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Social Demographic Factors in High-Risk Pregnancy: Analysis of Indonesian Health Survey Data 2023

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Abstract

High-risk pregnancy is a condition that can negatively impact the health of both the mother and the fetus. Social and demographic factors such as maternal age, educational level, economic status, employment, and place of residence contribute to pregnancy risk levels. Indonesia continues to experience a high maternal mortality rate (MMR), necessitating an in-depth analysis of the social determinants affecting high-risk pregnancies. This study employs a cross-sectional design and utilizes secondary data from the 2023 Indonesian Health Survey (SKI). The study sample consists of 46,699 pregnant women from 38 provinces across Indonesia. The independent variables include maternal age, education, employment, economic status, and place of residence, while the dependent variable is high-risk pregnancy. Data analysis was conducted using the chi-square test to identify associations between social determinants and pregnancy risk. The findings indicate that 15.4% of pregnant women experience risk factors in their pregnancy. Significant social factors associated with high-risk pregnancy include maternal age, education level, employment, place of residence, and economic status ($p < 0.05$). Adolescent mothers (aged 10–19 years) and older mothers (>35 years) are at higher risk. Women with low education levels, unemployment, and lower economic status are also more vulnerable to high-risk pregnancies. High-risk pregnancy is influenced by various social and demographic factors. Therefore, inclusive health policies are needed to improve maternal healthcare access, especially for high-risk groups. Health education programs on reproductive health and increased access to prenatal healthcare services can help reduce the prevalence of high-risk pregnancies in Indonesia.

Keywords: high-risk pregnancy, social determinants, maternal health, Indonesian Health Survey

INTRODUCTION

Maternal health is a crucial component of a woman's life cycle, as pregnancy poses various potential health risks ¹. One of the primary indicators of a nation's health status is the Maternal Mortality Rate (MMR). MMR is used to assess women's health levels and serves as an essential component of quality of life measurements. According to the World Health Organization (WHO) (2020), the global maternal mortality rate remains alarmingly high. Approximately 287,000 women die during pregnancy and childbirth each year, with nearly 95% of these deaths occurring in low- and lower-middle-income countries ². In 2020, the MMR in low-income countries was 430 per 100,000 live births, compared to 12 per 100,000 live births in high-income countries. In alignment with the Sustainable Development Goals (SDGs), which aim to ensure healthy lives and promote well-being for all ages, WHO has set a global target of reducing MMR to fewer than 70 per 100,000 live births by

¹ Noah Isla, "The Importance of Prenatal Care : Supporting Maternal and Fetal Health during Pregnancy," *Journal of Women's Health Care OPEN* 12 (2023): 1–2, <https://doi.org/10.35248/2167->.

² WHO, UNFPA, and WORLD BANK, *Trends in Maternal Mortality 2000 to 2020: Estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division*. Geneva: World Health Organization; 2023. Licence: CC BY-NC-SA 3.0 IGO., *Sexual and Reproductive Health*, 2019.

2030³.

According to UNICEF's 2023 annual report, Indonesia ranks eighth globally in maternal mortality, stillbirths, and neonatal deaths⁴. Data from Indonesia's Central Bureau of Statistics (2020) shows that the country's MMR stands at 189 deaths per 100,000 live births, which is higher than other Southeast Asian nations such as Malaysia, Brunei, Thailand, and Vietnam. Meanwhile, the Infant Mortality Rate (IMR) is estimated at 16.85 deaths per 1,000 live births⁵. In 2023, Indonesia recorded 4,482 maternal deaths, with the leading causes being hypertensive disorders in pregnancy (412 cases), obstetric hemorrhage (360 cases), and other obstetric complications (204 cases)⁶. To meet the SDG targets by 2030, Indonesia must reduce its maternal mortality rate to 70 per 100,000 live births and its infant mortality rate to 12 per 1,000 live births. A high-risk pregnancy is defined as a pregnancy where maternal or fetal conditions affect maternal, perinatal, or both outcomes⁷. The primary complications contributing to 80% of maternal deaths include postpartum hemorrhage, puerperal infections, hypertensive disorders during pregnancy (preeclampsia and eclampsia), and unsafe abortions. Studies indicate that 15–40% of pregnancies fall into the high-risk category, with the highest risk occurring during labor^{8,9}. Health issues related to pregnancy, childbirth, and maternal mortality are influenced by several factors, including maternal health status, pregnancy readiness, antenatal care, skilled birth attendance, postpartum care, and sociocultural aspects¹⁰.

