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## **Nutritional Status, Iron Status (Hb) and Attitude to Reproductive Health as Components of Adolescent Reproductive Readiness**

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**Abstract:** The fertility rate for adolescents aged 15-19 years in Indonesia reaches 10%. Approximately 1.4 million (30%) young women aged 15-19 years have sexual intercourse, which results in pregnancy and around 57% of these pregnancies are unwanted. The tendency to get married and get pregnant at a young age, whether planned or not, results in reproductive readiness, both mental and physical, which is very important for young women. Their nutritional status measures adolescents' physical readiness—meanwhile, reproductive knowledge and perceptions of reproductive health measure adolescents' mental readiness for reproduction. The study aimed to identify risk factors for nutritional status, iron status and reproductive health attitudes. This type of research is analytic observational with a cross-sectional design. The population of this study was all adolescents in Ogan Komering Ilir District. The sampling technique used was cluster sampling. The research sample was 139 young girls at SMA N 1 Kayuagung, Ogan Komering Ilir Regency, South Sumatra. Data is presented in univariate and bivariate. The statistical test was chi-square with the Fisher's exact/Kolmogorov Smirnov alternative test. The results showed that around 52.5% of female adolescents were underweight, 15.6% had anaemia, and 6.5% had poor reproductive health attitudes. Based on bivariate analysis, risk factors related to adolescent iron status were eating habits (p-value = 0.039), risk factors related to adolescent attitudes were class level (p-value = 0.0005), father's education level (p-value = 0.017), puberty age (p-value = 0.008) and level of knowledge (p-value = 0.003). Education is needed to increase reproductive health knowledge and improve adolescent eating habits intensively with exciting and not dull material such as role-playing or group discussions.

**Keywords:** Reproductive readiness, Adolescents, Nutritional status, Haemoglobin, attitude

### **Introduction**

Adolescence is a period of transition from childhood to adulthood (Kementerian Kesehatan RI, 2015) The process of rapid growth and reproductive development in adolescents causes adolescents to have a great curiosity and dare to take risks without careful consideration (Soetjningsih et. al. 2004) The magnitude of the risk of adolescent behavior is not in line with information related to pregnancy unwanted and sexually transmitted diseases received by adolescents (Susanto & Rahmawati, 2016).

The fertility rate for adolescents aged 15-19 in Indonesia reaches 10% (Departemen Kesehatan RI, 2004). Approximately 1.4 million (30%) female adolescents aged 15-19 have sexual intercourse which results in pregnancy and approximately 57% of these pregnancies are unwanted (Soetjningsih et. Al, 2004). IDHS report

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in 2012, the fertility rate for the 15-19 year age group was 48 births per 1000 women. Pregnancy at a young age can be at risk of premature birth, low birth weight (LBW), and childbirth bleeding, which can increase maternal and infant mortality. The 2012 IDHS found that neonatal, postneonatal, infant and under-five mortality rates for mothers aged less than 20 years were higher than those for mothers aged 20-39 years (Kementerian Kesehatan RI, 2015).

The consumption patterns of adolescents who tend to limit themselves and are low in nutrients have an impact on their nutritional status (Rahmiwati, 2013). A study of 1,200 young women in Bengkulu City found that 79.2% of adolescents' diets were not good and the prevalence of anemia was 43% (Suryani et al, 2017). The prevalence of anemia was > 40%, including severe category problems (WHO, 2007). Unhealthy eating patterns result in adolescents who are very thin due to malnutrition (malnutrition) and in the long-term Chronic Energy Deficiency (CED). SEZ is a condition where there is a chronic lack of energy and protein nutritional intake which is characterized by an upper arm circumference of LLA <23.5 cm (Departemen Kesehatan RI, 2002). KEK women are at risk of giving birth to children who are LBW or low birth weight < 2500 grams. Prevalence of risk of KEK in women of childbearing age is generally 20.8% nationally and the prevalence of CED risk in the 15-19 group who were not pregnant increased from 30.9% in 2007 to 46.6% in 2013 (Kementrian Kesehatan Republik Indonesia, 2013).

The tendency to get married or get pregnant at a young age, whether planned or not, results in reproductive readiness, both mental and physical, which is very important for young women. Adolescents' physical readiness is measured by their nutritional status. Meanwhile, adolescents' mental readiness for reproduction is measured by reproductive knowledge and adolescent perceptions of reproductive health (Matodipuro, 2000). In 2012, there were 57 cases of infant mortality in Ogan Komering Ilir (OKI) District, 48 cases were neonatal deaths and LBW caused 31% of these neonatal deaths. In the same year 2012, in Ogan Komering Ilir (OKI) District, 17 maternal deaths were recorded, with 35% due to bleeding. In 2012, the number of pregnant women with KEK in OKI Regency was 561 people or 2.94% of the number of pregnant women.

