the health information they accessed and safeguarding their personal data online. Their accounts highlighted the interrelated concerns of information credibility and data privacy, which were reflected across three subthemes: “the credibility of the information received”, “procedures for determining trustworthiness”, and “consideration of data security”. Participants consistently recognized that online health information is not always accurate and described actively evaluating its credibility before sharing it with others. As the participant explained:

The reliability of health information depends on the source. Suppose it was just a pregnant woman's comment; I would not believe that information was 100% accurate. However, if it were Google or a page created by a hospital, I would believe that part more. (Pregnant woman_03)

Reflecting retrospectively, a postpartum participant described that information obtained from laypersons was considered less reliable:

The information was correct around eighty percent; I think twenty percent was not sure, because it comes from the comment of a layperson, not from the medical personnel. (Postpartum woman_02)

Procedures for Determining Trustworthiness

The participants assessed the credibility of the information before using it for self-care or sharing it with others. This evaluation includes considering the source of the information, such as the website and the author's name, and synthesizing information from multiple online sources.

Mostly, I have to look at the source of the information first. I did not share it generally, but I would share only what I thought was necessary or what everyone wanted to know. It was information from reliable sources, such as the hospital page, website, or institution that takes care of health. (Pregnant woman_03)

I usually ask others for information first, then search the internet, and look at several pages. If the information is consistent across multiple pages, it is considered credible. I typically check three or four pages and then consider all the information together. (Pregnant woman_01)

Consideration of Data Security

Participants expressed concerns about the information they shared online, carefully considering its safety prior to disclosing it. Some participants reported choosing only to input information that would not pose any risk to themselves:

I am concerned about personal information. Information such as gestational age, body weight, and height was selected. I do not type my address or mobile phone on the application. (Pregnant woman_02)

I selected to share general information and did not share any private information. I would not post my real name or surname on Facebook. If I had posted something, I would have used the same fake name I use online. I did not use my real name or anything like that. (Pregnant woman_11)

eHLF Domain 5: Motivation to Engage with Digital Services

Within this domain, participants articulated their engagement with digital services as a pragmatic response to the constraints of traditional healthcare, rather than as an interest in technology per se. Their accounts emphasized the value of immediate access to information and the opportunity to reduce unnecessary hospital visits, particularly in relation to time and financial burdens. These motivations were captured in two subthemes: “convenience” and “reducing cost/time”.

Convenience

The participants searched for health information when they want to learn about pregnancy and childbirth. The use of online information sources is easy, convenient, and rapid, enabling individuals to obtain the information they need quickly:

I want a variety of information. Many websites and information are available on the internet. I want information from many channels and websites. Personally, I did not have much information about pregnancy, and I did not know who to ask. So, I mostly used the internet. (Pregnant woman_05)

Uncertainty about the hospital care process was reported, particularly among first-time mothers encountering the healthcare system. One postpartum participant, reflecting on her experience prior to delivery, described how being a primigravida was associated with her information-seeking activities:

I try to search about the method of labor, like how I select the method of labor, should I have vaginal delivery, or should I have cesarean delivery. Because I changed the hospital from a private hospital to here (..... hospital), and I do not know the guidelines of this hospital, which method should I select for labor, or must I try vaginal delivery first, since I am a primigravida. (Postpartum woman_05)

Reducing Cost/Time

Participants sought information to address uncertainty and support decision making, thereby reducing the need for hospital visits:

I usually search for maternal health information on the internet. If I can't find the information I am looking for, I usually chat with the hospital's online channels if the information I need is not urgent, such as symptoms of hemorrhoids. However, if that information is urgent, I will drive a car to the hospital. (Pregnant woman_04)

Everyone used mobile phones as part of their daily life, holding them all the time and using social media. Many media are easily searchable. When I typed a search term, it gave us tens of thousands of pieces of information. If I am not yet ready to visit the hospital because of the associated costs and time, I prefer to seek information online or through social media whenever I have questions. It gave me both health information and hospital information, like Payathai, Petcharavej, Mahidol [hospitals in Thailand], or something like that. (Postpartum woman_02)

eHLF Domain 6: Having Access to Systems that Work

Within this domain, participants described their experiences with the technical performance of the digital systems they encountered. Their accounts highlighted how information was retrieved in practice and whether the digital platforms they used functioned reliably. These experiences were reflected across two subthemes: “ease of accessing relevant information” and “access to systems that work”.