Personal and socioeconomic characteristics such as age, number of pregnancies, education level, marital status, income level, and employment status are associated with well-being in high-risk pregnant women. Therefore, women who have never given birth, are younger, with lower education levels, lower financial status, and financial insecurity are at greater risk for poorer well-being¹¹. Nearly 90% of women classified as very high-risk and 78% of those in the high-risk category undergo cesarean section, compared to 51% of low-risk pregnancies. The most common indication for cesarean section is a previous cesarean delivery, followed by fetal distress¹². Among high-risk pregnancies, previous cesarean delivery is the leading indication, while fetal distress is the most common indication for low-risk pregnancies. Other indications include antepartum hemorrhage, malpresentation, labor dystocia, and hypertensive disorders of pregnancy.

Efforts to accelerate MMR reduction focus on ensuring every mother has access to high-quality healthcare services, including antenatal care, skilled birth attendance at healthcare facilities, postpartum care for both mother and baby, specialized care and referrals in case of complications, and family planning services, including postpartum contraception¹³. Therefore, a more in-depth statistical analysis is necessary, incorporating variables from multiple previous studies to identify the most influential determinants of high-risk pregnancy. Based on this context, the present study aims to determine the most significant factors contributing to high-risk pregnancy in Indonesia using data from the 2023 Indonesian Health Survey (SKI).

³ UNICEF, "Maternal and Newborn Health Coverage Database," 2024, <https://data.unicef.org/topic/child-health/adolescent-health>.

⁴ UNICEF.

⁵ Badan Pusat Statistik, "Mortalitas Di Indonesia," *Mortalitas Di Indonesia Hasil Long Form Sensus Penduduk 2020*, 2020, 1–98.

⁶ Kementerian Kesehatan Republik Indonesia, *Profil Kesehatan Indonesia 2023*, 2024.

⁹ Junu Shrestha et al., "Identifying High Risk Pregnancy and Its Effectiveness in Determining Maternal and Perinatal Outcome," *Birat Journal of Health Sciences* 6, no. 2 (2021): 1565–72, <https://doi.org/10.3126/bjhs.v6i2.40360>.

¹⁰ Isla, "The Importance of Prenatal Care : Supporting Maternal and Fetal Health during Pregnancy."

¹¹ Kobra Mirzakhani et al., "Well-Being in High-Risk Pregnancy: An Integrative Review," *BMC Pregnancy and Childbirth* 20, no. 1 (2020): 1–14, <https://doi.org/10.1186/s12884-020-03190-6>.

¹² Biaggi et al., "Identifying the Women at Risk of Antenatal Anxiety and Depression: A Systematic Review."

¹³ Kementerian Kesehatan Republik Indonesia, *Profil Kesehatan Indonesia 2023*.

METHOD

This study employs a quantitative approach with a cross-sectional design. The data used are sourced from the 2023 Indonesian Health Survey (SKI), focusing on high-risk pregnancies in Indonesia. The study population consists of all pregnant women recorded in the SKI 2023 report. A total sampling technique was applied, covering 38 provinces and involving 46,699 pregnant women. The Independent variables are: Maternal age at pregnancy, Maternal education level, Maternal employment status, Place of residence and Economic status, while, Dependent variable is: High-risk pregnancy and Data analysis used in this research are: Univariate analysis was used to describe the distribution of dependent and independent variables and Bivariate analysis was conducted using the chi-square test to examine the association between social demographic determinants and high-risk pregnancy.

