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The Correlation between Parity and Residence with Maternal Mortality Due to Miscarriage and Abortion in Papua Province in 2020

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A B S T R A C T

The Maternal Mortality Ratio (MMR) in Papua Province was 289 per 100,000 live births in 2017, rising to 565 per 100,000 live births by 2020. This study analyzes the correlation between parity and residence with maternal mortality due to miscarriage and abortion in Papua Province. This paper was a retrospective cross-sectional study. The population was comprised of reproductive-aged women aged 15-49 who participated in the Indonesia Demographic and Health Survey (IDHS) 2020. There were 14,802 respondents by total sampling. Bivariate analysis used logistic regression at a 95% confidence level (α=0.05). The results showed that most respondents had less than or equal to three-born children (83.64%) and lived in rural areas (72.06%). In addition, 14.35% of them died due to miscarriage and abortion. The logistic regression test results on the parity variable indicated p=0.000 and negative Odds Ratio (OR)=0.475. It indicated respondents with more than three-born children had a higher risk of maternal mortality compared to those with less than or equal to three-born children. In addition, the test results of the residency variable showed p=0.000 and negative OR=0.394. It implied that respondents who lived in urban areas faced a higher risk of maternal mortality due to miscarriage and abortion compared to rural mothers. In conclusion, parity and residence significantly correlate with maternal mortality due to miscarriage and abortion.

INTRODUCTION

Implementing strategic measures to enhance health is one of the Sustainable Development Goals (SDGs) 2030 Agenda (United Nations, 2023). One of the health improvement initiatives of The World Health Organization (WHO) is to expedite the decrease of the global Maternal Mortality Rate (MMR). Maternal mortality refers to death occurring during pregnancy or within 42 days following the conclusion of pregnancy, resulting from pregnancy or its management, and not attributable to accident or injury (WHO, 2023). More specifically, Maternal Mortality Ratio (MMR) refers to the death of a woman during pregnancy or within 42 days of pregnancy termination, irrespective of the gestational duration or birth location. It happens during gestation, parturition, and the postpartum phase (BPS Statistics Indonesia, 2021). According to the Indonesian Demographic and Health Survey (IDHS), MMR was 189 per 100,000 live births in 2020. The MMR in Papua Province was 289 per 100,000 live births in 2017, rising to 565 per 100,000 live births by 2020. Thus, Maternal mortality in Papua Province has dramatically increased during the past three years (Badan Pusat Statistik Provinsi Papua, 2020). At the same time, the Millennium Development Goals (MDGs) aim to achieve a maternal mortality rate of 70 per 100,000 live births by 2030 (WHO, 2023).

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The International Classification of Diseases (ICD) categorizes maternal death into many definitions. The death of a woman during pregnancy or within less than one year after delivery may be due to difficulties arising during pregnancy or the exacerbation of a pre-existing illness and is not related to the physiological effects of pregnancy. Pregnancy problems are physical and psychological issues that may occur before, during, or after pregnancy, thereby impacting the health of pregnant individuals, postpartum individuals, and their infants (CDC, 2023). In addition, late maternal mortality refers to the demise of a woman resulting from direct or indirect obstetric causes occurring more than 42 days but less than one year following the conclusion of pregnancy. The growing accessibility of life-sustaining interventions and technologies allows more women to survive such complications. It may also prevent death after the 42-day postpartum interval.

Issues in maternal mortality arise from improper intervention and treatment, as well as neglect (WHO, 2023). Maternal death causes are categorized into direct and indirect maternal deaths. Direct maternal deaths refer to mortalities resulting from issues arising during pregnancy, childbirth, and the postpartum phase. Over 75% of direct maternal deaths are severe bleeding, infection, hypertension during pregnancy, delivery difficulties, and botched abortion (WHO, 2023). Meanwhile, indirect maternal deaths result from pre-existing diseases aggravated by the pregnancy or diseases that develop during pregnancy and impact the pregnancy. These diseases include malaria, anemia, Human Immunodeficiency Virus (HIV) / Acquired Immune Deficiency Syndrome (AIDS), and cardiovascular disease (UNICEF, 2023).

