

Hubungan Asupan Protein Total Dan Aktivitas Fisik Dengan Lingkar Betis Pada Pasien Diabetes Melitus Tipe 2 Di Kota Semarang

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ABSTRAK

Latar Belakang: Diabetes melitus tipe 2 merupakan penyakit metabolik yang disebabkan oleh resistensi insulin. Penyakit ini menyebabkan komplikasi, salah satu nya yaitu penurunan massa otot. Salah satu cara sederhana untuk mengindikasi penurunan massa otot dengan mengukur lingkar betis. Diketahui asupan protein yang cukup dan aktivitas fisik memiliki peran dalam menjaga massa otot. Kedua hal tersebut dapat mengatur resistensi insulin.

Tujuan: Mengetahui hubungan antara asupan protein total dan aktivitas fisik dengan lingkar betis pada pasien diabetes melitus tipe 2 di Kota Semarang.

Metode: Penelitian ini menggunakan desain observasional dengan pendekatan *cross-sectional* yang dilaksanakan pada bulan Desember 2024 hingga Februari 2025. Subjek berjumlah 67 orang yang dipilih secara *purposive sampling* di Puskesmas Kedungmundu. Data asupan protein diperoleh melalui kuesioner *Semi Quantitative Food Frequency Questionnaire (SQ-FFQ)*, aktivitas fisik diukur menggunakan kuesioner *Global Physical Activity Questionnaire (GPAQ)*, dan lingkar betis dilakukan pengukuran secara langsung. Analisis data dilakukan menggunakan uji korelasi *Spearman* dan regresi linear berganda.

Hasil: Ditemukan bahwa terdapat hubungan bermakna antara kecukupan asupan protein total dengan lingkar betis ($r=0,246; p=0,045$). Sementara itu, aktivitas fisik tidak menunjukkan hubungan bermakna dengan lingkar betis ($p=0,102$). Hasil analisis multivariat menunjukkan bahwa kecukupan protein dan usia memiliki pengaruh signifikan terhadap lingkar betis ($p<0,05$), dengan kontribusi sebesar 9,4%.

Simpulan: Kecukupan protein berhubungan positif secara signifikan dengan ligkar betis pada pasien diabetes melitus tipe 2. Aktivitas fisik tidak menunjukkan hubungan bermakna, yang dapat disebabkan oleh intensitas dan durasi aktivitas yang rendah.

Kata Kunci: Diabetes melitus tipe 2, lingkar betis, asupan protein, massa otot

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The Relationship Between Total Protein Intake and Physical Activity with Calf Circumference in Patients with Type 2 Diabetes Mellitus in Semarang City

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ABSTRAK

Backgorund: Type 2 diabetes mellitus is a metabolic disorder marked by insulin resistance and continues to increase in prevalence worldwide. Beyond affecting blood sugar regulation, this condition may lead to serious complications, including the gradual loss of muscle mass. One simple and practical way to assess muscle mass is by measuring calf circumference. Maintaining muscle mass is crucial for physical function and quality of life, especially among individuals with diabetes. Adequate protein intake and regular physical activity play key roles not only in preserving muscle mass but also in improving insulin sensitivity.

Objective: To examine the relationship between total protein intake and physical activity with calf circumference among type 2 diabetes mellitus patients in Semarang City.

Methods: This study employed an observational design with a *cross-sectional* approach, conducted from December 2024 to February 2025. A total of 67 participants were selected using *purposive sampling* at Kedungmundu Public Health Center. Protein intake data were collected using the *Semi Quantitative Food Frequency Questionnaire SQ-FFQ* questionnaire, physical activity was assessed using the *Global Physical Activity Questionnaire (GPAQ)*, and calf circumference was measured directly. Data were analyzed using *Spearman* correlation and multiple linear regression tests.

Results: A significant correlation was found between adequate total protein intake and calf circumference ($r=0,246$; $p=0,045$). However, physical activity did not show a significant association with calf circumference ($p=0,102$). Multivariate analysis revealed that protein adequacy and age significantly influenced calf circumference ($p<0,05$), with a contribution of 9,4%

Conclusion: Adequate protein intake is significantly and positively associated with calf circumference in patients with type 2 diabetes mellitus. Physical activity showed no significant relationship, which may be due to low intensity and short duration of the activity.

Keywords: Type 2 diabetes mellitus, calf circumference, protein intake, muscle mass

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