

# Pengaruh program penurunan berat badan pada penyandang obesitas dengan weight cycling terhadap perubahan komposisi tubuh petanda sindrom metabolik petanda inflamasi dan stres oksidatif = Effect of weight loss program on body composition markers of metabolic syndrome inflammation and oxidative stress in obese subjects with weight cycling

Samuel Oetoro, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20390503&lokasi=lokal>

---

## Abstrak

Latar belakang. Obesitas merupakan masalah kesehatan masyarakat dunia dengan prevalensi yang semakin meningkat. Obesitas meningkatkan risiko sindrom metabolik dan penyakit kardiovaskular, yang diyakini akibat inflamasi dan stres oksidatif. Penurunan berat badan (BB) dengan cara diet dan olahraga merupakan strategi dasar dalam manajemen obesitas. Penyandang obesitas seringkali mengalami peningkatan dan penurunan BB yang dikenal sebagai weight cycling (WC). Penelitian menunjukkan risiko sindrom metabolik dan penyakit kardiovaskular meningkat pada WC dibandingkan dengan penyandang obesitas pemula [first encounter obesity (FEO)]. Penelitian ini bertujuan untuk menilai pengaruh program penurunan BB terhadap komposisi tubuh, petanda sindrom metabolik, petanda inflamasi dan stres oksidatif pada penyandang obesitas WC dibandingkan dengan FEO.

Metode. Penelitian ini merupakan uji klinis terbuka selama delapan minggu yang dilakukan di Balai Kota DKI Jakarta. Subyek penelitian diambil secara konsekutif dan diklasifikasikan menjadi kelompok WC dan FEO. Kedua kelompok diberikan program penurunan BB yang terdiri dari pengurangan asupan energi sebesar 1000 kkal/hari dan olah raga intensitas ringan - sedang tiga kali seminggu selama 45 menit.

Pengukuran antropometri dan komposisi tubuh (BB, indeks massa tubuh/IMT, massa lemak/ML, massa bebas lemak/MBL, massa otot/MO, rating lemak visceral, intracellular water /ICW yang merupakan indikator anabolisme protein ), petanda sindrom metabolik (kadar trigliserida/TG dan LP), petanda inflamasi (high sensitivity C-reactive protein/hs-CRP, interleukin/IL-6), dan stres oksidatif (F2-isoprostan) dilakukan pada awal penelitian, minggu ke-4 dan pada akhir penelitian (minggu ke-8).

Hasil. Dari total 73 subyek (34 subyek kelompok WC dan 39 subyek kelompok FEO) didapatkan karakteristik yang setara dalam hal usia, riwayat obesitas pada keluarga, asupan makanan, proporsi komposisi makronutrien, dan aktivitas fisik, namun tidak terdapat kesetaraan dalam hal distribusi subyek laki-laki dan perempuan, riwayat lamanya obes. Kelompok WC memiliki ML yang lebih tinggi, MBL, MO dan ICW yang lebih rendah, serta petanda inflamasi yang lebih buruk dibanding kelompok FEO, sebaliknya kelompok FEO memiliki kadar TG, F2-isoprostan lebih tinggi daripada WC. Setelah intervensi diet dan olah raga selama 8 minggu, penurunan BB, IMT, ML, MBL, MO, rating lemak visceral dan kadar ICW pada kelompok WC cenderung lebih rendah daripada kelompok FEO ( $p > 0,05$ ). Penurunan LP pada kelompok WC cenderung lebih rendah daripada kelompok FEO ( $p = 0,23$ ). Kadar TG pada kelompok WC meningkat, sedangkan pada kelompok FEO terjadi penurunan kadar TG, namun perbedaannya tidak bermakna ( $p = 0,055$ ). Penurunan kadar hs-CRP dan IL-6 pada kelompok WC cenderung lebih besar daripada FEO ( $p > 0,05$ ). Penurunan kadar F2-isoprostan lebih tinggi pada kelompok FEO daripada kelompok WC ( $p = 0,017$ ).

