



MARITAL STATUS ROLE IN DELAYED ANTENATAL CARE INITIATION AMONG INDONESIAN MADURESE

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Abstract

Background: The diversity of marital status in Madura, influenced by the socio-cultural context, has the potential to cause delays in initiating ANC visits. **Objective:** The study aimed to explore the role of marital status in delayed Antenatal Care (ANC) initiation among Madurese women in Indonesia. **Method:** The secondary analysis utilized the 2023 Indonesian Health Survey data. The study analyzed 551 women who delivered babies within the last five years. In addition to delayed ANC initiation as the outcome variable and marital status as the exposure variable, we examined eight control variables: regency, residence, age, education, employment, wealth, insurance, and parity. Binary logistic regression was employed in the final analysis. **Results:** The findings indicate that 23.3% of Indonesian Madurese women delayed ANC initiation. Currently, 3.2% of Madurese women are either divorced or widowed. In terms of marital status, divorced/widowed Indonesian Madurese women are likely 5.726 times more to have delayed ANC initiation than those married group (95% CI 5.432-6.035). Moreover, the study found eight control variables associated with delayed ANC initiation: regency, residence type, age group, marital status, education level, employment, wealth, health insurance ownership, and parity. **Conclusion:** The study concluded that marital status was associated with delayed ANC initiation among Indonesian Madurese women. Divorced/widowed Madurese women were likely five times more to have delayed ANC initiation than married women.

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INTRODUCTION

The Maternal Mortality Ratio (MMR) is an important indicator in public health as it reflects the safety of mothers during pregnancy and childbirth. Globally, MMR has decreased by 34.8% between 2000 and 2020, from 342 to 223 deaths per 100,000 live births. However, this declined rate is still insufficient to meet the Sustainable Development Goal (SDG) target of 70 deaths per 100,000 live births by 2030. This indicates that MMR remains a global priority.^{1,2}

In Indonesia, although the MMR trend shows a decline, the national average is still above 100 per 100,000 live births. East Java province recorded a rate of 184 per 100,000 live births, the second highest in Java after West Java. Despite a decrease in maternal deaths to 499 cases in 2022 from 1,279 cases in the previous year, MMR remains a health challenge that requires serious attention.^{3,4}

One of the proven efforts to reduce MMR is by increasing the coverage and quality of Antenatal Care (ANC) services. Regular pregnancy check-ups aim to monitor the health of the mother and fetus, as well as to prepare the mother for childbirth and the postpartum period. The Ministry of Health of the Republic of Indonesia recommends at least six ANC visits should be done during pregnancy, with two of them performed by a doctor. However, delays in starting ANC visits remain a challenge. In East Java Province, the coverage of the first ANC visit (K1) decreased from 97.6% in 2022 to 89.1% in 2023, indicating the need for attention to timely ANC initiation.⁵

In Madura, the coverage of ANC visits is relatively high, although it varies among districts. Sampang recorded a 100% coverage for the fourth ANC visit (K4), followed by Pamekasan (97%) and Sumenep (96%), while Bangkalan had a lower rate of 81%. This difference suggests that social and structural factors likely influence access and the regularity of ANC visits in this region.⁶

One of the social factors that influence delays in ANC visits is marital status. Previous studies have shown that married women are more likely to have complete ANC visits compared to women who are unmarried or divorced. Data from the East Java Central Statistics Agency in 2022 shows that the divorce rate in Madura Island is quite high, with Sumenep being the district with the highest number of cases (942 cases), followed by Bangkalan, Pamekasan, and Sampang. The high divorce rate may serve as an indicator of the potential vulnerability of women in accessing ANC services.⁷

Marital status that deviates from social norms, such as pregnancy outside of marriage or after divorce, often leads to social stigma. In Madura society, which has strong traditional norms and religiosity, stigma against women who are pregnant without a lawful partner can trigger feelings of shame, social rejection, or even ostracism. This condition can create psychological and social barriers in accessing ANC services, especially during the first visit, which requires initiative from the mother.⁸

The unique socio-cultural characteristics of Madura, such as the strong kinship system, patriarchal societal structure, and the role of religion in daily life, provide a distinct context for health-seeking behavior, particularly for women. Understanding these local dynamics is important to develop intervention approaches that align with the values of the local community.⁹

Based on this background, this study aims to explore the role of marital status in the delay of ANC visit initiation among Madurese women in Indonesia. This study is expected to provide contextual understanding of the social and cultural barriers women face in accessing timely pregnancy care services.

