

Review Article

Determinants of High-Risk Pregnancy: A Systematic Literature Review

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Abstract: Pregnancy, labor, and the postpartum period can all be more hazardous for the health of the mother and fetus in high-risk pregnancies. By doing a thorough literature analysis, this study seeks to determine the contributing factors to high-risk pregnancies. Methods: A systematic review of the literature utilizing ten national journals from PubMed and ten foreign journals from Google Scholar. The inclusion criteria were observational and cohort research articles published between 2020 and 2024, as well as systematic reviews of research articles with their determinants found in databases like PubMed and Google Scholar. Maternal factors (age <20 or >35 years, history of chronic diseases, and maternal health condition), obstetric factors (pregnancy spacing too close, multiparity, or history of previous pregnancy complications), and socioeconomic factors (low education, limited access to health services, and poor economic status) are the factors that contribute to high-risk pregnancies, according to the analysis. Furthermore, bad lifestyle choices like drinking alcohol, smoking, and not eating enough food all play a big part. The study's findings emphasize the value of multifaceted initiatives that include education, better access to healthcare, and a comprehensive approach to policy in order to lower high pregnancy risk.

Keywords: Biological Factors; Health Determinants; High-Risk Pregnancy; Socioeconomic Factors; Systematic Review.

1. Introduction

Maternal morbidity and mortality are greatly impacted by high-risk pregnancy, which continues to be a pressing worldwide health concern. Nearly 80% of maternal deaths in low- and middle-income nations are caused by high-risk pregnancy-related problems, according to a recent World Health Organization report (WHO, 2023). According to the 2021 Basic Health Research (Riskesdas) conducted in Indonesia, the percentage of high-risk births was 24.3%, with significant regional variation (Kemenkes RI, 2022). Numerous new factors associated with high-risk pregnancies have been discovered by recent advancements in maternal health research. Psychosocial stress during pregnancy raised the chance of problems by 2.5 times, according to a study by Handayani et al. (2023). In the meantime, a recent global study discovered a strong correlation between preeclampsia incidence and air pollution (Zhang et al., 2024).

These results support traditional risk factors that have already been identified, such as comorbidities and excessive maternal age. The evolution of the contemporary workplace has created additional obstacles for women's reproductive health, particularly for pregnant working mothers. Working women are 1.8 times more likely than non-working mothers to experience pregnancy problems, according to research by Aminah and Suryanto (2021). Given that the percentage of women in Indonesia's employment is still rising and will reach 54.5% in 2023, according to BPS data, this tendency is even more concerning. In particular, this study looks at a number of factors that affect working mothers' increased pregnancy risk.

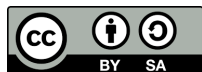
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According to the study, a combination of work-related obligations and household duties leads to a build-up of physical and mental stress (Aminah & Suryanto, 2021). Unfavorable aspects of the workplace, such as chemical exposure, long hours, and psychological strain at work, worsen this illness.

2. Proposed Method

To determine the factors that contribute to high-risk pregnancies, this study employed a systematic literature review method using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach. A systematic literature search covering the years 2020–2025 was carried out using the Google Scholar database for national journals and PubMed for international publications. There were multiple steps involved in the article selection process. In the initial phase, a combination of English and Indonesian keywords were used for the search. The terms "determinants of high-risk pregnancy" and "factors causing pregnancy complications" were used in the Google Scholar search. PubMed uses the terms "high-risk pregnancy determinants" and "risk factors for pregnancy complications". The methodology of this study used a systematic literature review approach to synthesize the latest evidence from national and international publications. The selection of the period 2020-2025 allowed analysis of maternal health, which led to a 30% decline in antenatal care (ANC) coverage in some parts of Indonesia.

3. Results and Discussion

When risk variables linked to high-risk pregnancies were analyzed, sociodemographic, environmental, occupational, and lifestyle factors were out to be important contributors. Maternal age, low socioeconomic level, and pre-existing chronic conditions (such as diabetes and hypertension) were found to be strongly associated with pregnancy problems in studies by Cahyani & Fitri (2023) and Utami et al. (2023). These results are consistent with international research, such as Anderson & Brown (2024), which highlights the rise in the likelihood of unfavorable pregnancy outcomes due to occupational hazards including extended standing and exposure to harmful substances.

