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Early marriage as a risk factor for undernutrition among children aged under three years old in Gangga Subdistrict, North Lombok District

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ABSTRACT

Background and purpose: The prevalence of severe and mild undernutrition among children aged under five years in North Lombok District is ranked second in West Nusa Tenggara Province after Bima City. The number of reported cases of early marriages in West Nusa Tenggara is higher than the national average. This study aims to examine the association between early marriages and undernutrition among children aged under three years in Gangga Subdistrict, North Lombok District.

Methods: A case-control study was conducted with a total of 49 cases (severe undernourished children) and 98 controls (normal-weight children). A systematic random sampling was used to select all cases and controls from the health post register based on the weight/age indicator in Gangga Public Health Centre. Variables of sex and residency were matched between cases and controls. Data were collected from October to November 2016 through interviews with the mother at their house. Logistic regression using a software STATA SE 12.1 was employed to identify the association between early marriages and nutritional status of the children.

Results: Cases and controls were comparable based on children's gender, mother's age, area of residency, employment status of mother, and family income. There were significant differences on children's age and mother's education. Multivariate analysis showed an association between the nutritional status and early marriages with adjusted odds ratio (AOR)=5.21 (95%CI: 1.36-19.95), the frequency of sickness over the last three months (AOR=1.93; 95%CI: 1.26-2.97) and low birth weight (AOR=14.12; 95%CI: 3.37-59.05).

Conclusions: Early marriages, frequency of sickness over the last three months, and low birth weight are associated with undernutrition among children aged under three years. Preventative measures to prevent early marriages, child infections and low birth weight need to be enhanced.

Keywords: Early marriage, frequency of sickness, low birth weight, undernutrition, West Nusa Tenggara

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INTRODUCTION

The UNICEF/WHO/World Bank group in 2016 reported the prevalence of wasting in children aged under five years was 51.7 million – with the highest prevalence in the Asia region (35.9 million).[1] The Indonesia Basic Health Research (*Riskesdas*) in 2013 showed the prevalence of undernutrition in West Nusa Tenggara was 25.7% (weight/age), 45.3% (height/age), and 11.9% (weight/height).[2] The prevalence of undernutrition in children aged under five years in North Lombok District is 32.0% (weight/age) and 65.8% (height/age).[3] This figure is the second highest in West Nusa Tenggara after Bima City.[3] Early marriages in West Nusa Tenggara is high. It was reported that early marriages among teenage girls aged 15-19 years in West Nusa Tenggara was 16.3%. This figure is the fourth highest in Indonesia and significantly higher than the national average of 11.5%.[4]

Studies have explored risk factors for undernutrition in children aged under five years in Indonesia. However, the findings remain inconsistent, for example, studies in Mungkur Island and Mataram City.[5,6,7] This present study aims to examine the association between early marriages and undernutrition in children aged under three years in Gangga Subdistrict, North Lombok District, West Nusa Tenggara.

METHODS

A case-control study was employed to examine the association between early marriages and undernutrition in children aged under three years in Gangga Subdistrict. A total of 49 cases (malnourished children) and 98 controls (normal-weight children) were selected using systematic random sampling from the health post register based on weight/age indicator. Sex and the area of residence between cases and controls were matched. Data

Table 1 Characteristics of cases and controls

Characteristics	Cases n (%)	Control n (%)	p value
Sex (children)			
Male	27 (55.10)	56 (57.14)	0.233
Female	22 (44.90)	42 (42.86)	
Children's age (months), mean±SD	27.8±7.6	22.24±7.2	0.000
(Range)	(12-36)	(12-36)	
Mother's age (years), mean±SD	27.7±6.12	29.01±5.8	0.216
(Range)	(17-40)	(18-47)	
Area of residence			
Bentek	9 (18.37)	19 (19.39)	0.627
Gegelang	10 (20.41)	28 (28.57)	
Gondang	11 (22.45)	23 (23.47)	
Rempek	13 (26.53)	16 (16.33)	
Sambik Bangkol	6 (12.24)	12 (12.24)	
Mother's education			
High (senior high and university)	10(20.41)	41(41.84)	0.010
Low (junior high, primary, never schooling)	39(79.59)	57(58.16)	
Mother's employment			
Employed	13 (26.53)	38 (38.78)	0.141
Housewives	36 (73.47)	60 (61.22)	
Family income (IDR, million), median	0.8	0.6	0.11
(Range)	(0.1-4)	(0.2-3.5)	

Table 2 Association between under nutrition in children and several variables

Variables	Cases n (%)	Controls n (%)	p value
Early marriage (≤15 years)			
Yes	8(16.33)	4(4.08)	0.017
No	41(83.67)	94(95.92)	
Exclusive breastfeeding			
0 month	2(4.08)	2(2.04)	0.93
1-2 months	2(4.08)	6(6.12)	
3-4 months	2(4.08)	5(5.10)	
5-6 months	43(87.76)	85(86.73)	
Immunisation status			
Complete	43(87.76)	89(90.82)	0.56
Incomplete	6(12.24)	9(9.18)	
Supplementary feeding initiation			
3-4 months	0(0.00)	3(3.06)	0.30
5-6 months	43(87.76)	86(87.76)	
≥7 months	6(12.24)	9(9.18)	