METHODS

Data Source and Study Design

The study used the 2023 Indonesian Health Survey secondary data. The Ministry of Health oversees national health. A national survey collects information on health status, risk factors for diseases, and access to and utilization of health services in Indonesia. Data in this survey was collected through structured interviews, questionnaires and direct health examinations, with samples selected in a representative manner to reflect the national and regional population. Secondary data from this survey is comprehensive and has gone through a validation process, so it can be used for epidemiological analysis, monitoring health trends, and evaluating health policies. The use of secondary data from the 2023 Indonesian Health Survey in this study gives advantages in terms of time and resource efficiency, and allows analysis based on extensive and reliable data.

The study used multistage and stratified random sampling to mix household and individual instrument interviews. The poll ran from May to July 2023, and 91.49% of respondents responded.¹⁰ The study included Indonesian Madurese women who had given birth five years prior. Around 573 women answered the weighted sample.

Variables

The outcome variable was the delayed ANC initiation. The early initiation of pregnancy checks in this study refers to the first ANC visit occurring at 4 months (16 weeks) of pregnancy or earlier. Consequently, delayed ANC initiation is defined as having the first ANC visit over 4 months of pregnancy. The 2023 Indonesian Health Survey designated the first ANC visit in months as "1" for pregnancies over four months. If scheduled within four months and tagged "0", it was early initiation. Whereas, marital status was an exposure factor in the study. It consists of married and divorced or widowed. In the 2023 Indonesian Health Survey, the term divorced refers to the marital status of respondents who are no longer legally or socially bound by marriage due to official divorce or separation without legal ties. Respondents surveyed were women aged 10–54 years with marital status categorized as married and divorced/widowed. The data collected includes the history of the

last pregnancy within the last 5 years, starting from January 1 2018 until the time when the interview was conducted.

The study examined control variables: regency, residence, age group, education level, employment status, wealth status, health insurance, and parity. Regency and residence are important geographic factors that can influence access to health services, including ANC. Urban and rural disparities in healthcare infrastructure often lead to differences in ANC utilization, with areas lacking adequate facilities experiencing higher rates of ANC delays. Similarly, maternal age plays a crucial role in ANC initiation, as it is associated with knowledge levels, pregnancy readiness, and healthcare access. Younger and older mothers may have different patterns of ANC visits compared to other age groups. Marital status also affects access to healthcare services, as mothers with marital status of married often receive more social and economic support, enabling them to seek ANC more readily compared to those who are divorced/widowed. Furthermore, education level significantly impacts a mother's awareness of ANC benefits and her decision-making ability regarding pregnancy health. Mothers with higher education levels are generally more proactive in seeking early ANC services.

Employment status can also affect ANC visits, as working mothers may face time constraints that lead to delays in accessing healthcare services. Economic status is another critical determinant, with lower-income mothers potentially struggling with transportation costs and other indirect expenses, making ANC visits less accessible. Health insurance ownership plays a crucial role in mitigating financial barriers, as uninsured women may be hesitant to initiate ANC due to concerns about medical costs. Lastly, parity influences ANC utilization, as multiparous women, believing they are experienced in pregnancy, may prioritize ANC visits less than first-time mothers.

Regency consisted of Bangkalan, Sampang, Pamekasan, Sumenep. Residence was divided into urban and rural. The study included age groups ≤ 19 , 20-29, 25-29, 30-34, 35-39, 40-44, and ≥ 45 . Moreover, education consisted of no education, primary school, junior high school, senior high school, and college. Employment was divided into unemployed and employed.