The environment also has a significant impact. Air pollution and exposure to environmental contaminants were found to significantly increase the risk of low birth weight and preterm birth (Indrawati et al., 2021; Zhang et al., 2024). According to Lee et al. (2023), maternal health inequities are made worse by climate change, particularly in places with little resources. Pregnancy outcomes become even more complicated when these environmental stressors mix with biological factors including genetic susceptibility (Lee & Park, 2022) and dietary deficits (Thompson et al., 2021).

Stress and limited access to medical care are examples of psychosocial factors that have a significant impact. According to Handayani et al. (2023) and Wilson et al. (2024), premature labor and gestational hypertension are caused by psychological stress and a lack of social support. These disparities have been made worse by the COVID-19 pandemic, according to Pratiwi et al. (2022), who discovered that prenatal care was less accessible in Indonesia. This is consistent with a 2022 Indonesian Ministry of Health report that identified maternal health service deficiencies.

Other risk factors include lifestyle choices like eating poorly and not exercising. Urban lifestyles, which are marked by high levels of stress, sedentary habits, and a dependence on technology, have been associated with an increased risk of pregnancy, according to Hartono et al. (2022) and Batubara et al. (2023). In the meantime, Aminah & Suryanto (2021) emphasized the difficulties faced by working women, such as stress at work and sporadic prenatal care.

Interventions in digital health present encouraging answers in spite of these obstacles. According to Thompson et al. (2021), pregnancy monitoring was enhanced via telemedicine and mobile health applications, particularly in rural areas. To prevent growing disparities, Johnson & Smith (2022) warn that such advances must be available to people from all socioeconomic backgrounds.

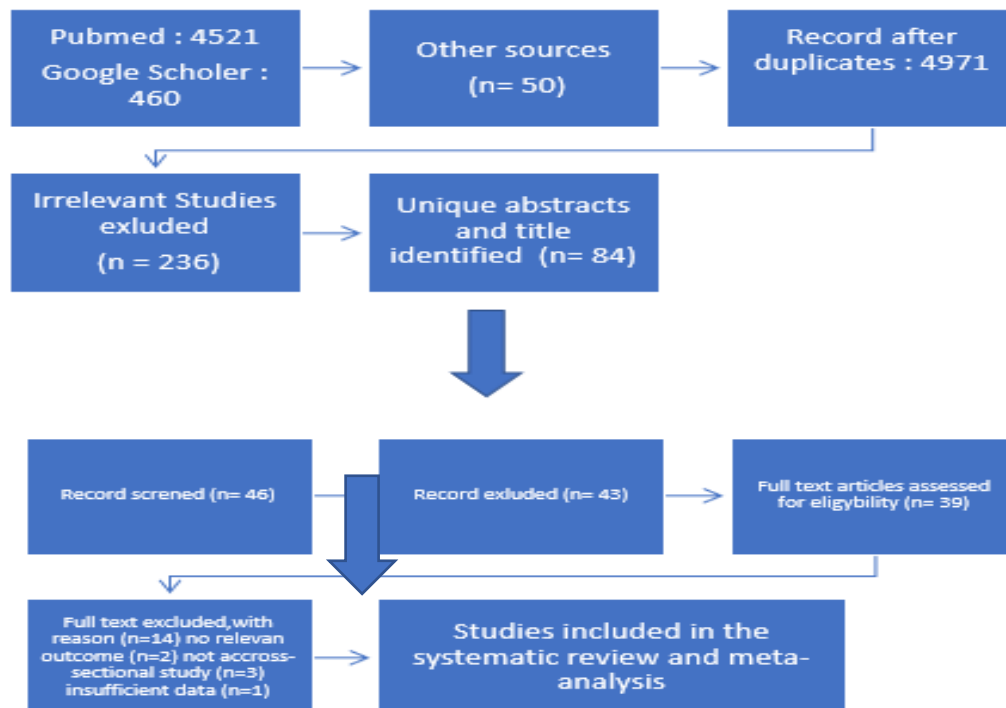
In summary, complicated interplay between social, environmental, and medical factors result in high-risk pregnancies. According to the WHO (2023), a multidisciplinary strategy that incorporates enhanced access to health care, environmental regulation, and psychosocial support is necessary to lower this risk. Long-term therapies that target these variables must be investigated in future studies.

