

## Effect of Acupressure at ST 36 & SP 6 Points on Hemoglobin Levels among Adolescent Girls: Preliminary Study

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### ABSTRACT

Menstruation is one of signs of puberty in adolescent girls. The process of menstruation often affects hemoglobin levels in adolescent girls regarding the incidence of anemia and may also have a negative effect on the growth and development of adolescent girls. In addition to the iron tablet supplementation program, several non-pharmacological methods can be applied as an alternative to increase hemoglobin levels among adolescent girls with anemia, one of which is acupuncture and acupressure methods. This was a pre-experimental study with a one group pretest posttest design. The population involved 25 adolescent girls at Taruna Pembangunan Intensive High School in Surabaya according to the inclusion criteria. In further stage, the samples were trained how to perform acupressure at Zusanli (ST36) point and Sanyinjiao (SP 6) point every 2 days for 10 minutes which was carried out for 2 months from September to November 2021. Data that had been collected were tested for homogeneity and analyzed by Wilcoxon test. Before acupressure, almost half of the respondents had Hb levels of 11-12 mmHg (44%), and 7 respondents had Hb levels of <11 mmHg. After acupressure therapy, more than half of the respondents had Hb levels of 13-14 mmHg (53%). The Wilcoxon signed rank test obtained a p value = 0.000 (<0.05) which meant that there was a difference between Hb levels in pre-test and post-test. Thus, it can be concluded that there was an effect of acupressure at ST36 and SP 6 points on the increase in hemoglobin levels among adolescent girls. However, there is a need for further research on acupressure method which involved more samples and subjects with different levels of anemia, so as to confirm the effectiveness of acupressure on the increase in hemoglobin levels.

*Menstruasi merupakan tanda datangnya masa pubertas pada remaja putri. Proses pengeluaran darah menstruasi sering kali beresiko mempengaruhi kadar hemoglobin pada remaja, yaitu terjadinya anemia dan dapat menimbulkan efek yang negatif bagi tumbuh kembang remaja putri. Selain program pemberian Tablet Tambah Darah (TTD), beberapa metode non farmakologi dapat digunakan sebagai alternatif dalam membantu meningkatkan kadar hemoglobin pada remaja putri dengan anemia, salah satunya adalah dengan metode akupunktur dan akupresur. Penelitian ini menggunakan pra-eksperimental design dengan rancangan one group pretest posttest design. Pengambilan sampel menggunakan purposive sampling yaitu 25 remaja putri di Sekolah Menengah Atas Intensif Taruna Pembangunan Surabaya sesuai dengan kriteria inklusi, yaitu usia 12 – 18 tahun, saat pemeriksaan Hb tidak sedang haid, bersedia melakukan akupresur secara mandiri. Tahap selanjutnya sampel dilatih cara melakukan akupresur pada titik Zusanli (ST36) dan titik Sanyinjiao (SP 6) 2 hari sekali selama 10 menit yang dilakukan selama 2 bulan dari September hingga November 2021. Data yang telah terkumpul diuji homogenitas dan dianalisis dengan wilcoxon. Sebelum mendapatkan akupresur, hampir setengahnya responden mempunyai kadar Hb antara 11-12 mmHg (44%), tujuh remaja putri mempunyai kadar Hb < 11 mmHg. Setelah melakukan terapi akupresur, lebih dari separuh responden kadar Hb remaja putri naik antara 13-14 mmHg (53%). Hasil uji Wilcoxon signed rank test p value = 0.000 (<0.05) di mana artinya ada perbedaan antara Hb pre-test dan Hb post-test, sehingga dapat disimpulkan ada pengaruh akupresur titik ST36 dan SP 6 terhadap peningkatan kadar haemoglobin pada remaja putrid. Namun perlu adanya penelitian pengembangan lanjutan tentang metode akupresur dengan sampel yang lebih luas dan dengan subyek yang memiliki kadar anemia yang berbeda-beda, sehingga dapat dilihat efektifitas peran akupresur dalam peningkatan kadar hemoglobin.*

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## Introduction

Menstruation is one of signs of puberty in adolescent girls. The process of menstruation often affects hemoglobin levels in adolescent girls regarding the incidence of anemia and may also have a negative effect on the growth and development of adolescent girls. Conditions that may arise as a result of anemia include decreased concentration in learning, sub-optimal growth indicated by constant height, and decreased physical ability (Pudiastuti, 2012).