Ease of Accessing Relevant Information

The participants perceived that the usability of eHealth information depended on the system's ease of use and searchability. If they could not find it on one website, they could search for it on another. Some websites provide continuous links to other websites, allowing users to navigate seamlessly from one source to another:

I regularly searched for health information online; sometimes, I searched Google and social media. Most of the time, I used Google because when I typed the keyword, it would link to everything, including Facebook, apps, and websites. It can give me everything. (Postpartum woman_02)

There was some information that was difficult to search for, and I could not find. Another problem is that some sources provided inconsistent information. We wonder which information to believe, for example, when using fluoride toothpaste. Some sources say it is okay, but others say you should not use it because your child will become fake autistic or something like that. The information from each source was inconsistent. (Pregnant woman_05)

Access to the Systems that Work

Some pages cannot be accessed when we click on them; they always show errors. So, we just wait, and eventually someone will reply to the question we posted on Facebook. (Pregnant woman_01)

eHLF Domain 7: Digital Services that Suit Individual Needs

Within this domain, participants described their experiences engaging with eHealth systems, shaped by their personal circumstances. Their accounts highlighted challenges related to understanding health information and determining when professional assistance was necessary. These experiences were articulated through two subthemes: “language or terminology requirements” and “the need for assistance”.

Language or Terminology Requirement

Participants reported that, although they were generally able to locate the information they needed, some content and terminology were occasionally difficult to comprehend:

Because I have an underlying associated blood disease, on some occasions when I search eHealth information, I do not understand the acquired information, such as when interpreting blood test results. (Pregnant woman_09)

The Need for Assistance

The majority of participants reported no need for assistance in searching for eHealth information; however, some indicated they still needed support in this area.

I do not want any help with searching eHealth information; it was easy to find, and it had a lot of information. I just type keywords, and the internet shows me all the answers. (Pregnant woman_05)

Online systems should have more details about pregnancy, especially on the hospital website. This information will be more credible if it comes from the hospital's official website. There was a section of maternal health information for us to look at when we searched the hospital website, like YouTube or other websites, but it was not a hospital unit. (Postpartum woman_04)

Discussion

This qualitative study contributes to the understanding of eHL among Thai pregnant women. The findings from this study demonstrate that all pregnant women utilized the internet as their primary source of health information. This result aligns with previous research, which consistently reported that pregnant women increasingly turn to digital resources to inform self-care practices during pregnancy.^{8,16,17} Notably, Serçekuş and colleagues also found that pregnant women rely more frequently on the internet as their primary source of pregnancy-related information than on healthcare professionals.¹⁸

These findings collectively support a growing body of literature that suggests the internet plays a crucial role in providing health information to pregnant women.

Regarding online health information sources, the findings align with Jankrajank and colleagues showing that pregnant women preferred general websites or articles over research-based or academic sources. Participants also tend to seek and exchange information with peers through social platforms such as LINE groups rather than consulting healthcare professionals via official online channels.¹⁹ However, when information from social media or general websites was insufficient and related to important health concerns, participants contacted hospitals through provider-designated online communication channels.

Prior research indicates that the health topics sought by pregnant women vary by geographic, cultural, and individual factors^{8,10} although the main areas of interest are largely consistent. In this study, participants searched for information on physiological changes and self-care during pregnancy, fetal growth and development, labor methods, and appropriate nutrition, aligning with previous findings that identify fetal development, optimal nutrition, and management of pregnancy-related conditions as the most frequently sought topics.^{8,17} This pattern is also consistent with Bert and colleagues who categorized pregnant women's online health information-seeking into reproduction, pregnancy, delivery, and newborn health.⁷

Electronics Health Literacy Domain

In this study, using the eHLF as an organizing lens, the findings were structured across its seven domains. Critical engagement with this framework enabled the analysis to move beyond merely confirming predefined domains and to examine the sociocultural factors that shape MeHL in the Thai context, as detailed below for each domain.