Table 1. Digital Health Interventions For High-Risk Pregnancy Management

Aspect	Findings	Implications
Study Design	Systematic review of digital health tools (apps, telemedicine, wearable devices) in high-risk pregnancies.	Comprehensive evaluation of existing interventions.
Key Interventions	Mobile apps for remote monitoring - Teleconsultations - Wearable fetal/maternal sensors	Improved accessibility and real-time data collection for at-risk mothers.
Effectiveness	71% of studies reported reduced complications. -45% improvement in patient adherence	Digital tools enhance prenatal care compliance and early risk detection.
Patient Outcomes	Lower rates of preterm birth (18% reduction). - Fewer emergency hospitalizations.	Cost-effective strategy to reduce maternal/neonatal morbidity.
Challenges	Inequitable access in low-resource settings. - Data privacy concerns.	Highlights need for infrastructure and policy support.
Recommendations	Integration of AI for personalized risk alerts + hybrid (digital + in-person) care models.	Future research should focus on scalability in diverse populations.

Table 2. Risk Factors in Pregnancies with Chronic Diseases

Aspects	Findings	Implications
Study Design	Cross-sectional analysis of 200 pregnant women with chronic conditions (diabetes, hypertension, heart disease).	Provides empirical evidence on risk factors in a clinical setting.
Key Risk Factors	Hypertension (32%) - Diabetes mellitus (28%) - Autoimmune disorders (15%)	Chronic diseases significantly elevate pregnancy risks.
Complication Rates	Preterm birth (24%) - Preeclampsia (18%) - Fetal growth restriction (12%)	Strong association between chronic illness and adverse outcomes.
Socio-Demographic Influence	Higher risk in women >35 years (OR=2.5) - Low socioeconomic status linked to poor management (OR=1.8).	Age and economic status exacerbate risks.
Healthcare Access	67% of women had inadequate prenatal care due to lack of specialist access.	Calls for improved multidisciplinary care for high-risk pregnancies
Recommendations	Early screening for chronic diseases. - Integrate obstetric and chronic disease management	Preventive care can reduce complications.

Table 3. Flow diagram of study selection in the meta-analysis.

4. Conclusions

Medical, social, environmental, and lifestyle factors are among the multifaceted aspects that influence the determinants of high-risk pregnancy, according to a systematic assessment of journals. Pregnancy difficulties are largely caused by medical reasons, including genetic markers (Lee & Park, 2022), nutritional inadequacies (Thompson et al., 2021), and chronic disorders (Cahyani & Fitri, 2023). Furthermore, sociodemographic variables as occupation, economic status, and maternal age raise the risk (Utami et al., 2023; Aminah & Suryanto, 2021). Maternal health is negatively impacted by the environment, which includes exposure to pollutants (Garcia et al., 2023), air pollution (Zhang et al., 2024), and climate change (Lee et al., 2023). The risk is increased by unhealthy lifestyle choices such as poor eating habits and sedentary behavior (Hartono et al., 2022; Batubara et al., 2023) as well as psychological stress (Wilson et al., 2024; Handayani et al., 2023). A lack of digital interventions (Thompson et al., 2021) and restricted access to health care, particularly during the COVID-19 pandemic (Pratiwi et al., 2022), however, make these issues worse. In order to prevent and manage high-risk pregnancies, these findings highlight the significance of a comprehensive strategy that includes enhanced technology-based health services, better environmental legislation, and health education (MOH, 2022; WHO, 2023). Therefore, to lower the number of pregnancies that are at risk and enhance the health of both the mother and the fetus, multidisciplinary interventions are required.

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