Education as Predictor of Low Birth Weight among Female Worker in Indonesia

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Abstract

Female workers are a vulnerable group in Indonesia because in addition to working to help their husbands earn a living, they also still have to be responsible for domestic affairs. This study aimed to analyze the effect of the level of education on the incidence of LBW in female workers in Indonesia. The analysis uses the 2017 Indonesian Demographic and Health Survey data. Stratification and multistage random sampling method get 18,061 female workers as respondents. The final stage was done using binary logistic regression. The results found that there was no difference between primary education female workers and no education female workers at the risk of giving birth to LBW babies. Secondary education female workers have a 0.561 times chance compared to no education female workers to give birth to LBW babies. Meanwhile, higher education female workers have a possibility of 0.414 times compared to no education female workers to give birth to LBW babies. Apart from the education level, the results of the analysis also found two other variables as predictors of LBW among female workers, namely wealth status and ANCvisits. It was concluded that the education level is a predictor of LBW among female workers in Indonesia. The higher the education level, the lower the possibility of female workers to have LBW babies in Indonesia.

Keywords: *Low birth weight, female worker, education,maternal health, nutrition.*

Introduction

Female workers are a group that is prone to various health-related risks[1]. In addition to exposure in the workplace, women who are also of childbearing age need optimal health conditions because it is a key element of intergenerational health[2,3]. Adequacy of nutrition for women, whether they are still in the status of young women, pre-pregnant adults, and even more so during pregnancy, are factors that directly contribute to the nutritional status of the children they will be born with[4]. A study conducted in several developing countries states that three socio-economic factors can explain the problem of child malnutrition, namely women's social status, sanitation, and urbanization. The positive influence of children's nutritional status is related to the role of women in decision-making and gender equality in society, in addition to caring for children and providing nutrition directly from mother to fetus[5].

For this reason, the health of female workers is an important factor in achieving the goals of global health development. Globally, the female labor force participation rate is quite high (% of female population ages 15+), in 2019 it is estimated at 47.14%. Meanwhile in Indonesia, the percentage of female workers is greater, namely 53%in 2019 it is estimated at 47.14%. Meanwhile in Indonesia, the percentage of female workers is greater, namely 53%[6]. This means that most women in Indonesia are female workers, both in the formal and informal sectors. In general, women workers work in three sectors, namely education, health, and

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social workers[7]. The average profile of housewives in Indonesia is also a worker, although not as the main support for family economic activities. They work in agriculture, services, and trade with the status of helping their husbands or families.

Among the risk factors for women in the workplace were revealed by previous studies. A high workload and a lower wage than men are experienced by female workers on average. On average, women dedicate 3.2 times more working hours per day than men to unpaid work[8]. The International Labor Organization states that 76.2% of women do unpaid care work. Besides, exposure to environmental hazards, stress, and nutritional insufficiency. Various risks experienced by women have an impact on public health if they cannot be controlled optimally[7]. Previous studies revealed that 81% of children to working mothers have a higher risk of neonatal death when compared to children born to non-working mothers[9]. Female workers who experience malnutrition are at risk of producing malnourished babies. One of the indicators of malnutrition is the low birth weight (LBW), a previous study stated the relationship between female workers and the occurrence of LBW[10,11].

LBW is currently the main cause of child mortality and mortality. Every year nearly 1.1 million babies die from complications of preterm birth. LBW is not only a major predictor of prenatal mortality and morbidity but also increases the risk of slower cognitive development, non-communicable diseases such as diabetes and cardiovascular disease later in life[7].Several studies suggest that LBW is associated with poverty and education indicators[12,13].LBW had the consequence that they had to spend the first few days or weeks of life in the NICU. This is to ensure the baby's life is guaranteed with an artificial uterus. The risks of complications that can be suffered by LBW babies are the health consequences of LBW infants, thermoregulation, hypoglycemia, fluid and electrolyte imbalance, nutrition, hyperbilirubinemia, chronic lung disease, patent ductus arteritis, infections, necrotizing enterocolitis, intraventricular hemorrhage, apnea of prematurity, anemia, hearing and adult health problems[14]. Based on the background description, this study aims to analyze the effect of the level of education on the incidence of LBW in female workers in Indonesia.