Kesimpulan: Penyandang obesitas WC memiliki ML yang lebih tinggi dari FEO, disamping itu memiliki anabolisme protein yang lebih rendah, oleh karena itu program diet dan olahraga pada WC harus mempertimbangkan modalitas yang mampu meningkatkan anabolisme protein. Penyandang WC memiliki petanda inflamasi yang lebih buruk dibanding FEO, sedangkan setelah menjalani program diet dan olahraga selama 8 minggu pada penelitian ini tidak didapatkan perbedaan perubahan BB, komposisi tubuh, petanda sindrom metabolik, dan petanda inflamasi, kecuali perubahan petanda stres oksidatif yang lebih baik pada penyandang FEO.

.....

**Background.** The worldwide prevalence of obesity is increasing rapidly and has become a serious health burden globally. Obesity increases risks of metabolic syndrome and cardiovascular diseases which may partly be caused by inflammation and oxidative stress. Effective weight loss programs include diet and exercise, and these interventions are considered as a first-line strategy of obesity management. Obese individuals often experience repeated cycles of weight loss followed by weight regain, which is recognized as weight cycling (WC). Several studies demonstrated that weight cyclers have a higher risk of metabolic syndrome and cardiovascular diseases than individuals with first encounter obesity (FEO). This study aimed to assess the effect of weight loss programs using diet and exercise on body composition, selected markers of metabolic syndrome, inflammation, and oxidative stress in obese subjects with WC and FEO.

**Methods.** This study was an 8-week open clinical trial held at Balai Kota DKI Jakarta. Subjects were recruited consecutively and classified into WC and FEO groups. All subjects were assigned to receive weight loss programs with the following goals: 1,000 Kcal reduction of total energy intake/day and 45-minute mild-to-moderate intensity exercise, three times a week. Anthropometric and body composition (body weight/BW, body mass index/BMI, fat mass, fat free mass, muscle mass, visceral fat rating, intracellular water/ICW as an indicator of protein anabolism), markers of metabolic syndrome (triglyceride/TG levels and waist circumference), inflammation (high sensitivity C-reactive protein/hs-CRP, interleukin/IL-6), and oxidative stress (F<sub>2</sub>-isoprostane) were measured at baseline, week 4, and the end of study (week 8).

**Results.** A total of 73 subjects consisting of 34 subjects with WC (WC group) and 39 subjects with FEO (FEO group). Both groups had similar characteristics in age, family history of obesity, dietary intakes, macronutrient composition, and physical activities; meanwhile, gender and duration of obesity were significantly different between groups. WC group had more body fat, less fat free mass, muscle mass and ICW, higher markers of inflammation than FEO group. On the other hand, TG and F<sub>2</sub>-isoprostane levels in FEO group were higher than WC group. Following 8-week intervention with diet and exercise, the reduction in BW, BMI, fat free mass, muscle mass, visceral fat rating, and ICW in WC group was comparable with FEO group ( $p > 0.05$ ). The reduction of waist circumference in WC group tended to be lower than FEO group ( $p = 0.23$ ). Triglyceride levels in WC group increased, but it declined in FEO group. However, these differences were not statistically significant ( $p = 0.055$ ). The decline in hs-CRP and IL-6 levels in WC group tended to be higher than FEO group ( $p > 0.05$ ). Meanwhile, the decrease in F<sub>2</sub>-isoprostane levels in FEO group was significantly higher than WC group ( $p = 0.017$ ).

**Conclusion.** Obese subjects with WC had more body fat but lower protein anabolic capacity than those with FEO. These results suggest that diet and exercise programs for weight cyclers should consider effective ways to enhance protein anabolism. In addition, obese subjects with WC had higher inflammatory processes than those with FEO. Using the current model of 8-week intervention with diet and exercise, this study was not able to demonstrate differences between WC and FEO groups in the magnitude of changes in body

composition and inflammation indicators, except oxidative stress indicator.