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Exploring Fathers' Educational Media Needs During the Maternal-Perinatal Period in Yogyakarta

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ABSTRACT

Introduction: In this study, we aimed to identify the needs for interactive educational media to optimize fathers' involvement during the maternal-perinatal period in Yogyakarta. With evidence showing that paternal engagement contributes significantly to maternal well-being, child development, and family health outcomes, our objective was to explore the specific barriers and preferences of expectant fathers to address gaps in current health education strategies that remain largely mother-centered.
Methods: This qualitative study employed focus group discussions with midwives and in-depth interviews with expectant fathers and mothers at public health centers in Yogyakarta (July–August 2025). Participants (6 midwives, 10 fathers, 10 mothers) were purposively recruited to ensure variation in socioeconomic and educational backgrounds. Data collection proceeded until thematic saturation was achieved. Transcripts were coded inductively and analyzed thematically using NVivo, applying constant comparison across cases. Credibility was enhanced through iterative refinement of codes. Ethical clearance was obtained from the Health Research Ethics Committee of UNISA Yogyakarta (Ref No.4601/KEP-UNISA/VI/2025); all participants gave written informed consent.
Results: The primary outcome was the identification of fathers' educational needs during the maternal-perinatal period. Four themes emerged from data analysis and revealed; limited access to practical; father-focused learning resources; cultural barriers due to patriarchal norms; and a strong preference for interactive and technology-based media such as mobile applications, simulations, and audiovisual content
Conclusion: This study underscores the need for father-focused, context-specific educational media. Findings suggest incorporating mobile-based modules featuring short videos, simulations, gamified content, and blended online-offline practice. Such designs can possibly strengthen paternal confidence and engagement, enhancing maternal well-being and infant outcomes while informing innovative perinatal health promotion strategies in similar contexts.

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INTRODUCTION

The maternal-perinatal period, encompassing pregnancy, childbirth, and the immediate postnatal phase, is a critical window that significantly determines the health and well-being of both mother and child (1). This stage is not only important for reducing maternal and neonatal morbidity and mortality but also essential for establishing the foundation of long-term child development (2). According to the World Health Organization (WHO), approximately 287,000 women worldwide died from pregnancy-related causes in 2020, with the vast majority of these deaths occurring in low- and middle-income countries (3). Similarly, neonatal mortality remains a global challenge, with 2.4 million newborns dying within the first 28 days of life in 2021, translating to about 6,700 deaths per day (4).

In Indonesia, maternal and neonatal health indicators remain a significant public health concern. The Maternal Mortality Ratio (MMR) in Indonesia is estimated at 189 deaths per 100,000 live births, one of the highest in Southeast Asia according to Statistics Indonesian (5). Meanwhile, the Neonatal Mortality Rate (NMR) stands at 15 deaths per 1,000 live births (6). Yogyakarta, despite being recognized as one of the provinces with relatively better health infrastructure, continues to report challenges in achieving maternal and neonatal health targets (7). Regional reports indicate that preventable causes, such as inadequate prenatal care, delayed decision-making, and insufficient family involvement, particularly from fathers, contribute significantly to these outcomes (7).

Traditionally, maternal health has been framed almost exclusively as the responsibility of women, while fathers' roles have often been marginalized or overlooked (8). However, an increasing body of evidence demonstrates that paternal involvement during the maternal-perinatal period has substantial benefits (9). Fathers who actively engage in pregnancy, childbirth, and newborn care positively influence maternal health behaviors, breastfeeding practices, and child developmental outcomes (10). Moreover, studies have shown that when fathers participate in prenatal visits and are educated about perinatal health, there is an associated increase in antenatal care compliance, reduced maternal stress, and improved neonatal outcomes (11).

Despite these documented benefits, paternal engagement in maternal-perinatal care remains limited in Indonesia (12). Social and cultural norms, deeply rooted in patriarchal structures, often position fathers primarily as financial providers, while caregiving and maternal health responsibilities are relegated to women (13). This cultural orientation contributes to limited awareness among fathers about their potential roles, compounded by a lack of accessible educational resources tailored specifically for men (14). Furthermore, healthcare services, such as antenatal classes or counselling sessions, are often designed with a maternal-centric approach, unintentionally excluding fathers from the learning process (15).

A significant barrier is the lack of effective and engaging educational media that speaks directly to fathers' needs and contexts (16). Existing health education materials are commonly delivered through conventional methods pamphlets, lectures, or static booklets that fail to capture the attention of younger generations accustomed to digital and interactive forms of learning (17). In addition, time constraints and occupational commitments often hinder fathers from attending face-to-face sessions at health facilities (18). This underscores the importance of exploring innovative approaches, such as interactive digital media, that can provide flexible, accessible, and engaging platforms for paternal education (19).

Globally, the use of interactive educational media in health promotion has shown promising results (20). Mobile health (mHealth) applications, gamified educational tools, and interactive audiovisual content have been found to improve health literacy, engagement, and behavioral outcomes (21). For instance, interactive applications for pregnancy tracking and newborn care have successfully increased paternal knowledge and involvement in several studies conducted in high-income settings (22). However, adaptation to the Indonesian sociocultural context, particularly in Yogyakarta, remains largely unexplored.

The integration of interactive educational media into paternal health education also aligns with broader digital transformation trends in Indonesia (23). As of 2020, more than 210 million Indonesians are active internet users, with mobile phones serving as the primary mode of access (24). This digital penetration creates a unique opportunity to leverage interactive platforms for health promotion, especially among fathers who may be more responsive to technology-based interventions. Nevertheless, the effectiveness of such interventions is contingent on a thorough understanding of local needs, cultural considerations, and user preferences (25).

Despite the importance of these evidence, empirical studies focusing specifically on fathers in Yogyakarta are limited. While several programs have targeted maternal health education, few have systematically assessed the

perspectives and needs of fathers regarding interactive educational media. This gap in the literature highlights the urgency of conducting localized research that not only documents fathers' barriers and preferences but also informs culturally appropriate strategies for fostering their involvement.

