

Body Composition and COPD – part of the CARE4COPD study

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Nutritional status and body composition are important determinants of health outcomes in patients with COPD. BMI alone does not reflect nutritional status. Fat-free mass index (FFMI) provides information on muscle depletion and may better reflect metabolic health. We aimed to investigate how BMI and FFMI are related to lung function and symptom burden in COPD.

Methods:

Baseline data were collected from 128 patients aged ≥ 40 years, referred to the COPD Center at Sahlgrenska after moderate exacerbations or exacerbation-related hospitalization (recruited 2022–2024). BMI was categorized into underweight (< 21), normal weight (21–24.9), overweight (25–29.9) and obesity (≥ 30 kg/m²). Body composition was measured by bioelectrical impedance. Low FFMI was defined as ≤ 16 kg/m² for men and ≤ 15 kg/m² for women.

Results:

BMI data were available for 126 patients. Most were women (67%), with a mean age of 75 ± 8 years. Mean BMI was 26.2 ± 6 kg/m². Underweight patients had lower FEV₁ (MD -0.3 L) than other BMI groups but this was not significant. Underweight was significantly associated with lower FEV₁% (MD -8.6% , 95% CI -16% to -1.2%) and lower DLCO% (MD -15% , 95% CI -20% to -9%). Similar reductions in FEV₁, FEV₁%, and DLCO% were observed in the low FFMI group.

Higher BMI showed a non-significant trend toward higher COPD Assessment Test scores (CAT) (MD 2 points). Patients with higher dyspnea scores (mMRC) had higher mean BMI, 27 ± 6 kg/m², compared with 24 ± 6 kg/m² in the less symptomatic group (95% CI 0.4–5.5; $P = 0.02$).

Conclusion:

Underweight was associated with worse lung function, lower DLCO%, and often with low FFMI, suggesting advanced impairment. Elevated BMI was associated with greater symptom burden despite better lung function. Low FFMI was prevalent among normal and elevated BMI groups, supporting body composition assessment alongside BMI to identify patients at risk.