This study assessed a household's worth by its items. Housing was evaluated based on access to drinking water, bathrooms, first-floor materials, and the number and type of controls, such as TVs, bicycles, and cars. The number was calculated using principal component analysis. Each family member's average score divided 20% of the population into five wealth tiers nationwide. The survey split persons by wealth into five groups: poorest, poorer, middle, richer, and richest.^{11,12}

Furthermore, the study further separated those with health insurance into insured and uninsured. Parity also denoted the total number of live children. Primiparous (≤ 1) and multiparous (2 or more) are the two forms of parity.

Data Analysis

The data in the 2023 Indonesian Health Survey (SKI), has gone through the cleaning and weighting process by the Central Statistics Agency (BPS) and is ready to be used for analysis without the need to make further adjustments related to the complexity of the sample design. This cleaning process includes identifying and correcting inconsistent data as well as handling outliers to ensure data validity and reliability. Thus, even though the initial sampling was carried out using multistage random sampling and stratified random sampling methods, the weighting values provided allow the data to be analyzed directly without having to take into account the effects of the complex sampling design again in the analysis stage.

In addition, SKI 2023 uses a prevalence and proportion approach in presenting data, depending on the source and method of collecting the information. Prevalence is used for indicators obtained through physical examination, laboratory, or interviews with confirmation of the diagnosis by health workers, while proportion is used for indicators based on the results of direct interviews with respondents without medical confirmation. The choice of analysis method in this research takes into account the characteristics of the data that have been categorized in the 2023 SKI, so that the statistical approach used remains in accordance with secondary data processing standards from national surveys.

The Chi-Square test was used to examine two variables for the first part. The collinearity test was used to show no critical link between the independent factors in the second part of the study. We used the entry method for the last binary logistic regression test. AORs from the survey were shown along with CIs that are 95% sure. For the statistical analysis, we also used IBM SPSS 26.

Ethical Approval

The National Ethics Committee approved the 2023 Indonesian Health Survey (LB.02.01/I/KE/L/287/2023). The survey removed all respondents' names from the dataset, and all of them gave written permission to participate in the study. The author got permission to use data from <https://layanandata.kemkes.go.id/> for this study.

RESULTS

The findings indicate that 23.3% of Indonesian Madurese women delayed the ANC initiation. Currently, 3.2% of Madurese women are either divorced or widowed. Additionally, Table 1 presents the findings of the bivariate study concerning individual characteristics and marital status.

Table 1. The outcome of bivariate test (n=551)

Demographic Characteristics	Marital Status		p-value
	Married % (n=537)	Divorced/Widowed % (n=14)	
Delayed ANC initiation:			
No	77.5	50.2	
Yes	22.5	49.8	
Regency			<0.001
Bangkalan	32.7	17.4	
Sampang	18.6	10.5	
Pamekasan	24.1	5.3	
Sumenep	24.7	66.7	
Residence			
Urban	28.0	35.2	
Rural	72.0	64.8	
Age group			<0.001
≤ 19	0.7	3.8	
20 - 24	14.1	39.4	
25 - 29	30.6	9.7	
30 - 34	25.6	29.4	
35 - 39	15.3	0.0	
40 - 44	10.3	8.2	
≥ 45	3.5	9.6	
Education Level			<0.001
No education	5.2	0.0	
Primary school	50.0	64.8	
Junior high school	21.3	6.5	
Senior high school	19.0	27.4	
College	4.5	1.3	
Employment status			
Unemployed	51.2	12.7	
Employed	48.8	87.3	
Wealth Status			
Poorest	6.8	30.2	
Poorer	30.8	17.3	
Middle	30.1	37.6	
Richer	23.1	0.0	
Ricest	9.3	14.8	
Health Insurance			
Uninsured	30.0	13.5	
Insured	70.0	86.5	
Parity			<0.001
Primiparous	37.7	55.7	
Multiparous	62.3	44.3	

Table 1 displays that divorced/widowed women have a proportion of delayed ANC initiation nearly equivalent to the one on-time performance. Meanwhile, Sumenep Regency has the highest proportion of divorced/widowed women. In terms of the type of residence, rural areas have almost twice the ratio of divorced/widowed women than urban areas. Moreover, according to age group, women aged 20-24 have the highest proportion in the divorced/widowed group.

