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The Effect of Giving Krispi Potato Skin on Increasing Hemoglobin Levels in Adolescent Girls at Salafiyah Syafi'iyah Islamic Boarding School Sukorejo Situbondo

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ABSTRACT

Introduction: *An adolescent is someone who experiences rapid growth and development. Not infrequently, information that says that adolescents often experience several diseases, especially anemia. anemia is characterized by Hb levels below normal. Usually those who often experience anemia are adolescent girls, therefore it is necessary to prevent and overcome anemia by increasing Hb levels.*
Objective: *the purpose of this study was to determine the effect of giving crispy potato skins on increasing hemoglobin levels in adolescent girls at the Salafiyah Syafi'iyah Islamic Boarding School in Sukorejo Situbondo.*
Methods: *the method used in this study is a pre-experiment one group test, conducted on adolescent girls aged 13-22 years as many as 25 people.*
Result: *the results of this study are independent variables, namely age (0.227), knowledge (0.517) and provision of potato skins (0.999) have no effect on increasing Hb levels.*
Conclusions: *the conclusion of this study is to minimize the level of error when conducting research so that the results obtained are maximized and in accordance with the desired research objectives.*

Introduction

An adolescent is someone who experiences growth from childhood to adulthood who has experienced social emotional and physical maturity. One of the physical maturities they experience is the release of blood every month which is commonly referred to as menstruation in adolescent girls and base dreams in adolescent boys. Menstruation experienced by adolescent girls causes the amount of blood in the body to decrease, resulting in a lack of hemoglobin levels in the body.

Hemoglobin is a protein found in red blood cells and plays an important role in the body, namely binding and distributing oxygen throughout the body, someone who has Hb levels less than normal is called anemia which has symptoms such as fatigue, frequent dizziness, pale or yellowish skin, frequent drowsiness and others. One of the age groups that are prone to anemia is adolescent girls. Seen in several data reports that mention this.

Anemia in adolescent girls has a high percentage in the world, which is 50-80% (WHO, 2015). According to data from the Indonesian Ministry of Health in 2019 shows that the percentage of anemia incidence in adolescents is 18.22% (Indonesian Ministry of Health, 2019). Other data says that adolescent girls who experience anemia are 32% after 15-24 years. This means that 4 out of 10 adolescents in Indonesia suffer from anemia (Riskesdas, 2018). Data reports that show the incidence of anemia in adolescent girls are still relatively high, this is inversely proportional to the government program that has been running for decades, namely

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providing iron tablets to adolescents, especially adolescent girls. It is possible that the program is not running well because it is caused by several factors, one of which is that adolescents do not understand the importance of taking iron tablets and the uneven socialization of the side effects of iron tablets, thus making young women reluctant to consume these iron tablets. other preventive efforts that can be given so that young women can meet their iron needs are to consume foods that contain high iron, namely potato skins.

Potato skins have been tested for iron content previously conducted in a laboratory that can analyze the substances contained in these foods. iron levels in potato skins can meet the needs of iron in the body. So far, it is known that potato skins are only used as garbage and are not properly utilized by the community. However, when analyzed from the substance content contained in potato skins, it is very useful, especially for adolescent girls who need more iron.

Potato skins can be utilized by all age groups, especially for young women who can be made into processed foods so that they can be consumed every day. One of the preparations that can be made is potato skins that are made into crisps. These food preparations are very popular with the teenage age group so that they can be consumed regularly. Potato skin itself has no side effects even though it is consumed every day, only when making it into processed food, potato skins must be cleaned first because it contains compounds from soil and bacterial buildup. Crispy potato skins can help adolescent girls to increase Hb levels and avoid anemia. The purpose of this study was to determine the effect of giving crispy potato skins on increasing hemoglobin levels in adolescent girls at the Salafiyah Syafi'iyah Islamic Boarding School in Sukorejo Situbondo.

Methods

This research is a quantitative study with a one group test pre-experiment design which means that this research design is only carried out in one group without a comparison group (Notoatmodjo, 2018). This research was conducted at Pondok Pesantresn Salafiyah Syafi'iyah Sukorejo Situbondo in September 2023-February 2024. The independent variables in the study were the provision of crispy potato skins, knowledge, characteristics of adolescent girls: education and age while the dependent variable was the increase in Hb levels. The measuring scale used in the dependent variable uses nominal categorization and for the independent variable in this study uses an ordinal measuring scale. The sample used in the study was 25 female adolescent students by purposive sampling, namely respondents who fell into the criteria or conditions. The criteria in question are adolescent girls in the Salafiyah Syafi'iyah Islamic Boarding School Sukorejo Situbondo with an age range of 13-22 years and do not have a history of any disease. Respondents were not allowed to fast during the research process and agreed to the conditions that had been proposed by the researcher. The study used food ingredients from potato skins which were processed into crispy potato skins. The ingredients used in making crispy potato skins are potato skins, salt, garlic, baking powder, chicken broth, wheat flour and cooking oil.