Data derived from Basic Health Research in 2018 showed that 32% of adolescents in Indonesia had anemia, meaning that of 10 adolescent girls, there were 3-4 who suffer from anemia. Such condition can illustrate that approximately 7.5 million adolescents in Indonesia are at risk of experiencing delays in growth, development and cognitive abilities; and are susceptible to infectious diseases. This condition can be aggravated by factors of low nutrition and lack of physical activity.

In addition to the iron tablet supplementation program, several non-pharmacological methods can be applied as an alternative to increase hemoglobin levels among adolescent girls with anemia (Iswati, Ayu, & Rosyida, 2019). Many studies regarding administration of family medicinal plants have been conducted, while interventions through acupressure and acupuncture have not been widely reported. The result of previous study reported that combination between acupuncture and mung bean juice could increase hemoglobin levels among patients (Utami, 2019).

Fulfillment of nutrition in adolescents requires real action, not only from the health sector, but must be supported by various parties. Therefore, it is necessary to develop non-pharmacological methods. This novel innovation was not carried out to replace conventional methods, but as a companion in efforts to fulfill nutrition and treat anemia in adolescent girls. Adolescents who have difficulty in consuming iron tablets can choose the acupressure method as an alternative method. In this study, the researchers are intended to determine the effect of acupressure at Zusanli (ST36) and Sanyinjiao (SP 6) points on the increase in hemoglobin levels among adolescent girls in Surabaya.

## Methods

This was a pre-experimental study with a one group pretest posttest design. The population involved adolescent girls at Taruna Pembangunan Intensive High School in Surabaya according to the inclusion criteria. The inclusion criteria included adolescent girls aged 12-18 years, not in menstrual period at the time of Hb examination, and were willing to perform independent acupressure at home. The study samples were selected by purposive sampling to obtain a sample size of 25 respondents. In further stage, the samples were trained how to perform acupressure at Zusanli (ST36) point and Sanyinjiao (SP 6) point every 2 days for 10 minutes which was carried out for 2 months from September to November 2021. Based on previous study, acupuncture which was a given 12 times (2 days for 10 minutes) in combination with green beans could increase Hb levels (Utami, 2019). Examination of Hb levels was carried out 2 times, namely before treatment and after treatment, using an electric Hb meter (easy touch gchb). Researchers created a WhatsApp group to monitor and observe respondents involved. Data that had been collected were tested for homogeneity and analyzed by Wilcoxon test.

**Results**

**Table 1.** Characteristics of Respondents

Variable	Frequency		P-value
	n=25	(%)	
<b>Age (years)</b>			
a. 15	7	28	0.003
b. 16	10	40	
c. 17	5	20	
d. 18	3	12	
<b>Weight (Kg)</b>			
a. < 50	7	28	0.165
b. 50-60	15	60	
c. > 60	3	12	
<b>Height (cm)</b>			
a. <150	4	16	0.017
b. 150-160	12	48	
c. >160	9	36	
<b>HB level (gram/dL) (pre-test)</b>			
a. <11	7	28	0.005
b. 11-12	11	44	
c. 13-14	7	28	
<b>HB levels (gram/dL) (post-test)</b>			
a. <11	3	12	0.019
b. 11-12	9	36	
c. 13-14	13	52	

Based on the table above, it can be observed that almost all characteristic variables had a p value of <0.05 data were not normally distributed. Most of the respondents aged 16 years (40%), more than half of respondents had a weight of 50-60 kg (60%), and almost half of respondents had a height of 150-160 cm (48%). Before acupressure, almost half of the respondents had Hb levels of 11-12 mmHg (44%), and 7 respondents had Hb levels of <11 mmHg. After acupressure therapy, more than half of the respondents had Hb levels of 13-14 mmHg (53%).