In Indonesia, the primary contributors to indirect maternal mortality are 4 T and 3 T cases. 4T is Too old and young to get pregnant, too frequent childbirth, and too close birth spacing. Risk factors for 4T cases are age and parity, leading to complications if not adequately screened and managed. The National Population and Family Planning Board can evaluate 4T cases to assess the success of the Family Planning program (Hazairin *et al.*, 2021). In addition, 3T means Too late decision-making, referral, and treatment at the referral center. 3T cases exhibit delays in decision-making on referrals to health services, identifying pregnancy danger signals, and obtaining appropriate care at referral facilities. The delay in decision-making regarding referrals to health facilities typically arises during the family's decision-making process. Therefore, enhancements to various aspects affecting medical decision-making and identifying postpartum danger indications are crucial. Enhancing the transportation system can also facilitate expedited access to healthcare facilities and eliminate delays in reaching referral destinations. Further, the delay in effective management within health facilities is attributed to prolonged administrative procedures, insufficient referral health facilities, a shortage of healthcare personnel at referral sites, inadequate infrastructure, and insufficient blood supply, failing to meet maternal needs. Consequently, the Regional Government should aid in the reduction of maternal mortality rates in Papua Province (Ulfah, 2019).

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Parity is associated with postpartum maternal mortality. Maternal parity is the total number of children a mother has borne, whether living or deceased. It is an indirect indicator to evaluate the maternal condition during pregnancy and the status of the fetus till delivery (Kurniawan and Melaniani, 2019). In addition, residence may reflect disparities in disease incidence between rural and urban regions. Factors contributing to disparities in disease prevalence and mortality between rural and urban areas include population density and age distribution, differences in occupational and lifestyle practices, divergent health and illness perceptions, and discrepancies in living conditions and sanitation (Lengkong, Langi and Posangi, 2020). This study analyzes the correlation between parity and residence with maternal mortality due to miscarriage and abortion in Papua Province.

METHOD

This paper was a retrospective cross-sectional study. The population was comprised of reproductive-aged women aged 15-49 who participated in the Indonesia Demographic and Health Survey (IDHS) 2020 (BPS Statistics Indonesia, 2020a). After data cleaning, the initial cohort of 439,562 individuals was reduced to a research sample of 14,802. The researcher employed total sampling in this study, focusing on maternal mortality due to miscarriages and abortions within the last two years. The exclusion criteria included incomplete data and discrepancies in Household ID among variables. The data were categorized and structured utilizing SPSS software version 26 for Windows. Bivariate analysis used logistic regression at a 95% confidence level (α=0.05).

RESULT

The Indonesia Demographic and Health Survey (IDHS) 2020 data categorize maternal mortality into four distinct types: pregnancy, miscarriage and abortion, delivery, and postpartum (BPS Statistics Indonesia, 2020a). The Statistics Indonesia results showed that maternal mortality in Papua Province was significantly higher than in other provinces. Table 1 shows the distribution of maternal mortality in Papua Province in 2020. 14.35% of respondents die due to miscarriage and abortion.

Table 1 Distribution of Maternal Mortality in Papua Province in 2020

Maternal Mortality Cause	Death n (%)	Life n (%)
Pregnancy	121 (26.30)	
Miscarriage and abortion	66 (14.35)	
Delivery	204 (44.35)	
Postpartum	69 (15)	
Total	460 (3.10)	14,342 (96.90)

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Table 2 displays independent variables, including parity and residence. It indicates that most respondents have less than or equal to three-born children (83.64%) and live in rural areas (72.06%).

Table 2. Distribution of Parity and residence

Independent variables	n (%)
Parity	
>3 children	2,421 (16.36)
≤3 children	12,381 (83.64)
Residence	
Urban	4,136 (27.94)
Rural	10,666 (72.06)

The logistic regression test results on the parity variable indicated *p*=0.000 and negative Odds Ratio (OR)=0.475. It indicated respondents with more than three-born children had a higher risk of maternal mortality compared to those with less than or equal to three-born children. In addition, the test results of the residency variable showed *p*=0.000 and negative OR=0.394. It implied that respondents who lived in urban areas faced a higher risk of maternal mortality due to miscarriage and abortion compared to rural mothers. Thus, there was a correlation between parity and residence with maternal mortality due to miscarriage and abortion (Table 3).