RESULT & DISCUSSION

This study's findings include both univariate and bivariate analyses, which examine various factors influencing pregnancy conditions, such as risk factors, maternal age, education, employment, place of residence, and economic status. The data provide a comprehensive overview of the characteristics of pregnant women in the studied population and the relationships between these factors.

Table 1. The Frequency Distribution of Pregnant Women's Characteristics in Indonesia.

Variable	Frequency	Percentages (%)
Pregnancy Risk		
<i>Has risk factors</i>	7187	15,4
<i>No risk factors</i>	26853	57,5
<i>No recorded data</i>	12152	26,0
Age		
<i>10-19 (Adolescents)</i>	564	1,2
<i>15-49 (Women of Reproductive Age)</i>	46135	98,8
Education		
Never attended school	584	1,3
Did not complete elementary school	1503	3,2
Completed elementary school	7617	16,3
Completed junior high school	10990	23,5
Completed senior high school	18342	39,3
Completed diploma/undergraduate degree	7066	15,1
Employment Status		
Unemployed	29349	62,8
Student	252	0,5
Civil servant/military/state-owned enterprise employee	1268	2,7
Private-sector employee	4617	9,9
Entrepreneur	4160	8,9
Farmer/agricultural laborer	1797	3,8
Fisherman	33	0,1
Laborer/driver/domestic worker	948	2,0
Others	3768	8,1
Place of Residence		
Urban	26860	57,5
Rural	19332	41,4
Economic Status		
Lowest	5210	11,2
Lower middle	8159	17,5
Middle	10008	21,4
Upper middle	11650	24,9
Highest	11165	23,9

The table above presents the distribution of characteristics among 46,699 pregnant women in Indonesia in 2023. The findings indicate that 15.4% of pregnant women had risk factors associated with their pregnancies, 57.5% did not have any risk factors, and 26.0% lacked complete recorded data. In terms of socio-demographic variables, the majority of pregnant women fell within the reproductive age range of 15-49 years (98.8%), while 1.2% were adolescents aged 10-19 years. Regarding educational attainment, most pregnant women had completed senior high school (39.3%), whereas the smallest proportion (1.3%) had never attended school. In terms of employment status, a majority of pregnant

women were unemployed (62.8%), followed by those working as private-sector employees (9.9%) and entrepreneurs (8.9%), while 0.5% were still in school. Place of residence analysis shows that the proportion of pregnant women residing in urban areas (57.5%) was higher than those in rural areas (41.4%). Based on economic status, most pregnant women were in the middle-income category (24.9%), while the lowest economic status category accounted for 11.2% of the population.

Table 2 Relationship Between Socio-Demographic Factors and High-Risk Pregnancy

Variable	Has risk factors (%)	No risk factors (%)	No recorded data (%)	Total	Chi-Square Value	p-value
	%	%	%			
Age					15,317 ^a	< 0.05
10-19 (Adolescents)	10,5	58,0	31,6	564		
15-49 (Women of Reproductive Age)	15,6	58,1	26,3	46135		
Education Level					57,630 ^a	< 0.05
Never attended school	15,8	56,3	27,9	584		
Did not complete elementary school	13,1	58,6	28,3	1503		
Completed elementary school	14,8	57,8	27,4	7617		
Completed junior high school	14,9	57,8	27,3	10990		
Completed senior high school	15,7	58,9	25,4	18342		
Completed diploma/undergraduate degree	17,8	56,7	25,5	7066		
Employment Status					552,719 ^a	< 0.05
Unemployed	15,3	58,0	26,7	29349		
Student	19,4	53,6	27,0	252		
Civil servant/military/state-owned enterprise employee	14,1	59,0	26,9	1268		
Private-sector employee	18,5	58,5	23,0	4617		
Entrepreneur	16,7	59,6	23,7	4160		
Farmer/agricultural laborer	10,9	40,0	49,1	1797		
Fisherman	12,1	39,4	48,5	33		
Laborer/driver/domestic worker	17,5	56,5	25,9	948		
Others	14,1	56,6	29,3	3768		
Place of Residence					99,961 ^a	< 0.05
Urban	16,9	57,8	25,3	26860		
Rural	13,7	58,6	27,7	19332		
Economic Status					78,417 ^a	< 0.05
Lowest	12,5	59,5	28,0	5210		
Lower middle	15,2	57,1	27,7	8159		
Middle	15,8	57,1	27,1	10008		
Upper middle	16,6	58,7	24,7	11650		
Highest	16,1	58,6	25,3	11165		

