

## ABSTRAK

**Latar belakang:** Anemia merupakan salah satu masalah kesehatan di dunia dan di Indonesia yang dapat dialami oleh semua kelompok umur. Prevalensi anemia pada usia 15-24 tahun di Indonesia mengalami peningkatan dari 18,4% menjadi 32%. Suplementasi Tablet Tambah Darah sebagai upaya penanggulangan anemia telah dilakukan sejak tahun 1990 di Indonesia, tapi cakupannya masih rendah. Pemberian sari kacang hijau dengan prebiotik dapat meningkatkan penyerapan zat besi, sekaligus melindungi saluran cerna dari bakteri enteropatogen akibat efek samping suplementasi Tablet Tambah Darah.

**Metode Penelitian:** Penelitian eksperimental dengan rancangan *Randomized Controlled Trial* (RCT) *single-blind*, dilakukan di Kabupaten Sleman, D.I Yogyakarta. Melibatkan 61 subjek penelitian dari SMP, SMA dan Co-Ass FK-KMK UGM yang dibagi 2 kelompok secara randomisasi. Kelompok perlakuan diberikan sari kacang hijau (250 ml) dengan prebiotik (10 g) dan tablet besi (1 butir), sedangkan kelompok kontrol diberikan tablet besi (1 butir) dan air gula Jawa (250 ml), diminum setiap hari selama 12 minggu. Output penelitian adalah status besi (kadar hemoglobin, kadar feritin serum, dan jumlah retikulosit) setelah dikontrol variabel asupan gizi. Data dianalisis secara univariat, bivariat, multivariat.

**Hasil:** Pemberian sari kacang hijau dengan prebiotik dan tablet besi sesudah 12 minggu meningkatkan kadar hemoglobin sebesar  $3,28 \pm 1,77$  g/dL (95% CI 2,62 - 3,94 g/dL) secara signifikan ( $p$ -value 0,015), meningkatkan kadar ferritin serum sebesar 36,11  $\mu$ g/L (95% CI 29,42 - 42,81) secara signifikan ( $p$ -value 0,0001), meningkatkan jumlah retikulosit pada minggu ke-2 sebesar 0,59% (95% CI 0,44 - 0,75) secara signifikan ( $p$ -value 0,0001). Jumlah retikulosit menurun pada minggu ke-4: 0,14% (95% CI 0,03 - 0,25) dari jumlah retikulosit awal ( $p$ -value 0,015), dan pada minggu ke-12: 0,11% (95% CI 0,05 - 0,20) dari jumlah retikulosit awal ( $p$ -value 0,026) sejalan dengan penurunan persentase anemia, yaitu 60% pada minggu ke-4 dan 16,67% pada minggu ke-12. Hasil analisis multivariat menunjukkan pemberian sari kacang hijau dengan prebiotik dan tablet besi meningkatkan kadar hemoglobin 1 g/dL lebih besar dibandingkan pemberian tablet besi dan air gula Jawa ( $p$ -value 0,014); meningkatkan kadar feritin serum 4,251  $\mu$ g/L ( $p$ -value 0,316); menurunkan jumlah retikulosit 0,127% ( $p$ -value 0,136). Variabel asupan gizi bukan merupakan variabel perancu ( $p$ -value > 0,05).

**Kesimpulan:** Pemberian sari kacang hijau dengan prebiotik dan tablet besi meningkatkan kadar hemoglobin remaja putri dengan anemia defisiensi besi yang secara klinik dan statistik signifikan, meningkatkan kadar feritin serum yang secara klinik signifikan, namun secara statistik tidak signifikan, dan menurunkan jumlah retikulosit yang secara klinik dan statistik tidak signifikan.

**Kata Kunci:** kacang hijau (*Vigna radiata*); prebiotik; status besi; anemia defisiensi besi; remaja putri

## ABSTRACT

**Background:** Anemia is a health problem affecting various age groups worldwide, including Indonesia. The prevalence of anemia among individuals aged 15-24 years in Indonesia has increased from 18,4% to 32%. Blood tablet supplementation has been implemented to combat anemia in Indonesia since 1990, but its coverage remains low. Providing mung bean drinks with prebiotics can enhance iron absorption and protect the digestive tract from enteropathogenic bacteria, which are potential side effects of blood tablet supplementation.

**Research Methods:** Experimental research with a randomized controlled trial (RCT) single-blind design. The research was conducted in Sleman Regency, Yogyakarta Special Region, involving 61 research subjects from junior high schools, senior high schools, and the Co-Ass FK-KMK UGM. The subjects were randomly assigned to two groups. The treatment group received mung bean drinks (250 ml) with prebiotic (10 g) and an iron tablet (1 item), while the control group received an iron tablet (1 item) and palm sugar water (250 ml), taken daily for 12 weeks. The intervention was administered daily for 12 weeks. The research output measured iron status (hemoglobin level, serum ferritin level, and reticulocyte count) after controlling for nutritional intake variables. The data were analyzed using univariate, bivariate, and multivariate analysis.

**Results:** mung bean drinks with prebiotics and iron tablets for 12 weeks resulted in a significant increase in hemoglobin levels by  $3.28 \pm 1.77$  g/dL (95% CI 2.62 – 3.94 g/dL) (p-value 0.015), increased serum ferritin levels by 36.11 µg/L (95% CI 29.42 – 42.81) (p-value 0.0001), increased reticulocyte counts by 0.59% (95% CI 0.44 - 0.75) in the second week (p-value 0.0001). The reticulocyte counts decreased by 0.14% (95% CI 0.03 - 0.25) from baseline in the fourth week significantly (p-value 0.015), and by 0.11% (95% CI 0.05 - 0.20) in the twelfth week significantly (p-value 0.026), corresponding to a reduction in the percentage of anemia, namely 60% in the fourth week and 16.67% in the twelfth week. Multivariate analysis results showed that mung bean drinks with prebiotics and iron tablets led to a significant increase in hemoglobin levels by 1 g/dL compared to the iron tablets and Palm sugar water (p-value 0.014); it increased serum ferritin levels by 4.251 µg/L (p-value 0.316); and it reduced reticulocyte count by 0.127% (p-value 0.136). The nutritional intake variable was not a confounding variable (p-value > 0.05).

**Conclusion:** Mung bean drinks with prebiotics and iron tablets significantly increased hemoglobin levels in adolescent girls with iron deficiency anemia, both clinically and statistically, it also led to an increase in serum ferritin levels, which was clinically significant but not statistically significant, and there was a decrease in reticulocyte count, which was both clinically and statistically insignificant.

**Keywords :** mung beans ( *Vigna radiata* ) ; prebiotics; iron status; iron deficiency anemia; adolescent girl