The significance of optimizing paternal involvement cannot be overstated (9). Fathers play a crucial role not only in supporting maternal health but also in shaping the emotional and developmental environment of the child (11,26,27). Enhanced paternal knowledge and engagement contribute to stronger family resilience, improved maternal mental health, and healthier child outcomes (18). In the long term, these benefits extend beyond individual families, contributing to broader public health gains and the achievement of Sustainable Development Goals (SDGs), particularly SDG 3: Good Health and Well-being and SDG 5: Gender Equality.

Given this background, there is a compelling need to investigate the requirements and preferences of fathers in Yogyakarta regarding interactive educational media. By systematically identifying these needs, this study aimed to provide a foundation for developing innovative, context-specific educational interventions that can enhance paternal involvement during the maternal-perinatal period.

METHOD

To address the study objectives, a qualitative approach was employed to gain an in-depth understanding of fathers' educational needs during the maternal-perinatal period. This design enabled the exploration of personal experiences, cultural influences, and professional perspectives that may not be captured through quantitative measures. The following subsections describe the research type, participants, study setting, instruments, data collection procedures, and ethical considerations. Below are the components of the methodology:

Research Type

This study adopted a generic qualitative design to explore the educational needs of fathers during the maternal-perinatal period. A qualitative approach was deemed appropriate to capture participants' lived experiences, perceptions, and preferences in depth (28). The selection of a generic qualitative design was deliberate, as the study aimed to explore diverse perspectives and practical needs rather than to build substantive theory (as in grounded theory) (29) or to capture lived existential meanings (as in phenomenology) (30). This flexible approach allowed the integration of views from fathers, mothers, and midwives, producing contextually rich insights that could inform intervention design. By prioritizing breadth of themes over theory generation or phenomenological depth, the chosen design ensured methodological appropriateness, conceptual coherence, and practical utility for developing father-inclusive educational strategies in Indonesian contexts. Data were analyzed thematically to identify recurrent patterns and emerging insights, using Braun and Clark approach (31).

Population and Sample/Participants

The study population comprised three groups of informants: expectant fathers, expectant mothers, and midwives providing maternal-perinatal care. A total of six midwives, ten expectant fathers, and ten expectant mothers participated. Participants were selected using purposive sampling, a strategy chosen to ensure diversity of perspectives across socioeconomic, educational, and cultural backgrounds. Expectant fathers and mothers were recruited through referrals from midwives at public health centers in Yogyakarta. Midwives were identified based on their direct involvement in antenatal and perinatal care services. Eligibility criteria included being married and first time pregnancy (for expectant fathers and mothers), willingness to participate in interviews, and ability to provide informed consent. For midwives, inclusion required at least two years of professional experience in maternal-perinatal care. Recruitment was facilitated by midwives, who provided initial introductions to families during routine antenatal visits. Potential participants were then approached directly by the research team, provided with detailed study information, and invited to join the study.

Research Location

Data collection was conducted between July and August 2025 across several public health centers in Yogyakarta, Indonesia, chosen to represent typical community-level maternal-perinatal services where paternal engagement interventions may be integrated.

Instrumentation

Two primary instruments were employed in this study: a semi-structured interview guide for expectant fathers and mothers, and a focus group discussion (FGD) guide for midwives. Both instruments were developed based on a review of existing literature on paternal involvement in maternal-perinatal care and refined through expert consultation with maternal health specialists and qualitative researchers. To enhance the rigour of the study (32), the instruments underwent a pilot test with two expectant fathers and one midwife who were not part of the final sample. The piloting process assessed the clarity, cultural appropriateness, and relevance of questions, as well as the feasibility of data collection procedures (33). Feedback from the pilot was used to revise the wording of questions, adjust the sequence of topics, and ensure that the guides encouraged open and detailed responses. The final instruments consisted of open-ended questions designed to explore participants' knowledge, experiences, perceived barriers, and preferences regarding father-focused educational media. Probing questions were included to elicit richer descriptions and to allow participants to clarify or expand their views.

Data Collection Procedures

Data collection was conducted by employing In-depth interviews with expectant fathers and mothers were carried out in private rooms within the health centers to ensure confidentiality, comfort, and minimal disturbance. A total of 20 in-depth interviews were conducted individually with 10 expectant fathers and 10 expectant mothers, while one focus group discussion (FGD) was held with six midwives. Each session lasted approximately 45–60 minutes and was guided by a semi-structured protocol, allowing participants to elaborate on issues of importance to them. In contrast, FGD with midwives were conducted online via Zoom to accommodate scheduling constraints and geographical dispersion. Each FGD lasted around 90 minutes and was facilitated by the principal investigator, and other researchers acting as note-taker and technical support. All interviews and discussions were conducted in Bahasa Indonesia, audio-recorded with participant consent, and supplemented by field notes to capture contextual observations. Data collection continued until thematic saturation was reached, confirmed when no new codes or themes emerged during the final interviews.

Data Analysis

Data were analyzed using thematic analysis following Braun and Clarke's six-step framework (31). This approach was chosen for its flexibility in identifying, analyzing, and reporting patterns across qualitative data. The process involved: (a) familiarization with the data through repeated reading of transcripts; (b) generation of initial codes inductively from meaningful text segments; (c) searching for themes by collating codes into potential categories; (d) reviewing and refining themes against the dataset; (e) defining and naming themes to capture their essence; and (f) producing the final report with supporting extracts. All verbatim transcripts from interviews and focus group discussions were imported into NVivo 12 Pro software, which was used to organize data systematically and support coding. A thematic map was constructed to illustrate relationships among codes and themes. The analysis was conducted iteratively, with codes and themes refined through team discussions to ensure accuracy and reduce researcher bias. Reflexive memo writing was applied throughout to document analytic decisions and provide transparency. Representative quotations were selected to illustrate key findings and to preserve the voices of participants. The trustworthiness of this study was ensured through multiple strategies (34), explained in Table 1.

Table 1: Rigour Aspect and Applied Strategies

Rigour Aspect	Applied Strategies
Credibility	Achieved through triangulation of data sources (fathers, mothers, and midwives) and regular peer debriefing sessions with qualitative research experts to validate coding and interpretation.
Dependability	Ensured by maintaining a clear audit trail, including coding frameworks, memos, and analytic decisions, allowing the research process to be traceable.
Confirmability	Enhanced through reflexivity, with researchers keeping reflective notes to acknowledge and minimize potential biases.
Transferability	Strengthened by providing thick descriptions of the research context, participant characteristics, and setting, enabling readers to assess the applicability of findings to similar contexts.

