



Early Marriage in Women and the Risk of Low Birth Weight

Muhammad Azinar¹✉, Arulita Ika Fibriana¹, Alfiana Ainun Nisa¹, Mohammad Zen Rahfiludin², Gunawan Supto Indrianto³, Irfan Sholahuddin¹, Putri Nur Tamalla¹, Claudia Permatasari¹

¹Public Health Department, Universitas Negeri Semarang, Indonesia

²Public Health Nutrition Department, Faculty of Public Health, Diponegoro University, Indonesia

³Population and Civil Registry Office of Grobogan Regency, Central Java, Indonesia

Article Info

Article History

Submitted October 2021

Accepted December 2021

Published January 2022

Keywords:

Early Marriage; Low Birth Weight; Women

DOI:

<https://doi.org/10.15294/ujph.v11i1.51231>

Abstract

Neonatal mortality, largely caused by Low Birth Weight (LBW), is a big challenge in Grobogan district, Central Java. For instance, the year 2020 recorded 111 infant mortality cases due to LBW. The following year, an additional 63 cases were reported from January- July bringing the total to 174 instances recorded in less than two years. Early marriage in women has been touted as the cause of the high LBW witnessed. Notably, Law Number 16 of 2019 set the base age at 19 years for marriage for both men and women. Statistics show that a total of 380 women got married at 19 years in 2020. However, the cases have significantly heightened to 453 in the year 2021. The research sample for this study was drawn from babies born to women aged 30 and below. The data was analyzed using the Chi-square test, whose results confirmed that residence, level of education, and employment status were related to the incidence of early marriage in women. Furthermore, it was found that women who married at 20 years and below had a greater risk (1,728 times) compared to those who gave birth between 20-30 years.

INTRODUCTION

Neonatal mortality, infant mortality, under-five mortality and maternal mortality are currently still a global health problem, especially in developing countries including Indonesia. The results of the Indonesia Demographic and Health Survey (IDHS) in 2017 showed a neonatal mortality rate of 15 per 1,000 live births, an infant mortality rate of 24 per 1,000 live births, and a child mortality rate of 32 per 1,000 live births (Central Bureau of Statistics, 2020).

Neonatal mortality is the biggest cause of under-five mortality. This is shown in 2019, out of 29,322 under-five deaths, 69% (20,244 deaths) occurred in the neonatal period (age 0-28 days). Of all reported neonatal deaths, 80% (16,156 deaths) occurred in the first six days of life, 21% (6,151 deaths) occurred at 29 days to 11 months and 10% (2,927 deaths) occurred at 12-59 months. The main causes of neonatal death are low birth weight (LBW) which is 35.3%, asphyxia 27.0%, and congenital abnormalities

✉ Correspondence Address:

Public Health Department, Universitas Negeri Semarang,
Sekaran, Gunungpati, Semarang, Indonesia 50229
E-mail: azinar.ikm@mail.unnes.ac.id



pISSN 2252-6781
eISSN 2548-7604

12.5% (Ministry of Health, 2020).

The achievement of reducing neonatal mortality, infant mortality, and under-five mortality in Indonesia is still very far from the sustainable development targets or the Sustainable Development Goals (SDGs) which target to reduce infant mortality to 16 per 1000 live births in 2024, and under-five mortality to 18,8 per 1000 live births in 2030 (Central Bureau of Statistics, 2020).

The neonatal mortality rate in Central Java Province, in 2019 was 5.8 per 1,000 live births. Grobogan Regency is an area in Central Java which in recent years has had a high neonatal mortality rate in Central Java and the figure is much higher than the provincial figure. The neonatal mortality rate in Grobogan in 2018 was 11.5 per 1,000 live births, and in 2019 there were 207 cases out of 21,559 live births or a neonatal mortality rate of 9.6 per 1,000 live births (Central Java Provincial Health Office, 2020).

The cause of neonatal death in Grobogan is mostly due to low birth weight. Data from the Health Service stated that in 2020 there were 111 cases of infant mortality due to LBW. In the following year, 2021, the number of cases is still high, until July 2021 there have been 63 cases of neonatal deaths due to low birth weight from 11,465 live births or the neonatal mortality rate due to low birth weight has reached 5.5 per 1,000 live births. In general, infants with low birth weight in Grobogan district are also high. The number of LBW cases in 2020 is 1,149 cases, and from 2021 to July there have been 638 cases (Central Java Provincial Health Office, 2020).