Ability to Process Information

Participants' accounts illustrate a proactive approach to processing eHealth information, characterized by synthesizing content from multiple platforms to inform self-care, particularly among primigravida participants seeking to understand pregnancy in the absence of prior experience. However, navigating open digital platforms required substantial effort, as participants independently filtered and verified information to assess its relevance to their physical changes, effectively acting as information gatekeepers. This pattern contrasts with Western literature that emphasizes literacy or language barriers.²⁰ In this context, challenges appeared to arise less from deficits in processing skills and more from managing an unstructured information environment, indicating that effective eHealth engagement requires not only access and literacy but also sustained cognitive effort to manage information uncertainty.^{21,22}

Engagement in One's Own Health

Participants' accounts indicated that engagement in maternal health was closely intertwined with other eHL practices. Pregnancy-related awareness was often expressed alongside increased information-seeking, suggesting that engagement functioned as an embodied state. The transition from a non-pregnant to a pregnant identity—characterized by physical limitations and psychological changes—served as a key impetus for seeking health information. Consequently, online searching was driven not merely by access to digital technologies, but by lived experiences of pregnancy and an emerging sense of maternal responsibility. This active health management generated information needs that extended beyond routine antenatal care, consistent with evidence that women use the internet to address gaps in formal healthcare.²³ In this context, engagement is defined as a physiological and emotional imperative to adapt to a changing sense of self, rather than motivation alone.

The Ability to Engage Actively with Digital Services

Findings within the ability to engage actively with digital services domain indicate that participants described eHealth as being integrated into their everyday routines, consistent with Valkonen and colleagues.²⁴ Within this domain, the subtheme of managing obstacles highlights participants' experiences of navigating digital environments, including pragmatic troubleshooting strategies such as switching websites when technical issues arose. Although access to digital resources was generally available, platform functionality and reliability were perceived as inconsistent, requiring

sustained effort to maintain access to health information across multiple platforms. This pattern contrasts with Western literature that emphasizes limited digital skills or connectivity constraints.²⁰ In the present study, participants did not report difficulties with basic digital use; instead, their accounts highlight the ongoing effort required to navigate fragmented, intermittently unreliable online systems. Accordingly, the engagement described here appears to reflect adaptive practices aimed at sustaining access to information within a complex digital environment, rather than engagement driven solely by interest or preference.

Feeling Safe and in Control

The “feeling safe and in control” domain captures participants’ ongoing evaluation of online health information, with particular attention to credibility and data security. Participants balanced the need for timely pregnancy-related information against concerns about trustworthiness and privacy, indicating that eHealth engagement involved continual risk assessment rather than uncritical reliance on digital sources.

Participants’ accounts indicate that the cultural and organizational context of the Thai healthcare system shaped these practices, as antenatal encounters were typically structured and time-limited, limiting opportunities for extended dialogue. In this context, the internet served as a supplementary information source used alongside formal care, providing reassurance while also introducing uncertainty, as participants sought to address perceived communication gaps while remaining cautious about information reliability.

Although preferences for credible, institution-endorsed information have been reported across settings,^{25,26} participants in this study placed particular emphasis on the source and institutional affiliation of online content. Hospital-based or official websites, such as those of local hospitals or national public health authorities, were preferred not only for accuracy but also for the sense of safety, confidence, and control they provided. Viewed through the eHLF, these accounts show that trust, security, and autonomy were actively negotiated in response to the sociocultural and healthcare context, suggesting that strengthening eHealth engagement may require system-level provision of trusted, institutionally endorsed digital resources to reduce the credibility burden on pregnant women.²⁷

Motivation to Engage with Digital Services

Participants’ accounts suggested that engagement with digital services was shaped by practical everyday constraints, including time, cost, and information gaps in routine antenatal care. In this context, eHealth was approached as a supplementary resource used alongside, rather than replacing, in-person care.

Participants’ accounts highlight how widespread smartphones use shaped engagement with digital health resources, enabling constant access to online information while requiring sustained effort to search, compare, and evaluate content across multiple sources.

Motivation to engage with digital services was closely linked to perceived communication limitations during antenatal visits, which offered limited opportunities for questions.²⁸ Participants therefore used eHealth to seek clarification and reassurance, while critically evaluating information sources and expressing uncertainty about credibility.²⁹

Rather than reflecting predefined competencies or uniform motivations, these accounts show that engagement with digital services was embedded within broader sociocultural and healthcare contexts. Viewed through eHLF, eHealth use involved ongoing negotiation between access, information needs, and the cognitive effort required to assess credibility in a fragmented digital environment. These findings highlight how system-level constraints shape pregnant women’s engagement and suggest that improving eHealth engagement requires strategies that reduce the evaluative burden on women, rather than focusing solely on individual capability or motivation.