The analysis results (Table 2) indicate a significant association between various socio-demographic factors and high-risk pregnancy. Based on age, 15.6% of women in the reproductive age range experienced high-risk pregnancies. Among education levels, women who never attended school had a higher proportion of pregnancy risk factors (15.8%), whereas those who completed senior high school had the lowest proportion of risk factors (58.9%). In terms of employment status, pregnant women who were still in school had the highest risk of pregnancy complications (19.4%), while farmers had the lowest (10.9%). Furthermore, place of residence was also a determining factor for high-risk pregnancies. Women residing in urban areas had a higher prevalence of high-risk pregnancies (16.9%) compared to those in rural areas (13.7%). Economic status also played a role, with the highest prevalence of high-risk pregnancies occurring among those in the upper-middle-income category (16.6%), while those in the lowest-income category had a slightly lower prevalence (12.5%). All variables exhibited significant associations with pregnancy risk factors, as indicated by p-values less than 0.05.

The majority of pregnant women in this population, approximately 57.5%, did not have any risk factors associated with pregnancy. This indicates that most pregnancies in this group occur without severe complications. However, around 15.4% of pregnant women were identified as having risk factors, suggesting that a subset of expectant mothers requires greater attention in their healthcare to mitigate the potential complications during pregnancy, childbirth, or the postpartum period. Additionally, 26.0% of pregnant women had unrecorded risk factor data, which may be attributed to incomplete data collection or inadequate monitoring of pregnancy risk factors.

Pregnancy is considered high-risk when maternal or fetal complications are present, potentially affecting the health or safety of the mother or baby. All pregnancies should be evaluated to determine whether risk factors exist or may emerge ¹⁴. Pre-existing risk factors, complications in previous pregnancies, pre-existing medical conditions, and risk factors developing during pregnancy can contribute to high-risk pregnancies ¹⁵. Identifying high-risk pregnancies ensures that they receive additional attention and appropriate care, thereby significantly reducing maternal and neonatal morbidity and mortality rates.

Most pregnant women in this study were within the ideal reproductive age range of 15 to 49 years (98.8%). This age group falls within the category of women of reproductive age (WRA), who generally experience optimal fertility levels. Only about 1.2% of pregnant women were adolescents aged 10-19 years, indicating that a small proportion of this population consisted of teenage mothers. Lack of attention to primary health care among adolescents can lead to unintended pregnancies, inadequate prenatal care, and, consequently, negative outcomes in first pregnancies, mainly explained by late access to health services and preconception care ¹⁶. Teenage pregnancies tend to have a higher risk of health complications for both the mother and the baby, as adolescent bodies may not yet be fully developed to undergo pregnancy. Teen mothers are also at a higher risk of delivering low birth weight infants. Furthermore, pregnancy-induced hypertension and gestational diabetes risks increase with maternal age, along with the likelihood of chromosomal abnormalities in the fetus ^{17,18}. Women aged 35 years and above are at a higher risk of complications such as hypertension, gestational diabetes, and labor complications ^{19,20}. Diabetes is a serious threat to global health that does not see socioeconomic status or national boundaries. There are 463 million adults currently living with diabetes mellitus, this will be a risk factor in pregnancy ²¹.

The educational background of pregnant women indicates that the majority (39.3%) had completed secondary education (high school equivalent), while 15.1% had attained higher education (diploma or university degree). This suggests that a substantial proportion of women in this group possess adequate knowledge regarding the importance of prenatal healthcare. Conversely,

¹⁴ D L Lovelace, L R McDaniel, and D Golden, "Long-Term Effects of Breast Cancer Surgery, Treatment, and Survivor Care," *Journal of Midwifery and Women's Health* 64, no. 6 (2019): 713–24, <https://doi.org/10.1111/jmwh.13012>.