Ethical Approval

Ethical clearance was granted by the Health Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta (UNISA) (Ref: No.4601/KEP-UNISA/VI/2025). Written informed consent was obtained from all participants after providing information on the study's objectives, procedures, and confidentiality safeguards. Participation was voluntary, with the right to withdraw at any time respected.

RESULTS

A total of 26 participants were involved in this study, comprising 10 expectant fathers, 10 expectant mothers, and 6 midwives.

Characteristics of Participants

Participants represented diverse socioeconomic, educational, and occupational backgrounds, with fathers ranging from unskilled laborers to professionals, and mothers from homemakers to working women, that describe in Table 2:

Table 2. Characteristics of Expectant Fathers and Mothers

No	Participant	Age	Level of Education	Occupation
1	Expectant Father 1	25	High School	Seeking A Job
2	Expectant Mother 1	24	High School	Shopkeeper
3	Expectant Father 2	26	High School	Unskilled Labourer
4	Expectant Mother 2	21	High School	Shopkeeper
5	Expectant Father 3	27	Bachelor degree	Programmer
6	Expectant Mother 3	25	Diploma III	Government Employee
7	Expectant Father 4	20	High School	Package Courier
8	Expectant Mother 4	18	High School	Homemaker
9	Expectant Father 5	24	High School	Security
10	Expectant Mother 5	24	High School	Homemaker
11	Expectant Father 6	23	High School	Garage worker
12	Expectant Mother 6	19	High School	Homemaker
13	Expectant Father 7	19	High School	Shopkeeper
14	Expectant Mother 7	19	High School	Cashier in Convenience Store
15	Expectant Father 8	30	Bachelor Degree	Government Employee
16	Expectant Mother 8	28	Bachelor Degree	Government Employee
17	Expectant Father 9	20	High School	Unskilled Labourer
18	Expectant Mother 9	19	High School	Homemaker
19	Expectant Father 10	24	High School	Unskilled Labourer
20	Expectant Mother 10	23	High School	Homemaker

Source: Primary Data

Midwives had between 2 and 30 years of professional experience in maternal-perinatal care, providing a broad perspective on both community and clinical contexts.

Table 3. Characteristics of Midwives

No	Participant	Age	Year of Experience	Education
1	Midwife 1	45	24 years	Diplom 4
2	Midwife 2	38	17 years	Diplom 3
3	Midwife 3	50	29 years	Diplom 4
4	Midwife 4	35	13 years	Diplom 3
5	Midwife 5	25	2 years	Diplom 4
6	Midwife 6	32	10 years	Diplom 3

Source: Primary Data

Themes

Thematic analysis following Braun and Clarke's approach generated four major themes reflecting fathers' educational needs and preferences during the maternal-perinatal period: (a) Limited access to father-focused learning resources; (b) Cultural barriers shaped by patriarchal norms; (c) Fathers' desire for practical, hands-on knowledge; and (d) Strong preference for interactive and technology-based media. These themes highlight both structural and cultural constraints on paternal involvement, as well as opportunities to enhance engagement through innovative educational strategies. Diagram 1 describes the themes emerged from the study.

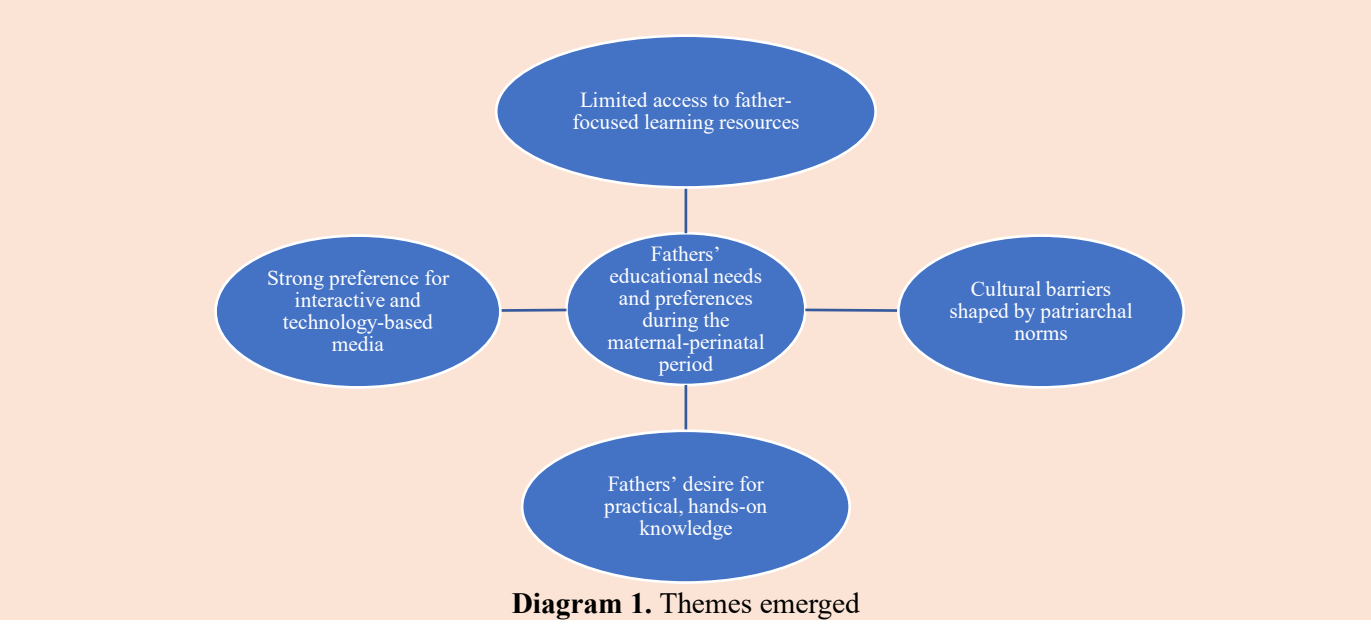

Diagram 1. Themes emerged

Theme 1: Limited access to father-focused learning resources

The greatest obstacle in providing education to expectant fathers lies in the limitations of resources and structural support. One midwife stated, *"In our facility, there is a budget for premarital education classes. However, it is only held about three times a year, while the number of participants is far greater, so it actually cannot cover everyone." (Midwife 4).* This quotation illustrates that although educational programs have been planned, their implementation remains limited due to insufficient budget allocation. As a result, access to formal education for expectant fathers is low, leaving many of them without adequate knowledge and preparation.