Start the preparation by preparing the potato skins that have been cleaned beforehand and have been separated from the potato flesh. The next step is to mix salt and potato skins with the technique of squeezing until the two are mixed and let stand for five minutes. Then put the potato skins that have been mixed with salt into water that is also mixed with baking powder and chicken broth and garlic that has been mashed and let stand for 15 minutes then drain. After that, put it in flour and the last step is frying.

Data collection used in this study used primary data. This study measured Hb levels in respondents before and after the intervention. The intervention carried out was to give crispy potato skins weighing 100 grams to respondents every day with the same weight for 5

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consecutive days. The research instrument used was a questionnaire sheet to determine the knowledge of respondents and an observation sheet to document Hb levels. Data analysis used in this study was univariate analysis, bivariate using chi-square test and multivariate with logistic regression test to statistically test the effect between dependent and independent variables.

Results

The results of the research that has been carried out by conducting analytical tests on the dependent variable, namely the increase in hemoglobin levels and the independent variables are age, latest education, the number of crispy potato skins given and knowledge. The analysis test used is univariate analysis, bivariate analysis using chi square and multivariate analysis with logistic regression. The results of research conducted on adolescents as many as 25 respondents.

The results of the univariate analysis test on the characteristics of respondents consisting of education and age, knowledge, the amount of consumption of crispy potato skins and increased hemoglobin levels are listed in the table below. The results should include findings of the study, including, if appropriate, results of statistical analysis, which must be included either in the text or as tables and figures.

Table 1. Characteristics of respondents

Variabel Penelitian	f	%
Karakteristik		
Pendidikan		
Tinggi (≥SMA atau sederajat)	25	100
Rendah ≤SMP atau sederajat)	0	0
Jumlah	**25**	**100**
Umur		
17-18 tahun	16	64
19-20 tahun	9	36
Jumlah	**25**	**100**

Table 1. shows that the characteristics of education and age are that all respondents have the latest education (≥SMA or equivalent) as much as 100% and most are aged 17-18 years, namely 64%.

Table 2. Knowledge, provision of "*crispy potato skins*" and increased Hb levels

Variabel Penelitian	f	%
Pengetahuan		
Kurang (10-55)	6	24
Baik (60-100)	19	76
Jumlah	**25**	**100**
Pemberian "Kulit Kentang Krispi" (Konsumsi dalan 4 hari)		
50-100 gram	0	0
200-300 gram	2	8
350-400 gram	23	92
Jumlah	**25**	**100**
Kadar Hb		
Meningkat	12	48
Tidak meningkat	13	52
Jumlah	**25**	**100**

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Table 2. shows that respondents who have good knowledge are more than respondents who have less knowledge as much as 76%. Respondents consumed more crispy potato skins for 4 days, namely 350-400 gr as much as 92%. Hb levels that did not increase in respondents were more than Hb levels that increased by 52%.

The results of the bivariate analysis test on the variable characteristics of respondents, namely age education, knowledge and the provision of "*crispy potato skins*" to increase Hb levels in adolescents can be seen in the table below.

Table 3. Relationship between respondent characteristics, knowledge and provision of "*crispi potato skins*" to increase Hb levels

Variabel	Peningkatan Kadar Hb		Nilai P
	Meningkat n (%)	Tidak Meningkat n (%)	
Pendidikan			-
Tinggi (≥SMA atau sederajat)	12 (48)	13 (52)	
Rendah ≤SMP atau sederajat)	0 (0)	0 (0)	
Umur			0,161
17-18 tahun	6 (37,5)	10 (62,5)	
19-20 tahun	6 (66,7)	3 (33,3)	
Pengetahuan			0,910
Kurang (10-55)	3 (50)	3 (50)	
Baik (60-100)	9 (47,3)	10 (52,7)	
Pemberian "Kulit Kentang Krispi"			0,157
50-100 gr	0 (0)	0 (0)	
200-300 gr	0 (0)	2 (100)	
350-400 gr	12 (52,1)	11 (47,9)	

Table 3. states that respondents with higher education (≥SMA or equivalent) had more Hb levels that did not increase as many as 13 people (52%) and there were no respondents who had low education (≤SMP or equivalent). Characteristics based on age, respondents who have age l7-18 years more Hb levels that do not increase as many as 10 people (62.5%) and Hb levels that increase as many as 6 people (37.5%). Respondents who had good knowledge experienced an increase in Hb levels as many as 10 people (52.7%). Looking at the respondents who were given crispy potato skins 350-400 gr in 4 days had an increase in Hb levels as many as 12 people (52.1%). When viewed based on the P value, all independent variables, namely respondent characteristics (education and age), knowledge and administration of crispy potato skins are not associated with the dependent variable, namely the increase in Hb levels in adolescents. However, the results of the analysis test were subjected to multivariate analysis using SPSS. These results can be tested multivariate analysis to determine the magnitude of influence between independent variables on the dependent variable.

