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Education as Predictor of the Knowledge of Pregnancy Danger Signs in Rural Indonesia

Ratna Dwi Wulandari[a*], Agung Dwi Laksono[b], [a]Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia. Campus C Mulyosari, Surabaya 60115, Indonesia, [b]National Institute of Health Research and Development, Indonesia Ministry of Health. Percetakan Negara 29, Jakarta 10560, Indonesia, Email: [a*]ratna-d-w@fkm.unair.ac.id

The research aim was to analyse education as a predictor of knowledge of the pregnancy danger signs in rural Indonesia. There were 44,647 childbearing age women (15-49) used as a sample. The variables analysed included knowing the danger signs of pregnancy, education, age, employment, marital, wealth, and parity. Binary logistic regression tests were used to detect the predictors. Women with primary education were 1.973 times more likely to know the danger signs of pregnancy than women with no education. Women with secondary education were 3.355 times more likely to know the danger signs of pregnancy than women with no education. Women with higher education were 7.169 times more likely to know the danger signs of pregnancy than women with no education. The higher the education, the more knowledge of the danger signs of pregnancy. Age, employment, wealth, and parity were also found as predictors of the knowledge of the pregnancy danger signs. Employed women were likely 0.958 times to know the pregnancy danger signs than unemployed women. All wealth status categories were more likely to know the pregnancy danger signs than the poorest women. Multiparous and grand multiparous women were less likely to know the pregnancy danger signs than primiparous women. Education was a predictor of the knowledge of the pregnancy danger signs in rural Indonesia. Besides that, there were 4 other variables which were also predictors, namely age, employment, wealth, and parity.

Key words: *Reproductive Health Knowledge, Maternal Health, Pregnancy Care, Risk for Pregnant Women.*

Introduction

Various efforts to reduce the maternal mortality rate have been carried out in various countries, but until now the maternal mortality rate is still a global issue. Although a decrease in the number of deaths began to be measured, the progress was too slow to meet the SDG's target of 2030. Approximately 810 women died every day from preventable causes related to pregnancy and childbirth. These maternal mortality events are mainly concentrated in low-income countries, and are related primarily to the lack of access to essential health services (World Health Organisation, 2019).

According to the 2019 World Health Organisation report, globally the maternal mortality rate was 216 per 100,000 live births, while for the South East Asia Region it was 164 per 100,000 live births. Indonesia, as one of the countries in the Southeast Asia Region, contributed a large number of deaths, namely 126.0 and ranked 4th in the list of maternal deaths among ASEAN countries, under Lao PDR, Myanmar, and Cambodia. The closest neighbouring countries such as Malaysia and Singapore have much lower maternal mortality rates, which are 23.8 and 7.1 (The Asean Secretariat, 2018).

Maternal deaths are caused by multiple factors. The direct causes of maternal death include complications during pregnancy, childbirth and postpartum. Most of these complications develop during pregnancy, but others may exist before pregnancy and become worse during pregnancy. The major complications, that account for 80% of all maternal deaths, are severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), and high blood pressure during pregnancy (pre-eclampsia and eclampsia) (Department of Reproductive Health and Research World Health Organisation, 2019).

Maternal deaths caused by pregnancy complications mostly include preventable death (World Health Organisation, 2019), (Bhatia, Mohi and Singh, 2018). In general, complications during pregnancy and the possibility of risk during childbirth can be detected early through an assessment of risk factors or danger signals. That is, if the mother understands the danger signs during her pregnancy period, then deterioration can be avoided. But unfortunately, there are still many mothers who are less aware of the danger signs of pregnancy. Negligence was the main reason for not having a good awareness of the danger signs of pregnancy (Gebrehiwot, Bahta and Haile, 2014). More than half of the antenatal women were lacking in knowledge of pregnancy danger signs (See Poh Teng et al., 2015).