Based on education level, Table 1 informs that women in primary school have the highest ratio of divorced/widowed women. In addition, employed women dominates the divorced or widowed group. Women with middle-wealth status have the highest ratio in the divorced/widowed group. Also, insured women dominates the divorced/widowed group, and primiparous women have a higher proportion than multiparous women.

The second part of the study included a collinearity test. The tests show that there isn't much of a link between the separate factors. At least one 0.10 is in the limit number for each factor. The difference between the two measures is also less than 10.00. The data clearly show that the regression model does not have multicollinearity.

Table 2. The outcome of binary logistic regression (n=551)

Variables	Delayed ANC Initiation			
	p-value	Adjusted Odds Ratio	95% Confidence Interval	
			Lower Bound	Upper Bound
Marital: Married	-	-	-	-
Marital: Divorced/Widowed	< 0.001	5.726	5.432	6.035
Regency: Bangkalan	-	-	-	-
Regency: Sampang	< 0.001	1.737	1.683	1.792
Regency: Pamekasan	< 0.001	1.875	1.821	1.931
Regency: Sumenep	< 0.001	2.028	1.970	2.089
Residence: Urban	-	-	-	-
Residence: Rural	< 0.001	1.097	1.072	1.123
Age: ≤ 19	-	-	-	-
Age: 20 – 24	< 0.001	.037	.033	.041
Age: 25 – 29	< 0.001	.058	.052	.065
Age: 30 – 34	< 0.001	.120	.107	.134
Age: 35 – 39	< 0.001	.069	.062	.077
Age: 40 – 44	< 0.001	.082	.073	.092
Age: ≥ 45	< 0.001	.034	.030	.038
Education: No education	< 0.001	1.879	1.746	2.022
Education: Primary school	< 0.001	2.072	1.950	2.202
Education: Junior high school	< 0.001	1.849	1.738	1.966
Education: Senior high school	< 0.001	1.747	1.643	1.858
Education: College	-	-	-	-
Employment: Unemployed	< 0.001	1.258	1.231	1.285
Employment: Employed	-	-	-	-
Wealth: Poorest	-	-	-	-
Wealth: Poorer	< 0.001	1.467	1.409	1.529
Wealth: Middle	< 0.001	1.094	1.050	1.141
Wealth: Richer	< 0.001	1.670	1.600	1.743
Wealth: Richest	< 0.001	1.170	1.110	1.233
Insured: Uninsured	< 0.001	2.099	2.051	2.149
Insured: Insured	-	-	-	-
Parity: Primiparous	-	-	-	-
Parity: Multiparous	< 0.001	1.842	1.795	1.890

Table 2 presents the outcome of a multivariate test. In terms of marital status, the table shows that divorced/widowed Indonesian Madurese women are likely 5.726 times more to have delayed ANC initiation than those married ones (95% CI 5.432-6.035).

The study also indicated eight control factors significantly linked to delayed ANC initiation among Madurese women in Indonesia: regency, residence, age group, marital status, education level, employment, wealth, health insurance ownership, and parity. In terms of regency, all regencies are more likely to have delayed ANC initiation than Bangkalan. According to the residence, rural women are likely 1.097 times more to have delayed ANC initiation than urban women (95% CI 1.072-1.123). Meanwhile, based on age group, all ages are less likely than ≤ 19 to have delayed ANC initiation. Moreover, all education levels are more likely to have delayed ANC initiation than college group.

Table 2 shows, according to employment status, unemployed women are likely 1.258 times more to have delayed ANC initiation than employed women (95% CI 1.231-1.285). According to wealth status, all statuses are more likely to have delayed ANC initiation than the poorest group. In addition, uninsured women are likely 2.099 times more to have delayed ANC initiation than insured women. Also, multiparous women are likely 1.842 times more to have delayed ANC initiation than primiparous women (95% CI 1.795-1.890).

