

PENGARUH RENANG BERBAGAI INTENSITAS TERHADAP KADAR HDL-LDL PADA TIKUS (*Rattus norvegicus*) MODEL OBESITAS

ABSTRAK

Latar Belakang – Induksi *High Fat Diet* (HFD) pada tikus dapat menyebabkan obesitas yang akhirnya dapat menurunkan kadar HDL dan meningkatkan kadar LDL. Salah satu upaya meningkatkan kadar HDL dan menurunkan kadar LDL penderita obesitas adalah dengan melakukan aktivitas fisik berupa renang. Renang berbagai intensitas berpotensi meningkatkan kadar HDL dan menurunkan kadar LDL.

Tujuan – Mengetahui pengaruh latihan renang dengan intensitas yang bervariasi (ringan, sedang, dan berat) terhadap kadar HDL-LDL pada tikus (*Rattus norvegicus*) model obesitas.

Desain Penelitian – Penelitian ini menggunakan *true experimental* dengan pendekatan *posttest-only control group design*. Jumlah sampel 25 ekor tikus putih jantan galur Wistar yang dibagi menjadi lima kelompok, yaitu kelompok 1 yang berisi tikus sehat serta kelompok 2, 3, 4, dan 5 berisi tikus yang diinduksi *High Fat Diet* (HFD) sehingga obesitas. Kelompok 1 dan 2 tidak diberi perlakuan renang, sedangkan kelompok 3, 4, dan 5 diberi perlakuan renang intensitas ringan, sedang, dan berat. Sampel darah diambil 3 hari setelah perlakuan renang terakhir dan diperiksa menggunakan metode kolometri enzimatis. Data dianalisis menggunakan uji *One-way ANOVA*.

Hasil – Hasil penelitian menunjukkan renang berbagai intensitas dapat menurunkan kadar LDL dan meningkatkan kadar HDL secara signifikan antar kelompok perlakuan dengan nilai $p = 0,00$ ($p < 0,05$). Kadar LDL ($36,00 \pm 3,91$) dan HDL ($52,00 \pm 4,69$) paling baik setelah perlakuan adalah pada kelompok renang intensitas sedang.

Kesimpulan – Renang berbagai intensitas dapat meningkatkan kadar HDL dan menurunkan kadar LDL pada tikus (*Rattus norvegicus*) model obesitas dengan intensitas paling baik untuk menurunkan kadar LDL dan meningkatkan kadar HDL adalah intensitas sedang.

Kata Kunci: HDL (*High Density Lipoprotein*), LDL (*Low Density Lipoprotein*), Obesitas, Renang Intensitas Ringan, Renang Intensitas Sedang, Renang Intensitas Berat

**“EFFECT OF SWIMMING VARIOUS INTENSITIES ON HDL-LDL
LEVELS IN RATS (*Rattus norvegicus*) OBESITY MODEL”**

ABSTRACT

Background – High Fat Diet (HFD) induction in rats can cause obesity which can ultimately reduce HDL levels and increase LDL levels. One way to increase HDL levels and reduce LDL levels in obese sufferers is by doing physical activity, one of which is swimming. Swimming of various intensities has the potential to increase HDL levels and reduce LDL levels.

Objective – To determine the effect of swimming training with varying intensities (light, moderate and strenuous) on HDL-LDL levels in rats (*Rattus norvegicus*) models of obesity.

Research Design – This research is true experimental with a posttest-only control group design. The total samples were 25 male white Wistar rats divided into five groups. Group 1 contained healthy rats, while groups 2, 3, 4, and 5 contained rats induced by a high-fat diet (HFD) resulting in obesity. Groups 1 and 2 were not given swimming treatment, while groups 3, 4, and 5 were given light, moderate, and strenuous intensity swimming treatment. Blood samples were taken 3 days after the last swimming treatment and examined using the enzymatic colometry method. Data were analyzed using the One-way ANOVA test.

Results - The results of the study showed that swimming of various intensities could reduce LDL levels and increase HDL levels significantly between treatment groups with a value of $p = 0.00$ ($p < 0.05$). The best LDL (36.00 ± 3.91) and HDL (52.00 ± 4.69) levels after treatment were in the moderate-intensity swimming group.

Conclusion – Swimming of various intensities can increase HDL levels and reduce LDL levels in rats (*Rattus norvegicus*) obesity models with the best intensity for reducing LDL levels and increasing HDL levels being moderate intensity.

Keywords: HDL (High-Density Lipoprotein), LDL (Low-Density Lipoprotein), Light Intensity Swimming, Moderate Intensity Swimming, Obesity, Strenuous Intensity Swimming