¹⁵ Laura A. Magee et al., "The 2021 International Society for the Study of Hypertension in Pregnancy Classification, Diagnosis & Management Recommendations for International Practice," *Pregnancy Hypertension* 27, no. September 2021 (2022): 148–69, <https://doi.org/10.1016/j.preghy.2021.09.008>.

¹⁶ Thamara de Souza Campos Assis et al., "Recurrence of Teenage Pregnancy: Associated Maternal and Neonatal Factor Outcomes," *Ciencia e Saude Coletiva* 27, no. 8 (2022): 3261–72, <https://doi.org/10.1590/1413-81232022278.00292022EN>.

¹⁷ Lovelace, McDaniel, and Golden, "Long-Term Effects of Breast Cancer Surgery, Treatment, and Survivor Care."

¹⁸ Abiyyu Didar Haq et al., "Pregnancy-Related Complications in Relation with Delivery Complication in Urban Public Health Center in 2019-2020: An Analytic Comparative Study," *Journal of Community Empowerment for Health* 6, no. 2 (2023): 93, <https://doi.org/10.22146/jcoemph.77441>.

¹⁹ Magee et al., "The 2021 International Society for the Study of Hypertension in Pregnancy Classification, Diagnosis & Management Recommendations for International Practice."

²⁰ Haq et al., "Pregnancy-Related Complications in Relation with Delivery Complication in Urban Public Health Center in 2019-2020: An Analytic Comparative Study."

²¹ Habibah Yulia Resti and Widya Hary Cahyati, "Kejadian Diabetes Melitus Pada Usia Produktif Di Puskesmas Kecamatan Pasar Rebo," *Higeia Journal Of Public Health Research And Development* 6, no. 3 (2022): 350–61, <http://journal.unnes.ac.id/sju/index.php/higeia>.

approximately 1.3% of pregnant women had never attended school, and 3.2% had not completed primary education, indicating possible limitations in accessing information and understanding reproductive health. Consequently, raising awareness and improving education on maternal and child health is crucial, particularly among women with lower educational attainment. A study conducted in Kelantan reported an average knowledge score of 11.37 ± 3.94 , revealing that 51.9% of respondents possessed a moderate level of knowledge ²²²³. However, specific topics related to preconception health, such as the risks associated with poor birth spacing, recommendations for optimal birth spacing, and maternal anemia risks to the fetus, remained poorly understood among respondents ²⁴²⁵. In pregnant women, efforts have been made to improve nutritional intake and health, to prevent anemia and chronic energy deficiency. This effort is to reduce the risk of Low Birth Weight (LBW) and the risk of stunting ²⁶.

Most pregnant women (62.8%) were unemployed, which could imply a focus on household responsibilities or economic inactivity. This may be influenced by economic status and cultural norms within society ²⁷²⁸. Conversely, approximately 9.9% of pregnant women were employed in the private sector, and 8.9% were self-employed, indicating the presence of working mothers in both formal and informal sectors. Employment may be associated with better access to healthcare services, although job status does not necessarily guarantee equitable access for all individuals ²⁹³⁰. Work schedules, exposure to physically demanding jobs (e.g., lifting heavy objects or standing for long periods), and exposure to workplace chemicals have been associated with a variety of adverse birth outcomes. Although working during pregnancy is generally safe, some people work in jobs or workplaces that pose risks to their health and that of their babies, especially if accommodations, such as sitting breaks, are not provided. The impact of unsafe workplace practices is potentially far-reaching; two-thirds of women giving birth for the first time worked during pregnancy, with the majority (86%) working full-time and into their third trimester ³¹.

The majority of pregnant women resided in urban areas (57.5%), which generally provide better access to healthcare facilities and essential pregnancy-related information. Meanwhile, 41.4% lived in rural areas, where access to quality healthcare services, education, and other support facilities may be

²² Esther Raya-Diez et al., "Risk Factors and Social Consequences of Early Pregnancy: A Systematic Review," *SAGE Open* 14, no. 3 (2024): 1–16, <https://doi.org/10.1177/21582440241271324>.

