

Improvement of Knowledge on Iron Deficiency Anemia and Its Prevention among Bustanul Athfal Teachers in Malang

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Abstract: Iron deficiency anemia is still one of the national nutritional problems in Indonesia. This anemia mainly affects women and children. In woman, increased of iron is due to pregnancy, childbirth, and breastfeeding. In infants and children this due to their needs for growth. Iron deficiency anemia is also influenced by socio-economic factors, mal absorption, and infection. In this study, a deficiency anemia prevention training was conducted among Busthanul Athfal Teachers in Malang. This study is aimed to compare the average knowledge about iron deficiency anemia and its prevention before and after training. The research was conducted with training activities, pretest and posttest. Data was analyzed by comparative analytic paired t-test. The questionnaire was filled by 46 respondents. The average value of the pretest knowledge was 47.8, and the test post was 75.2. Result of data analysis on different test was 0,000 ($p < 0.05$). There was an increase in knowledge about iron deficiency anemia and its prevention. There was an increase in knowledge about iron-deficiency anemia and its prevention after training among Busthanul Athfal Malang teachers.

1 INTRODUCTION

The World Health Organization (WHO) reported that in 2011, there were an estimated 800 million children and women who developed anemia. The highest prevalence occurred in children at 42.6% and pregnant women at 38.2%. In Indonesia, the prevalence of anemia occurs in 32% of children aged 6-59 months, 22% in non-pregnant women aged 15-49 years, 30% in pregnant women aged 15-49 years (WHO *et al.*, 2011; World Health Organization, 2015).

In Indonesia, Riset Kesehatan Dasar (Riskesmas) in 2013 reported that the prevalence of anemia at age > 1 year was 27.1%. Based on the age group, it was found that anemia in children under five was quite high at 28.1%, and pregnant women around 37.1% (Kementrian Kesehatan Republik Indonesia, 2019).

Efforts should be made to reduce the prevalence of iron deficiency anemia. The strategic activity is training on Busthanul Athfal teachers in Malang, because every day they interact with toddlers and their parents. After this training, it is expected to be able to transfer knowledge to parents of students, and pay more attention to giving iron-rich nutrition to

their students. The obstacle is that the knowledge about iron deficiency anemia and its prevention is not good. This activity was carried out by increasing their knowledge of iron deficiency anemia and its prevention, and the introduction of a variety of iron-rich foods.

Anemia occurs when hemoglobin (Hb) levels are below 13.0 g / dl in adult men, below 12.0 g / dl in non-pregnant women, and below 11.0 g / dl in pregnant women (World Health Organization, 2015). The erythrocytes morphology in iron deficiency anemia appear microcytic hypo chrome characterized by a decrease in the mean corpuscular hemoglobin (MCH) index and mean corpuscular volume (MCV), there is a decrease in transferrin saturation below 20% and ferritin below 30 mg / ml (Jimenez, Kulnigg-Dabsch and Gasche, 2015). On blood smear, erythrocytes appear hypochromic microcytic, anisocytosis-poicytosis, target cells and pencil cells. Erythroblasts in the bone marrow show crude irregular cytoplasm and the absence of iron reserves, but bone marrow is usually not used for diagnosis (World Health Organization, 2015; DeLoughery, 2017).

Iron deficiency anemia will only occur when the body's iron reserves are very low and not enough to produce erythrocyte cells. The etiology of iron deficiency anemia can occur due to low iron in diet, blood loss (excessive menstrual blood, blood loss after childbirth, diseases that cause chronic blood loss) and low absorption of iron in the intestine (Chron's disease, gastric bypass, worms, or the presence of substances that inhibit iron absorption in food (Harper *et al.*, 2007; Jimenez, Kulnigg-Dabsch and Gasche, 2015).

The initial symptoms of iron deficiency, often in the form of weakness and restless leg syndrome. The anemia will occur if the iron deficiency continues and a negative balance arises between iron input and its use. (Jimenez, 2015). The symptoms of anemia may not be specified in the form of paleness, fatigue, dizziness, sensitivity to light, shortness of breath, anorexia, and headache (DeLoughery, 2017; Wong, 2017). There are also symptoms such as brittle and jagged nails (koilonychia), mouth sores (angular cheilosis), red and swollen tongue (glossitis), abnormal appetite (pica), thinning hair, pharyngeal looking like a nest (Paterson-Kelly syndrome) (Reynolds *et al.*, 1968; Korman, 1990; Borgna-Pignatti and Zanella, 2016)

The management of iron deficiency anemia depends on their etiology (Goddard *et al.*, 2011; Pavord *et al.*, 2012). It is necessary to manage the underlying primary disease, provide iron supplements, a diet of rich iron-containing foods, and avoid consuming food along with other foods that contain other ingredients that inhibit iron absorption (Harper *et al.*, 2007; Jimenez, Kulnigg-Dabsch and Gasche, 2015)

Iron is a mineral that is very important in the synthesis of hemoglobin in erythrocytes. Iron in food from animal sources (heme iron) is two to three times higher absorbed by the intestine than non-heme iron (Verena T, 2017; Kaufman C, 2016). Some of the best sources of iron are lean beef, oysters, chicken, and turkey. Although iron absorption from plant sources is lower, consumption of iron-rich plants can be combined with vitamin C to increase iron absorption. Some plants that are rich in iron are: nuts, tofu, baked potatoes, cashews, dark green vegetables like spinach, fortified cereals, fortified wheat bread (Zimmermann and Hurrell, 2007)

Some foods can inhibit iron absorption, so it is recommended to eat it not at the same time or not close to the time with food sources of iron. These foods include: foods that contain phytate or phytic acid are found in grains, cereals, soybeans, and nuts, foods that are high in calcium, such as in dairy

products and calcium supplements, and foods that contain polyphenols, such as tea and coffee (Hurrell, 2009).