Table 2 Association between under nutrition in children and several variables

Variables	Cases n (%)	Controls n (%)	p value
Source of water			
Pipe water in the house	17(34.69)	26(26.53)	0.57
Retail tap water	0(0.00)	2(2.04)	
Boreholes	28(57.14)	63(64.29)	
Well (dug, unprotected)	0(0.00)	1(1.02)	
Water springs (protected)	4(8.16)	6(6.12)	
The frequency of sickness (last 3 months)			
Never	7(14.29)	22(22.45)	0.15
≤2 times	34(69.39)	66(67.35)	
≥3 times	8(16.33)	10(10.20)	
Family income (IDR, million), median	0.8	0.6	0.13
(Range)	(0.1-4)	(0.2-3.5)	
Mother's employment			
Employed	13(26.53)	38(38.78)	0.14
Housewives	36(73.47)	60(61.22)	
Parity, mean	1.7	1.9	0.26
(Range)	(1-5)	(1-8)	
Birth spacing			
None (no sibling)	25(51.02)	47(47.96)	0.92
≥2 years	21(42.86)	47(47.96)	
<2 years	3(6.12)	4(4.08)	
Mother's education			
High (senior high and university)	10(20.41)	41(41.84)	0.01
Low (junior high, primary, never schooling)	39(79.59)	57(58.16)	
Birth weight			
Low birth weight (≤2500 grams)	11(22.45)	3(3.06)	0.001
Normal birth weight (>2500 grams)	38(77.55)	95(96.94)	
Total	49 (100.00)	98 (100.00)	

Table 3 Risk factors of undernutrition in children aged under three years

Variables	Adjusted OR	95%CI	p value
Early marriage (≤15 years)	5.21	1.36-19.95	0.016
Frequency of sickness ≥3 times (last 3 months)	1.93	1.26-2.97	0.002
Low birth weight (≤2500 grams)	14.12	3.37-59.05	0.000

were collected from October to November 2016 through interviews with the mother at their house. Written informed consent was obtained from the mother before the interview. STATA SE 12.1 was used to analyse the data of this study. Logistic regression was applied to identify the association between early marriages and undernutrition in children aged under three years.

Ethics approval was obtained from the Human Research Ethics Committee Faculty of Medicine Mataram University, West Nusa Tenggara on October, 14th 2016.

RESULTS

Table 1 shows the characteristics of cases on controls which included sex, age of children, age of mother, area of residence, mother's education, mother's employment, and family income. It is found that cases and controls are comparable in

several variables: sex, age of mother, area of residence, mother's employment, and family income (p>0.05), but not comparable for the age of the child (p<0.01) and mother's education (p=0.010).

Table 2 shows the association between the nutritional status of children aged under three years and variables of early marriages (p=0.017), exclusive breastfeeding (p=0.93), immunisation status (p=0.56), initiation of supplementary feeding (p=0.30), source of water (p=0.57), frequency of sickness over the last three months (p=0.15), family income (p=0.13), employment (p=0.14), parity (p=0.26), birth spacing (p=0.92), education (p=0.01), and birth weight (p=0.001). All variables with p-value <0.25 were included in the multivariate analysis.

Table 3 shows the results of multivariate analysis. It was found that there is a significant association between under-nutrition in children aged under three years with early marriages (≤15 years) (AOR=5.21; 95%CI: 1.36-19.95), the frequency of sickness over the last three months (AOR=1.83; 95%CI: 1.20-2.78) and low birth weight (AOR=11.82; 95%CI: 2.88-48.44).

DISCUSSION

This study found a significant association between the nutritional status in children aged under three years with early marriages, the frequency of sickness (≥3 times) over the last three months, and low birth weight.

In the present study, the early marriage was defined using the cut-off point of 15 years. However, if the cut-off point of 18 years is used, no significant association was found in this study (AOR=1.23; 95%CI: 0.61-2.47). A case-control study in India showed an association between undernutrition and early marriages (marital age of 15-24 years) with AOR=1.24 (95%CI: 1.14-1.36).[8] Another study in Indonesia that re-analysed the Indonesia Basic Health Research 2010 data found an association between early marriages (marital age of 10-18 years) and growth and development of children.[5] A study in Nepal also found similar finding. Children aged 6-56 months who were born from mother aged <20 years or >35 years are 3.21 more likely to experience undernutrition compared to those who were born from mother aged 20-35 years (95%CI: 1.30-7.94).[9]

In our study, the frequency of sickness (≥3 times) over the last three months and low birth weight were found to be risk factors for undernutrition in children aged under three years. A case-control study in East Nusa Tenggara found that the frequency of sickness (≥4 times) over the last six months is a risk factor for undernutrition in children with AOR=35.4 (95%CI: 4.8-256.8).[10] Similarly, a cross-sectional study in Manado City found an association between the frequency of sickness (>6 times) over the last year and stunting (p=0.023).[11] However, a case-control study in Salatiga City found no significant association between the frequency of sickness and underweight in children aged 2-5 years (p=0.752).[12]

In our study, low birth weight is found to be a risk factor for undernutrition in children aged under three years. This finding is consistent with another case-control study in Mataram City. It found an association between low birth weight and stunting with OR=20.47 (95%CI: 1.16-354.25).[7] A cross-sectional study in Vietnam also found an association between low birth weight and undernutrition in children aged under five years based on weight/age (OR=7.7; 95%CI: 3.771-16.24), height/age (OR=5.6; 95%CI: 2.84-11.33), and weight/ height (OR=5.2; 95%CI: 2.38-11.0).[13]

The main limitation of this study is that the nutritional status was assessed based on weight/age which reflects only the acute malnutrition. Early marriages, frequency of sickness, and low birth weight are more likely to relate with the chronic undernutrition among children aged under three years. In addition, we only cover the limited area in Gangga Subdistrict, North Lombok District, leading to the limited generalizability of our findings to the wider population.

CONCLUSION

Early marriages, the frequency of sickness over the last three months, and low birth weight are significantly associated with undernutrition among children aged under three years. Preventative measures to prevent early marriages, child infections and low birth weight need to be enhanced.

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