In addition, cultural factors play a significant role. The persistence of patriarchal norms in society often positions men's involvement in parenting preparation as secondary. This is reflected in the statements, *"There is still a patriarchal culture here" (Expectant Mother 1)* and *"It's the mother's task, the mother's duty, that's how it is (patriarchy)." (Expectant Father2).* Such views reinforce the belief that childcare is exclusively the mother's responsibility, while fathers are expected only to provide financially. This cultural perspective widens the gap between fathers and their engagement in maternal health education.

Other barriers also arise from limited human resources and facilities. As one informant explained, *"Since we don't have a psychologist, the general health screening will later be conducted by a general practitioner." (Midwife 1).* This indicates that a shortage of professional staff restricts the provision of psychosocial education specifically for fathers, even though psychological preparation is an essential component in helping them transition into their new role.

Another challenge is the lack of awareness and motivation among expectant fathers to participate in educational programs. A health worker reported, *"At Puskesmas (Public Health Centre), we once planned to hold a class for pregnant mothers along with their partners, but in reality, only three women came accompanied by their husbands….." (Midwife 6).* A similar sentiment was expressed in the statement, *"Most men feel they don't need to join the class; they leave it up to their wives."* (Expectant Mother 6). These findings highlight that even when

opportunities are available, expectant fathers often lack interest, resulting in minimal participation and a limited role in the preparation process.

Work obligations also serve as a major hindrance. Expectant fathers, who generally work full-time, find it difficult to allocate time to attend educational programs. This is reflected in the remark, *"Usually the reason is work, so indeed fathers' involvement has not been optimal due to time constraints."* (Midwife 3). Consequently, most of the educational focus is directed toward mothers, as fathers are frequently absent.

The final barrier relates to the educational media currently in use. Available materials are still dominated by written formats such as brochures and posters, which are considered unattractive. One participant shared, *"Perhaps for educational media, in the form of reading materials it is less effective. They prefer videos….." (Midwife 5).* Another added, *"Brochures or posters are usually just skimmed over and not really paid attention to….." (Expectant Father 8).* These statements suggest that fathers prefer more interactive and visual media, such as videos, which are perceived as easier to understand and more relevant to their daily lives.

Overall, the barriers faced by expectant fathers in accessing parental preparation education are multidimensional, ranging from budget constraints, patriarchal cultural norms, limited professional staff, low motivation, and work-related time constraints, to the mismatch between available educational media and fathers' preferences. These barriers are interrelated and contribute to the limited involvement of fathers in prenatal education, highlighting the need for more creative and inclusive approaches to improve their participation.

Theme 2: The Needs of Expectant Fathers During the Maternal–Perinatal Period

The needs of expectant fathers during the maternal-perinatal period are multifaceted, encompassing access to information, emotional readiness, financial stability, and practical skills in childcare. One of the primary concerns expressed by participants was the limited access to information and counseling tailored specifically for fathers. As one participant stated, *"There was no counseling from the Office of Religious Affairs (KUA), and there has not been any provided here either…"(Expectant Father 7)* while another noted, *"No, ma'am, I never joined any training or seminars about pregnancy, childbirth, or childcare." (Expectant Father 10).* The absence of such programs restricts fathers' opportunities to acquire accurate knowledge about their roles during pregnancy and childbirth.

Beyond access to information, emotional and psychological support emerged as a critical need. Several participants highlighted the importance of paternal involvement in maintaining the mother's emotional stability. One informant stated, *"My husband is very supportive… he even helps with sunbathing the baby. So, he helps a lot."* (Expectant Mother 8). In contrast, others reported a lack of such support, often due to work obligations: *"Perhaps in terms of moral support, emotional support for the mother… when we explored further, it turned out the husband's support was lacking because he was at work…." (Midwife 2).* These accounts suggest that fathers require not only emotional reinforcement to build their own confidence in a new role, but also the capacity to provide reassurance and psychological support to their partners. Without such involvement, mothers may be more vulnerable to postpartum psychological distress, including baby blues or depression.

Fathers also expressed a need for practical education on pregnancy and childbirth. Many admitted that they had not given much thought to these issues, as reflected in the statement, *"I have not thought about it yet, ma'am (information about pregnancy, childbirth, postpartum care, and raising a baby)…." (Expectant Father 1).* Yet simultaneously, they acknowledged the importance of practical guidance, *"I think it is very important to know how to calm my wife during contractions, how to care for a newborn, and what the mother can and cannot do after giving birth." (Expectant Father 5).* These accounts highlight the demand for knowledge that is directly applicable to real-life situations in supporting their partners during labor and caring for their newborns.

The need for knowledge about maternal and infant health was also strongly emphasized. Informants expressed their desire to learn about physiological changes during pregnancy, nutrition, safe exercises, warning signs, and infant development. For example, one father stated, *"Yes, ma'am, it is important to know about the changes related to health, such as how pregnant women can exercise….."* (Expectant Father 8), while another added, *"That is important, ma'am (understanding infant development and danger signs)."* (Expectant Father 1). Such insights indicate that fathers perceive health literacy as essential for ensuring maternal well-being and safeguarding infant development.

Financial readiness was another dimension repeatedly emphasized by participants. Many fathers positioned financial security as a prerequisite for their preparedness to assume parental roles. As one participant explained, *"I feel ready. The main aspect of readiness is financial security. Thank God, it is safe for my wife and baby during delivery, and also for the future. I have already prepared savings for this…."* (Expectant Father 4), while another succinctly stated, *"Preparation, of course, means money…."* (Expectant Mother 3). These accounts reveal how strongly fathers equate financial stability with responsible fatherhood and family security.

