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Education and Effectiveness of Parent Participation in The Provision of Blood Supplementation Tablets on Increasing Hemoglobin Levels in Adolescent Girls

Theresia Limbong [1(CA)], **Syaniah Umar**[2], **Suriana Koro**[3]
[1(CA)]Department of Midwifery, Poltekkes Kemenkes Makassar, Indonesia; theresia_dewarta@yahoo.co.id (Corresponding Author)
Department of Midwifery, Poltekke Kemenkes Makassar, Indonesia; syaniah_umar@poltekkes-mks.ac.id
Department of Midwifery, Poltekkes Kemenkes Kendari, Indonesia; suriana.koro@gmail.com

ABSTRACT

Iron anemia control is a program to prevent anemia through health education by giving blood supplement tablets to adolescent girls. This study aims to study the effect of education and the effectiveness of parental participation in giving blood-added tablets to increase blood hemoglobin levels. The study was carried out at SMA PGRI Makassar from January to October 2021. The population was adolescent girls aged 12-18 years who participate in the blood-boosting tablet supplement program with a total of 45 respondents. The sample size was determined by the Slovin formula so that 41 were obtained which were taken using a simple random sampling technique. Data were collected using a questionnaire before and after being given an anemia education model and parental participation in increasing hemoglobin levels. To determine the hemoglobin level used Sahli's Hb with units of g/dl. In the paired t-test analysis, there was a significant change in the knowledge of adolescent girls about anemia after being given the education model with p-value = 0.000 (less than 0.05). There was a significant difference in parental participation in the administration of blood-added tablet supplements. As conclusion, education and the effectiveness of parental participation affect increasing hemoglobin levels.

Keywords: adolescent girls; parental participation; blood supplement tablet (TTD); Hb level

INTRODUCTION

The cause of anemia is due to lack of iron intake in food which is characterized by low (below normal) hemoglobin (Hb) levels. Adolescent girls are at risk of anemia because during puberty they experience menstruation, as well as accelerated growth and development, where this condition will be exacerbated if the intake of nutrients in the body is low. Iron deficiency anemia is chronic and often asymptomatic and may go undiagnosed. Patients are typically between 6 months and 3 years or between 11 and 17 years as this is an age of rapid growth and increased blood volume[(1)]. Iron deficiency is defined as a condition in which no iron stores can be mobilized, as a result of long-term negative iron balance and leading to impaired iron supply to tissues. Currently, Iron Deficiency Anemia (IDA) is the most common micronutrient deficiency in the world, bringing serious economic consequences and obstacles to national development[(2)].

Iron deficiency is the most common nutritional deficiency in the world, affecting <10-20% of the population[(3)]. In general, the cause of iron deficiency can be due to deficiency of intake, inadequate absorption, blood loss, postnatal, abnormal intracellular transport or utilization, and so on[(1,2)]. It is generally agreed that adolescent girls are particularly susceptible to iron-deficiency anemia as a result of increased iron requirements for growth, iron loss due to menstruation, and poor eating habits[(4)].

According to a report by the World Health Organization, globally more than 3 billion people suffer from anemia. Anemia is one of the most common human diseases affecting nearly 20% of the world's population[(5)]. Micronutrient problems commonly occur in developing countries, including anemia, the incidence is estimated at 30% of the world's population. The incidence of anemia generally occurs in all age groups, especially in adolescents and pregnant women. The incidence of anemia in adolescent girls remains high. The incidence is estimated at 30% of the world's population. Based on data quoted from the Ministry of Health in 2018 that there is a 22.2% prevalence of nutritional anemia in the adolescent age group. The results of Riskesdas (Basis Health

Research) 2018 show that as many as 76.2% of adolescent girls aged 10-19 years have received blood-added tablets[6]. The results of the National-3 Family Health Survey show that the prevalence of anemia in children is 79% and 56% of adolescent girls suffer from anemia. Iron deficiency accounts for anemia in 5% of women and 2% of men in America[3,7].

