

## ABSTRAK

### PENGARUH SUPLEMENTASI WHEY PROTEIN TERHADAP PERUBAHAN NILAI PHASE ANGLE, MASSA OTOT APENDIKULAR, DAN KEKUATAN GENGGRAMAN TANGAN PADA PASIEN KANKER KEPALA LEHER YANG MENJALANI RADIOTERAPI

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**Latar belakang:** Pasien kanker kepala leher yang menjalani radioterapi berisiko mengalami malnutrisi, penurunan massa otot, dan gangguan fungsi otot. Suplementasi protein *whey* berpotensi memperbaiki kondisi tersebut, namun bukti klinis masih terbatas. Penelitian ini bertujuan menganalisis perubahan phase angle (PhA), massa otot apendikular (ASM), dan kekuatan genggram tangan (HGS) pada pasien kanker kepala leher yang menjalani radioterapi antara kelompok suplementasi protein *whey* dan kontrol..

**Metode penelitian:** Penelitian eksperimental dengan desain *pretest–posttest control group* melibatkan 60 pasien. Kelompok intervensi menerima protein *whey* 20 g/hari selama 14 hari. PhA dan ASM diukur dengan BIA, serta HGS dengan handgrip dynamometer. Analisis menggunakan uji parametrik dan nonparametrik.

**Hasil penelitian:** Nilai PhA menurun bermakna pada kontrol ( $5,3 \pm 0,87$  menjadi  $4,9 \pm 0,94$ ;  $p=0,001$ ) dan intervensi ( $5,5 \pm 0,87$  menjadi  $5,2 \pm 0,97$ ;  $p=0,001$ ), tanpa perbedaan antar kelompok ( $p=0,414$ ). Nilai ASM juga menurun bermakna pada kontrol ( $11,1 \pm 2,49$  menjadi  $9,9 \pm 2,33$ ;  $p<0,001$ ) dan intervensi ( $11,4 \pm 2,66$  menjadi  $10,4 \pm 2,25$ ;  $p<0,001$ ), tanpa perbedaan bermakna ( $p=0,600$ ). Terdapat proporsi HGS penurunan lebih tinggi pada kontrol (23,3%) dibandingkan intervensi (13,3%) namun perubahan tersebut tidak bermakna pada ( $p>0,05$ )

**Simpulan:** Suplementasi protein *whey* jangka pendek belum menunjukkan efek bermakna terhadap PhA, ASM, dan HGS, namun berpotensi memberikan efek protektif terhadap penurunan massa dan fungsi otot.

**Kata kunci:** protein *whey*, *phase angle*, massa otot, *handgrip strength*, kanker kepala leher

# EFFECTS OF WHEY PROTEIN SUPPLEMENTATION ON CHANGES IN PHASE ANGLE, APPENDICULAR MUSCLE MASS, AND HANDGRIP STRENGTH IN HEAD AND NECK CANCER PATIENTS UNDERGOING RADIOTHERAPY

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**Background:** Patients with head and neck cancer undergoing radiotherapy are at high risk of malnutrition, muscle mass loss, and impaired muscle function. Whey protein supplementation may improve these conditions; however, clinical evidence remains limited. This study aimed to analyze changes in phase angle (PhA), appendicular muscle mass (ASM), and handgrip strength (HGS) in head and neck cancer patients undergoing radiotherapy between the whey protein supplementation group and the control group.

**Methods:** This experimental study with a pretest–posttest control group design involved 60 patients. Intervention group received whey protein supplementation of 20 g/day for 14 days. PhA and ASM were measured using bioelectrical impedance analysis (BIA), and HGS was assessed using a handgrip dynamometer. Data were analyzed using parametric and non-parametric tests.

**Results:** PhA decreased significantly in both the control group (5.3±0.87 to 4.9±0.94; p=0.001) and the intervention group (5.5±0.87 to 5.2±0.97; p=0.001), with no significant between-group difference (p=0.414). ASM also declined significantly in the control group (11.1±2.49 to 9.9±2.33; p<0.001) and the intervention group (11.4±2.66 to 10.4±2.25; p<0.001), without a significant difference between groups (p=0.600). A higher proportion of HGS decline was observed in the control group (23.3%) compared to the intervention group (13.3%); however, this difference was not statistically significant (p>0.05).

**Conclusion:** Short-term whey protein supplementation did not show a significant effect on PhA, ASM, and HGS; however, it may provide a protective effect against muscle mass and functional decline.

**Keywords:** whey protein, phase angle, muscle mass, handgrip strength, head and neck cancer