Indonesia is a country with thousands of ethnic groups. The many ethnic groups also create a lot of local knowledge that is growing, including local knowledge about pregnancy and childbirth. In the Gayo tribe in Gayo lues, for example, women feel they have to keep their pregnancy a secret because they are eaten by evil spirits (Pratiwi et al., 2019). Muyu women in

Boven Digoel must be exiled because the bad odour of childbirth can cause all family members to need the hospital (Laksono, Soerachman and Angkasawati, 2016). The Ngalum women in the Bintang Mountains must get out of the house and live in an isolated hut because the community considers the blood of childbirth to bring evil (Kurniawan and Laksono, 2013). Local knowledge about pregnancy and childbirth is often found to be contrary to modern medical knowledge and often endangers the condition of the mother.

Although it does not always run linearly between education and knowledge, several studies have found that one of the factors associated with low maternal knowledge about the danger signs of pregnancy is the level of education (See Poh Teng et al., 2015) (Geleto et al., 2019). This shows that an assessment of the level of education as a predictor of knowledge of pregnancy danger signs is still needed. Similar research that has been done only identifies educational variables as one of the determinants of maternal knowledge, and there is no in-depth study of the level of education itself. That is why this research will fill the void of discussion about the role of education in shaping knowledge of pregnancy danger signs.

Based on the background description, this article was prepared to analyse education as a predictor of knowledge of the pregnancy danger signs in rural Indonesia. The results of this study are needed as one of the clear and directed guidelines for policymakers to determine the policy objectives of disseminating the danger signs of pregnancy to reduce MMR in Indonesia.

Methods

Data Source

The analysis in this study utilises secondary data from the 2017 Indonesian Demographic Data Survey (IDHS). The IDHS was one of the international Demographic and Health Survey (DHS) survey series. DHS was internationally operated by the Inner City Fund (ICF). The sampling method in IDHS uses stratification and multistage random sampling. In this study, the unit of analysis used was a woman in childbearing age (15-49 years) in rural Indonesia. The sample size used was 44,647 women.

Procedure

The 2017 IDHS has passed the ethical test from the national ethics committee. The respondents' identities have all been deleted from the dataset. Respondents have provided written approval for their involvement in the study. Permission for data utilisation was also obtained by researchers for this study from ICF International. Applying for permission through the website: https://dhsprogram.com/data/new-user-registration.cfm.

Data Analysis

Education was the respondent's acknowledgment of the last education completed. Education consists of 4 levels, namely no education, primary, secondary and higher. Knowledge of the pregnancy danger signs was the respondent's knowledge of the dangers of prolonged labour, vaginal bleeding, fever, convulsions, babies in the wrong position, swollen limbs, faints, breathlessness, tiredness, and others. Know the danger signs of pregnancy were divided into 2 categories, "do not know" and "know". Respondents fall into the category of "know" if they claim to know all the danger signs of pregnancy.

Independent variables involved in the analysis of this study include age groups, employment status, marital status, wealth status, and parity. The age group was divided into 7 categories at 5-year intervals. Employment status was divided into 2 categories, namely not employed and employed. Marital status was divided into 3 categories, namely; never in a union, married or living with partners, and widowed or divorced.

Wealth status was determined based on the wealth index calculation. The wealth index was a composite measure of a household's cumulative living standard. The wealth index was calculated using easy-to-collect data on household ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities. Wealth index was divided into 5 categories, namely the poorest, poorer, middle, richer, and richest. Parity was the number of children ever born alive. Parity is divided into 3 categories, namely primiparous (≤ 1), multiparous (2 - 4), and grand multiparous (> 4).

A collinearity test was run at an early stage to ensure there was no collinearity between variables. All variables involved in the analysis of this study were dichotomous variables, therefore the chi-square test was used to determine whether there were significant differences in knowledge of the danger signs of pregnancy in rural Indonesia. In the final stage, binary logistic regression was used because of the nature of the dependent variable. All statistical analyses were carried out using SPSS 22 software.

Results

The collinearity test results can be seen in Table 1. Collinearity test results showed no co-linearity between the dependent and independent variables. The tolerance value of all variables as shown in Table 1 is greater than 0.10, while the VIF value for all variables is less than 10.00. Then referring to the basis of decision making in the multicollinearity test, it can be concluded that there were no symptoms of multicollinearity in the regression model.