Figure 1. Muscle mass index status across BMI categories

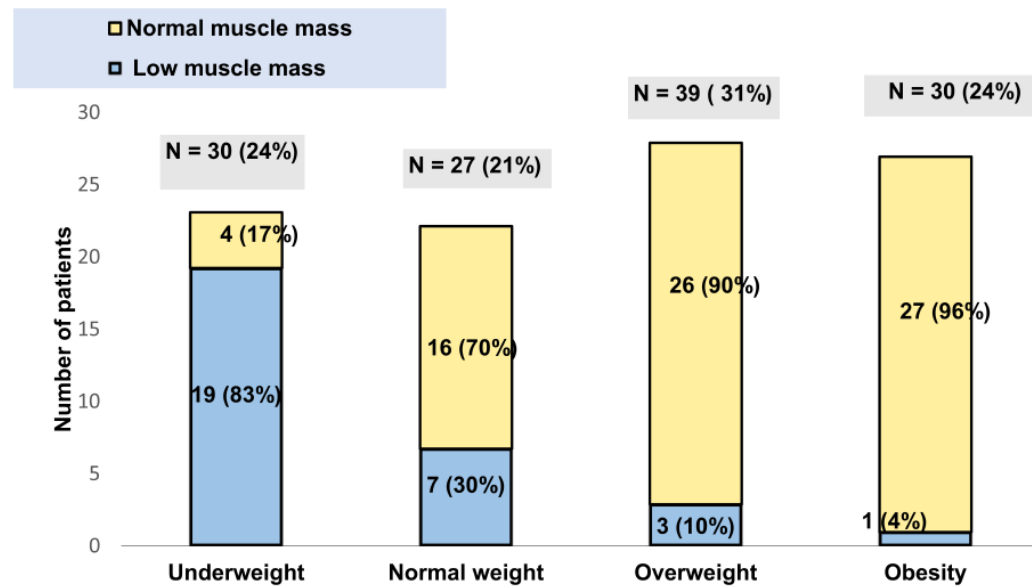


Figure 2. FEV₁ (L) across BMI categories

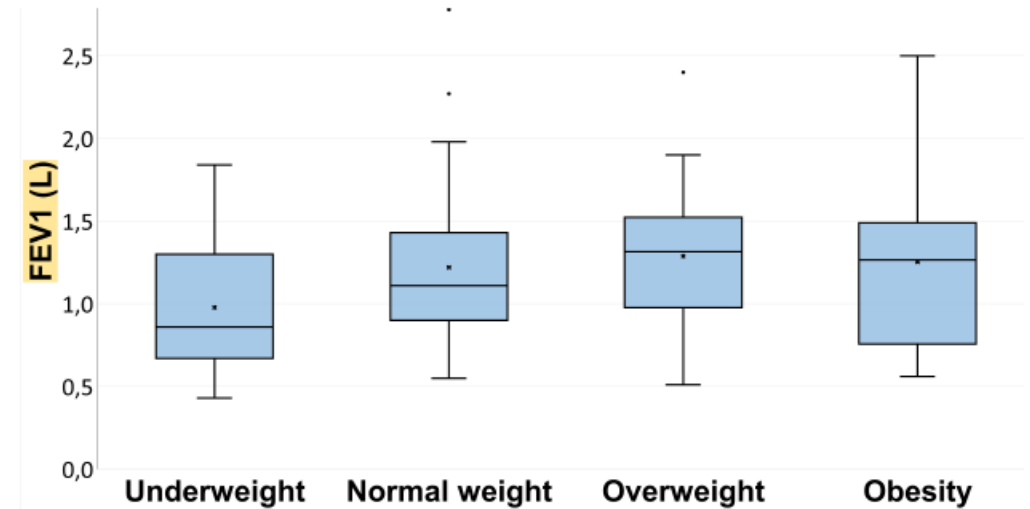


Figure 3. FEV₁ % of predicted across BMI categories

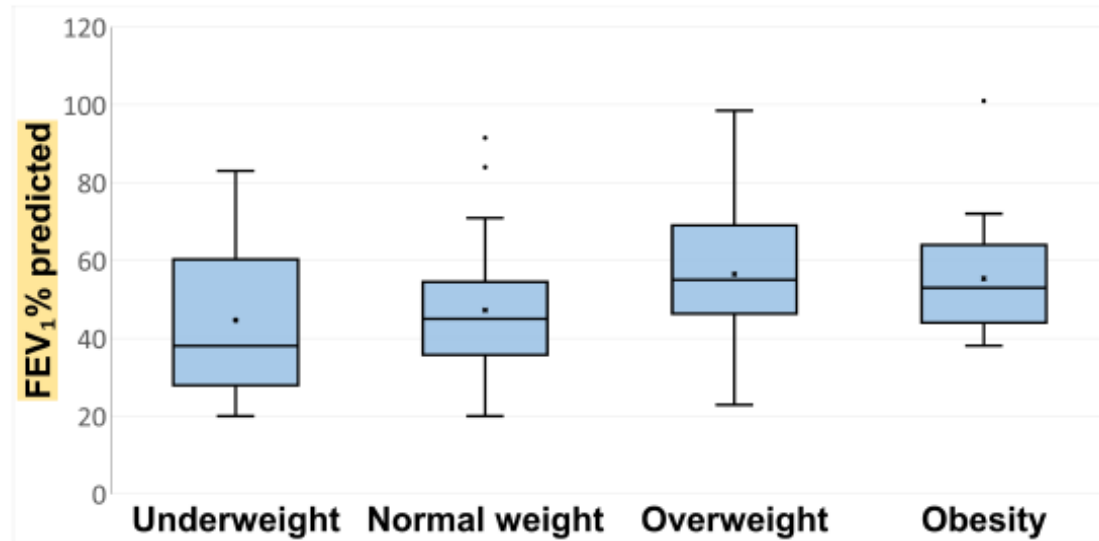


Figure 4. DLCO% of predicted across BMI categories