The iron deficiency anemia caused by dietary factors can be prevented by consuming food in a balanced composition and consuming iron-based foods. The combination of vegetable food sources of iron with vitamin C also prevents iron deficiency by increasing its absorption capacity. An example is a combination of spinach with lemon juice, fortified cereals with berries, etc. (Zimmermann and Hurrell, 2007; Hurrell, 2009). Another prevention is to avoid consumption together or in the close time meal between food sources of iron and those that inhibit absorption such as food from dairy products, or coffee (Zimmermann and Hurrell, 2007; Hurrell, 2009).

2 METHODS

The study was conducted at the Busthanul Athfal Aisyiyah Malang Teachers Association, after being given training in knowledge and prevention of iron deficiency, followed by pretest and posttest. Data were analyzed using a comparative pairing t-test.

3 RESULTS AND DISCUSSION

The training was held on February 26, 2019, at TK Aisyiyah Busthanul Athfal X, Jl. Manyar 29 Malang. Sixty-three respondents attended it, but 46 respondents only filled the questionnaire. The pre-test average value was 47.8, and the test post was 75.2. T-test results 0,000 ($p < 0.05$). The pre-test value appears low and increases after training. The results show a significant increase in respondents' knowledge.

From the study, respondents were mostly aware of the causes of iron deficiency anemia. After training, the respondents who answered incorrectly declined from 6.5% to 2.2%. The respondents were not aware of the most frequent age group affected by iron deficiency anemia, but after training those who answered incorrectly appeared to decline from 95.7% to 87%. The respondents were less aware of symptoms of iron-deficiency anemia. After training, there was an increase from 69.6% to 91.3%. Most respondents did not know about foods that contain a lot of iron (91.3%). After training, those who did not know were reduced (21.7%). Respondents who knew the cause of iron deficiency anemia after training 78.3%.

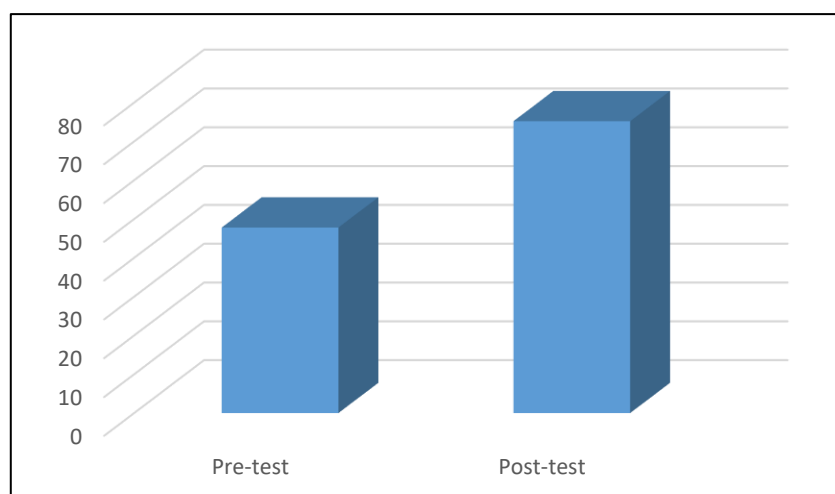


Figure 1: Chart of average pretest and post-test value

Table 1: Pretest and posttest questionnaire answer.

Question	Answer (%)		
	Wrong	Right	
What cause of iron deficiency anemia?	Pretest	6,5	93,5
	Posttest	2,2	97,8
What is the common age group with iron deficiency anemia	Pretest	95,7	4,3
	Posttest	87	13
What is the symptom of iron deficiency anemia?	Pretest	30,4	69,6
	Posttest	8,7	91,3
What food is the most contain a lot of iron?	Pretest	91,3	8,7
	Posttest	21,7	78,3
What food can inhibit iron absorption	Pretest	34,8	65,2
	Posttest	2,2	97,8

Respondents who knew the food that could inhibit iron absorption, only 65.2% increased to 97.8% after training. After the training, it appeared that respondents became more aware of the symptoms of iron deficiency anemia, the types of foods that contain a lot of iron, and foods that inhibit iron absorption. However, respondents were still not aware of the most frequent group affected by anemia, and possibly the respondents were not in a state of full concentration (Goddard *et al.*, 2011; Jimenez, Kulnigg-Dabsch and Gasche, 2015).

4 CONCLUSIONS

The early knowledge of Malang Aisyiyah Busthanul Athfal Teacher about iron deficiency anemia and its prevention is still low. After the training activities, there was an increase in knowledge about iron deficiency anemia and its prevention. It is necessary to feedback to the respondents regarding the results of the questionnaire about the most frequent groups that have this disease, so that they know and are more aware to prevent iron deficiency anemia in their students.

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