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The Effect of Peer Education on Knowledge and Attitudes about Anemia and Chronic Energy Deficiency of Adolescent Girls at Percut Village, Indonesia

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Abstract

Adolescent nutrition is a very important need in addition to physical development, cognitive also for the development of reproductive organs. If young women experience nutritional problems such as anemia and chronic energy deficiency (CED) this will have an impact on their future condition when becoming a prospective mother in their pregnancy at risk of experiencing prolonged anemia and having an impact on giving birth to premature babies and low birth weight, this will contribute to stunting in Indonesia. It is necessary to provide education to increase the knowledge and attitudes of adolescents about anemia and chronic energy deficiency who are trained to become peer educators so that they will become agents of change in their village to be able to provide education to other peers to reduce the incidence of anemia and CED in adolescent girls.

Method. This type of research is quasi-experimental, with separated sample pre and post-test with control group design. The purpose of this study was to see the effect of peer education on knowledge and attitudes about anemia and CED in adolescent girls with a sample of 25 people in each treatment and control group, then each peer educator educated 5 peers so that the total was 150 samples. Using paired t-test and unpaired t-test.

Results. There was a difference in the mean value of knowledge and attitudes about anemia in the treatment group ($p=0.0001$) while there was no difference in the mean in the control group ($p>0.05$). There was a difference in the mean value of knowledge and attitudes about CED in the treatment group ($p=0.0001$) while for the control group it was not significant ($p>0.05$). There was an effect of providing education on nutrition material about anemia and CED on knowledge and attitudes of adolescent girls, where the mean value was higher in the treatment group than in the control group ($p=0.0001$). There was a difference in the mean value of knowledge ($p=0.0001$) and attitudes (0.0001) about anemia and CED in the peer group, meaning that the education provided by the peer educator to peers was very effective in increasing their knowledge and attitudes.

Conclusion. It is hoped that the support of the local government in providing facilities such as facilities and infrastructure to launch peer education activities in Percut Village is expected. It is necessary to cooperate with all relevant parties to prevent the incidence of anemia and CED in adolescent girls.

Keywords: Peer education, Knowledge, Attitude, Anemia, CED, Adolescent Girls

Introduction

Adolescent nutrition has important implications for the country's ability to achieve sustainable development goals (SDGs), as well as economic growth and development. Meanwhile, young women are the future mothers and their nutritional status has a direct impact on the nutritional and health status of the next generation (1). It can be said that adolescents who have good nutrition should have a positive impact on themselves, both in the short term, such as maintaining their fitness and maximum concentration on learning, and in the long term when they are ready to become healthy mothers-to-be.

Adolescence is a period where the physical and psychological development of the body tends to change very quickly. Indirectly, this certainly requires adequate balanced nutritional intake for

adolescents to support puberty. The active and dynamic lifestyle of adolescents often causes adolescents to consume food based on social and or emotional needs, while considerations of nutritional aspects are often neglected.

Teenagers' diet as illustrated by the 2016 Global School Health Survey (2), includes: They don't always have breakfast (65.2%), most of them don't eat enough fiber and fruit vegetables (93.6%), and often eat flavored foods (75.7%). Likewise, what is currently a trend among teenagers regarding body image, teenagers try to maintain their appearance so they tend to be more selective about daily food intake. The results of Merita's research (2020) in Jambi found that 68.2 percent of teenagers' food quality was low, and there was a relationship between diet quality and hemoglobin (Hb) levels (p=0.003) (3). Adolescents' diets are still less influenced by adolescent knowledge about the selection and diversity of food which is also still low so that the food menu does not vary. This will put teenagers at risk of nutritional problems. When puberty, adolescents cannot control their intake and are carried out continuously, in their growth and development period, they are very at risk of experiencing iron deficiency anemia and CED. Basic Health Research Data (Riskesdas) 2018 (4) shows that the prevalence of anemia in adolescent girls is 48.9 percent, an increase of 11.8 percent compared to data in Riskesdas (2013). Research in India also found that adolescent girls are a group prone to anemia. Adolescent girls are prone to anemia because they experience menstruation and catch up with their growth period. Furthermore, for CED data as many as 25.7 percent of adolescents aged 13-15 years and 26.9 percent of adolescents aged 16-18 years with short and very short nutritional status. In addition, there is 8.7 percent of adolescents aged 13-15 years and 8.1 percent of adolescents aged 16-18 years with thin and very thin conditions.

