



**DOI:**

10.22301/IJHMCR.2528-3189.558

**Article can be accessed online on:**

<http://www.ijhmcr.com>

**INTERNATIONAL JOURNAL  
OF HEALTH MEDICINE AND  
CURRENT RESEARCH**

**ORIGINAL ARTICLE**

**THE EFFECT OF SPINACH CAPSULES (AMARANTHUS TRICOLOR L) TO INCREASE THE LEVEL OF HEMOGLOBIN (HB) IN PREGNANT WOMEN IN MAHIA VILLAGE, CENTRAL TOBELO SUB-DISTRICT, NORTH HALMAHERA REGENCY**

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**ARTICLE INFO**

**Article History:**

Received 20th July, 2017

Received in revised form

07th Agustus, 2017

Accepted 22th Agustus, 2017

Published online 27th September, 2017

**Key words:**

Spinach Red, Hb level.

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**ABSTRACT**

According to WHO about 40% -55% of maternal mortality in developing countries is associated with low hemoglobin (Hb) from pregnant women causing anemia in pregnancy and also mostly caused by iron deficiency and acute angina, even if not rarely integrate each other. The government has been working to improve the nutrition of the community, one of which is the iron nutritional anemia suffered by pregnant women and women in general. The incidence of anemia in pregnant women in Indonesia reached 63.5%, One source of iron from vegetable materials is red spinach (amaranthus tricolor L). Objective of the study to determine the effect of red spinach capsule (Amaranthus tricolor L). To increase Hemoglobin (Hb) levels in pregnant women in Mahia Village, Tobelo Tengah Sub-district, North Halmahera Regency in 2017. Quasi experimental research.

Method with one pretest-posttest study group design. The population in this study were all pregnant women Trimester II (14-28 weeks) as many as 10 people I Mahia village Tobelo Subdistrict, sampling technique using total sampling that is 10 people pregnant mother with second trimester of pregnancy.

Result The mean rate of Hb level before treatment is 11,210 gr%, 1 week after treatment that is 11,850 gr%, Increase Hb concentration of pregnant mother who given red spinach capsule daily 3 times for 1 week consecutively

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**Citation: Martina Maljeti<sup>1</sup>, Arend L. Mapanawang<sup>1,2</sup>, Martha Korompis<sup>1,2</sup>, 2017 "The Effect Of Spinach Capsules (Amaranthus Tricolor L) To Increase The Level Of Hemoglobin (HB) In Pregnant Women In Mahia Village, Central Tobelo Sub-District, North Halmahera Regency", International Journal of Health Medicine and Current Research, 2, (03), 558-562.**

that is average 0,93 gr% . Result of analysis test with Paired Sample T-Test obtained value of meaning (p) equal to 0,000. Mean value of p <0.05.

Conculcion : There is a significant effect of red spinach capsules three times a day for 1 consecutive week in pregnant women Trimester II to increase Hb level.

## INTRODUCTION

Pregnancy was a linked continued process and consisted of ovulation of ovum, migration of spermatozoa and ovum, conception and zygote grew, nidasi, (implantation, placenta forming, and growth and development of conception result until aterm. Introduction and understanding about physiological change became basic modal in recognizing pathological condition that could disturb mom's or baby's health status.<sup>1</sup>

In order to overcome anemia problem, Indonesia government had planned distribution equity of tablet Fe at each visitation ANC (pregnancy) and Fe1 contained of 30 tablets dan Fe2 contained 90 tablets of iron during pregnancy. The scope of pregnant mom got tablet Fe in 2015 was 85.17%, where the highest scope was DKI Jakarta (97,12%) and the lowest was Papua 24,36%, while North Maluku was 69.82%.<sup>6</sup> And it was needed to do regularly visitation of education to the pregnant mom to keep the nutrient and must be always visit the clinic.<sup>7</sup>

One of other strategic step in order to decrease anemia (by increasing Hb degree at pregnant moms) was giving education of nutrients that rich of iron, and had been known by the society that green vegetable which was very rich of iron was red spinach (*Amaranthus tricolor L.*).<sup>8</sup> as well the research of Purnawijayanti 2009, spinach was known with the vegetable source of iron, instead contained Vitamin A, Vitamin C, and Calcium, spinach also contained carotene and flafonoid which were addictive substances with the function of antioxidant.<sup>2</sup>

During this time, red spinach was easy cultivated in this area, but it hadn't been much used as iron source for pregnant mom, society especially pregnant moms only used synthetic drugs to handle and prevent anemia. From the description and data above, the researcher was interested to study "Influence of Giving Red Spinach Squeeze (*Amaranthus tricolor L.*) toward Increasing of Hemoglobin (Hb) degree at pregnant mom at Mahia Village Central Tobelo Sub district North Halmahera Regency in 2017.