In addition, participants articulated the importance of gaining childcare skills and hands-on parenting knowledge. One informant noted, *"Yes, ma'am, I need information about childcare and the father's role…."* (Expectant Mother 4), while another emphasized, *"It is very necessary, ma'am (skills such as bathing the baby or changing diapers)….."* (Expectant Father 10). These statements underscore fathers' desire for tangible, practical training that allows them to play an active role in daily childcare routines, moving beyond traditional notions of fathers as merely financial providers.

Finally, the accounts also highlighted the importance of conflict management within marriage during the perinatal period. One participant reflected, *"In my opinion, it is all about mental readiness and managing the conflict between her and myself…." (Expectant Father 1).* This remark referred not only to the challenges of parenthood but also to the ability to manage relational stress within marriage. Supportive behaviors such as sharing domestic tasks*"My husband is very supportive…. So, he helps a lot…"* (Expectant Mother 9) were seen as strategies to minimize conflict. However, work-related absences often emerged as potential sources of tension, as one participant stated, *"Perhaps in terms of moral support, emotional support for the mother… when we explored further, it turned out the husband's support was lacking because he was at work."* (Midwife 1). These narratives demonstrate that fathers need education not only in medical and childcare domains but also in communication, role-sharing, and conflict management to foster a harmonious family environment.

Taken together, the findings illustrate that the needs of expectant fathers during the maternal-perinatal period are multidimensional. Fathers require adequate access to information and counseling, emotional and psychological reinforcement, practical knowledge about pregnancy and childbirth, and guidance in maternal and infant health. They also emphasize financial preparedness, hands-on childcare skills, and the ability to manage marital conflicts constructively. Addressing these diverse needs is essential to strengthen fathers' readiness, foster supportive partnerships, and ultimately enhance maternal well-being and infant development.

Theme 3: Knowledge and Experiences of Expectant Fathers During the Maternal–Perinatal Period

Although some expectant fathers had participated in premarital preparation programs at the Office of Religious Affairs (KUA) or received educational sessions from midwives, such experiences did not necessarily translate into confidence in assuming their paternal roles. Several participants emphasized that the education provided was often too general and insufficiently addressed the technical or psychological aspects they required. As one father stated, *"At the KUA, there was premarital preparation, but it was more about the requirements for a valid marriage and religious rituals, not about what to do when my wife is pregnant….."* (Expectant Father 7). Another added, *"During antenatal checkups the midwife did give some information, but it was mostly directed to my wife. I listened, but I would still feel confused if I had to put it into practice…."(Expectant Father 10).*

This illustrates that while formal educational access was available, the content remained inadequately applicable for fathers. Much of the material focused primarily on religious aspects or maternal health, positioning fathers as passive listeners rather than active participants. As a result, many continued to feel hesitant and lacked confidence in engaging actively during the perinatal period. One young father further reflected, *"The midwife did tell me about how to take care of my wife, but if my wife gets sick or the baby cries, I am still confused about what to do….."(Expectant Father 6)* Such accounts underscore that limited hands-on experience and insufficiently tailored education for fathers left them unprepared, despite having received formal guidance.

For many others, knowledge and experience concerning maternal-perinatal issues remained strikingly limited. The majority of expectant fathers admitted that they had never accessed information specifically about pregnancy, childbirth, or parenting. This was reflected in statements such as, *"Not at all, ma'am (I have never accessed information about pregnancy, childbirth, or parenting)….." (Expectant father 2)* and, *"I have not thought about it (information about pregnancy, childbirth, postpartum, and childcare)." (Expectant Father 9).* These remarks

underscore the low level of reproductive health literacy and limited awareness of paternal roles, leaving fathers inadequately prepared to support their wives or care for their children.

Such limitations led many fathers to rely on informal sources of information from their social environment. Some acknowledged that their knowledge of pregnancy and childcare came primarily from family or friends, as one informant noted, *"Mostly, I just hear from friends or family (about pregnancy and childcare)…." (Expectant Father 3).* Rather than accessing professional or scientifically validated sources, fathers tended to absorb anecdotal accounts from those around them. While such sources may provide general insights, they are prone to bias and may not align with medical guidelines, thereby risking misconceptions in childcare practices and maternal support.

The lack of reliable knowledge also translated into uncertainty and confusion about their roles. This confusion was clearly articulated in statements such as, *"I am still confused, ma'am. I haven't really thought about my responsibilities toward the child,"* (Expectant Father 10) and, *"I am confused because I haven't thought about what it will be like to have a child in the future."* (Expectant Father 2). These admissions reveal that many expectant fathers lacked a concrete vision of what would be required of them after their child was born, both in terms of caregiving responsibilities and broader family involvement. Such uncertainty reflects a significant gap in reproductive health literacy and highlights the insufficient preparation of fathers for their roles beginning in the prenatal period.

In sum, the findings demonstrate that while some educational opportunities exist, such as premarital programs at the Office of Religious Affairs (KUA) and information provided by midwives, these remain insufficient to foster confidence among expectant fathers. Most fathers continue to possess limited knowledge, often relying on informal and potentially unreliable sources, which fosters uncertainty and confusion about their paternal responsibilities. Addressing this knowledge gap through more targeted, practical, and father-inclusive educational strategies is crucial for enhancing paternal preparedness and promoting shared responsibility in maternal and child health.

Theme 4: Educational Media and Methods

The preferred media and methods of education among expectant fathers are strongly influenced by their daily habits of accessing information. Most fathers expressed a preference for digital media, primarily due to its accessibility through mobile phones. This was illustrated in the statements, *"Perhaps because they always have their phones with them, the educational media should also be based on that… they prefer videos…." (Midwife 3),* and *"Through social media, yes, I would be interested to join……" (Expectant Father 4).* Such quotations highlight those concise, visual, and easily accessible educational formats, such as videos or social media content are more appealing compared to conventional reading materials, which are often perceived as monotonous. A similar perspective was voiced by one wife, who remarked, *"My husband prefers it if the material is in the form of short videos, so he does not get confused and can understand more easily…."* (Expectant Mother 4). This emphasizes the relevance of digital media in formats that are both practical and user-friendly for fathers.