The marriage law, number 16 of 2019, has regulated the minimum age for marriage for women is the same as for men, which is 19 years. Marriages that occur under the age of 19 are declared early marriages and must get dispensation by the Religious Courts. Grobogan Regency is one of the areas with the highest cases of female early marriage (less than 19 years old) in Central Java (Central Java Office of Women's Empowerment and Child Protection, 2020; Wilonoyudho & Salim, 2020).

Data from the Office of the Ministry of Religion of Grobogan Regency, states that in the

last two years there has been an increase in cases of early marriage of women. According to marriage registration data, women who married at the age of less than 19 years in 2020 were 380 cases, this number increased in the following year. As of July 2021, there have been 453 cases of women getting married at the age of less than 19 years.

This early marriage of women will lead to early pregnancy. Women's readiness to become a mother indirectly has an important role in preventing child morbidity and mortality, because teenage marriages will have an impact on increasing teenage pregnancies, and births by teenage mothers.

National socio-economic survey data in 2017 shows the percentage of women aged 20-24 years who married before the age of 18 years and the age of first pregnancy before the age of 18 years was 63.08%. This means that almost 2 out of 3 women aged 20-24 years who were married before the age of 18 had their first pregnancy also under the age of 18 (Central Bureau of Statistics, 2020).

Pregnancy in adolescence (less than 18 years) has an impact on the morbidity and mortality of children born. Research in India, states that the prevalence of morbidity and mortality is significantly higher in children born to mothers who are under 18 years of age compared to mothers who are married at the age of 18 years and over (Paul, 2019). Child marriage can also lead to an increased risk of premature birth and death as a neonate, infant, or child (Nour, 2006).

Infant birth weight is a significant predictor of the immediate and future health status of newborns. Low birth weight (LBW) is a major public health problem and one of the strongest single risk factors for neonatal mortality and morbidity (Chrisman et al., 2016; Assefa et al., 2012). LBW is defined as birth weight less than 2,500 grams regardless of gestational age. As a result, LBW is thought to be associated with a greater risk of early childhood death compared to normal birth weight (Yadav et al., 2011).

Based on these facts, there has been concern about the relationship between mothers

who give birth at an early age with the health of the babies born, especially related to the baby's birth weight. The purpose of this study is to analyze the incidence of early marriage in women and the risk to the birth weight of the baby.

METHOD

This study uses secondary data, namely: birth registration data from January 2020 to July 2021 at the Population and Civil Registration Office of Grobogan district. The data analyzed included maternal age at marriage, education, occupation, sex of the baby, birth weight and length of the baby's body at birth. Data related to the sex of the baby, birth weight and length of the baby at birth are sourced from birth certificates from hospitals, health centers, maternity clinics, doctors, private practice midwives or other birth attendants brought by the baby's parents when registering birth of a child.

The research sample was the first child born to a woman aged less than 30 years in January 2020 to July 2021. The data were taken from the registration of child births at the Population and Civil Registry Office of Grobogan Regency ($n = 3,400$), excluding the health service place where baby is born. Therefore, the baby's weight and length were not measured directly or by using the same instrument but were measured using separate tools that were available and used in each delivery service at that time.

Birth weight is categorized into two, namely low birth weight (LBW) and normal birth weight. Babies are declared LBW if their birth weight is less than 2,500 grams and normal if their birth weight is 2,500 grams or more. Maternal age at marriage in this study is categorized into two, namely early age less than 20 years and adults if married at the age of 20 to 30 years. This is based on the risk of pregnancy. Several studies state that early marriage will lead to pregnancy and childbirth at a young age (less than 20 years) which has a risk of premature birth and low birth weight. Data analysis was carried out using the Chi Square test, namely by examining the relationship between the mother's

marriage age and the baby's birth weight. Ethical clearance obtained from the Commission Health Research Ethics (KEPK) Universitas Negeri Semarang (approval number 317/KEPK/EC/2021).

RESULT AND DISCUSSION

Based on child registration data The Population and Civil Registration Office of Grobogan Regency, during January 2020 to July 2021, there have been 3,400 live births recorded. According to the mother's age, the babies were born to mothers aged 14 to 30 years. If you look at the regional structure, most of the Grobogan district is rural, only 5% of the area is categorized as urban area, namely Purwodadi sub-district.

Judging from the characteristics of women who gave birth to babies during 2020-2021, it is known that 35.7% of women married at an early age (less than 20 years) and 64.3% married at the age of 30 to 40 years. Based on other characteristics, it is known that almost all (91.1%) of women who gave birth live in rural areas, 63.73% have low education, namely junior high school and below and some even do not go to school, and 39.1% are not working.