## THEORETICAL REVIEW

### PREGNANCY

#### a. Definition

##### 1) According to Prawiroharjo:

Pregnancy was the beginning of conception until the partus of fetus, the period of normal pregnant was adalah 280 days (40 weeks or 9 months 7 days) counted from the first day of the last menstruation<sup>10</sup>

2) According to Kissanti 2008, Pregnancy was meeting of sperm cell and ovum that occurred through sexual activity between male and female. Conception occurred inside the womb when the women were at fertile period..<sup>1</sup>

3) According to Mandriwati 2008, pregnancy was natural and physiologic process of each woman who had healthy reproduction organs, who had got menstruation and did sexual activity with a man with healthy sexual organ. 11

#### b. Clasification of pregnancy according to Prawiroharjo (2010) :<sup>10</sup>

1) Pregnancy of three-month I:: 0 to 12 weeks.

2) Pregnancy of three-month II: 12 to 28 weeks.

3) Pregnancy of three-month III: 28 to 40 weeks.

### Anemia at pregnancy

#### a. Description of anemia at pregnancy

According to Varney 2007 Anemia was a decreasing of number of red blood cell or decreasing of concentration of hemoglobin in the blood circulation, with the condition of Hemoglobin degree < 10,0 gram /dl for pregnant women.<sup>1</sup>

Anemia at pregnancy was condition of mom with Hemoglobin degree less than 11 gr/dl in the three semester I and III or Hb degree < 10,5 gr in three semester II.<sup>13</sup>

#### b. Limitation of anemia at pregnancy

According to Prawirohardjo (2010), average degree of hemoglobin at pregnancy each semester were:<sup>10</sup>

- 1) Three semester I hemoglobin 12,3 gr/dl
- 2) Three semester II hemoglobin 11,3 gr/dl
- 3) Three semester III hemoglobin 10,8 gr/dl

### Red Spinach (*Amaranthus tricolor L.*)

Red spinach came from India (India spinach). Commonly it grew in the field, yard of the house, side of the road, and badlands. It could grow at the height of 1-700 mdpl. Red spinach plant had characteristic of single

leave, the tip was tapered, soft and wide. The stem was soft and white reddish. The fruit wasn't fleshy, but it's seed was much, very small, round and easily break. This plant had tap root and side root. It's side root was strong and somewhat deep. This plant was shrubs or bush. Red spinach (*Amaranthus tricolor* L.) or commonly called spinach pull or spinach sekul, was reddish (red spinach) and also green whitish (white spinach). This spinach was flowered at the armpit leaves.<sup>14</sup>

It could be seen in the following picture:

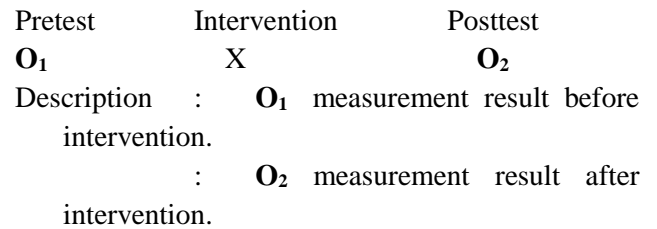


**Figure 1.** Nutrient contain and benefit of red spinach (*Amaranthus tricolor* L.)

According to Rajalaksmi *et al.*, red spinach leave (*Amaranthus tricolor* L.) contained of vitamin A, vitamin B6, Vitamin C, chlorophyll, beta carotene, and riboflavin, as well Al-Dosari 2010 stated in Wuri (2016) that red spinach leaves (*Amaranthus tricolor* L.) also contained alkaloid, glycoside, flavonoid, tannin, antrakuinon, saponin, volatile oil, kumarin, sterol and triterpen. Other research result mentioned that contain inside the red spinach leave (*Amaranthus tricolor* L.) were carbohydrate, flavonoid such as betasianin A and B, amaranthine, isoamaranthin, quercetin and some sterol compounds such as spinasterol, cholesterol campestral, 24-metilen cholesterol, stigma sterol, sit sterol, fukosterol andisofukosterol.<sup>14</sup>

