Study Correlation Between Nutritional Status and Anemia Among Adolescent Girls In Rural Jatinangor

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Abstract— Adolescents are the future generation of any country who their nutritional needs are seriously issue of the society. Several factors affect the nutritional status of adolescents, including anemia which the highest risk of suffering are adolescent girls. In this case, anemia can be caused by various causes such as deficiency of folic acid, vitamin B12, vitamin A, and iron. This study aims to determine the prevalence of anemia and its correlation between anemia and nutritional status among adolescent girls in Rural Jatinangor, Sumedang-Indonesia. The study was conducted on 92 adolescent girls (10-19 years old) in Rural Jatinangor. The nutritional status were classified by Body Mass Index (BMI) categories as obese, overweight, normal weight, thinnest, and severe thinnest according to the WHO standard (BMI for Age). Blood sample for the determination of hemoglobin concentration was collected in EDTA bottle which determined by cyanmethemoglobin method. Results: A cross-sectional study was carried out in adolescent girls of seven villages in Rural Jatinangor*.* Among 92 adolescent girls 26.09% were anemia, and 73.91% were normal. The result for nutritional status 8.70% were overweight, 9.78% were thinnest, 75% were normal, 4.35% were obese, 2.17% were severe thinnest. Data were analyzed according to Lambda Correlation, the result showed p>0.05. The result of this study showed there is no significant correlation between nutritional status with anemia in adolescent girls. **Conclusion:** Even though the nutritional status did not contribute significantly to anemia, further research is needed to analyze the other factors contribute to anemia among adolescent girls in Rural Jatinangor.

Keywords : Peer Education, Knowledge, HIV AIDS prevention, Adolescent

1. INTRODUCTION

World Health Organization has defined adolescent as a period among 10-19 years old.[1] Adolescent is a susceptible period for the development of various nutritional disorders in the human life phase. In girls, it is a maturity process from girlhood to womanhood. During this stage, the requirement of nutrition and micronutrients is relatively high. Nutritional issues can be overcome when the adolescent girls increase higher consumption of iron in their daily diet. Besides, bad nutrition in teenage mother increases the risk of poor obstetric outcome which gives an impact to the future children health.[2,3] As a result, the children can be born short, petite, under-weight and less logically than their peers.[4,5]

Adolescents are the future generation of any country who their nutritional needs are seriously issue of the society. Several factors affect the nutritional status of adolescents, including anemia which the highest risk of suffering is adolescent girls. In the developing countries, anemia is a health issue which caused by various factors.

Anemia is defined by World Health Organization (WHO) as low blood hemoglobin concentration, <12 g/dl, and has been regarded as public health problem in both developed and developing countries.[4] The prevalence of anemia is disproportionately high in developing countries, due to poverty, inadequate diet, certain diseases, pregnancy/lactation and poor access to health services.[7]

Severe anemia in developing countries is the major cause of maternal mortality and morbidity.

Severe anemia causes 26% of maternal deaths. Moreover, it causes cardiac failure death, poor healing of wound, and increased susceptibility of infections. In pregnancy, it can rise the risk of intrauterine growth retardation, prematurity, and low birth weight resulting in increased perinatal mortality.[8–10]

Anemia can be caused by various causes such as deficiency of folic acid, vitamin B12, vitamin A, and iron. Nutritional issues can be overcome when the adolescent girl increase their high consume of iron in their daily diet.[6,11] Based on several studies, the incidence of anemia is influenced by many factors for instance, poor of makronutrients and mikronutrients intake, and nutritional status.

Some studies suggest that there is a correlation between nutritional status and anemia, however there are still a few studies stated that no relationship between nutritional status and anemia. Therefore, this study purposes to find the relationship between nutritional status and the occurrence of anemia among the adolescent girls in the rural area of Jatinangor.

2. MATERIALS AND METHOD

This is a community based cross sectional survey, conducted at Rural Jatinangor during April to August 2018, was carried out after obtaining permission from institutional ethical committee. The study population consists of adolescent girls, with total 92 adolescent girls are from 7 villages, namely Cilayung, Cileles, Hegarmanah, Sayang, Cikeruh, Cipacing, and Cibeusi.