Table 1 shows that there is a significant relationship between place of residence and women's age at marriage ($p < 0.001$). Women who marry at an early age (less than 20 years), are more common in rural areas (33.4%) than in urban areas (2.3%), PR 1.411 (1.160-1.715), meaning that women who live in Rural people are 1.4 times more likely to be married at the age of less than 20 years, compared to those living in urban areas.

Likewise with education, there is a relationship between education level and age at marriage ($p < 0.001$). Women who marry at an early age are more common in women with low education (not until they finish high school). At most, they only graduated from junior high school and even only finished school and had no school status.

Employment status was also associated with women's age at marriage ($p < 0.001$). More women whose working status married at the age of more than 20 years, on the other hand, those

Table 1. The relationship between characteristics and the age of marriage of women who gave birth to live births in Grobogan district in January 2020 to July 2021

Characteristics		Married Age				PR 95% CI	p value
		Early age (< 20 years)		Mature (20-30 years)			
		f	%	f	%		
Residence	Rural	1.135	33.4	1961	57.7	1,411 (1,160-1,715)	< 0.001
	Urban	79	2.3	225	6.6		
Level of education	Not completed in primary school	98	2.9	37	1.1	-	< 0.001
	Elementary school/ equivalent	357	10.5	518	15.2		
	Middle school/ equivalent	499	14.7	793	23.3		
	High school/ equivalent	260	7.6	638	18.8		
	College	0	0.0	200	5.9		
Job status	Does not work	522	15.4	806	23.7	1,177 (1.075-1.288)	0.001
	Work	692	20.4	1,380	40.6		

who did not work tended to get married at the age of less than 20 years, PR 1.177 (1.075-1.288), meaning that women whose status did not work had a 1.177 times greater tendency to get married at an early age (less than 20 years).

The results of this study also stated that from 3,400 babies born, as many as 145 babies (4.3%) were declared to have low birth weight (less than 2,500 grams), as many as 1,214 babies (35.7%) were born to mothers who married at the age of 15. early (< 20 years). Based on statistical analysis, it is known that there is significant relationship between age marriage with the baby's birth weight (p 0.001). More cases of LBW babies were born to women who married at the age of less than 20 years. In other words, women who married at the age of less than 20 years, had a 1.728 times greater risk of giving birth to LBW babies compared to women who married at the age of 20-30 years (95% CI 1.257-2.374).

The results of this study indicate that women who marry early and become pregnant at the age of less than 20 years will have a higher risk of giving birth to babies with low birth weight. This could be because mothers who are

pregnant under the age of 20 may be at risk of having a preterm birth (premature birth). Babies born prematurely tend to have a lower birth weight when compared to babies born at term. Gestational age is at risk significantly as a risk factor that causes LBW (Rahfiludin & Dharmawan, 2018).

Most LBW babies are born to mothers who are less than 20 years old and more than 35 years old. Mothers aged 20 to 35 years are more likely to give birth to babies with normal weight. The ideal age for a woman to give birth to her first child is 20-25 years, if it is less or more it will be risky. Young and old gestational ages will be at risk of giving birth to babies with low birth weight (Owa et al., 2017; C et al., 2020).

Paul's study (2019) also mentions the prevalence of morbidity and mortality is significantly higher in children born to mothers under the age of 18 years compared to mothers who are married at the age of 18 years and over. Children born to women who married under the age of 18 were more likely to have diarrhea (OR: 1.04, 95% CI: 1.01-1.07) and fever (OR 1.03, 95% CI: 1.01 to 1.06) in the last 2 weeks compared to

Table 2. The relationship between female characteristics and the weight of babies born in Grobogan district in January 2020 to July 2021

Characteristics	Baby Birth Weight				PR 95% CI	p value	
	LBW		Normal				
	f	%	f	%			
Residence	Rural	134	3.9	2,962	87.1	1,196 (0.564-2.187)	0.663
	Urban	11	0.3	293	8.6		
Married Age	Early age (< 20 years)	71	2.1	1,143	33.6	1,728 (1,257-2,374)	0.001
	Adult (20-30 years old)	74	2.2	2,112	62.1		
Level of education	Not completed in primary school	10	0.3	125	3.7	-	0.185
	Elementary school / equivalent	40	1.2	835	24.6		
	Middle school/equivalent	50	1.5	1,242	36.5		
	High school / equivalent	33	1.0	865	25.4		
	College	12	0.4	188	5.5		
Job status	Does not work	47	1.4	1,281	37.7	0.748 (0.532-1.052)	0.112
	Work	98	2.9	1,974	58.1		
Baby Gender	Male	63	1.9	1,678	49.4	0.732 (0.531-1.010)	0.068
	Female	82	2.4	1,577	46.4		

children who had his mother married at the age of 18 or older. Early female marriage was also associated with an increased likelihood of child mortality (OR: 1.33, 95% CI: 1.28-1.38) and infant mortality (OR: 1.30, 95% CI: 1.25-1, 35)

Another study in India also showed that there was a significant relationship between female marriage at childhood and the incidence of infant diarrhea, malnutrition (shortness, underweight, underweight), low birth weight, and death. Early marriage of mothers was the cause of infant or child mortality (OR 1.55, 95% CI 1.35-1.78). These data indicate that mothers who marry at an early age will be at risk of infant mortality 1.55 times greater than mothers who marry in adulthood (Raj et al., 2010).

