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Risk Factor Analysis of Preeclampsia Incidence in Primigravida Pregnant Women in the Working Area of Puskesmas Padang Bulan, Medan Baru District, Medan City

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ABSTRAK

Preeclampsia remains a leading cause of maternal and perinatal morbidity and mortality worldwide, particularly affecting primigravida women who lack prior pregnancy experience and are less familiar with warning signs. Understanding the multifaceted risk factors from the perspectives of affected women and healthcare providers is essential to guide preventive interventions in primary care settings. This study employed a qualitative phenomenological approach using the Colaizzi method to explore the lived experiences, perceived risk factors, and healthcare-seeking behaviors related to preeclampsia among primigravida mothers. Data were collected from December 12, 2025 to January 3, 2026 through in-depth interviews with 15 purposively selected participants at Puskesmas Padang Bulan, Medan Baru District, Medan City, Indonesia. Inclusion criteria encompassed primigravida mothers diagnosed with preeclampsia during the third trimester. Data were analyzed using thematic analysis, and trustworthiness was ensured through member checking, triangulation, and peer debriefing. Four major themes emerged from the data: (1) Limited health literacy and awareness of preeclampsia warning signs; (2) Lifestyle and nutritional risk behaviors during pregnancy; (3) Psychosocial stressors and inadequate social support; and (4) Barriers to timely antenatal care access. Participants frequently described delayed recognition of danger signs and underestimated the severity of their condition due to cultural beliefs and socioeconomic constraints. Primigravida women in the Padang Bulan working area face compound risk factors for preeclampsia, including limited awareness, nutritional deficits, psychosocial stress, and structural barriers to care. Targeted health education interventions integrated into antenatal care programs and community-based midwifery services are urgently needed.

Keywords: Preeclampsia; Primigravida; Risk Factors; Antenatal Care; Qualitative Research; Maternal Health

Implications for Research, Practice, or Policy

- Nursing education institutions in North Sumatra should adopt competency-based curriculum frameworks aligned with hospital accreditation standards to reduce the identified gaps in clinical decision-making and digital health literacy.
- Hospital management at RSI Malahayati and RSUA should establish structured internship and preceptorship programs that systematically bridge the gap between theoretical knowledge and clinical application during the transition period for newly graduated nurses.
- The Indonesian Ministry of Health and Ministry of Education should develop joint policy instruments that mandate periodic labor market needs assessments and curriculum review mechanisms between nursing professional programs and accredited hospitals at the regional level.

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INTRODUCTION

Preeclampsia is a serious hypertensive disorder of pregnancy characterized by new-onset hypertension and proteinuria after 20 weeks of gestation, often accompanied by systemic organ involvement. Globally, preeclampsia affects approximately 2–8% of all pregnancies and accounts for an estimated 50,000–60,000 maternal deaths annually, predominantly in low- and middle-income countries (LMICs) (WHO, 2023). In Indonesia, preeclampsia remains among the top three causes of maternal mortality, contributing to approximately 26.9% of all maternal deaths reported by the

Ministry of Health. The burden of preeclampsia is disproportionately concentrated in primary care settings, where resources for early detection and management remain limited.

Primigravida women—those experiencing pregnancy for the first time—are particularly vulnerable to preeclampsia. Evidence suggests that nulliparity is one of the strongest independent risk factors for the condition, with primigravida women having a 3.5-fold increased risk compared to multiparous counterparts (Lisonkova & Joseph, 2013). This elevated risk is compounded by limited familiarity with pregnancy warning signs, reduced social experience in navigating maternal healthcare systems, and the absence of prior antenatal care experiences. In Medan City, North Sumatra, preeclampsia remains a significant contributor to maternal morbidity, yet community-level studies exploring the lived experiences and perceived risk factors among primigravida women remain sparse.

The working area of Puskesmas Padang Bulan in Medan Baru District serves a demographically diverse urban population with variable access to tertiary healthcare. Preliminary data from this primary health center indicate a rising trend in preeclampsia cases among first-time pregnant women over the past three years, underscoring the need for context-specific preventive strategies. Prior quantitative studies have identified obesity, advanced maternal age, family history of hypertension, and inadequate antenatal care attendance as key risk factors. However, these studies insufficiently capture the experiential and sociocultural dimensions of preeclampsia risk, including how women perceive, respond to, and navigate these risks in their daily lives.