Adolescents who often experience anemia and CED, when they are pregnant can increase the risk of premature birth, low birth weight babies (LBW), stunting (short children), maternal and infant mortality. Coupled with the rampant incidence of early marriage, whether due to premarital sex or other factors. Placing adolescents at severe risk with anemia. During pregnancy is a woman's risk for developing anemia, especially if the teenager is already pregnant, while adolescents are also included in the risk group for anemia, and the risk is double.

Adolescent girls are susceptible to anemia and CED not only because of factors that do not vary in food intake (5.6) or unavailable food that meets their nutritional adequacy (7) but can also be caused by the perspective on their body image, there is an assumption that beauty is when you have a slim body shape like a pencil and skinny (8). The concept of an unrealistic ideal body is a factor that encourages teenagers to take unhealthy diets. The results of Rahmadani's research (9) showed that of 30 young women, there were 81.1 percent running unhealthy diet behaviors and 18.9 percent running extreme diets. Unhealthy diets are carried out by teenagers in the form of them skipping breakfast, lunch, dinner, controlling strict diets, and consuming weight loss products. This happens because all respondents have less body image which makes them not confident so they take an unhealthy diet.

Government programs to solve the problem of anemia in adolescents have already been carried out, including the program of giving blood-added tablets from the public health center, but this is not running optimally. Socialization about anemia in adolescents is still very poorly delivered, anemia prevention programs are more focused on pregnant women. However, to overcome the problem of adolescent anemia, the program has not been seen to be running, such as whether there is a Hb check for adolescent girls that are routinely carried out by the public health center. In fact, it is very important to screen for the incidence of anemia in adolescents so that it can be treated early. There is an opinion that the problem of anemia is not permanent, because later it will return to

normal. This opinion should not be taken lightly, every incident of anemia in adolescents must be taken seriously because this will have an impact on their reproductive health in the future (10).

One form of problem-solving can be done and started from the teenager herself. In adolescence, they trust the words of their peers to talk about the problems they face. This is because teenagers know the problem and are more spontaneous in making appointments. Peers have a very dominant contribution as an example (modeling) in behavior because peers are teenagers with the same age or maturity level.

One way to overcome the problem above is an approach through the role of peers to be trained as adolescent peer educators. Youth peer education programs provide great benefits for other youth. The results showed that the formation of peer educators had a great influence on decision making and could increase the knowledge, attitudes, and actions of adolescents about adolescent nutrition. This can be seen in Khodijah's research (11), adolescents are trained to become peer educators and are expected to become agents of change in terms of adolescent nutrition to their peers.

Percut Village is an area where the majority of the population work as fishermen, laborers, and traders with middle to lower-income, from the previous initial survey, found cases of anemia in adolescent girls as much as 57.8%, low knowledge about anemia and CED problems. This research is important to do, to educate young women as peer educators to other peers.

Method

The type of this research is a quasi-experimental design with a separated sample pre and post-test with control group design, in the initial stage, 25 female adolescents (aged 12 -16 years) were obtained as the treatment group and 25 as controls were obtained from the formula for the difference in the mean of the two populations. The purpose of the study was to determine the effect of providing education on adolescent nutrition problems (anemia and chronic energy deficiency) on the knowledge and attitudes of young women who were trained to become peer educators. The research stage at the first stage was given a pretest to assess knowledge of anemia and chronic energy deficiency (CED) (15 questionnaire items), attitudes about anemia (15 questionnaire items), and attitudes about CED (10 questionnaire items) of adolescent girls about nutritional problems in both of the treatment group and the treatment group control, then the treatment group was given education with content about nutritional problems in adolescent girls including anemia and chronic energy deficiency for two days and repeated the next week, and posttest was carried out again to assess knowledge and attitudes in both groups. In the next stage, each peer educator (treatment group) will educate 5 peers in the same way. So the total sample is 150 (25 + 125) young women. The statistical test used was paired t-test to see the difference in mean knowledge and attitudes before and after treatment, while the unpaired t-test was to see the effect of providing nutrition education on knowledge and attitudes between the treatment and control groups. The research location is in Percut Village, Deli Serdang Regency, North Sumatra Province, Indonesia