The results of the multivariate analysis test on the independent and dependent variables can be seen in the table below.

Table 4. Multivariate analysis test results

Variabel	95%CI		Nilai P
	Minimum	Maximum	
Umur	0,053	2,006	0,227

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Pengetahuan	0,495	0,59	0,517
Pemberian "Kulit Kentang Krispi"	0,000	0,000	0,999

Table 4. presents the results of the multivariate analysis test using the logistic regression test on the SPSS application. The results in the table state that the variables of age, knowledge and the provision of "crispy potato skins" have no effect on increasing Hb levels in adolescents because the P value> 0.05.

The results of the difference in Hb levels before and after consumption of "crispy potato skins" are shown in the table below.

Table 4. Difference in Hb levels before and after consumption of "*crispy potato skins*"

	Pre (gr/dL)	**Post (gr/dL)**
Mean Hb	12,8	12,6

Table 5. shows the results of the average value (mean) on hb levels before and after being given crispy potato skins. The average (mean) value of hb levels before being given crispy potato skins is 12.8 gr/dl and hb levels after being given crispy potato skins are 12.6 gr/dl. These results decreased by 0.2 gr/dl.

Discussion

Increased Hb levels in adolescents are influenced by several factors, including age, education, knowledge and consumption of iron-containing foods. However, it has mixed test results and depends on the type of research conducted.

The results of the study on 25 respondents who were given crispy potato skins with the administration of 100 grams each per day for 4 consecutive days were more who did not increase, namely 52%. This is probably because when making crispy potato skins, there is more flour when processing this food. Thus, when consumed, what is tasted is flour, not potato skins. Although respondents consumed crispy potato skins every day for 4 days (92%). However, when consuming this food, there were some complaints from respondents about the impact after consuming it. These included nausea and dizziness. Some other respondents who consumed crispy potato skins regularly claimed to be happy with the food because it tasted good. However, some respondents who were not regular in consuming krispi potato skins said there were impacts that were less pleasant to feel. This is a shortcoming in this study, so that further research on crispy potato skins is carried out in order to minimize the impact experienced after consuming it.

Based on the results of the bivariate analysis test using logistic regression, it shows that age, knowledge and provision of crispy potato skins have no effect on increasing Hb levels in adolescents with a P value>0.05. It is possible that this can happen because age in adolescents is not a benchmark or standard for someone experiencing Hb levels below normal. This is in line with research conducted by Purwaningtyas and Galuh (2017) which states that there is no relationship between age and the incidence of anemia (Purwaningtyas & Galuh, 2017). It is likely that this is because 17-18 year olds like to choose the food to be consumed. This is what causes respondents to be less interested in crispy potato skins because they have an unpleasant impact.

Knowledge is information that a person knows consciously. The knowledge a person has will change behavior from bad to better. In this case, more respondents have good knowledge than those who are less, namely 76%. However, knowledge has no effect on increasing Hb levels in adolescents. It is possible that respondents in this study had little knowledge about anemia, as evidenced by the fact that some respondents were irregular in consuming potato skins for 4 days. This is in line with research conducted by Arifarahmi in 2021 which states that knowledge has no relationship to increasing Hb levels (Arifarahmi, 2021). Knowledge is not the main factor in

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increasing a person's Hb levels, but there are several other factors that can increase Hb levels. One of them is good nutrition, namely the fulfillment of iron in the body so that a person's Hb levels will increase. This is in line with research by Budiarti A et al that nutritional intake is one of the factors that can reduce the incidence of anemia (Budiarti A, 2021).

Another independent variable is the provision of potato peels has no effect on increasing Hb levels in adolescents. Although potato skins have previously been researched by Ifa N in 2023 that there are 111.8 grams of iron contained in potato skins (Ifa N, 2023). However, this may be influenced by the processed ingredients to make crispy potato skins, namely flour. This research has not been done much before, especially on the basic ingredients of potato skins. So that not many references are used reminding that potato skins are not much glimpsed by researchers to be used as research material.

The education variable cannot be tested for influence on the provision of crispy potato skins because all respondents have a high education, namely ≥SMA or equivalent. The education variable only has 1 category, so it cannot be analyzed using the chi square test and logistic regression.

Conclusion

In this study it can be concluded that age, knowledge and provision of potato skins have no relationship to increasing Hb levels in adolescents. This is due to the many shortcomings in conducting this research, especially when making crispy potato skins.

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