Table 3 Logistic Regression Test of Parity and Residence with Maternal Mortality Due to Miscarriage and Abortion

Parity	Maternal Mortality		Total n (%)	*p*	Odds Ratio (95% CI)
	Life n (%)	Death n (%)			
> 3 children	2,412 (16.30)	9 (0.06)	2,421 (16.36)		0.475
≤ 3 children	12,324 (83.25)	57 (0.39)	12,381 (83.64)	0.005*	0.284-0.794
Urban	4,121 (27.85)	15 (0.1)	4,136 (27.95)		0.394
Rural	10,615 (71.71)	51 (0.34)	10,666 (72.05)	0.000*	0.258-0.602

*Meaningful if p-value < 0.05

DISCUSSION

The Ministry of Health categorizes the party into an ideal parity (less than or equal to three-born children) and non-ideal parity (more than three-born children). Women with high parity are riskier in future pregnancy. Most respondents in this study had low or ideal parity (83.64%). Parity is intricately linked to complications during childbirth, leading to maternal and neonatal mortality (Kurniawan and Melaniani, 2019). The parity of 2-3 deliveries is associated with low maternal mortality risk and vice versa. Meanwhile, mothers with high or non-ideal parity in this investigation were 16.36%.

This paper found a correlation between parity and maternal mortality. Respondents with more than three-born children had a higher risk of maternal mortality compared to those with less than or equal to three-born children. It aligns with the Ministry of Health of the Republic of Indonesia report in 2018, indicating that having too many kids results in high demands on family resources. There are disparities between needs and resources, specifically attention and affection among family members, since mothers prioritize

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one of their children. Consequently, mothers are becoming progressively susceptible to health issues. Their survival capacity is also diminishing due to the demands of pregnancy that necessitate a focus on maternal and fetal health. Thus, parents should consider health, economic factors, caregiving, and other significant considerations to decide the number of children. They may seek counsel from health professionals to obtain suitable Family Planning services. Mothers who bear many kids are at high risk of maternal mortality (Kementerian Kesehatan RI, 2020). According to research by Hazairin *et al.* (2021), decreased reproductive organ functions can elevate the risk of labor difficulties, low birth weight, and other health issues resulting in maternal mortality. Moreover, high parity is typically correlated with the old mother's age and reduced birth intervals, elevating the risk of maternal mortality (Hazairin *et al.*, 2021). Thus, encouraging the government to enhance the family planning program for the community and increasing awareness of the dangers associated with pregnancy, labor, and postpartum periods that may arise with high or non-ideal parity is crucial.

Papua is an island in eastern Indonesia, where the population typically experiences impoverished, isolated, and underdeveloped circumstances. Presidential Regulation Number 131 of 2015 identifies 122 districts as undeveloped areas in 2015 to 103 districts, or 84% in 2019, located in the eastern portion of Indonesia (BPS Statistics Indonesia, 2020b). The Eastern Region of Indonesia is characterized by mountainous terrain, hilly landscapes, and steep topography, comprising small islands divided by the sea (Badan Pengembangan Infrastruktur Wilayah (BPIW) Kementerian PUPR, 2017). Insufficient infrastructure, challenging accessibility, limited regional connectivity, inadequate service availability in health, education, and other essential areas, and diverse natural conditions prevent individuals from optimally fulfilling their basic needs, leading to a decreased quality of life (Bappenas, 2016). Residency significantly influences the accessibility of healthcare services. Pregnant women who live in rural are typically isolated communities. They also have challenging transportation. They potentially have higher maternal mortality rates due to prolonged travel times to health services when referred, as well as limited access to prenatal care. The prevalence of maternal mortality is elevated in women living in rural regions and lower middle-class economies (WHO, 2023).

Most respondents in this investigation lived in rural areas. This research found that residence correlated with maternal mortality due to miscarriage and abortion. Respondents who lived in urban areas faced a higher risk of maternal mortality due to miscarriage and abortion compared to rural mothers. The results may be due to unintended pregnancies associated with hazardous abortion procedures. Indonesian Basic Health Research data showed the annual incidence of abortion is 2.5 million, with a higher prevalence in urban regions (Kementerian Kesehatan RI, 2020). In 2018, Papua Province ranked 10th in Indonesia for the number of miscarriages and abortion cases during the past five years. The Indonesian Basic Health Research provides a nationwide overview of the prevalence of miscarriage and abortion, unplanned

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pregnancy, and attempted miscarriage and abortion in Indonesia. It also becomes a foundation to correlate demographic and socio-economic to evaluate the motivations for abortions (Setia Pranata and Sri Sadewo FX, 2010). However, there is no data to identify the causes of mortality due to miscarriage and abortion in adult women; only information about adolescent pregnancies is available. Childbirth, miscarriage, or elective abortion without medical justification can significantly increase the risk of adolescent or maternal mortality (Ray *et al.*, 2024).

CONCLUSION

Parity and residence significantly correlate with maternal mortality due to miscarriage and abortion. The parity of more than three children and urban residence are its risk factors. The research findings provide a strong foundation for future policies and interventions to reduce maternal mortality in Papua Province.

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