Results

The description of the characteristics of the respondents (25 people in both the treatment and control groups can be seen in the table below

Table 1. The Frequency distribution of Respondents Characteristics of Young Women Peer Educator (n-25)

Characteristics of Respondents	Treatment Group		Control Group	
	n	%	n	%
Age				
- 12 years	2	8,0	3	12,0
- 13 years	4	16,0	5	20,0
- 14 years	7	28,0	7	28,0
- 15 years	7	28,0	8	32,0
- 16 years	5	20,0	2	8,0
Father's Education				
- Elementary	4	16,0	5	20,0
- Junior High School	9	36,0	10	40,0
- Senior High School	12	48,0	10	40,0
Mother's Education				
- Elementary	5	20,0	7	28,0
- Junior High School	12	48,0	12	48,0
- Senior High School	8	32,0	6	24,0
Job				
- Farmer	2	8,0	3	12,0
- Fisherman	7	28,0	8	32,0
- Laborer	6	24,0	5	20,0
- Trader	5	20,0	5	20,0
- Private employees	1	4,0	0	0,0
- Entrepreneur	4	16,0	4	16,0
Total	**25**	**100,0**	**25**	**100,0**

From the table above shows that the distribution of the age range of the peer educator respondents was homogeneous between the treatment and control groups at the age of 14 and 15 years, the father's education was mostly in the high school category of 48.0% in the treatment group and 40.0% in the control group. The highest maternal education was in the junior high school category as much as 48.0% in both groups, and the most work was in the business as fishermen (28.0% and 32.0%) and laborers (24.0% and 20.0%). This shows that the socio-demographic factors of the respondents are still very low.

Table 2. The Results of the t-paired test of Knowledge and Attitudes about Anemia and Chronic Energy Deficiency (KEK) in the Treatment and Control Groups (n1=n2=25)

Variabel	Treatment		p.value	Control		P.Value
	Mean	SD		Mean	SD	
Anemia Knowledge						
- Before	7,92	2,100	0,0001	7,40	2,309	0,327
- After	9,32	1,406		7,12	1,986	
Anemia Attitude						
- Before	54,68	5,194	0,0001	54,12	5,652	0,508

- After	59,20	4,183		55,12	5,161	
CED Knowledge						
- Before	8,72	1,514	0,0001	7,92	1,73	0,627
- After	11,08	1,256		7,84	1,772	
CED Attitude						
- Before	38,84	2,211	0,0001	38,92	2,105	0,518
- After	42,64	2,737		37,45	2,031	

The results of the paired t-test above show that there is an effect of providing nutrition education on knowledge and attitudes about anemia and chronic energy deficiency (KEK) in adolescents in the treatment group where p-value = 0.0001, it can be seen that there is a difference in the mean value of knowledge and attitudes before and after being given education on nutrition problems, after being given education the average value of knowledge and attitudes about anemia and CED increased. Meanwhile, in the control group, there was no difference in the mean before and after knowledge of anemia (p=0.327), attitudes about anemia (p=0.508), for knowledge about CED (p=0.627), and for attitudes about CED (p=0.518).

Table 3. The Results of the unpaired t-test Knowledge and Attitudes about Anemia and Chronic Energy Deficiency (CED) (n1=n2=25)

Variable	***Mean Difference***	**t**	**df**	**p.**
Anemia Knowledge	2,133	6,600	41,873	0,0001
Anemia Attitude	3,420	7,699	62,333	0,0001
CED Knowledge	2,893	11,092	113,820	0,0001
CED Attitude	3,656	20,570	149,151	0,0001

From the table above, it can be seen that there is an effect of providing nutrition education on knowledge and attitudes about anemia and chronic energy deficiency (CED), where p-value = 0.0001, meaning that the provision of continuous education will have an impact on increasing knowledge and attitudes in young women who are trained to become peer educators.