Table 1: Results for the collinearity test of knowledge of the pregnancy danger signs in rural Indonesia (n=44,647)

Variables	Collinearity Statistics	
	Tolerance	VIF
Education level	0.804	1.244
Age groups	0.697	1.436
Employment status	0.948	1.055
Marital status	0.983	1.017
Wealth status	0.829	1.206
Parity	0.719	1.391

***Dependent Variable:** Know the pregnancy danger signs

Descriptive Results

The results of the descriptive statistical analysis of education levels and factors related to knowledge of the danger signs of pregnancy in rural Indonesia can be seen in Table 2. Table 2 shows that women who know the danger signs of pregnancy are dominated by women with secondary and higher education. Female no education and primary education is dominated by women in the age group 45-49.

Table 2: Descriptive statistic of education level and factors related to the knowledge of the pregnancy danger signs in rural Indonesia (n=44,647)

Characteristics	Education Level								P
	No Education		Primary		Secondary		Higher		
	n	%	n	%	n	%	n	%	
Know the danger signs of pregnancy									***< 0.001
- No (ref.)	1791	77.0%	12392	58.4%	7489	41.6%	698	22.4%	
- Yes	534	23.0%	8826	41.6%	10494	58.4%	2423	77.6%	
Age groups									***< 0.001
- 15-19 (ref.)	7	0.3%	80	0.4%	174	1.0%	5	0.2%	
- 20-24	39	1.7%	483	2.3%	1321	7.3%	138	4.4%	
- 25-29	103	4.4%	1480	7.0%	2406	13.4%	544	17.4%	
- 30-34	201	8.6%	2990	14.1%	3564	19.8%	843	27.0%	
- 35-39	379	16.3%	4707	22.2%	3963	22.0%	655	21.0%	
- 40-44	554	23.8%	5614	26.5%	3710	20.6%	464	14.9%	
- 45-49	1042	44.8%	5864	27.6%	2845	15.8%	472	15.1%	
Employment status									***< 0.001
- Not Employed (ref.)	640	27.5%	8162	38.5%	7985	44.4%	547	17.5%	
- Employed	1685	72.5%	13056	61.5%	9998	55.6%	2574	82.5%	
Marital status									***< 0.001
- Never in union (ref.)	2	0.1%	14	0.1%	22	0.1%	4	0.1%	
- Married/living with partner	2099	90.3%	19895	93.8%	17123	95.2%	2962	94.9%	
- Widowed/divorced	224	9.6%	1309	6.2%	838	4.7%	155	5.0%	
Wealth status									***< 0.001
- Poorest (ref.)	1844	79.3%	11276	53.1%	6346	35.3%	458	14.7%	

- Poorer	314	13.5%	5101	24.0%	4347	24.2%	531	17.0%	
- Middle	109	4.7%	2925	13.8%	3443	19.1%	579	18.6%	
- Richer	43	1.8%	1448	6.8%	2626	14.6%	776	24.9%	
- Richest	15	0.6%	468	2.2%	1221	6.8%	777	24.9%	
Parity									***< 0.001
- Primiparous (ref.)	66	2.8%	1116	5.3%	2383	13.3%	596	19.1%	
- Multiparous	952	40.9%	13082	61.7%	12333	68.6%	2299	73.7%	
- Grand multiparous	1307	56.2%	7020	33.1%	3267	18.2%	226	7.2%	

Note: $* p < 0.05$; $** p < 0.01$; $* * *p < 0.001$.

Table 2 informs that in all categories the level of education is dominated by employed women. While based on marital status, all education level categories are dominated by women with the marital status 'married'.

Table 2 shows that in all categories the level of education was dominated by the poorest women, except for women with a higher education, who were more dominantly richer and the richest women. While based on parity, all education level categories are dominated by multiparous women.

Multivariate Regression Analysis

The results of the binary logistic regression test on knowledge of danger signs of pregnancy in rural Indonesia can be seen in Table 3. The binary logistic regression test was carried out to determine the determinant of the knowledge of the danger signs of pregnancy in rural Indonesia. As a reference, the chosen category is "do not know the danger signs of pregnancy".