Materials and Method

This research was employed with secondary data from the 2017 Indonesian Demographic Data Survey (IDHS). The analysis unit was female workers aged 15-49 years old who had given birth in the last 5 years. The 2017 IDHS sampling method was done by stratification and multistage random sampling so that there were 18,061 female workers as respondents.

LBW is a birth weight of fewer than 2,500 grams (or 5.5 pounds). LBW is determined regardless of gestational age. Birth weight is the first birth weight of a newborn measured after birth[15]. The education level is the last certificate the respondent has. Other independent variables analyzed in this study were age group, marital status, wealth status, ANC visits, and smoking behavior.

The final stage for determining the education level as a predictor of LBW was done using binary logistic regression because of the nature of the dependent variable. All statistical analyzes were carried out using SPSS 22 software.

Results and Discussion

Table 1 shows descriptive statistics of the education level of female workers in Indonesia. It can be seen that all categories of education level are dominated by female workers who give birth to LBW babies, except for female workers who have higher education. Based on the age group, all education level categories were dominated by the 35-39 age group, except for female workers who had higher education, which was dominated by the 30-34 age group.

Based on marital status, all education level categories are dominated by female workers who are married/living with partners. Meanwhile, based on wealth status, all categories of education level were dominated by the poorest female workers, except for female workers who had higher education, which was dominated by the richest. Based on the ANC visits, all education level categories were dominated by female workers who made complete ANC visits (≥ 4 times) during pregnancy. Finally, based on smoking behavior, all education level categories are dominated by female worker smokers.

Table 2 shows the results of the binary logistic regression of LBW among female workers in Indonesia. It was found that there was no difference between primary education female workers and no education female workers at the risk of giving birth to LBW babies. Secondary education female workers are 0.561 times

more likely than no education female workers to give birth to LBW babies (OR 0.561; 95% CI 0.370-0.850). Meanwhile, higher education female workers have a 0.414 times chance compared to no education female workers to give birth to LBW babies (OR 0.414; 95% CI 0.265-0.645). This information shows that the higher the education level, the lower the possibility of female workers to produce LBW babies in Indonesia.

Table 1. The descriptive statistics of the education level of the female workers who had given birth in the last 5 years in Indonesia(n=18,061)

Variables	Education Level								P
	No Education		Primary		Secondary		Higher		
	n	%	n	%	n	%	n	%	
Low Birth Weight									***0.000
No	129	22.4%	1524	28.5%	3404	41.0%	2047	53.6%	
Yes	448	77.6%	3831	71.5%	4905	59.0%	1773	46.4%	
Age group									***0.000
15-19	3	0.5%	20	0.4%	72	0.9%	0	0.0%	
20-24	24	4.2%	209	3.9%	693	8.3%	95	2.5%	
25-29	51	8.8%	635	11.9%	1523	18.3%	797	20.9%	
30-34	104	18.0%	1192	22.3%	2190	26.4%	1338	35.0%	
35-39	157	27.2%	1710	31.9%	2215	26.7%	1067	27.9%	
40-44	157	27.2%	1235	23.1%	1318	15.9%	413	10.8%	
45-49	81	14.0%	354	6.6%	298	3.6%	110	2.9%	
Marital status									***0.000
Never in union/Divorced/Widowed	24	4.2%	291	5.4%	382	4.6%	75	2.0%	
Married/Living with partner	553	95.8%	5064	94.6%	7927	95.4%	3745	98.0%	
Wealth status									***0.000
Poorest	481	83.4%	2953	55.1%	1833	22.1%	268	7.0%	
Poorer	53	9.2%	979	18.3%	1694	20.4%	386	10.1%	
Middle	25	4.3%	731	13.7%	1721	20.7%	519	13.6%	
Richer	13	2.3%	467	8.7%	1706	20.5%	866	22.7%	
Richest	5	0.9%	225	4.2%	1355	16.3%	1781	46.6%	
ANC visits									***0.000
< 4 times	56	42.7%	307	18.2%	303	8.5%	99	5.1%	
≥ 4 times	75	57.3%	1383	81.8%	3244	91.5%	1826	94.9%	
Smoking Behavior									
No	516	89.9%	5134	95.9%	8115	97.7%	3790	99.2%	
Yes	58	10.1%	218	4.1%	192	2.3%	30	0.8%	