²³ Rosnani Kasim et al., "Knowledge, Attitudes and Practice of Preconception Care among Women Attending Appointments at a Rural Clinic in Kelantan," *Education in Medicine Journal* 8, no. 4 (2016), <https://doi.org/10.5959/eimj.v8i4.475>.

²⁴ Magee et al., "The 2021 International Society for the Study of Hypertension in Pregnancy Classification, Diagnosis & Management Recommendations for International Practice."

²⁵ Haq et al., "Pregnancy-Related Complications in Relation with Delivery Complication in Urban Public Health Center in 2019-2020: An Analytic Comparative Study."

²⁶ Sulis Diana, Chatarina Umbul Wahyuni, and Budi Prasetyo, "Maternal Complications and Risk Factors for Mortality," *Journal of Public Health Research* 9, no. 2 (2020): 195–98, <https://doi.org/10.4081/jphr.2020.1842>.

²⁷ Magee et al., "The 2021 International Society for the Study of Hypertension in Pregnancy Classification, Diagnosis & Management Recommendations for International Practice."

²⁸ Kasim et al., "Knowledge, Attitudes and Practice of Preconception Care among Women Attending Appointments at a Rural Clinic in Kelantan."

²⁹ Diana, Wahyuni, and Prasetyo, "Maternal Complications and Risk Factors for Mortality."

³⁰ Biniyam Wae Melkamu et al., "Magnitude of Maternal Complications and Associated Obstetric Factors among Women Who Gave Birth by Cesarean Section at Arba-Minich General Hospital, Southern Ethiopia: Retrospective Cohort," *Journal of Public Health and Epidemiology* 9, no. 5 (2017): 133–44, <https://doi.org/10.5897/jphe2016.0898>.

³¹ Julia M. Goodman et al., "Work as a Social Risk Factor in Pregnancy: A Systematic Review of Screening Practices Related to Working Conditions and Family Leave among Pregnant Adults," *Birth* 50, no. 1 (2023): 32–43, <https://doi.org/10.1111/birt.12695>.

more limited³²³³. This geographical factor significantly influences pregnancy complications in rural Indonesia, as pregnant women in these areas often encounter challenges in obtaining adequate medical care³⁴. Accessibility to healthcare facilities, availability of trained medical personnel, maternal knowledge, social norms, and economic factors are interconnected and affect pregnant women's decisions to undergo regular check-ups. Therefore, collaborative efforts from the government, healthcare professionals, and communities are necessary to address these challenges. Government interventions should focus on improving healthcare accessibility, ensuring adequate medical personnel distribution, and conducting community outreach programs to emphasize the importance of antenatal care³⁵³⁶.

Economic status data highlight significant social disparities. Socioeconomic status is known to significantly influence health outcomes. In particular, the relationship between socioeconomic status and perinatal health is well established. Low socioeconomic status is typically associated with poor economic conditions, physically demanding jobs, increased likelihood of unhealthy behaviors and exposure to chronic stress, and decreased utilization of health services, all of which are considered risk factors for adverse birth outcomes³⁷. Approximately 24.9% of pregnant women belonged to the upper-middle-income category, likely granting them better access to healthcare services and an overall improved standard of living³⁸³⁹. However, 11.2% of pregnant women were in the lowest economic category, potentially facing difficulties in obtaining adequate healthcare services, nutritious food, or proper housing. These disparities require urgent attention, as women from lower economic backgrounds are at greater risk of pregnancy complications due to limited access to healthcare resources⁴⁰⁴¹. Disparities also exist in the interaction between communities and healthcare providers. For some women, home births are preferred due to perceived comfort, better emotional support from family members, and the belief that their health condition does not necessitate hospital delivery.

Non-pregnant women with chronic health conditions, including obesity, diabetes, and hypertension, often lack awareness of pregnancy-related risks and do not engage in preconception health promotion efforts. Similarly, a study in the United States involving pregnant women with type 2 diabetes who gave birth between 2002 and 2010 revealed that only a small fraction (4%) reported

³² Lovelace, McDaniel, and Golden, "Long-Term Effects of Breast Cancer Surgery, Treatment, and Survivor Care."