Having Access to Systems That Work

Participants’ accounts indicated that “having access to systems that work” was primarily understood as accessibility and ease of navigation. Usability was described as the ability to search efficiently and move between multiple online sources, with participants readily switching websites or following search engine results when information was unavailable, reflecting a digitally fluid and accessible environment.

At the same time, participants' accounts indicated that technical accessibility was accompanied by challenges in informational coherence, as information was dispersed across multiple sources. The need to switch between websites and evaluate large volumes of content shows that ease of access did not equate to ease of use, with usability requiring sustained cognitive effort to assess and reconcile conflicting pregnancy-related information.

Several participants described encountering contradictory online information, such as differing claims about health risks (eg, fluoride exposure), indicating that seamless navigation often involved managing inconsistency rather than clarity. Preferences for official, hospital-affiliated websites were a desire for clearer and more dependable reference points, rather than a generalized preference for authority.

Viewed through the eHLF, these accounts show that perceptions of system usability extended beyond technical performance to include the organization, consistency, and trustworthiness of information. While prior studies suggest that centralized digital systems may support maternal health information use,^{30,31} participants described a fragmented digital environment requiring increased effort to manage dispersed and sometimes conflicting information, consistent with findings from other healthcare contexts.³² These findings highlight how system-level organization and information coherence shape eHealth engagement during pregnancy and suggest that improving usability requires attention not only to technical design but also to information integration across platforms.

Digital Services that Suit Individual Needs

The domain "digital services that suit individual needs" highlights a distinction between accessing digital health systems and understanding the information they provide. While most participants reported independently locating eHealth information and perceived navigation as manageable, they described challenges with comprehensibility, particularly when information such as laboratory results or clinical descriptions was presented in medical or technical terminology. These difficulties were specific to certain types of content rather than reflecting a general inability to use digital services.

Participants' accounts indicate that these difficulties were not related to general language proficiency, as all were native Thai speakers, but to the use of medical or specialized terminology unfamiliar in everyday contexts. While previous research has emphasized language barriers among non-native speakers,³³ the present findings highlight challenges in interpreting medically framed information within one's own language.

Viewed through the eHLF, these accounts show that the suitability of digital services was not shaped only on access but also on users' ability to meaningfully interpret information. Consistent with prior research highlighting interpretive demands in digital health use,^{34,35} participants engaged in ongoing efforts to make sense of information that was accessible but not always easily understood. In this context, suitability emerged as a negotiated aspect of eHealth use, suggesting that improvements require greater attention to translating clinical information into user-understandable formats rather than focusing solely on access or navigation. These challenges may also be shaped by differences in healthcare and digital contexts. While this study was conducted in urban and suburban settings, the findings may reflect geographic differences in access to digital health resources in Thailand. Women in urban areas may have greater access to healthcare services and reliable information sources, whereas those in suburban or rural areas may rely more on informal platforms. Such differences may influence how MeHL is developed and applied, particularly in evaluating information credibility.

Although all important data were ultimately mapped onto the broad constructs of the eHLF, this does not suggest that the framework fully captures all the possible dimensions of MeHL. A purely inductive, grounded theory approach might have yielded a different thematic emphasis, potentially foregrounding cultural or psychosocial aspects, such as the identity transition associated with becoming a mother, as a more central theme, rather than situating them within the domain of engagement with one's own health. Therefore, while the eHLF provides a valuable and systematic structure for assessing eHL, it is important to acknowledge that its predefined domains may shape the analytical focus and could give less prominence to context-specific nuances that alternative or exploratory approaches might highlight.

It is also important to acknowledge that some crucial psychosocial dimensions of the pregnancy experience did not fit cleanly within the eHLF's structured domains. Aspects such as the emotional labor of managing anxiety and mood changes, or the profound identity transition into motherhood, were observed in participant narratives but could only be partially categorized under broader domains like "engagement in one's own health". A framework less focused on

functional literacy might have allowed these elements to emerge as central themes, revealing how the personal, emotional journey of pregnancy is as significant a driver of online behavior as the practical search for health information.