Beyond digital formats, fathers also underscored the importance of enjoyable and interactive learning methods, particularly through educational games conducted either online or offline. As participants noted, *"It feels more like preparation for childcare. For example, playing a game where you pretend to bath the baby…" (Expectant Father 1),* and *"If there were some kind of game, it would be better, not boring. It feels like playing but you also learn…." (Expectant Father 8).* These accounts demonstrate the demand for role-play or simulation-based learning approaches that are both engaging and practical.

Moreover, blended learning combining online delivery with direct practice was considered more effective by participants. One father explained, *"Maybe if there is an online session first, then followed by direct practice, it would be easier to understand…"(Expectant Father 6),* while another highlighted the importance of peer forums, *"It would be necessary for young fathers to gather and share experiences…" (Expectant father 2).* Such accounts reinforce that integrating flexible digital tools with experiential learning opportunities can strengthen both understanding and active participation among fathers.

Equally important is the style of educational delivery. Fathers expressed greater receptivity to information when it was conveyed in a relaxed and relatable manner. One informant stated, *"Perhaps if the information is delivered in a more relaxed way, more easy-going, maybe with some humor added…." (Expectant Father 3).* This indicates that when educational content is presented in a light-hearted, conversational style, fathers are more open and comfortable in receiving it.

Overall, the findings suggest that expectant fathers seek educational approaches that are accessible, interactive, enjoyable, and applicable to their daily lives. Digital media such as videos and social media platforms are considered effective in reaching them, while educational games, role-play simulations, and peer-sharing forums add further value. A blended model combining online sessions with face-to-face practice, delivered in a relaxed and relatable manner, is perceived as particularly effective in enhancing motivation, comprehension, and paternal engagement during the maternal-perinatal period. The summary of a summary table of themes, subthemes, and illustrative quotations can be seen in Table 4.

Table 4. Themes, Subthemes and Illustrative Quotes

Theme	Subthemes	Illustrative Quotations
1. Limited access to father-focused learning resources	Budget and structural constraints	"In our facility, there is a budget for premarital education classes. However, it is only held about three times a year, while the number of participants is far greater, so it actually cannot cover everyone." (Midwife 4)
	Patriarchal cultural norms	"There is still a patriarchal culture here." (Expectant Mother 1) / "It's the mother's task, the mother's duty, that's how it is (patriarchy)." (Expectant Father 2)
	Limited professional staff	"Since we don't have a psychologist, the general health screening will later be conducted by a general practitioner." (Midwife 1)
	Low motivation and awareness	"At Puskesmas… only three women came accompanied by their husbands….." (Midwife 6) / "Most men feel they don't need to join the class; they leave it up to their wives." (Expectant Mother 6)
	Work-related time constraints	"Usually the reason is work, so indeed fathers' involvement has not been optimal due to time constraints." (Midwife 3)
	Unattractive educational media	"Perhaps for educational media, in the form of reading materials it is less effective. They prefer videos….." (Midwife 5) / "Brochures or posters are usually just skimmed over and not really paid attention to….." (Expectant Father 8)
2. The needs of expectant fathers during the maternal-perinatal period	Access to information and counseling	"There was no counseling from the Office of Religious Affairs (KUA), and there has not been any provided here either…" (Expectant Father 7) / "No, ma'am, I never joined any training or seminars about pregnancy, childbirth, or childcare." (Expectant Father 10)
	Emotional and psychological support	"My husband is very supportive… he even helps with sunbathing the baby." (Expectant Mother 8) / "Husband's support was lacking because he was at work…." (Midwife 2)
	Practical knowledge on childbirth and childcare Maternal and infant health literacy	"I think it is very important to know how to calm my wife during contractions, how to care for a newborn, and what the mother can and cannot do after giving birth." (Expectant Father 5) "Yes, ma'am, it is important to know about the changes related to health, such as how pregnant women can exercise….." (Expectant Father 8)
	Financial readiness	"The main aspect of readiness is financial security. Thank God, it is safe for my wife and baby during delivery, and also for the future." (Expectant Father 4)
	Hands-on parenting skills	"It is very necessary, ma'am (skills such as bathing the baby or changing diapers)….." (Expectant Father 10)
	Marital conflict management	"In my opinion, it is all about mental readiness and managing the conflict between her and myself…." (Expectant Father 1)
3. Knowledge and experiences of expectant fathers during the maternal–perinatal period	Formal education insufficient or misdirected	"At the KUA, there was premarital preparation, but it was more about the requirements for a valid marriage and religious rituals, not about what to do when my wife is pregnant….." (Expectant Father 7)

Theme	Subthemes	Illustrative Quotations
	Passive role in maternal care education	"During antenatal checkups the midwife did give some information, but it was mostly directed to my wife. I listened, but I would still feel confused if I had to put it into practice…." (Expectant Father 10)
	Limited knowledge and low literacy	"Not at all, ma'am (I have never accessed information about pregnancy, childbirth, or parenting)….." (Expectant Father 2)
	Reliance on informal sources	"Mostly, I just hear from friends or family (about pregnancy and childcare)…." (Expectant Father 3)
	Uncertainty and confusion about paternal roles	"I am still confused, ma'am. I haven't really thought about my responsibilities toward the child." (Expectant Father 10)
4. Educational media and methods	Preference for digital and mobile-based media	"Perhaps because they always have their phones with them, the educational media should also be based on that… they prefer videos…." (Midwife 3)
	Interest in interactive and game-based learning	"If there were some kind of game, it would be better, not boring. It feels like playing but you also learn…." (Expectant Father 8)
	Blended learning: online and practice	"Maybe if there is an online session first, then followed by direct practice, it would be easier to understand…" (Expectant Father 6)
	Peer learning and sharing experiences	"It would be necessary for young fathers to gather and share experiences…" (Expectant Father 2)
	Relaxed and relatable delivery style	"Perhaps if the information is delivered in a more relaxed way, more easy-going, maybe with some humor added…." (Expectant Father 3)

Source: Primary Data

DISCUSSION

This study can be meaningfully interpreted through Bandura's Social Cognitive Theory (SCT) (35), which emphasizes that human learning is shaped by the reciprocal interaction of personal, behavioral, and environmental factors. In the context of fatherhood during the maternal-perinatal period, expectant fathers' self-efficacy, observational learning, and perceived outcome expectancies influence their readiness to engage in childcare and support their partners (36). SCT suggests that confidence to act rather than knowledge alone is a key driver of behavior, and that modeling, reinforcement, and accessible role-relevant resources are necessary to transform abstract information into concrete action (37). The transition-to-parenthood framework further complements this lens by conceptualizing fatherhood as a developmental role acquisition process, in which men navigate shifting identities, relational expectations, and competencies. Both theoretical perspectives help to situate the current findings: fathers were not passive bystanders but individuals negotiating cultural scripts, structural barriers, and personal uncertainties in their efforts to embody a new paternal role.

