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Title: Effects of BMI on task-related VO_2 and dyspnea during activities of daily life (ADLs) in COPD

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Body: COPD patients use a higher proportion of their peak VO_2 during the performance of domestic ADLs compared to healthy peers, accompanied by higher task-related dyspnea and fatigue. To date, the influence of BMI on the task-related metabolic demands remains unknown. Therefore, we aimed to study the effects of BMI on metabolic load in 94 COPD patients (61% men, age 60 ± 9 yrs, BMI 25 ± 5 kg/m², FEV₁ $51 \pm 19\%$ pred) during the performance of 5 consecutive domestic ADLs: putting on socks, shoes and vest, ADL1; folding 10 towels, ADL2; putting away groceries, ADL3; washing up 4 dishes, cups and saucers, ADL4; sweeping the floor for 4 min, ADL5. Task-related VO_2 was assessed using a mobile oxycon, while Borg scores were used to assess task-related dyspnea and fatigue. Baseline characteristics were comparable after stratification for BMI. Underweight COPD patients (<21 kg/m², n=24) had the lowest absolute task-related VO_2 after performance of 5 ADLs (629 ± 151 mL/min) compared to patients with normal (21-25 kg/m², n=31; VO_2 : 818 ± 242 mL/min), overweight (25-30 kg/m², n=26; VO_2 : 806 ± 161 mL/min) and obese BMI (>30 kg/m², n=13; VO_2 : 1030 ± 259 mL/min; all $p < 0,05$). VO_2 expressed as a proportion of peak VO_2 and VO_2 per kilogram fat-free mass (FFM) were comparable between BMI groups (% VO_2 peak: 65 ± 16 , 72 ± 19 , 65 ± 15 and $73 \pm 21\%$; VO_2 /kgFFM: 16 ± 3 , 19 ± 4 , 17 ± 3 and 18 ± 4 mL/min/kg in underweight, normal, overweight or obese BMI, respectively). Moreover, Borg symptom scores for dyspnea and fatigue were comparable between BMI groups. To conclude, patients with different BMI's perform self-paced domestic ADLs at the same relative metabolic load, accompanied by comparable Borg symptom scores for dyspnea and fatigue.