The effects of anemia in adolescents include experiencing problems in growth and development, physical fatigue, being more sensitive to infections, and decreasing stamina and learning concentration. If teenagers understand well about anemia and how to prevent it, then it can be prevented[8]. Efforts have been made to overcome the problems mentioned above, including the results of research which states that education about iron nutrition can increase knowledge about anemia by as much as 43.3%. The iron nutrition education delivered includes intake patterns, signs of anemia, effects of anemia, and individual hygiene[9]. Stress levels can also affect poor consumption patterns. Busy work and busy schedules can cause stress to adolescent girls so sometimes it makes them neglect food consumption, which in turn increases the risk of anemia, which will affect their quality of life and achievement[10]. These efforts, which have been fully implemented, have not been able to significantly reduce the incidence of anemia in adolescent girls, because the approach used is only segmental and not comprehensive. Likewise, the efforts made by the government to overcome the problem of iron nutritional anemia do not always work effectively, because the problem of iron deficiency is multidimensional, namely in addition to the presence of iron supplements and their consequences, other things affect the effectiveness of the iron tablet supplement program. Iron, namely the quality factor of iron tablets, how to educate adolescent girls, parental participation and stakeholder collaboration, and training of educators[11].

Because iron deficiency is caused by multiple factors and has a broad impact or problem in life, especially in the growth process and the efforts that have been made have not been obtained optimally, the researchers consider it necessary to research to overcome the problems caused by iron deficiency. One of the efforts to overcome the problems mentioned above, the researchers conducted a study using an education approach and parental involvement in giving blood supplementation tablets to increase hemoglobin levels.

METHODS

This research was a pre-experimental type that was designed in the form of a pre-post test design which aims to study the effect of education and the effectiveness of parental participation in giving blood supplement tablets to increase blood hemoglobin levels of adolescent girls aged 12-18 years who participated in the blood-boosting tablet supplement program and totaled 45 respondents. The sample size was determined by the Slovin formula so that the sample size was 41 respondents, where the sampling technique was carried out by a simple random sampling technique. Data were collected before and after the anemia education model and blood supplement tablets were administered. Data was obtained by using a questionnaire to determine the knowledge of adolescent girls about anemia and parental participation in increasing hemoglobin levels. To determine the level of hemoglobin in the blood, Hb Sahli was used with units of g/dl, which was measured at the end of the administration of the blood-enhancing tablet.

The data obtained were analyzed with the Shapiro Wilk test used to analyze the normality of the data. The results of the analysis showed that the data were normally distributed so that further data analysis used a parametric test, namely the paired t-test to see the effect of the educational model and parental participation in giving blood supplement tablets to increase hemoglobin levels in adolescent girls. The results of the analysis showed that there was an influence of the education model and parental participation in giving blood supplement tablets, so it can be concluded that the education model and parental participation affected increasing hemoglobin levels in adolescent girls. This research had been approved by the Health Research Ethics Commission of Poltekkes Kemenkes Makassar with the number of 0305/KEPK-PTKMKS/V/2021.

RESULTS

This section presents the analysis and interpretation of the data collected through direct interviews in response to the problems in this study.

Table 1. Distribution of adolescent girls by age

Age (years)	Frequency	percentage
15	5	12.2
16	9	22.0
17	27	65.9

The general characteristics of the respondents include the age group of adolescent girls intending to know the frequency distribution of respondents. The characteristics of the respondents showed that the distribution of

respondents was based on age, the highest percentage of adolescent girls was in the 17-year-old group of 27 people (65.9%) while the lowest percentage was in the 15-year-old group, namely 5 (12.2%). Thus, it can be concluded that the most iron-deficient adolescent girls in this study were at the age of 17 years.

Table 2. Knowledge of adolescent girls about anemia and parents' participation in increasing hemoglobin before and after giving blood supplement tablets

Variable	Mean	SD	t-count	t-table	p
Adolescent girls knowledge Before After	3.317	1.293	-16.426	2.021	0.000
Parental participation Before After	3.878	1.308	-18.991	2.021	0.000

The results of the comparative analysis of knowledge of adolescent girls about anemia before and after giving blood-added tablets showed that the average increase in knowledge was 3.317 + 1.293. The results of statistical tests showed that there was a significant effect of giving blood supplement tablets to increase the knowledge of adolescent girls about anemia, where the t-count value was -16,426 and the t-table value was 2.021, with p-value = 0.000 (<0.05). Thus, it can be concluded that giving blood supplement tablets increases the knowledge of adolescent girls about anemia.

The comparative analysis of parental participation before and after giving blood-added tablets, it showed that the average increase in parental participation was 3.878 +1.308. The results of statistical tests showed that there was a significant effect of giving blood supplement tablets to increase the knowledge of adolescent girls about anemia, where the t-count value was -18,991 and the t-table value was 2.021 with p-value = 0.000 (<0.05). Thus it can be concluded that parental participation affects increasing hemoglobin levels of adolescent girls.