³³ Intan Tiarasari et al., "Determinants of Labour Complication in Indonesia (2017 IDHS Data Analysis)," *STRADA Jurnal Ilmiah Kesehatan* 12, no. 2 (2023): 87–100, <https://doi.org/10.30994/sjik.v12i2.958>.

³⁴ Diana, Wahyuni, and Prasetyo, "Maternal Complications and Risk Factors for Mortality."

³⁵ Biaggi et al., "Identifying the Women at Risk of Antenatal Anxiety and Depression: A Systematic Review."

³⁶ Talat Khadivzadeh, Zahra Shojaeian, and Ali Sahebi, "High Risk-Pregnant Women's Experiences of Risk Management: A Qualitative Study," *International Journal of Community Based Nursing and Midwifery* 11, no. 1 (2023): 57–66, <https://doi.org/10.30476/ijcbnm.2022.96781.2148>.

³⁷ Mikolaj Stanek, Miguel Requena, and Alberto del Rey, "Impact of Socio-Economic Status on Low Birthweight: Decomposing the Differences Between Natives and Immigrants in Spain," *Journal of Immigrant and Minority Health* 23, no. 1 (2021): 71–78, <https://doi.org/10.1007/s10903-020-01027-0>.

³⁸ Haq et al., "Pregnancy-Related Complications in Relation with Delivery Complication in Urban Public Health Center in 2019-2020: An Analytic Comparative Study."

³⁹ Melkamu et al., "Magnitude of Maternal Complications and Associated Obstetric Factors among Women Who Gave Birth by Cesarean Section at Arba-Minich General Hospital, Southern Ethiopia: Retrospective Cohort."

⁴⁰ Tiarasari et al., "Determinants of Labour Complication in Indonesia (2017 IDHS Data Analysis)."

⁴¹ Khadivzadeh, Shojaeian, and Sahebi, "High Risk-Pregnant Women's Experiences of Risk Management: A Qualitative Study."

receiving preconception care ⁴²⁴³. Preconception healthcare has the potential to yield substantial public health benefits, given the high prevalence of unplanned pregnancies, the delay between conception and pregnancy confirmation that may pose health risks, and the persistence of health risks before and after pregnancy ⁴⁴⁴⁵.

CONCLUSION

Based on the above findings, it can be concluded that the majority of pregnant women in this population do not face significant risk factors. However, a small subset requires greater attention due to pregnancy-related risk factors. Maternal age, education, employment status, place of residence, and economic status play critical roles in determining pregnancy risk levels. Therefore, more targeted healthcare policies are needed to enhance healthcare access for pregnant women in rural areas and those in lower economic strata. Additionally, reproductive health education should be strengthened, particularly among women with lower educational backgrounds, to reduce pregnancy complications and improve maternal and neonatal health outcomes.

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⁴² Biaggi et al., "Identifying the Women at Risk of Antenatal Anxiety and Depression: A Systematic Review."

⁴³ Natalie Hemsing, Lorraine Greaves, and Nancy Poole, "Sexual & Reproductive Healthcare Preconception Health Care Interventions : A Scoping Review," *Sexual & Reproductive Healthcare* 14 (2017): 24–32, <https://doi.org/10.1016/j.srhc.2017.08.004>.

⁴⁴ Khadivzadeh, Shojaeian, and Sahebi, "High Risk-Pregnant Women's Experiences of Risk Management: A Qualitative Study."

⁴⁵ Hemsing, Greaves, and Poole, "Sexual & Reproductive Healthcare Preconception Health Care Interventions : A Scoping Review."

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Her dual roles as a scholar and healthcare practitioner allow her to bridge theoretical knowledge with practical applications, particularly in the field of reproductive health. She has a passion for empowering women through education and health advocacy, aiming to contribute to the reduction of maternal mortality and the improvement of maternal health services in Indonesia.