Purposive sampling was used to select the individuals from each village. The nutritional status were classified by Body Mass Index (BMI) categories as obese, overweight, normal weight, thinnest, and severe thinnest according to the WHO standard (BMI for Age). Blood sample for the determination of hemoglobin concentration was collected in EDTA bottle. Hemoglobin concentration was determined by cyanmethemoglobin method in which the subjects were interviewed by asking their last 24 hours makronutrients and micronutrients intake to get more information related to nutritional status. The study protocol and informed consent procedure were approved by the Medical Ethic Review Committee, Faculty of Medicine, Padjadjaran University, Number: 321/UN6.KEP/EC/2018). Informed consent was obtained from each adolescent girls with their mother.

3. RESULTS AND DISCUSSION

A cross-sectional study was carried out in adolescent girls of seven villages of Rural Jatinangor.

Table 1. Distribution of Adolescents According to Anemia

Clasification	N	%
Anemia	24	26.09
No Anemia	68	73.91
Total	**92**	**100**

Table 1 shows that among 92 adolescent girls 26.09% were anemia and 73.91% were normal. According to WHO, the prevalence of anemia in adolescent girls is still high, this is related with this study where the number of adolescent girls with anemia is 24% (Table 1). Main cause for anemia is deficiency of dietary iron which many studies have also supported it.

Table 2. Nutritional Status of Adolescents Body Mass Index

Nutritional Status	N	%
Overweight	8	8.70
Thinnest	9	9.78
Normal	69	75
Obese	4	4.35
Severe Thinnest	2	2.17
Total	**92**	**100**

In reference to Table 2, it shows that the result for nutritional status 8.70% were overweight, 9.78% were thinnest, 75% were normal, 4.35% were obese, and 2.17% were severe thinnest. There is an urgent need for improving overall nutritional status of adolescents for instance through nutrition education, community awareness, and various supplementation programs especially for girls. The need for regular blood tests, particularly hemoglobin levels, is emphasized. Then the nutrition component is needed to be included in the college curriculum.[12]

Table 3. Nutritional Correlates of Anemia Among Adolescents

Nutritional Status	Anemia	No Anemia	p
Overweight	2	6	
Thinnest	5	4	
Normal	16	53	0,763
Obese	0	4	
SevereThinnest	1	1	

According to Table 3, it shows the data relation between anemia and nutritional status of adolescent girls, which were analyzed by Lambda Correlation. The result showed p>0.05, there is no correlation between nutritional status with anemia in adolescent girls.

Adolescent girls who have a less body mass index want to have a slim body, as a consequence the consumption of macronutrients and micronutrients is lacking. Some respondents experienced anemia because of lack of nutrition such as energy consumption, whereas they got unbalanced when consumed iron.

The significant number of anemia in adolescent girls can be explained by the fact that menarche is attained around 12 years old in which the first few cycles are irregular with increased blood loss.[11] Anemia can be caused by various aspects such as deficiency of folic acid, vitamin B12, vitamin A, and iron. However, adolescent girl has the highest risk of suffering from anemia.

Compared to the other study, there is a positive correlation of haemoglobin with grades of BMI which was found in boys and girls; however, none of the correlation showed significance to the levels of <0.05.[12]

The association between Anemia and Body Mass Index (BMI); a measure of nutritional and health status, has been controversial.[13] While earlier studies have shown that the occurrence of anemia has no definite relationship with BMI. Further studies are needed to document factors that may be associated with anemia among the adolescent.[14]

Furthermore, another research is needed to assess nutritional intake obtained by adolescent. A study states that there is a significant relationship between the habit of consuming green leafy vegetables as a source of Fe and the incidence of anemia.[15] Recently issue shows that social media give food style influences such as adolescents do not reconsider the nutritional content of food consumed only consume the junk food. Food or snack that they often consume contained more carbohydrates and sugar, which can trigger diminution of hemoglobin levels.

4. CONCLUSION

In conclusion, nutritional status did not contribute significantly to anemia in adolescent girls since there are so many factor cause anemia, especially dietary iron deficiency and ociodemographic characteristics.

5. ACKNOWLEDGEMENT

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