Malnutrition in children under 5 years of age is also often associated with child or adolescent marriage. The Indian study also found that children born to underage married women were significantly more likely to be stunted (OR 1.85, 95% CI 1.71-1.99), underweight (OR 1.19, 95% CI 1.07-1.31) and underweight (OR 1.87,

95% CI 1.74-2.01). Mothers who married before the age of 18 were more likely to give birth to a low-birth-weight baby (OR 1.13, 95% CI 1.004-1.26) than mothers who married in adulthood (Raj et al., 2010).

Another study stated that there were several predictors associated with low birth weight, namely early marriage, rural residence, prematurity, and no follow-up of antenatal care (Mengesha et al., 2017). This is slightly different from the results of this study which stated that there was no relationship between place of residence, education level, employment status, and sex of the baby with the baby's birth weight ($p > 0.005$), but these factors were significantly related to the age of marriage of women in the Grobogan district.

This study agrees with previous research which stated that women who being in the poor socioeconomic strata are more at risk for marrying young and giving birth to LBW babies, OR 1.4 95% CI 1.1 to 1.8 (Mahumud et al., 2017). Poor socioeconomic conditions, low

gestational age, anemia, irregular consumption of IFA tablets, inadequate food intake during ANC are factors that are significantly associated with low birth weight (Dasgupta et al., 2011; Figueiredo et al., 2018).

In line with this study, previous studies also state that residence in rural areas and early marriage are also associated with the risk of giving birth to LBW babies (Islam, 2015; Demelash, 2015; Kader & Perera, 2014; Paliwal, 2013; Manyeh et al., 2016). Low awareness and poor utilization of health services among women who marry at a young age also increase the risk of having a low-birth-weight baby. This gap can make these mothers have low quality in providing antenatal care and related services. These factors are potential or risk factors for the incidence of LBW. In addition, mothers who marry early have immature body systems and become complications in their pregnancy (Santhya, 2011).

This research is limited to the analysis of secondary data available from the child's birth certificate registration form at the Office of Population and Civil Registration of Grobogan Regency from January 2020 to July 2021, covering the mother's age of marriage, mother's education, mother's occupation, gender of the baby, birth weight and body length at birth. Therefore, this study has limitations, namely it does not consider the place of health service where the baby was born, does not consider the history of the baby's birth (full age or premature) and the instruments used to measure weight and length of birth are different according to what is used by each place of delivery at that time.

CONCLUSION

Place of residence, education level and employment status of women are related to the incidence of early marriage. Regarding the incidence of LBW, there is a significant relationship between age and marriage of women with infant birth weight ($p < 0.001$). Women who were married at the age of less than 20 years had a 1,728 times greater risk of giving birth to a LBW baby compared to women who were married over 20-30 years (95% CI 1,257-2,374).

ACKNOWLEDGEMENT

We would like to thank Semarang State University, Indonesia for funding this research by agreement letter basic research implementation Universitas Negeri Semarang, DIPA funds year 2021, number: 352.26.4/UN37/PPK.3.1/2021. We also thank the Department of Population and Civil Registry of Grobogan Regency, Central Java, Indonesia for the cooperation and data provided.