Table 4. Characteristics of Peer Respondents (n=125)

Characteristics of Respondents	**Peer Group**	
	n	**%**
Age		
- 12 years	30	24,0
- 13 years	26	20,8
- 14 years	23	18,4
- 15 years	35	28,0
- 16 years	11	8,8
Father's Education		
- Elementary	17	13,6
- Junior High School	48	38,4

- Senior High School	60	48,0
Mother's Education		
- Elementary	29	23,2
- Junior High School	49	39,2
- Senior High School	47	37,6
Job		
- Farmer	12	9,6
- Fisherman	34	27,2
- Laborer	36	28,8
- Trader	29	23,2
- Private employees	5	4,0
- Entrepreneur	9	7,2
Total	**125**	**100,0**

From the table above, it can be seen that the highest age distribution in the peer educator group was in the 15 year age group as much as 28.0%, the father's education in the high school category as much as 48.0%, the mother's education in the junior high school category as much as 39.2%, and the work of the father as a laborer as much as 28.8% and fishermen as much as 27.2%.

Table 5. The Results of the t-paired test of Knowledge and Attitudes about Anemia and Chronic Energy Deficiency (CED) in the Peer Group (n=125)

Variable	Peer Group		p.value
	Mean	SD	
Anemia Knowledge			
- Before	6,96	2,343	0,0001
- After	8,9	1,762	
Anemia Attitude			
- Before	55,11	6,173	0,0001
- After	58,36	5,717	
CED Knowledge			
- Before	8,1	1,994	0,0001
- After	11	1,35	
CED Attitude			
- Before	39	2,537	0,0001
- After	42,63	2,666	

From the table above, it can be seen that the results of peer educator education on peer groups showed that there was an effect, where the value of p = 0.0001 (p <0.05)and there was a change in the average value of knowledge and attitudes about anemia and CED before and after, the mean value after being given education increased significantly, meaning that the peer educator was considered capable of providing education about nutritional problems (anemia and CED) to their peers.

Discussions

Young women do not understand the meaning of nutrition well, they think that the purpose of food is to fill the stomach. While nutrition is food that provides health effects for humans. Especially for young women because nutrition is important for growth and development as well as reproductive health. Adolescents' knowledge and attitudes about anemia and chronic energy deficiency before being given nutrition education had a low mean value, adolescents did not know the symptoms of anemia, food sources rich in iron, adolescents did not understand what types of food or drinks could inhibit iron absorption, types of foods that can accelerate the absorption of iron, the impact of anemia especially on their reproductive health in the future, a nutritionally balanced food source or a variety of foods, because all this time young women choose foods that are easy to fill, such as fast food that is rich in carbohydrates, consume fewer vegetables and fruit. In addition, adolescents do not understand that nutrition is very important for their provision to be healthy when they become prospective mothers in the future, during pregnancy, they do not have anemia and chronic energy deficiency which has an impact on giving birth to babies with low birth weight. The risk of babies with LBW will experience stunting.

If this is allowed to continue, adolescents will be at risk with wrong consumption diets because they are based on low knowledge. Therefore, it is important to conduct education to increase their knowledge about the importance of balanced nutritional intake so that they can meet the iron needs of adolescent girls during puberty as the basic capital for subsequent pregnancies (12). Adolescents should be given socialization or information about micronutrient problems, especially iron which is important for adolescents so that adolescents do not experience anemia. It takes good cooperation between the village government, school principals, and health workers as well as parents to educate young women about anemia. So that it can prevent itself from the incidence of anemia (13).

