

“PERAN LATIHAN FISIK TERHADAP KADAR *HIGH DENSITY LIPOPROTEIN* (HDL) DAN TRIGLISERIDA PADA INDIVIDU *OVERWEIGHT* DAN OBESITAS YANG MENJALANI *LOW CALORIE DIET* (LCD) “

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INTISARI

Latar belakang: Kelebihan berat badan dan obesitas telah menjadi masalah kesehatan global. Prevalensi obesitas di Indonesia pada tahun 2010 sekitar 2,5% dan meningkat menjadi 3,5% pada tahun 2014. Obesitas banyak dihubungkan dengan berbagai masalah kesehatan seperti Diabetes mellitus tipe 2, tekanan darah tinggi dan penyakit kardiovaskular. Studi membuktikan bahwa orang obes lebih banyak mengalami abnormalitas lipid dan lipoprotein diantaranya kadar kolesterol HDL rendah dan peningkatan trigliserida akibat penurunan aktivitas enzim lipoprotein lipase dan penurunan kadar adiponektin. *Lifestyle intervention* yang meliputi terapi diet dan peningkatan aktivitas fisik secara signifikan dapat menurunkan berat badan dan memperbaiki faktor risiko komplikasi obesitas. Terapi diet berupa *low calorie diet* dapat memperbaiki abnormalitas lipid serta aktivitas fisik yang teratur dapat meningkatkan kadar kolesterol *high density lipoprotein* (HDL) dan menurunkan kadar trigliserida. Latihan fisik dapat meningkatkan sensitivitas dan aktivitas dari enzim lipoprotein lipase yang berfungsi dalam pemecahan lipoprotein kaya trigliserida, serta mampu meningkatkan apolipoprotein A-I yang berperan dalam metabolisme kolesterol HDL.

Tujuan : tujuan dari penelitian ini adalah untuk mengetahui pengaruh pemberian latihan fisik aerobik dan beban selama 8 minggu terhadap kadar kolesterol *high density lipoprotein* (HDL) dan trigliserida individu *overweight* dan obesitas yang diberikan *low calorie diet* (LCD)

Metode : jenis penelitian ini adalah penelitian eksperimental murni dengan rancangan *pre test* dan *post test with control group*. Subjek dibagi menjadi dua kelompok yaitu kelompok intervensi latihan fisik dan terapi diet serta kelompok kontrol terapi diet. Latihan fisik yang diberikan adalah latihan aerobik dan latihan beban dengan frekuensi 3x/minggu selama 60 menit. Terapi diet dengan pemberian konseling *low calorie diet* 1200 kkal. Untuk mengontrol kepatuhan subyek, dilakukan pengukuran antropometri, persen lemak tubuh dan recall 24 jam kepada subyek setiap 2 minggu sekali. Pengambilan darah puasa dari vena cubiti pada sebelum dan sesudah pemberian perlakuan. Kadar kolesterol HDL dan trigliserida ditentukan dengan metode dyasis. Asupan makan diukur menggunakan formulir recall 24 jam pada sebelum dan sesudah perlakuan. Rata-rata pengeluaran energi aktivitas fisik diukur menggunakan kuesioner IPAQ pada saat sebelum dan sesudah perlakuan. Rata-rata pengeluaran energi pada saat latihan diperkirakan dari banyaknya langkah subyek pada saat latihan.

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Hasil : hasil penelitian menunjukkan terdapat peningkatan kadar high density lipoprotein (HDL) pada kelompok intervensi ($p=0,286$, mean diff= 3,29) dan kelompok kontrol ($p= 0,461$, mean diff= 2,5) meskipun secara statistik tidak signifikan, tidak terdapat perbedaan peningkatan kadar HDL antara kelompok intervensi dengan kelompok kontrol. Terjadi penurunan kadar trigliserida secara signifikan pada kelompok kontrol ($p<0,05$) dan peningkatan kadar trigliserida secara signifikan pada kelompok intervensi ($p<0,05$), terdapat perbedaan yang signifikan antara perubahan kadar trigliserida pada kelompok intervensi dan kelompok kontrol.