The magnitude of the risk of teenage pregnancies needs to be anticipated with the reproductive readiness of young women in terms of nutritional status, reproductive knowledge, perceptions of reproduction, and others. However, the typical characteristics of adolescents and the tendency for poor consumption patterns push adolescents into health problems such as CED and anemia. So that it can contribute to the problem of LBW and bleeding in maternal and child mortality. Seeing the magnitude of the nutritional problems in pregnant women, LBW problems and bleeding that occur in OKI District which results in maternal and child deaths, it is necessary to identify the contribution to the reproductive readiness of young women in OKI District in these problems.

## **Results and Discussion**

Reproductive readiness was examined through variables of nutritional status, iron status (Hb) and adolescents' attitudes towards reproductive health. Based on Table 1, around 52.5 % of young women are underweight, 39.6% are normal weight and 7.9% are categorized as obese. Based on iron status or blood hemoglobin levels, 16.5% had anemia. Only 6.5% of adolescents have poor reproductive health attitudes. Based on Table 1, it can also be seen that a majority of teenagers are at the level/class 2 of SMA, as much as 46.0%. The teenagers, on average, came from fathers and mothers with tertiary education as much as 79.9% and 83.5%. Also, the average comes from fathers and mothers who work as employees as much as 96.4% and 50.4%. The majority of adolescents experience puberty at the age of  $\geq 12$  years, as much as 82.7%. Adolescents who do not receive information about reproductive health are 46.8%. In addition, most of these teenagers have bad eating habits, as much as 66.2%. Most of these teenagers live with their families, as much as 94.2%. Also, the average knowledge of adolescents about reproductive health is still lacking at 78.4%.

Table 2 shows the relationship between risk factors and the nutritional status of adolescents. From the results of the bivariate analysis, it can be seen that there are no risk factors related to the nutritional status of adolescents at SMA Negeri 1 Kayuagung. Table 2 also shows that for each of the characteristics of the respondents, the group with abnormal nutritional status (thin or fat) was still dominated, such as poor eating habits, 63% of whom came from the abnormal body group. Based on Table 3, it can be seen that the risk factor associated with adolescent iron status is eating habits (p-value = 0.039). The proportion of adolescents with poor eating habits and experience anemia is 21.7%, while adolescents with good eating habits and who experience anemia is only 6.4%. Adolescents who have poor eating habits are at risk 3,406 times higher for anemia compared to adolescents who have good eating habits.

Tabel 1. Distribution of respondent characteristics

Variabel	Total (n)	Percent (%)
Nutritional Status		
Thin	73	52,5
Normal	55	39,6
Fat	11	7,9
Iron Status		
Anemia	23	16,5
No Anemia	116	83,5
Reproductive Health Attitudes		
Poor	9	6,5
Good	130	93,5
School level		
Level 1	39	28,1
Level 2	64	46,0
Level 3	36	25,9
Father's Education		
Low	28	20,1
High	111	79,9
Mother's Education		
Low	23	16,5
High	116	83,5
Father's Job		
No working/labor	5	3,6
Employee	134	96,4
Mother's Job		
No working/labor	69	49,6
Employee	70	50,4
Puberty Age		
≥12 years	115	82,7
< 12 years	24	17,3
Source of Information		
No Adekwat	65	46,8
Adekwat	74	53,2
Eating habit		
Poor	92	66,2
Good	47	33,8
Residence		
Not With Family	8	5,8
With family	131	94,2
Knowledge		
Poor	109	78,4
Good	30	21,6

Table 2. Results of bivariate analysis of the relationship between risk factors and nutritional status

Variables	Nutrition Status				p-value	PR(95% CI)
	Poor		Good			
	n	%	n	%		
School level						
Level 1	24	51,5	15	38,5	0,886	0,886 (0,637-1,232)
Level 2	35	54,7	29	45,3	0,788	0,788 (0,577-1,075)
Level 3	25	69,4	11	14,2	-	Ref
Father's Education						
Low	16	57,1	12	42,9	0,856	0,933 (0,655-1,328)
High	68	61,3	43	38,7		
Mother's Education						
Low	13	56,5	10	43,5	0,852	0,923 (0,627-1,359)
High	71	61,2	45	38,8		
Father's Job						
No working/labor	3	60,0	2	40,0	1,000	0,993 (0,479-2,057)