Note: $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Table 2. Results of binary logistic regression of LBW among female worker who had given birth in the last 5 years in Indonesia (n=18,061)

Predictor	Low Birth Weight			
	P	OR	Lower Bound	Upper Bound
Education Level: No education	-	-	-	-
Education Level: Primary	0.163	0.747	0.496	10.126
Education Level: Secondary	**0.006	0.561	0.370	0.850
Education Level: Higher	***0.000	0.414	0.265	0.645
Age group of respondents: 15-19	-	-	-	-
Age group of respondents: 20-24	0.409	1.292	0.704	2.369
Age group of respondents: 25-29	0.814	1.074	0.592	1.950
Age group of respondents: 30-34	0.711	1.119	0.617	2.027
Age group of respondents: 35-39	0.970	0.989	0.543	1.799
Age group of respondents: 40-44	0.604	1.176	0.638	2.166
Age group of respondents: 45-49	0.398	1.348	0.674	2.698
Marital status: Never in union/Divorced/Widowed	-	-	-	-
Marital status: Married/Living with partner	0.627	1.080	0.791	1.474
Wealth status: Poorest	-	-	-	-
Wealth status: Poorer	0.152	0.863	0.705	1.056
Wealth status: Middle	0.103	0.841	0.684	1.035
Wealth status: Richer	**0.002	0.708	0.568	0.882
Wealth status: Richest	**0.006	0.722	0.572	0.912
ANC visits: < 4 times	-	-	-	-
ANC visits: ≥ 4 times	***0.000	0.603	0.497	0.730
Smoking behavior: No	-	-	-	-
Smoking behavior: Yes	0.727	1.081	0.699	1.672

Note: $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

A high level of education is one of the outputs of women's empowerment. Better education has an impact on maternal nutrition and reduces the incidence of LBW[16,17]. Several previous studies have informed that a good level of education is a major predictor of performance in the health sector[18,19]. On the other hand, poor education is an obstacle for the health sector to produce quality output[20,21].

Apart from the education level, the analysis also found two other variables as predictors of LBW among female workers in Indonesia. First, wealth status. The richer female worker has a 0.708 times chance compared to the poorest female worker to give birth to LBW babies (OR 0.708; 95% CI 0.568-0.882). The richest female worker has a probability of 0.722 times compared to the poorest female worker to give birth to LBW babies (OR 0.722; 95% CI 0.572-0.912). Wealth status as a predictor of LBW because it relates to food availability in the household. The poorer a family, the lower the food availability[22]. Several studies provide consistent findings. Some of them were carried out in India, Ethiopia, Bangladesh, and Pakistan[23–26].

The second, ANC visits. Female workers who made complete ANC visits (≥ 4 times) during their pregnancy were 0.603 times more likely than female workers who made incomplete ANC visits (<4 times) to deliver LBW babies (OR 0.603; 95% CI 0.497-0.730). The results of this analysis inform that carrying out complete ANC visits is a protective factor for LBW among female workers in Indonesia.

Conducting ANC visits as recommended by the Ministry of Health at least 4 times during pregnancy will monitor the health of pregnant women properly[27]. If there is a risk of pregnancy, for example, the mother is underweight, interventions can be immediately carried out to provide the best delivery output for the mother and the baby[28].

Conclusions

Based on the research results, it can be concluded that the education level is a predictor of LBW among female workers in Indonesia. The higher the education level, the lower the possibility of female workers to have LBW babies in Indonesia.

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