DISCUSSION

The study revealed that divorced or widowed Indonesian Madurese women were more inclined than their married counterparts to delay ANC initiation. The circumstances suggest that married women typically receive greater emotional and financial support from their spouses and families, potentially fostering more prompt healthcare-seeking behavior.¹³ Divorced or bereaved women may experience a deficiency of support, resulting in postponements in obtaining antenatal care.¹⁴ Women who are widowed or divorced may encounter financial difficulties stemming from the lack of a partner's income, complicating their ability to prioritize healthcare or finance transportation to clinics, hence resulting in delays in ANC initiation.^{15,16}

In Madurese communities, divorced or bereaved women may encounter social stigma or isolation, potentially resulting in diminished confidence in utilizing healthcare services or recognizing their significance.¹⁷ The same stigma in Divorced/Widowed Women is still found in a different cultural background in Indonesia.^{18,19} This situation has the potential to make divorced/widowed women ashamed to show themselves to have ANC when they are pregnant.

Grief, stress, or melancholy associated with divorce or widowhood may diminish the motivation or ability to prioritize maternal healthcare.¹³ Divorced or widowed Madurese women may encounter logistical difficulties, such as commuting independently to healthcare facilities, particularly in rural locations with restricted transportation options.^{15,20,21}

The study identified two location-related factors associated with delayed ANC initiation: regency and type of residence. Differences in healthcare infrastructure, accessibility to medical facilities, and availability of healthcare professionals across regencies may contribute to variations

in ANC initiation timing. Some regencies may have better healthcare services than others. Others, especially those in rural or remote areas, may have severe problems with buildings and staff, which could delay ANC initiation.^{22,23} On the other hand, women who live in rural places often have to wait longer to have ANC initiation because they can't quickly get to healthcare facilities. In rural areas, there may not be any close hospitals or health centers, and getting health care can be delayed by problems with transportation, such as long distances, bad roads, or a lack of public transportation. Also, there may not be as many doctors and nurses in rural places, and women may have to wait longer for appointments.²⁴

In addition, the findings indicated that four maternal characteristics were associated with delayed ANC initiation: age, education, employment, and wealth. Based on the results of the analysis in Table 2, the AOR value of less than 1 in the older age group indicates that as age increases, the risk of ANC delay decreases compared to the reference group (age ≤ 19 years). In other words, older age acts as a protective factor against ANC delay. Theoretically, this can be explained by several factors. Older women tend to have previous experience of pregnancy, a better understanding of the importance of antenatal care, and greater access to health information than teenagers. In contrast, younger women, especially teenagers, may experience delays in ANC due to not knowing how important it is to get immediate care for the mother, lack of awareness of the importance of prenatal care, limitations in decision making, or socio-cultural factors that limit their access to health services. Younger women, particularly adolescents, may delay ANC initiation due to a lack of awareness regarding the importance of early maternal healthcare. Also, younger women may feel shame, especially if they get unplanned pregnant, which makes them less likely to get help.²⁵ On the other hand, women with less schooling are more likely to have delayed ANC initiation. This could be because they don't know much about health or the benefits of early maternal care. Also, they might not know what healthcare services offer or they have trouble using the system. The situation included the education of the spouse.²⁶⁻²⁸

Unemployed women may delay ANC initiation because they can't afford it or cannot easily access it. When they don't have a fixed income, putting their health care needs first can be challenging, especially when other basic needs are more important.²⁹ Also, differences in wealth have a significant effect on access to health care. Women from poorer families are more likely to have to wait longer to have ANC initiation because they can't afford it, can't get to the clinic, or live in an area with few healthcare options. The cost of care might still be a problem, even if the government pays for some of it.³⁰