Table 3: Binary Logistic Regression of the knowledge of the pregnancy danger signs in rural Indonesia (n=44,647)

Predictor	Knowledge of The Pregnancy Danger Signs			
	Sig.	OR	Lower Bound	Upper Bound
Education level: No Education	-	-	-	-
Education level: Primary	***< 0.001	1.973	1.781	2.184
Education level: Secondary	***< 0.001	3.355	3.022	3.725
Education level: Higher	***< 0.001	7.169	6.266	8.202
Age group: 15-19	-	-	-	-
Age group: 20-24	***< 0.001	1.648	1.261	2.155
Age group: 25-29	***< 0.001	1.901	1.461	2.474
Age group: 30-34	***< 0.001	1.823	1.400	2.372
Age group: 35-39	***< 0.001	1.731	1.329	2.253
Age group: 40-44	***< 0.001	1.707	1.310	2.223
Age group: 45-49	**0.008	1.435	1.101	1.872
Employment status: Not employed	-	-	-	-
Employment status: Employed	*0.040	0.958	0.919	0.998

Marital status: Never in union	-	-	-	-
Marital status: Married/living with partner	0.108	1.713	.888	3.302
Marital status: Widowed/divorced	0.381	1.344	.694	2.603
Wealth status: Poorest	-	-	-	-
Wealth status: Poorer	***< 0.001	1.321	1.256	1.388
Wealth status: Middle	***< 0.001	1.523	1.437	1.614
Wealth status: Richer	***< 0.001	1.776	1.658	1.904
Wealth status: Richest	***< 0.001	1.660	1.510	1.825
Parity: Primiparous	-	-	-	-
Parity: Multiparous	*0.034	0.919	0.850	0.994
Parity: Grand multiparous	***< 0.001	0.762	0.697	0.833

Note: ∗ p < 0.05; ∗∗ p < 0.01; ∗ ∗ ∗p < 0.001.

Table 3 shows that women with primary education were 1.973 times more likely to know the danger signs of pregnancy than women with no education (OR 1.973; 95% CI 1.781-2.184). Women with secondary education were 3.355 times more likely to know the danger signs of pregnancy than women with no education (OR 3.355; 95% CI 3.022-3.375). Women with higher education were 7.169 times more likely to know the danger signs of pregnancy than women with no education (OR 7.169; 95% CI 6.266-8.202).

The results of this analysis inform that the higher the education level of a woman, the more knowledge of the danger signs of pregnancy. Based on the results of the analysis, note that in addition to the level of education, the researcher also found 4 other variables as determinants of the knowledge of the danger signs of pregnancy. The four variables are age group, employment status, wealth status, and parity.

Table 3 informs that women in the 20-24 age group had a 1.648 times higher chance of knowing the danger signs of pregnancy than women in the 15-19 age group (OR 1.648; 95% CI 1.261-2.155). Women in the 25-29 age group were 1.901 times more likely to know the danger signs of pregnancy than women in the 15-19 age group (OR 1.901; 95% CI 1.461-2.474). Women in the 30-34 age group were 1.823 times more likely to know the danger signs of pregnancy than women in the 15-19 age group (OR 1.823; 95% CI 1.400-2.372). Women in the 35-39 age group were 1.731 times more likely to know the danger signs of pregnancy than women in the 15-19 age group (OR 1.731; 95% CI 1.329-2.253). Women in the 40-44 age group were 1.707 times more likely to know the danger signs of pregnancy than women in the 15-19 age group (OR 1.707; 95% CI 1.310-2.223). Women in the 45-49 age group were 1.435 times more likely

to know the danger signs of pregnancy than women in the 15-19 age group (OR 1.435; 95% CI 1.101-1.872).

Table 3 shows that employed women are 0.958 times more likely to know the danger signs of pregnancy than non-employed women (OR 0.958; 95% CI 0.919-0.998). The results of this analysis inform that no employed women are likely to have knowledge about the danger signs of pregnancy more than employed women.

Table 3 informs that women with wealth poor status are 1.321 times more likely to know the danger signs of pregnancy than the poorest women (OR 1.321; 95% CI 1.256-1.388). Women with middle wealth status were 1.523 times more likely to know the danger signs of pregnancy than the poorest women (OR 1.523; 95% CI 1.437-1.614). Women with wealth richer status were 1.776 times more likely to know the danger signs of pregnancy than the poorest women (OR 1.776; 95% CI 1.658-1.904). Richest women are 1.660 times more likely to know the danger signs of pregnancy than the poorest women (OR 1.660; 95% CI 1.510-1.825).