Employee	81	60,4	53	39,6		
Mother's Job						
No working/labors	44	63,8	25	36,2	0,532	1,116 (0,852-1,462)
Employee	40	57,1	30	42,9		
Source of Information						
No Adekwat	35	53,8	30	46,2	0,189	0,813 (0,616-1,074)
Adekwat	49	66,2	25	33,8		
Eating habit						
Poor	58	63,0	34	37,0	0,485	1,140 (0,844-1,540)
Good	26	55,3	21	44,7		
Residence						
Not With Family	4	50,0	4	50,0	0,712	0,819 (0,404-1,659)
With family	80	61,1	51	38,9		

\* Sig. <0,05

Table 3. Results of bivariate analysis of the relationship between risk factors and iron status

Variabel	Status Besi				p-value	OR(95% CI)
	Anemia		Tidak Anemia			
	n	%	n	%		
School level						
Level 1	4	10,3	35	39,7	0,273	0,462 (0,152-1,403)
Level 2	11	17,2	53	32,8	0,726	0,773 (0,343-1,746)
Level 3	3	22,2	28	30,0		ref
Father's Education						
Low	2	7,1	26	29,9	0,164	0,378 (0,094-1,516)
High	21	18,9	90	31,1		
Mother's Education						
Low	4	17,4	19	32,6	1,000	0,062 (0,398-2,832)
High	19	16,4	77	33,6		
Father's Job						
No working/labors	0	0	5	100	0,590	
Employee	23	17,2	111	32,8		
Mother's Job						
No working/labors	12	17,4	57	32,6	0,970	0,107 (0,524-2,337)
Employee	11	15,7	59	34,3		
Puberty Age						
≥12 years	21	18,3	94	31,7	0,366	0,191 (0,550-8,729)
< 12 years	2	3,3	22	21,7		
Source of Information						
No Adekwat	3	12,3	37	37,7	0,302	0,607 (0,275-1,339)
Adekwat	15	20,3	59	29,7		
Eating habit						
Poor	20	21,7	72	28,3	0,039	0,406 (1,066-10,881)*
Good	3	5,4	14	23,6		
Residence						
Not With Family	1	12,5	7	37,5	1,000	0,744 (0,114-4,842)
With family	22	16,8	109	33,2		

\* Sig. <0,05

Based on the results of the multivariate analysis in table 5, it can be seen that eating habits have a significant relationship with iron status (p-value <0.05). Adolescents with poor eating habits have a 0.247 times lower risk of experiencing anemia compared to adolescents who have good eating habits after controlling for sources of information, school level, father's education, mother's education, and mother's occupation. With a 95% degree of confidence, in the general population, researchers believe that poor eating habits are a protective factor against iron status with a range of 0.066 to 0.933 (PRAdjusted = 0.247; 95% CI = 0.066-0.933).

Based on Table 4, it can be seen that the risk factors associated with adolescent attitudes are school level (p-value = 0.005), father's education (p-value = 0.017), puberty age (p-value = 0.008), and knowledge (p-value = 0.003). The proportion of adolescents with a good attitude tends to increase in the group at a higher level/class. Adolescents in grade 1 have a 0.795 times lower risk of unfavorable attitudes than grade 3 adolescents. The

proportion of adolescents with low fathers' education and poor attitudes is 17.9%—meanwhile, only 3.6% of adolescents with a high father's education and good attitude. Adolescents with low paternal education are at risk 4.955 times more for having unfavorable attitudes compared to adolescents with high paternal education

Table 4. Results of bivariate analysis of the relationship between risk factors and adolescent attitudes

Variables	Attitude				p-value	PR(95% CI)
	Poor		Good			
	n	%	n	%		
School level						
Level 1	8	20,5	31	79,5	0,005	0,795 (0,678-0,932)*
Level 2	1	1,6	63	98,4	1,000	0,984 (0,954-1,015)
Level 3	0	0	36	100	-	Ref
Father's Education						
Low	5	17,9	23	82,1	0,017	4,955 (1,423-17,257)*
High	4	3,6	107	96,4		
Mother's Education						
Low	1	4,3	22	95,7	1,000	0,630 (0,083-4,801)
High	8	6,9	108	93,1		
Father's Job						
No working/labor	0	0	5	100	1,000	-
Employee	9	6,7	125	93,3		
Mother's Job						
No working/labor	4	5,8	65	94,2	1,000	0,812 (0,227-2,896)
Employee	5	7,1	65	92,9		
Puberty Age						
≥12 years	4	3,5	111	96,5	0,008	0,167 (0,048-0,576)*
< 12 years	5	20,8	19	22,4		
Source of Information						
No Adekwat	5	7,7	60	92,3	0,734	1,423 (0,399-5,077)
Adekwat	4	5,4	70	94,6		
Eating habit						
Poor	0	0	8	100	1,000	-
Good	9	6,9	122	93,1		
Knowledge						
Poor	3	2,8	106	97,2	0,003	0,138 (0,037-0,518)*
Good	6	20,0	24	80,0		