Table 3. Increase in haemoglobin levels in adolescent girls before and after supplementing tablets add blood

Measurement	Mean	SD	t-count	t-table	p
Hemoglobin levels before intervention Hemoglobin levels after intervention	1.8195	0.4905	-23.751	2.021	0.000

The comparative analysis of the hemoglobin levels of adolescent girls before and after being given a blood-added tablet supplement, it showed an average increase of 1.8195 + 0.4905. The results of statistical tests showed that there was a significant effect of supplementation with blood-added tablets on the increase in hemoglobin levels of adolescent girls, where the t-count value was -23,751 and t-table 2,021 with p = 0.000 <0.05. Thus, it can be concluded that supplementation of blood-added tablets can increase the hemoglobin level of adolescent girls.

DISCUSSION

Adolescent girls involved in this study amounted to forty-one respondents aged between 15-17 years, of which 17-year-old girls were the most. This was chosen by the researchers because adolescent girls is one of the phases of human growth that has a great risk of developing anemia due to iron deficiency. In India, women of childbearing age are anemic about 19% of the population and micronutrient deficiencies including iron are a major nutritional problem for women of childbearing age. [(12,13)].

The results of the study of knowledge about blood-enhancing tablets and anemia in adolescent girls showed that most of their knowledge was low before being given education by health workers, but increased after attending education in the era of the covid 19 pandemic. Most of the adolescent girls had never received information about blood-added tablets. The increase in knowledge by adolescent girls is also supported by the media provided. Factors that can affect the lack of knowledge of adolescent girls about blood-added tablets and anemia include the lack of information obtained by respondents from health workers, mass media, electronic media, and from the family, as well as the ability of respondents to understand the information provided. Counseling also determines the increase in the knowledgeability of adolescent girls[(14,15)]. In addition to this, the lack of knowledge among adolescent girls is due to the lack of information provided by the local health center in collaboration with the school through the school health program. The program was previously routinely carried out at schools but due to the COVID-19 pandemic, all activities at schools were limited. The absence of an introduction and counseling program on the incidence of anemia and blood-added tablets as nutritional supplementation for adolescents at the school could be a factor in the lack of knowledge about blood-added tablets.

The lack of information-giving activities in collaboration with the school causes the knowledge and awareness of students about blood-added tablets to be minimal so that many students do not consume blood-added tablets during menstruation. [16].

The problem of anemia will have an impact on adolescent girls. The impact of anemia in adolescent girls includes a decreased concentration in learning and decreased physical fitness, decreased physical and cognitive abilities, decreased IQ, mental balance, concentration, verbal communication, and recognition. Another impact if adolescent girls experience pregnancy coupled with anemia will increase premature labor, postpartum hemorrhage, fetal heart abnormalities, postpartum infection, and stunting. [17]. The disobedience of adolescent girls in consuming Fe tablets is caused because adolescent girls experience side effects such as nausea, vomiting, heartburn, and dizziness, especially when there is no supervision from parents or teachers at school. [18,19]. The compliance of adolescent girls in consuming Fe tablets is influenced by environmental factors such as parents, peers, neighbors, and religious leaders who can invite them to consume Fe tablets[20]. Related to this research, parental participation is one of the factors needed to shape the intentions of adolescent girls in consuming blood-added tablets to prevent anemia. With the high support given by the family, a normative belief will be formed and adolescent girls will tend to form a positive perception of the consumption of blood-added tablets so that a strong intention is formed to consume these tablets to avoid the risk of anemia.[21].

The effect of the educational model and the effectiveness of parental participation in giving blood supplement tablets to increase hemoglobin levels in adolescent girls has an effect. An indicator of the success of the program for giving blood tablets in this study is by looking at the increase in hemoglobin levels in adolescent girls who have anemia[22–24]. The importance of giving this iron to someone who is experiencing iron deficiency anemia and there is no absorption disorder, then within 7-10 days, the level of hemoglobin increase can occur as much as 1.4 mg/Kg/BW/day. The factors that influence the increase in hemoglobin levels of adolescent girls are knowledge, parental participation, and consumption of blood-added tablets[22,25].

CONCLUSION

Based on the results, it can be concluded that the supplementation of blood-added tablets provides an increase in the knowledge of adolescent girls about anemia. Parental participation affects increasing the hemoglobin level of adolescent girls and supplementation of blood-added tablets can increase the hemoglobin level of adolescent girls.

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