Qualitative inquiry offers a complementary lens through which researchers can examine the underlying mechanisms connecting social determinants, behavioral patterns, healthcare utilization, and disease occurrence. Phenomenological research, in particular, enables an in-depth exploration of participants' lived experiences and the meanings they ascribe to health-related phenomena. This study draws on the phenomenological framework of Husserl and Heidegger, as operationalized through Colaizzi's methodological approach, to illuminate the subjective experiences of primigravida women with preeclampsia within the sociocultural context of Medan.

The aim of this study was to explore and analyze the risk factors for preeclampsia incidence in primigravida pregnant women as perceived and experienced by the participants themselves within the working area of Puskesmas Padang Bulan, Medan Baru District, Medan City, with data collection conducted from December 12, 2025 to January 3, 2026.

METHODS

Study Design

This study employed a qualitative phenomenological design to explore the lived experiences of primigravida women related to the risk factors of preeclampsia. Phenomenology was selected as the most appropriate approach because it allows researchers to capture the essence of participants' subjective experiences without imposing predefined theoretical constructs. Data collection was conducted from December 12, 2025 to January 3, 2026 at the Puskesmas Padang Bulan, Medan Baru District, Medan City, North Sumatra, Indonesia. This primary healthcare facility was selected because of its documented increase in preeclampsia cases among first-time mothers and its representativeness of urban community health settings in the region.

Research Team and Reflexivity

The research team comprised a principal investigator with academic training in maternal and reproductive health, supported by research assistants with experience in qualitative interviewing. Prior to data collection, all team members participated in a two-day reflexivity workshop to identify potential biases stemming from clinical and academic backgrounds. Reflexivity journals were maintained throughout the research process to document and critically examine the researchers' assumptions, decisions, and interpretations. No prior personal relationships existed between research team members and study participants. Peer debriefing sessions were conducted bi-weekly to validate emerging interpretations and minimize individual researcher bias.

Participants

Participants were purposively selected based on the following inclusion criteria: (1) primigravida women aged 18–40 years; (2) diagnosed with preeclampsia during the third trimester of pregnancy; (3) registered and receiving antenatal care at Puskesmas Padang Bulan; and (4) willing to

provide informed consent. Exclusion criteria included women with pre-existing chronic hypertension, renal disease, diabetes mellitus prior to pregnancy, or those unable to communicate verbally due to language barriers or cognitive impairments. Of 21 eligible candidates approached, 15 agreed to participate. Six declined participation, primarily citing personal discomfort and time constraints. No financial incentives were provided; however, participants received standard maternal health educational materials as a token of appreciation.

Data Collection

Individual in-depth interviews were conducted face-to-face at a private room within Puskesmas Padang Bulan to ensure confidentiality and comfort. Each interview lasted between 45 and 90 minutes. A semi-structured interview guide was developed based on a review of existing literature and validated through expert review by two senior maternal health researchers. Sample interview questions included: 'Can you describe your experience when you first noticed signs of your condition?'; 'What do you believe contributed to your pregnancy complication?'; and 'What challenges did you face in accessing antenatal care services?' All interviews were audio-recorded with participant consent and transcribed verbatim in Bahasa Indonesia by two trained transcriptionists. Transcripts were reviewed for accuracy by the principal investigator and returned to participants for member checking. Data saturation was achieved after the 13th interview, confirmed by the absence of new codes or themes in the 14th and 15th interviews.

Data Analysis

Data were analyzed using Colaizzi's seven-step phenomenological method: (1) reading all protocols to acquire a general sense; (2) extracting significant statements; (3) formulating meanings; (4) organizing themes into theme clusters; (5) developing an exhaustive description; (6) producing the fundamental structure; and (7) returning the structure to participants for validation. Analysis was conducted manually and supported by NVivo 14 software (QSR International) to facilitate systematic code organization and retrieval. Two researchers independently coded the data, and discrepancies were resolved through consensus discussion. An audit trail was maintained throughout the analytical process to ensure methodological transparency.

Trustworthiness and Rigor

Trustworthiness was established according to Lincoln and Guba's (1985) four criteria. Credibility was ensured through prolonged engagement in the field, triangulation of data sources (interviews, field notes, and patient records), and member checking with eight participants who reviewed and confirmed the accuracy of preliminary findings. Transferability was supported by providing thick descriptions of the study context and participant characteristics. Dependability was achieved through an audit trail documenting all methodological decisions. Confirmability was ensured through reflexivity journaling and peer debriefing with an external qualitative research expert.