The first theme, limited access to father-focused learning resources, underscores how structural conditions constrain the development of paternal self-efficacy. Fathers reported infrequent opportunities for targeted education, and midwives highlighted resource limitations that forced educational content to remain general and mother-centered. In SCT terms, the absence of accessible role models and structured opportunities for vicarious learning reduced fathers' ability to visualize themselves as competent caregivers. Prior studies have shown that paternal self-efficacy is enhanced when fathers are directly engaged in antenatal classes, offered scenarios for practice, and exposed to relatable role models (38). Conversely, when services marginalize fathers, men are left to rely on informal and sometimes unreliable sources, reinforcing confusion and low engagement (8).

Closely intertwined with structural constraints are cultural barriers grounded in patriarchal norms. The persistence of beliefs that childrearing is exclusively a maternal duty positions fathers as financial providers rather than co-parents. From a theoretical standpoint, such normative expectations act as environmental determinants that led fathers' motivation to learn, reduce opportunities for modeling supportive behaviors, and perpetuate inequities in caregiving roles. Prior cross-cultural evidence supports these findings: in many contexts, fathers' involvement in perinatal care is constrained not by unwillingness but by entrenched cultural narratives that define masculinity in

economic rather than nurturing terms (14,39). In this study, the cultural framing often led fathers to express uncertainty or even surprise at the notion that they should acquire hands-on skills for supporting their wives and infants. Addressing these barriers requires interventions that not only provide knowledge but also reframe paternal roles as legitimate and valued.

At the same time, fathers in this study articulated a strong desire for practical, hands-on knowledge. They sought concrete instructions on calming wives during contractions, identifying postpartum warning signs, and mastering baby care tasks such as bathing and diaper changing. Such findings resonate with SCT's principle that mastery experiences are the most powerful source of self-efficacy (40). Fathers did not simply want abstract guidance; they wanted practice-based opportunities to enact caregiving behaviors. This echoes evidence from intervention studies showing that fathers who engage in role-play or simulation during antenatal education report higher confidence, lower anxiety, and greater postnatal involvement (38,41,42). Yet participants frequently described a gap between being told what to do and knowing how to act in real-life scenarios, highlighting a disjuncture between current educational offerings and fathers' actual learning needs.

The role of financial readiness also emerged as a salient dimension of paternal preparedness. Many fathers equated responsible fatherhood with securing financial stability, framing material provision as the core marker of readiness. This finding reflects broader sociocultural scripts of masculinity but also underscores how structural economic pressures intersect with paternal roles (43). From a theoretical perspective, these outcome expectancies may simultaneously motivate and constrain fathers: while the sense of being a provider fosters responsibility, it can also overshadow other caregiving dimensions and justify absenteeism from educational sessions due to work obligations. Prior literature confirms that when fathers face economic precarity or long work hours, engagement in antenatal programs declines (14), even though paternal involvement in caregiving has independent benefits for maternal and infant well-being. Thus, paternal education must recognize and accommodate work-related constraints while simultaneously expanding men's understanding of fatherhood beyond the economic domain.

Another notable finding is the lack of confidence among fathers despite prior exposure to educational materials, such as premarital programs at the Office of Religious Affairs or information from midwives. This indicates that information alone is insufficient without contextually relevant, participatory, and father-focused delivery. SCT helps to explain this: observational learning and reinforcement are required for information to translate into action. Fathers in this study often felt like passive bystanders in sessions directed primarily at mothers. As a result, they lacked the opportunity to practice skills or receive direct feedback, which eroded their confidence. This is consistent with studies demonstrating that fathers benefit most from interactive and participatory learning formats rather than didactic approaches (44).

Equally significant is fathers' preference for digital and interactive educational media. The popularity of mobile phones and social media in daily life positioned these platforms as natural avenues for perinatal education. Fathers expressed enthusiasm for short videos, interactive games, and blended learning that combined online materials with practical face-to-face sessions. This preference aligns with a growing body of evidence showing that digital interventions can extend the reach of perinatal education, enhance flexibility, and improve engagement among fathers (45). Gamified and simulation-based learning were perceived as particularly effective (46), because they transformed education into an enjoyable, relatable experience rather than a burdensome obligation (47). From an SCT lens, such methods provide both vicarious learning (observing role models in video content) and mastery experiences (practicing through simulations), thereby strengthening self-efficacy.

Finally, fathers emphasized the importance of delivery style, preferring information that was relaxed, conversational, and relatable to daily life. This resonates with prior studies indicating that rigid or overly formal approaches can alienate fathers, while humor and relatability foster openness and retention (48). Education that is culturally sensitive, emotionally attuned, and responsive to fathers' lived realities can reshape paternal identities in constructive ways.

The themes identified were explicitly translated into design implications. Limited access to father-focused resources indicates the necessity of digital platforms; patriarchal barriers highlight culturally sensitive strategies; desire for practical knowledge supports simulation-based modules; and preference for interactive media confirms blended gamified learning as an innovative approach to enhance paternal engagement.

Taken together, these findings underscore that expectant fathers are not disinterested but underserved. Structural deficits, cultural scripts, and unresponsive educational modalities suppress their involvement, yet when given opportunities for interactive, practical, and accessible learning, fathers express enthusiasm and clear readiness to engage. By situating these findings within Social Cognitive Theory, it becomes evident that fathers' involvement hinges on enhancing self-efficacy through mastery experiences, modeling supportive behaviors, and restructuring environmental constraints.