REFERENCES

- Assefa, N., Berhane, Y. & Worku, A. 2012. Wealth Status, Mid Upper Arm Circumference (MUAC) and Antenatal Care (ANC) are Determinants for Low Birth Weight in Kersa, Ethiopia. *PLoS One*, 7 (6): e39957. [10.1371/journal.pone.0039957](https://doi.org/10.1371/journal.pone.0039957)
- Badan Pusat Statistik. 2020. *Survei Demografi dan Kesehatan Indonesia (SDKI) tahun 2017 (Indonesia Demographic and Health Survey (IDHS))*. Jakarta: BPS.
- Chrisman et al. 2016. Prevalence of Very Low Birthweight, Malformation, and Low Apgar Score among Newborns in Brazil According to Maternal Urban or Rural Residence at Birth. *Journal of Obstetrics and Gynecology Research*, 42 (5): 496-504. <https://doi.org/10.1111/jog.12946>
- Dasgupta, A. & Basu, R. 2011. Determinants of Low Birth Weight in a Block of Hooghly, West Bengal: A Multivariate Analysis. *International Journal of Biological & Medical Research*, 2 (4): 838-842. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.302.1435&rep=rep1&type=pdf>
- Demelash et al. 2015. Risk Factors for Low Birth Weight in Bale Zone Hospitals, South-East Ethiopia: A Case-Control Study. *BMC Pregnancy and Childbirth*, 15: 264. <https://doi.org/10.1186/s12884-015-0677-y>
- Dinas Pemberdayaan Perempuan dan Perlindungan Anak (DP3A) Jateng (Central Java Office of Women's Empowerment and Child Protection). 2020. *Data Pernikahan Anak di Bawah Umur di Provinsi Jawa Tengah Tahun 2020*. Semarang: DP3A Jateng.
- Figueiredo et al. 2018. Maternal Anemia and Low Birth Weight: A Systematic Review and Meta Analysis. *Nutrients*, 10 (5): 601. <https://dx.doi.org/10.3390%2Fnu10050601>

- Islam, M.M. 2015. Increasing Incidence of Infants with Low Birth Weight in Oman. *Sultan Qaboos University Medical Journal*, 15 (2): 177–183. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4450779/>
- Mahumud, R.A., Sultana, M. & Sarker, A.R. 2017. Distribution and Determinants of Low Birth Weight in Developing Countries. *Journal of Preventive Medicine and Public Health*, 50 (1): 18-28. <https://doi.org/10.3961/jpmph.16.087>
- Manyeh et al. 2016. Socioeconomic and Demographic Determinants of Birth Weight in Southern Rural Ghana: Evidence from Dodowa Health and Demographic Surveillance System. *BMC Pregnancy and Childbirth*, 16 (160). <https://doi.org/10.1186/s12884-016-0956-2>
- Mengesha, H.G., Wuneh, A.D., Weldearegawi, B. & Selvakumar, D.L. 2017. Low Birth Weight and Macrosomia in Tigray, Northern Ethiopia: who are the mothers at risk?. *BMC Pediatrics*, 17 (144). 10.1186/s12887-017-0901-1
- Nour, N.M. 2006. Health Consequences of Childmarriage in Africa. *Emerging Infectious Disease*, 12 (11): 1644–1649. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3372345/>
- Owa, K., Putra, I.W.G.A.E. & Windiani, I.G.A.T. 2017. Risk Factors for Low-Birth-Weight Infants in East Nusa Tenggara. *Public Health and Preventive Medicine Archive*, 5 (1): 49-54. <https://doi.org/10.15562/phpma.v5i1.40>
- Paliwal et al. 2013. Risk Factors Associated with Low Birth Weight in Newborns: A Tertiary Care Hospital based Study. *International Journal of Current Research and Review*, 5 (11): 42–48. http://ijcrr.com/uploads/1318_pdf.pdf
- Paul, P. 2019. Child Marriage and Its Association with Morbidity and Mortality of Children Under 5 Years Old: Evidence from India. *Journal of Public Health: From Theory to Practice*, 28: 331–338. <https://doi.org/10.1007/s10389-019-01038-8>
- Rahfiludin, M.Z. & Dharmawan, Y. 2018. Risk Factors Associated with Low Birth Weight. *Kesmas: National Public Health Journal*, 13 (2): 75-80. <http://dx.doi.org/10.21109/kesmas.v13i2.1719>
- Raj et al. 2010. The Effect of Maternal Child Marriage on Morbidity and Mortality of Children Under 5 in India: Cross Sectional Study of a Nationally Representative Sample. *BMJ*, 340: b4258. <https://www.bmj.com/content/340/bmj.b4258>
- Santhya, K.G. 2011. Early Marriage and Sexual and Reproductive Health Vulnerabilities of Young Women: A Synthesis of Recent Evidence from Developing Countries. *Current Opinion in Obstetrics & Gynecology*, 23 (5): 334-339. <https://doi.org/10.1097/gco.0b013e32834a93d2>
- Wilsonoyudho, S. & Salim, L.A. 2020. Social Impacts of Child Marriage in Grobogan Regency, Central Java Province, Indonesia. *Medico Legal Update*, 20 (4): 513-518. <https://ijop.net/index.php/mlu/article/view/1869>
- Yadav, D.K., Chaudhary, U. & Shrestha, N. 2011. Risk Factors Associated with Low Birth Weight. *Journal of Nepal Health Research Council*, 9 (19): 159-164. <https://pubmed.ncbi.nlm.nih.gov/22929846/>