Ethical Consideration

Ethical approval for this study was obtained from the Research Ethics Committee of Universitas Bunda Thamrin (UBT), Medan, Indonesia (Ethics Approval No.: UBT/LPPM/EC/2025). Additional site permission was granted by the Head of Puskesmas Padang Bulan and the Medan City Health Office. All participants provided written informed consent prior to enrollment. Participant anonymity was maintained through the use of alphanumeric codes (e.g., P1, P2). Audio recordings and transcripts were stored on a password-protected server accessible only to the research team and will be destroyed five years after publication.

Results

Participant Characteristics

A total of 15 primigravida women with preeclampsia participated in this study. Participants ranged in age from 19 to 36 years (mean age = 25.4 years). Educational attainment varied from junior secondary school (n=4) to senior secondary school (n=8) and diploma/undergraduate level (n=3). Most participants were homemakers (n=10), while others were employed in informal sectors (n=5). Gestational age at diagnosis ranged from 28 to 38 weeks. All participants received antenatal care at Puskesmas Padang Bulan, though the frequency of visits varied considerably.

Theme 1: Limited Health Literacy and Awareness of Preeclampsia Warning Signs

The majority of participants demonstrated limited understanding of preeclampsia as a distinct clinical condition. Most described initially dismissing symptoms such as headache, visual disturbances, and edema as normal pregnancy discomforts. Participants attributed this gap to insufficient information received during antenatal visits and a lack of accessible health education materials in vernacular language.

> *"I thought the swelling in my legs was normal because everyone said that happens in pregnancy. I did not know it could mean something serious." (P3)*
>
> *"The midwife told me to watch out for headaches, but she did not explain why or what to do if it happened. I just thought it would go away." (P7)*

This theme highlights a critical disconnect between the clinical knowledge held by healthcare providers and the health literacy level of first-time pregnant women in urban primary care settings.

Theme 2: Lifestyle and Nutritional Risk Behaviors During Pregnancy

Participants frequently described dietary patterns characterized by high salt consumption, irregular meal patterns, and insufficient intake of vegetables and fruits. Many attributed these patterns to economic constraints, cultural food preferences, and a lack of clear nutritional guidance. Physical inactivity was also commonly reported, particularly among those who lived in dense urban environments with limited access to safe walking spaces.

> *"We eat what we can afford. Rice with salted fish is our everyday food. Nobody told me that salt was bad for my pregnancy." (P5)*
>
> *"I stopped exercising when I got pregnant because I was afraid it would harm the baby. My mother-in-law told me to rest all the time." (P11)*

Pre-pregnancy obesity and excessive gestational weight gain were also noted as significant concerns among participants, consistent with established risk factor profiles in the literature.

Theme 3: Psychosocial Stressors and Inadequate Social Support

A prominent theme across interviews was the presence of multiple psychosocial stressors, including financial insecurity, marital conflicts, and the emotional burden of being a first-time mother without extended family support. Participants described elevated levels of anxiety and stress throughout their pregnancies, often without access to formal or informal mental health support.

> *"My husband was often away for work. I was alone most of the time. I worried constantly about everything—money, the baby, whether I was doing everything right." (P2)*
>
> *"My mother passed away last year. There was no one to guide me. I felt very lost. I think the stress made me sick." (P9)*

Social isolation, particularly among women who had recently migrated to Medan, emerged as a compounding vulnerability, limiting their access to community-based health information networks and peer support.

Theme 4: Barriers to Timely Antenatal Care Access

Participants identified multiple structural and attitudinal barriers to accessing timely antenatal care. These included long waiting times at the Puskesmas, perceived dismissiveness from healthcare providers, transportation difficulties, and work-related constraints. Cultural beliefs also played a role, with some participants expressing reluctance to seek care early in pregnancy due to fear of bad news or cultural traditions against disclosing a pregnancy during the first trimester.

> *"The Puskesmas is crowded every time I go. I have to wait three or four hours. It is very tiring when you are pregnant, so sometimes I just skip the visit." (P6)*
>
> *"In our culture, we do not tell people about the pregnancy until it is bigger. So I did not go to the midwife early. Maybe that was a mistake." (P13)*

Irregular antenatal care attendance, reported by 11 of 15 participants, significantly delayed the identification and management of early preeclampsia risk indicators.