In translating these findings into programmatic design within the Yogyakarta context, future interventions should incorporate modalities such as microlearning and peer education. Microlearning strategies, delivered through concise mobile-based video modules, interactive quizzes, or chat-based prompts, can accommodate fathers' occupational time constraints while reinforcing self-efficacy through incremental and accessible learning. Peer education models, meanwhile, may serve to counteract cultural and motivational barriers by fostering supportive networks in which fathers exchange experiences, observe role models, and collectively reframe paternal involvement as a valued and normative practice. When systematically integrated into community health services, these approaches not only align with fathers' expressed preferences for interactive, technology-driven education but also enhance cultural appropriateness and sustainability by leveraging existing social structures in Yogyakarta

Interpretation of Key Findings

The key findings of this study reveal that expectant fathers face structural and cultural barriers that limit their involvement in perinatal education, yet they demonstrate strong motivation when learning opportunities are accessible and relevant. Limited resources, patriarchal norms, and work obligations restrict participation, while existing education often positions fathers as passive observers. Despite this, fathers expressed clear needs for practical, hands-on skills in newborn care, maternal support, and conflict management, alongside financial readiness as a marker of responsibility. They preferred short videos, interactive games, and blended online–offline learning delivered in a relaxed and relatable manner. Collectively, these findings highlight the urgent need for father-focused, engaging, and inclusive educational models to enhance paternal preparedness and involvement.

Comparison with Previous Studies

Our findings align with previous studies showing that paternal involvement in perinatal education is often constrained by structural and cultural barriers. Similar to evidence that fathers in our study reported limited access to father-specific resources and perceived childcare as primarily the mother's role, reflecting entrenched patriarchal norms (14,49). Additionally, fathers sought practical, hands-on knowledge to build confidence, highlighting the importance of skill-based learning (16,18). Echoing recent digital intervention reviews (50), participants preferred short videos, interactive games, and blended formats, underscoring a global trend toward technology-driven, engaging educational methods tailored to fathers' lifestyles and learning preferences. Unlike some prior studies that focused mainly on barriers, our findings highlight fathers' proactive enthusiasm for digital and game-based learning, suggesting a stronger openness to innovative educational strategies.

This study extends existing Low Middle Ccountries (LMICs) scholarship on father-inclusive interventions by demonstrating how paternal engagement can be reframed through culturally sensitive and technologically adaptive strategies. While previous LMIC research has predominantly emphasized barriers to men's participation, our findings highlight fathers' expressed readiness for practical, interactive, and gamified educational tools. By aligning thematic insights with Social Cognitive Theory, we illustrate how self-efficacy, observational learning, and mastery experiences can be strengthened even in resource-constrained contexts. This contribution advances theoretical discourse beyond maternal compliance toward a more balanced, father-inclusive framework that enriches global discussions on equitable perinatal care

Limitations and Cautions

This study has several limitations that should be considered. First, the sample size was relatively small and drawn from a single cultural and geographic context, which may limit the transferability of findings to other populations. Second, reliance on self-reported data from interviews may have introduced social desirability bias, with participants potentially overstating their involvement or intentions. Third, the perspectives of healthcare providers

were limited to midwives, excluding other professionals who may influence paternal education. Finally, the qualitative design does not allow for causal inferences, and findings should be interpreted as exploratory insights rather than generalizable conclusions.

Although these limitations warrant caution, several strategies were undertaken to mitigate potential sources of bias. Interviewer neutrality was maintained by employing a semi-structured guide with open-ended questions, allowing participants to elaborate freely while minimizing the influence of researcher assumptions. Reflexive memo writing and peer debriefing were also applied to enhance consistency and reduce interpretive bias during analysis. Furthermore, participant confidentiality was ensured through anonymization of transcripts and secure data management, which fostered a safe environment for honest disclosure. These measures collectively strengthened the trustworthiness of the findings despite the inherent constraints of the qualitative design

Recommendations for Future Research

Future research should explore father-focused educational interventions using larger, more diverse samples across different cultural and socioeconomic contexts to enhance generalizability. Quantitative and mixed-methods designs are recommended to evaluate the effectiveness of innovative approaches such as digital modules, gamified learning, and blended online–offline formats in improving paternal knowledge, self-efficacy, and engagement. Longitudinal studies are also needed to examine how educational participation influences fathers' sustained involvement in childcare and maternal support over time. Additionally, future work should include perspectives from broader healthcare teams, such as psychologists, obstetricians, and community health workers to design more comprehensive, multidisciplinary paternal education models.

CONCLUSION

Expectant fathers in this study expressed clear and actionable needs: better access to father-oriented educational resources, practical caregiving skills, emotional and relational support, and interactive, technology-based learning approaches. Cultural and structural barriers remain, but the strong preference for blended, digital and gamified learning, combined with hands-on practice and peer support, offers a promising pathway to enhance paternal involvement. Designing paternal education programs with these features and embedding them systematically in perinatal care services could improve not only fathers' confidence and involvement but ultimately contribute to better maternal, infant, and family health outcomes.

AUTHOR'S CONTRIBUTION STATEMENT

Warsiti: conceived and designed the study, developed the research methodology, coordinated research administration. Andari Wuri Astuti: served as field coordinator, conducted data collection and analysis, and took primary responsibility for drafting and translating into English for the manuscript. Herlin Fitriani Kurniawati: managed research permits and ethical clearance, participated in data collection and analysis. Hari Akbar Sugiantoro collaborated in data collection and analysis, and was responsible for visualization, policy brief design, and supporting the preparation of publications. Kriska Afri Juliandari assisted in data collection and provided administrative support throughout the project. Sesaria Lukman contributed to field coordination, data collection and administrative tasks throughout the project.

CONFLICTS OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this manuscript.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the authors used Grammarly solely for the purpose of grammar and language editing. After using this tool, the authors reviewed and revised the content independently, and they take full responsibility for the integrity and accuracy of the manuscript's content.

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