Kesimpulan: Latihan fisik selama 8 minggu kepada individu *overweight* dan obesitas yang menjalani *low calorie diet* tidak memberikan perbedaan pada kadar kolesterol *high density lipoprotein* (HDL) dibanding dengan individu yang hanya mendapat *low calorie diet*. Namun, pemberian latihan fisik selama 8 minggu kepada individu *overweight* dan obesitas memberikan perbedaan yang signifikan pada kadar trigliserida dibanding dengan individu yang hanya mendapat *low calorie diet*

Kata kunci: obesitas, latihan fisik, *low calorie diet*, *high density lipoprotein*, trigliserida

THE ROLE OF PHYSICAL EXERCISE ON HIGH DENSITY LIPOPROTEIN (HDL) AND TRIGLYCERIDE LEVEL ON OVERWEIGHT AND OBESE PEOPLE WHO UNDERGO LOW CALORIE DIET (LCD)

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Abstract

Background: Overweight and obesity has become a global health problem. The prevalence of obesity in Indonesia in 2010 approximately 2.5% and increased to 3.5% in 2014. Obesity is associated with many health problems such as type 2 diabetes mellitus, hypertension and cardiovascular disease. Studies show that obese people experienced lipid and lipoprotein abnormalities include low HDL cholesterol and elevated triglycerides more than non-obese people due to decreased activity of the enzyme lipoprotein lipase and decreased levels of adiponectin. Lifestyle intervention that includes diet therapy and increased physical activity can significantly reduce body weight and improve risk factors for obesity complications. Diet therapy in the form of a low calorie diet can improve lipid abnormalities and regular physical activity can increase levels of high density lipoprotein cholesterol (HDL) as well as lowering triglyceride levels. Physical exercise can improve the sensitivity and activity of lipoprotein lipase enzyme that functions in the breakdown of triglyceride-rich lipoproteins, and able to increase apolipoprotein A-I, which plays a role in the metabolism of HDL cholesterol

Objective: the purpose of this study was to determine the effect of aerobic exercise and weight training for 8 weeks on cholesterol levels of high density lipoprotein (HDL) and triglycerides on overweight and obese subjects that were given a low calorie diet (LCD)

Methods: The type of this research is a pure experimental design using pre-test and post-test with control group. The subjects were divided into two groups: the intervention group that were given physical exercise and diet therapy, and the control group that were given diet therapy only. The physical exercise given is aerobic exercise and weight training with a frequency of 3 times/ week for 60 minutes. Diet therapy was given by low calorie diet (1200 kcal) counseling. To control the compliance of the subjects, we used anthropometry measurement, percentage of body fat and 24-hour recall to each subject every two weeks. Fasting blood sample was taken from the cubital vein before and after the treatment. HDL cholesterol and triglycerides were determined by dyasis methods. Food intake was measured using 24-hour recall form before and after the treatment. The average energy expenditure of physical activity was measured using an IPAQ questionnaire before and after the treatment. The average energy expenditure during exercise was measure by pedometer.

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Results: The results showed that there is an increase in levels of high density lipoprotein (HDL) in the intervention group ($p = 0.286$, mean diff = 3.29) and the control group ($p = 0.461$, mean diff = 2.5), although both were not statistically significant. There is no difference in HDL levels between the intervention group and the control group. There was a significant decrease in triglyceride levels in the control group ($p < 0.05$) and significant increase in triglyceride levels in the intervention group ($p < 0.05$), there are significant differences between the change in triglyceride levels intervention group and the control group.

Conclusion: The administration of 8 weeks physical exercise in overweight and obese individuals who undergo low calorie diet does not results in any difference in cholesterol level of high density lipoprotein (HDL) compared with individuals who only undergo low calorie diet. However, the administration of 8 weeks physical exercise in overweight and obese individuals results in significant difference in triglyceride levels compared with individuals who only undergo low calorie diet.

Keyword: Obesity, physical exercise, low calorie diet, high density lipoprotein, triglyceride