According to Azwar (14), the factors that can influence the formation of attitudes are personal experience, the influence of other people who are considered important, the influence of culture, education, religion, and mass media. Various forms of mass media such as television, radio, newspapers, magazines, and others have a great influence on the formation of public opinion and belief. As its main task in conveying information, the mass media carry messages that contain suggestions that can direct one's opinion. New information about something provides a new cognitive basis for the formation of attitudes towards it. The suggestive messages conveyed by the information, if strong enough, will provide an effective basis in judging something to form an attitude. Although the influence of the mass media is not as large as the influence of direct individual interactions, in the process of forming and changing attitudes, the role of the mass media is not small.

Attitude is a view, but in that respect, it is still different from the knowledge people have. Knowledge about anemia is not the same as attitude towards anemia. Knowledge of a new object becomes an attitude if that knowledge is accompanied by a willingness to act in accordance with the knowledge of the object. Good knowledge will encourage someone to display an attitude following the knowledge that has been obtained. Based on existing theories that knowledge can affect a person's attitude, with good knowledge a good attitude will also be realized (15).

The problem of adolescent nutrition is an important point in overcoming current nutritional problems in Indonesia. This can be started by intensifying socialization and nutrition education to the community and the youth themselves (16). Providing education to adolescents aims to increase their knowledge about the importance of balanced nutritional intake during puberty as the basic capital for a healthy pregnancy in the future (17).

Based on the results of the study, it was shown that there was an increase in the knowledge and attitudes of young women after being given nutritional education about anemia and chronic

energy deficiency in the treatment group (p = 0.0001) compared to the control group who were not given nutrition education. The provision of nutrition education is given repeatedly so that it will have a longer memory impact on young women, by presenting using presentations accompanied by pictures, young women who are trained to become peer educators are also given modules as their guidelines later in educating their peers, giving modules providing convenience for the youth to better understand the content of the nutritional material provided (18) accompanied by discussions during the training period, the presenters interacted closely with the peer educators so that they better understand the contents of this nutrition education material.

This is supported by the results of research conducted by Nesrin N, et al (19) who conducted nutrition education on increasing the knowledge and attitudes of young women in Jordan, the results showed that there was an effect of providing nutrition education about anemia on increasing knowledge and attitudes (p = 0.000). Likewise, a study conducted by Putra, et al (20) conducted nutrition education on 27 female adolescent girls as the treatment group and 27 in the control group, the increase in knowledge and attitudes was very significant in the group that was given nutrition education compared to the control group (p = 0.000) on students of SMP N 31 Semarang, Indonesia.

The teaching methods carried out by the peer educator to 5 peers were varied, some invited 5 of their peers to their house, some used the hall at the village hall and delivered nutrition materials, then the peer educator conducted education by sending messages on nutrition education materials via chat. In the WhatsApp group, peer educators also convey nutritional messages when they do activities together or play together, all for 2 weeks and re-evaluation. This method has proven to be very effective in increasing the knowledge and attitudes of adolescent girls of their peers about anemia and chronic energy deficiency. This is supported by research conducted by Nuryani (21) and Michael Azizi (22) who conducted peer education to increase the knowledge and attitudes of peer educators and showed that there was a positive effect.

The peer education program is very good for increasing the knowledge and attitudes of young women and taking advantage of the role of adolescents as agents of change in their village so that by being trained as peer educators in adolescent nutrition, there will be more other young women who can increase their knowledge and attitudes so that it is hoped that the incidence of anemia and chronic energy deficiency in adolescent girls were found to be lower. Therefore, the local government has to support this peer education program continues by providing facilities and infrastructure for the implementation of peer education activities.

Conclusions

1. The peer education method is very effective in increasing knowledge and attitudes about anemia and chronic energy deficiency in adolescent girls in Percut Village, Deli Serdang Regency, Indonesia
2. Support from the local government, especially the head of Percut Village, is needed to provide space and facilities for peer educators in carrying out nutritional education activities for peers
3. Cooperation of all relevant parties is needed, including village heads, heads of health centers, school teachers, and parents of adolescents in preventing the incidence of anemia and chronic energy deficiency in adolescent girls.

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