**METHODS**

This research was using Jenis *Quasy Experiment Design* with pretest and posttest designs, where it would be done in front measurement before intervention and measurement after intervention and over and over measurement after intervention (could allow high data validity). Form of this design was:



**RESULTS**

The research was conducted in Desa Mahia Village Central Tobelo Sub District North Halmahera Regency in order to see the influence of giving capsule of res spinach (*Amaranthus tricolor* L). toward the increasing of Hemoglobin (Hb) degree at pregnant moms in Mahia Village Central Tobelo Sub District North Halmahera Regency in 2017.

Total sample in this research were 10 persons who had fulfilled the inclusion criteria. The research result in the form of data had been organized became information in line with the research purpose that was described in the form of table and explanation. The data collected then was organized by using *SPSS for windows* program, which was differentiated into univariat and bivariat analysis.

The complete result of data organization was displayed as follow:

Univariat Analysis

Univariate analysis was done toward characteristics of respondents and research variables by describing those research result.

- a. Respondents' characteristics  
 Respondents' characteristic was special characteristic attached at respondents' themselves. Respondents' characteristics in this research included: age, gender, education, and profession. Description of respondents' distribution based on patients' characteristics at this research was as follow:

**Table 1.** Respondents' Characteristics based on Age.

Age	n	%
20-25	1	10
26-30	3	30
>30	6	60
Total	10	100

**Table 2.** Respondents' Distribution based on Education.

Education	n	%
SD	2	20
SMP	5	50
SMA	2	20
DIII/DIV/S1/ S2	1	10
Total	10	100

Education at this research related with the last education or graduation certificate owned by the respondents. Based on table 5.2, distribution of education level of patients of pregnant moms who were become the respondents at this research, the most was SMP of 5 persons (50.%), while the least respondents was at the level of DIII/DIV/SI/S2 1 person (10,0%).

**Table 3.** Respondents' distribution based on profession.

Profession	n	%
PNS	0	0
Entrepreneur	1	10
Housewife	9	90
Total	10	100

For the respondents' profession, it showed that the most of them was House wife of 9 persons (90.0%), while the least respondent was PNS of 0 person (00.0%).

## DISCUSSION

At this research, it was done intervention at pregnant mom of three semesters II by giving capsule of red spinach leave at 10 pregnant moms in line with the inclusion criteria. This research was aimed to know the influence of giving capsule of red spinach leave toward the increasing of Hemoglobin (Hb) at pregnant moms of three semesters II. After the data was organized and analyzed, so the discussion was as follow:

1. Making of capsule red spinach leave (*Sauropus Androgynus* L.Merr)

Red spinach plant which entered the harvest time was picked directly so it was got fresh leave. The spinach leave was picked/separated from it's stem, (taken the fresh/good one) then it was wet sorted with flow water. After that, the spinach leave was sliced (smalls cutting). Then, it dried under the direct sun at 7 am till 10.00 am. After getting dry, the spinach leave was powdered and weighed to get powder of 11,5 g. That powder was weighed again

for 7,5g, then it was divided into twenty one parts/wraps (each part/wrap was 350 mg), then it was put into the capsule and ready to be given to the patients. That dosage was adapted with the research of Astuti (2015), the dosage giving of spinach leave juice was 0,3-0,5% gr/ml 3 x a day during 7 days orderly, Hb degree at pregnant mom was increasing for 0,93 gr/%.<sup>8</sup>

## CONCLUSION

Based on the research result and discussion explained at the previous chapter, it was concluded as follow:

1. The average of mean of hemoglobin (Hb) degree before the giving of capsule of red spinach leave (*Amaranthus Tricolor* L.) was 7.1gr/%
2. The average of mean of hemoglobin (Hb) degree after the giving of capsule of red spinach leave (*Amaranthus Tricolor* L.) was 9.6 gr/%
3. There was influence of giving capsule of red spinach leave (*Amaranthus Tricolor* L.) toward the increasing of hemoglobin (Hb) degree at pregnant mom with p value = 0,000 < 0,05. With correlation coefficient of 0.084.

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