Table 3 shows that multiparous women were 0.919 times more likely to know the danger signs of pregnancy than primiparous women (OR 0.919; 95% CI 0.850-0.994). Grand multiparous women are 0.762 times more likely to know the danger signs of pregnancy than primiparous women (OR 0.762; 95% CI 0.697-0.833). The results of this analysis inform that having given birth to a child alive more than once does not give women a better chance of knowing the danger signs of pregnancy.

Discussion

In Indonesia, women with low education are dominant in rural areas. It is a common finding that knowledge and access of rural communities to health is lower than those who live in urban areas (Laksono, Wulandari and Soedirham, 2019) (Wulandari and Laksono, 2019). This condition also affects regionally. Regions that have the most rural areas have the lowest access to health (Laksono, Rukmini and Wulandari, 2020).
The results showed that education was a predictor of the knowledge of danger signs of pregnancy in rural Indonesia. The results of this analysis inform that the higher the education level of a woman, the more know the danger signs of pregnancy. Several studies in various countries found similar results. Women with secondary education are more likely to know the danger signs of pregnancy than women with no education or primary only (Vallely et al., 2019) (Bililign and Mulatu, 2017) (Mwilike et al., 2018).

The analysis results inform that age was related to the knowledge of the danger signs of pregnancy. The findings of this study are in line with a systematic review conducted with the subject level of women's knowledge in Ethiopia about the danger signs of obstetric health

issues. The results of the study found that, in addition to other demographic factors, age was one of the predictors of women's knowledge about pregnancy danger signs (Geleto et al., 2019) (Sam, 2001).

It was known that employed women have a better chance of knowing the danger signs of pregnancy than unemployed women. Research in three countries; Tanzania, Ethiopia, and Malaysia, with the same subjects, found similar results. These findings inform that employing status is one of the predictors of the knowledge of the danger signs of pregnancy (Bililign and Mulatu, 2017) (S.P. Teng et al., 2015) (Bintabara, Mpembeni and Mohamed, 2017).

The analysis shows that the better the wealth status, the better the knowledge of the danger signs of pregnancy. Wealth status is often found to be positively related to education level, so it is logical if wealth status is also positively related to the knowledge of the danger signs of pregnancy. Consistent research results are also shown in findings in several countries (S.P. Teng et al., 2015) (Salem et al., 2018). In the Indonesian context, several studies have also found that people who have low wealth status also have low health access (Wulandari et al., 2019) (Laksono, Paramita and Wulandari, 2020).

The analysis found that primiparous women had less knowledge of the danger signs of pregnancy than multiparous and grand multiparous women. This result is in line with two studies in India and Ethiopia (Maseresha, Woldemichael and Dube, 2016) (Amenu et al., 2016) (Haleema et al., 2019). The experience of giving birth to more children makes a woman better understand the danger signs of pregnancy (Mardiyanti et al., 2019).

Some of the findings in this study provide clear targets for policymakers. Women with low education, age groups 15-19, unemployed, poor, and primiparous, are groups that should be targeted to increase their knowledge of the danger signs of pregnancy. The government must redistribute health financing to the right target groups to reduce MMR in Indonesia (Pratiwi et al., 2014).

Conclusions

Based on the results of the analysis it could be concluded that of all variables tested, education is a good predictor of knowledge of the pregnancy danger signs in rural Indonesia. The higher the education level of a woman, the more knowledge of the danger signs of pregnancy. In addition, there were 4 other variables that were also predictors of the knowledge of pregnancy danger signs in rural Indonesia, namely age group, employment status, wealth status, and parity.

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Ethic and Consent

The 2017 IDHS has obtained ethical approval from the national ethics committee. The respondents' identities have all been deleted from the dataset. Respondents have provided written approval for their involvement in the study. The use of the 2017 IDHS data for this study has received permission from ICF International through its website: https://dhsprogram.com/data/new-user-registration.cfm.

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