**Table 2.** Analysis Results of the Wilcoxon Signed Ranks Test

	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
<b>Post-test – pre-test</b>	Negative Ranks	0 <sup>a</sup>	.00	.00
	Positive Ranks	22 <sup>b</sup>	11.50	253.00
	Ties	3 <sup>c</sup>		
	Total	25		.000

In Based on the table above, it can be observed that N, the mean rank and sum of ranks had a value of 0. Data showed that there was an increase in the Hb levels from pre-test to post-test. A total of 22 young women experienced an increase in Hb levels after acupressure at ST 36 and SP 6 points, with a mean increase of 11.50 and positive rating of 253.00.

The results of the Wilcoxon signed rank test obtained a p value = 0.000 (<0.05) which indicated difference between Hb levels in pre-test and post-test. Thus, it can be concluded that there was an effect of acupressure at ST36 and SP 6 points on the increase in hemoglobin levels among adolescent girls.

**Discussion**

Anemia in adolescent girls has both short-term and long-term impacts. In short-term, adolescent girls with anemia often experience problems with their health and achievement in school. The long-term

impact includes the risk of experiencing complications during pregnancy and causing stunted growth and development of the fetus which further lead to stunting children in the future. Efforts to reduce the prevalence of anemia in adolescent girls which is still high in Indonesia have been carried out since 2014. At that time, the government launched an iron tablet supplementation program for women of childbearing age and pregnant women (Regulation of the Ministry of Health of the Republic of Indonesia, 2014). This program is strengthened by the Circular Letter of the Ministry of Health of the Republic of Indonesia No.HK.03.03/V/0595/2016 concerning iron tablets supplementation for adolescent girls and women of childbearing age. Such program was carried out in junior and senior high schools simultaneously. In fact, this effort has many obstacles. Basic Health Research in 2018 reported that the coverage of iron tablets received by adolescents was 76.2%, of which 1.4% of adolescents received 52 iron tablets, while 98.2% only received <52 iron tablets. The low awareness of adolescent girls regarding the importance of consuming iron tablets as a preventive measure for anemia is influenced by many factors. A study conducted by Risva et al. (2016) among first-year students at the Faculty of Public Health, Universitas Diponegoro, Semarang reported that attitudes, culture and environmental support had a significant relationship with iron tablet consumption. In line with this, a study conducted by Apriningsih et al. (2019) reported that parents played an important role in the adherence of adolescents in consuming iron tablets. In this preliminary study, 73% of respondents had Hb levels of 12 g/dl. Adolescent girls can be defined to have anemia if Hb < 12 g/dl. In order to overcome the incidence of further anemia, many institutions have implemented a government program by providing iron supplements equivalent to 60 mg of elemental iron (in the form of Ferro Sulfate, Ferro Fumarate or Ferro Gluconate) and Folic Acid 0.400 mg at a dose of 1 tablet/week for 1 year (60 tablets/year). However, in reality, many adolescents feel bored with routinely consuming iron tablets for a long period of time. Therefore, acupressure at ST 36 and SP 6 points can provide a solution in overcoming the anemia problems often faced by adolescents. The results of this study showed changes in hemoglobin levels among adolescent girls after acupressure intervention at ST 36 and SP 6 points. According to Traditional Chinese Medicine (TCM) anemia is a condition of blood deficiency that occurs due to deficiency or dysfunction of organs that play a role in producing blood. This deficiency can occur in Zhang's three organs, namely the liver, spleen and kidneys. ST 36 (Zusanli) point is one of the gastric (stomach) meridian points. Acupressure at this point will improve the stomach, kidneys, strengthen Qi, blood as well as body endurance. Meanwhile, the SP 6 (Sanyinjiao) point is the general point of the spleen meridian as the meeting point of the spleen, liver and kidney meridians. Acupressure at this point will strengthen the spleen and kidney in producing blood (Koosnadi Saputra, 2017). One important thing to consider is that acupressure and other complementary measures will be meaningless if it is not balanced with a healthy diet.

## **Conclusion**

It can be concluded from this study that acupressure at ST36 and SP 6 points was effective to be applied as an alternative method in increasing hemoglobin levels in the community (especially among

adolescent girls or women) who do not like taking iron tablets. However, there is a need for further research on acupressure method which involved more samples and subjects with different levels of anemia, so as to confirm the effectiveness of acupressure on the increase in hemoglobin levels.

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