Health insurance ownership is included as a control variable because financial constraints can influence ANC initiation. Women without health insurance may face higher out-of-pocket costs, which could lead to delays in seeking maternal healthcare. Controlling for this factor ensures that

differences in ANC initiation are not solely attributed to economic barriers but also account for other determinants. If they don't have insurance, they might have to pay for doctor visits, testing, and treatments out of their own pockets, which can be too expensive for some people, especially those with less money. Because of this financial stress, healthcare is often put off or skipped.^{31,32}

Parity is considered a control variable as it may influence ANC initiation. Multiparous women might perceive themselves as more experienced in pregnancy and childbirth, potentially leading to a lower perceived need for early ANC. By controlling for parity, the analysis accounts for differences in healthcare-seeking behavior based on prior pregnancy experience. This can make people lazy or make them not realize how crucial early care is. Observations in Kwale County, Kenya, and studies in Addis Ababa, Ethiopia, also indicated that excessive parity had a significant negative link with timely ANC initiation.^{33,34}

Strength and Limitation

The study's primary significance involves its analysis of extensive data to provide insights at the national level of Indonesia. Conversely, due to the utilization of secondary data, the survey exclusively examines fundamental variables. This study does not discuss the many factors identified in other research that influence the delayed ANC initiation. These encompass perspectives, familial choices, or the valuation of children and families.^{35,36} Limitation of this survey is that marital status was recorded only at the time of the survey, without information on when changes such as divorce or separation occurred in relation to the last pregnancy. This lack of temporal data may introduce bias in the analysis, particularly in assessing the impact of marital status on maternal and child health. Additionally, the survey does not explicitly record cases of separation without formal divorce, which may have different implications compared to legal divorce or widowhood. The absence of this information limits the ability to explore the specific effects of separation on various aspects of maternal and child health. These limitations will be acknowledged in the research to highlight potential constraints in data interpretation. Another limitation is the potential information bias related to maternal age. Pregnancies among women aged 35 years and older particularly those over 45 may reflect specific or exceptional circumstances that are not broadly representative of the general reproductive population. While age categories were based on national survey standards, findings involving these age extremes should be interpreted with caution and not overgeneralized. Therefore, the primary analytical focus remains on the majority reproductive age group, with marital status emphasized as the more dominant social factor influencing delays in ANC initiation in the Madurese context.

CONCLUSION

The study concluded that marital status was associated with delayed ANC initiation among Indonesian Madurese women. Divorced/widowed Madurese women were likely five times more to have delayed ANC initiation than married women. The research results also showed that eight control variables were associated with delays in the first ANC visit: regency, type of residence, age group, marital status, education level, employment status, wealth, health insurance ownership, and parity.

RECOMMENDATION

Based on the findings of this study, more targeted interventions are needed for women with vulnerable marital statuses—such as divorced, widowed, or unmarried women—who are at higher risk of delayed ANC initiation. Local governments and health agencies should develop maternal health programs specifically designed to reach these groups through community-based approaches, such as peer support groups, psychosocial counseling, and locally scaled financial assistance. In addition, healthcare workers and community health volunteers should be trained to identify and support women with unstable marital status, particularly in culturally conservative settings such as Madura.

Strengthening community-based maternal surveillance systems is also essential to identify pregnant women who are not registered in the formal healthcare system. Optimizing the role of community health workers and utilizing simple information technology platforms (e.g., village-level WhatsApp reporting systems) can improve coverage and connection to ANC services. Given the potential reluctance to be formally identified, trust-based community engagement and reproductive health education from an early age are needed to increase acceptance and awareness of ANC.

More specific strategies should also be directed toward young mothers and those with low education levels, who share similar risks. Efforts to improve reproductive health literacy and physical access to ANC services should be integrated with strengthened local social support networks, ensuring that women with limited family support still receive timely and adequate maternal healthcare.

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Declarations

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- Additional information : Availability of data and materials
The author cannot publicly reveal the data as they lack authorization from the Ministry of Health of the Republic of Indonesia, which is the rightful owner of the data. Eligible researchers can obtain the 2023 Indonesian Health Survey dataset via the <https://layanandata.kemkes.go.id/>. The dataset contains sensitive information, and its access is subject to strict criteria.