\* Sig. <0,05

The proportion of adolescents who experience puberty at the age of  $\geq 12$  years and have a poor attitude is 3.5%. Meanwhile, adolescents who experience puberty at the age of  $<12$  years and have less attitude are 20.8%. Adolescents who experience puberty at the age of  $\geq 12$  years have a 0.167 times lower risk of having poor attitudes than adolescents who experience puberty at the age of  $<12$  years. The proportion of adolescents with less knowledge and less attitudes is 2.8%. While adolescents with sufficient knowledge and have less attitude, as much as 20.0%. Adolescents with less knowledge have a 0.138 times lower risk of having poor attitudes than adolescents with good knowledge.

Readiness is an individual state that supports it so that it is ready to respond or respond in the best way to the conditions that are happening (Slameto, 2015). Reproductive readiness is the most important developmental task in adolescence. Reproductive readiness consists of physical readiness as measured by the nutritional status of adolescents and mental readiness as measured by reproductive knowledge and adolescent perceptions related to reproductive health. Nutritional status is the state of the body that is influenced by food consumption, absorption of nutrients, and utilization of food nutrients. anthropometric, biological, clinical, and ecological factors and food consumption can be carried out (Riyadi, 2001). Assessment of nutritional status can be carried out by anthropometric, biological, clinical, and ecological factors and food consumption (Gibson, 2005). The results showed that more than half of the respondents weighed 52.5% thin and 7.9% body weight categorized as fat. A similar study also reported that 49.6% of young women aged 12-14 years in the city of Surabaya were undernourished (BMI  $<18.5$  kg/m<sup>2</sup>) (Santy, 2006). Waryana (2010) stated that a lack or excess of nutrition in the long term could hurt health. Adolescents who are very thin due to malnutrition often called malnutrition, if it lasts too long will result in Chronic Energy Deficiency (KEK) (Departemen Kesehatan RI, 2002). SEZ women are at risk of giving birth to children with LBW or Low Birth Weight  $< 2500$  grams (Lubis, Z. 2003).

Nutritional status is influenced by various factors including energy and nutrient intake, gender, education, fiber consumption habits, physical activity and parents' genetic factors. BMI nutritional status. These results need to be investigated further by examining the variable intake/consumption of adolescents and also the activities of adolescents.

Poor eating habits are a common cause of nutritional problems in adolescents such as eating irregularly, avoiding certain foods, reducing meal frequency, and consuming unbalanced food (Zofiran et al, 2011). The research results also show that the eating habits of adolescent girls are related to the incidence of anemia and around 15.6% of adolescent girls who were respondents experienced anemia. Adolescence is a period of growth and development, both physically, mentally and in activity, so the need for nutritious food is great (Zong, 2014). Nutritional anemia in adolescents contributes to increasing maternal mortality, LBW babies, and prenatal mortality. So to break the life cycle of malnutrition is to increase iron nutrition for young women (Kaur, 20016). Good eating habits can prevent anemia in young women, including consuming animal protein, eating fruit rich in vitamin C, consuming home-cooked food, and choosing nutritious snacks (Akib, 2017).

## **Conclusion**

Approximately 52.5% of female adolescents are underweight, 15.6% are anemic and 6.5% have poor reproductive health attitudes. Poor eating habits are a protective factor against iron status/anemia (PR Adjusted = 0.247; 95% CI = 0.066-0.933). Age of Puberty and knowledge are the most dominant risk factors for reproductive health attitudes.

## **Recommendations**

Education to increase reproductive health knowledge and improve adolescent eating habits intensively can increase the degree of reproductive readiness of adolescents. Further research is needed with more complete independent variables and on a larger sample.

## **Scientific Ethics Declaration**

The authors declare that the scientific ethical and legal responsibility of this article published in EPHELS journal belongs to the authors.

## **Acknowledgments or Notes**

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