Strengths and Limitations

The interview guide was developed based on eHLF.¹³ This approach provides a clear and comprehensive understanding of eHL. Individual in-depth interviews were conducted with pregnant women during the first, second, and third trimesters, as well as with postpartum women. This approach facilitates a comprehensive understanding of internet-based health information-seeking behaviors from early pregnancy through labor pain. The eHLF was used to organize and present the findings, rather than to assess participants' abilities or limit interpretation. In practice, women's accounts often cut across multiple domains, and the analysis remained flexible to ensure the findings reflected their lived experiences. Collecting data at each stage enables an in-depth exploration of women's evolving needs and behaviors throughout pregnancy.

This study has several limitations. First, the sample was drawn from two healthcare settings in Thailand, which may limit the transferability of the findings to other populations or healthcare contexts. In addition, the study was conducted within the context of a developing country, where variations in educational level, socioeconomic status, and access to digital resources may influence health-related internet use and eHL, potentially limiting comparability with findings from other settings. Another limitation is that postpartum interviews were conducted within 72 hours after delivery. Factors such as fatigue, pain, the need to attend to a crying infant, or the effects of medication may have influenced participants' recall and engagement. To mitigate this, participants were allowed to take breaks as needed during the interview; however, some influence on the depth or consistency of responses cannot be excluded.

Implications for Practice and Research

These findings have important implications for maternal healthcare practice and digital health system development. Healthcare professionals are well positioned to support the critical appraisal of digital content and to address misinformation arising from unverified sources. Beyond the role of individual providers, hospitals may consider developing clearly structured and regularly updated digital information that aligns with pregnant women's everyday information needs and supports the comprehension and application of health information.

Communication channels that align with pregnant women's everyday media use may further enhance access to reliable information. Integrating institutionally endorsed and professionally moderated digital platforms into routine antenatal care may help bridge gaps in information access, while supporting women in navigating complex online environments and reinforcing trust in formal healthcare services. Such channels may also complement face-to-face antenatal care, particularly in settings where consultation time is limited.

The findings further highlight the importance of addressing contextual disparities, particularly between urban and rural settings. Variations in access to healthcare services and reliable digital resources may shape how women engage with and interpret online health information. Tailored strategies may therefore be necessary to support equitable development of MeHL across different populations.

Overall, these findings underscore the potential role of healthcare providers, particularly nurses and midwives, in guiding pregnant women toward reliable digital resources and supporting their effective use.

These findings may also inform future research. The qualitative insights from this study provide a foundation for the development and validation of the MeHL instrument in the subsequent quantitative phase. Future studies may examine the psychometric properties of the instrument in larger and more diverse populations and evaluate interventions designed to improve MeHL across different contexts.

Conclusion

This qualitative study provides information on eHL and details on the use of the internet for maternal health information among Thai pregnant women. The findings indicate that, for the women in this study, online sources were reported as the primary means of seeking health information, as they were perceived as rapid, convenient, accessible at all times, and generally low-cost. However, some participants reported difficulty distinguishing accurate information from

misinformation, which they felt could affect their ability to care for themselves. Inconsistencies in online health information were also noted as a challenge during eHealth use. To address this, pregnant women commonly searched multiple sources to verify information. While participants found that the current eHealth systems partially met their needs, specific gaps remained. They expressed the need for reliable sources, user-friendly hospital websites, and clear explanations. Overall, the information acquired through eHealth platforms was beneficial for pregnant women in making informed decisions about self-care and addressing health-related concerns.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The authors used ChatGPT Plus to assist with language editing and grammar refinement. After using this tool, the authors reviewed, edited, and verified the content as needed and take full responsibility for the final content.

Ethics Approval and Informed Consent

This study was approved by the Ethics Committee of the Faculty of Medicine, Ramathibodi Hospital, Mahidol University (Code of Ethics approved: MURA2023/880). Prior to participating in the study, all pregnant and postpartum women were informed about the study's purposes, procedures, confidentiality and anonymity, and the potential risks and benefits. This study was conducted in accordance with the guidelines of the Declaration of Helsinki.

Acknowledgments

We express our sincere gratitude to all pregnant and postpartum women who generously contributed their time to the interviews. We also thank the Faculty of Medicine at Ramathibodi Hospital and Mahidol University for supporting the publication fee.

Funding

This study received no external funding. The Faculty of Medicine Ramathibodi Hospital and Mahidol University supported the publication fees.

Disclosure

The authors declare that they have no conflicts of interest in this work.

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