Discussion

Comparison with Existing Literature

The four themes identified in this study align with and extend existing evidence on preeclampsia risk factors in LMICs and specifically in the Indonesian context. The finding that primigravida women possess limited health literacy regarding preeclampsia warning signs

corroborates studies conducted in similar settings, which consistently report that nulliparous women are less likely to recognize hypertensive disorder symptoms than multiparous counterparts (Soma-Pillay et al., 2016; Oyeniran et al., 2021). This gap in recognition is particularly consequential given that symptom onset to clinical deterioration can be rapid in preeclampsia.

The nutritional and lifestyle patterns described by participants reflect broader dietary transitions occurring in Indonesian urban communities, where traditional rice-based diets are increasingly supplemented with high-sodium processed foods. Several quantitative studies from North Sumatra have similarly linked high dietary sodium intake and sedentary behavior to elevated preeclampsia risk in primigravida populations (Siagian et al., 2021; Nurhasanah & Wahyuni, 2022). This study adds qualitative depth by illustrating the socioeconomic and cultural drivers behind these dietary choices.

The prominence of psychosocial stressors as a perceived risk factor aligns with emerging evidence on the neuroendocrine pathways linking chronic maternal stress with endothelial dysfunction, a core mechanism in preeclampsia pathophysiology (Mulder et al., 2018). Participants' narratives of social isolation, financial insecurity, and inadequate spousal support suggest that psychosocial vulnerability may be a modifiable risk factor amenable to community-based intervention. These findings resonate with a systematic review by Biaggi et al. (2016), which identified social support deficits as a significant predictor of perinatal mental health complications, which in turn have been linked to adverse obstetric outcomes including preeclampsia.

The structural and attitudinal barriers to antenatal care identified in this study echo challenges documented across Indonesian primary healthcare settings (Agus & Horiuchi, 2012; Suryani et al., 2020). However, our findings uniquely highlight the intersection of cultural taboos around early pregnancy disclosure and formal healthcare utilization, a dimension insufficiently addressed in prior intervention programs. This cultural dimension suggests that outreach and demand-side strategies must be culturally contextual rather than adopting universal messaging frameworks.

New Knowledge and Conclusions

This study contributes novel insights into the lived experiences of primigravida women with preeclampsia in an urban Indonesian primary care context. While risk factors such as nulliparity, obesity, and inadequate antenatal care have been well documented quantitatively, this phenomenological inquiry reveals the experiential mechanisms through which these factors manifest—shaped by cultural beliefs, socioeconomic realities, relational dynamics, and healthcare system characteristics. The theoretical contribution of this study lies in its articulation of a multidimensional vulnerability framework that integrates biomedical, behavioral, psychosocial, and structural dimensions of preeclampsia risk in primigravida women.

Practical Applications of the Findings

Healthcare practitioners and midwives at Puskesmas Padang Bulan and similar primary health centers should integrate structured preeclampsia risk-factor counseling sessions into all routine antenatal care visits for primigravida women, using simple and culturally appropriate educational tools such as illustrated booklets and community radio messaging. Community health workers (kader) should be trained to conduct home visits for high-risk primigravida women, particularly those experiencing psychosocial stressors or demonstrating irregular antenatal care attendance. Additionally, nutrition counseling programs embedded within maternal health services should address sodium reduction and gestational weight management using practical, affordable, and locally relevant dietary guidance.

Limitations

This study has several limitations that should be acknowledged. First, the sample was drawn exclusively from the working area of Puskesmas Padang Bulan and may not be fully transferable to rural or peri-urban settings in North Sumatra or other Indonesian provinces. Second, the relatively small sample size of 15 participants, while appropriate for phenomenological inquiry, limits the breadth of perspectives captured. Third, as all data were self-reported, social desirability bias may have influenced participants' accounts of their health behaviors and care-seeking experiences. Finally, the cross-sectional nature of data collection precludes longitudinal insights into the evolution of risk factors across the pregnancy continuum.

CONCLUSION

This phenomenological study elucidated the multidimensional lived experiences of primigravida women with preeclampsia in the Puskesmas Padang Bulan working area, Medan Baru District, Medan City. Four interconnected themes—limited health literacy, lifestyle and nutritional risk behaviors, psychosocial stressors, and structural barriers to antenatal care access—collectively illuminate the complexity of preeclampsia risk in this population. These findings underscore the urgent need for comprehensive, culturally responsive, and community-integrated maternal health strategies that go beyond clinical management to address the social determinants shaping preeclampsia vulnerability among first-time mothers in urban Indonesia.

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