

Does a Measurement Tool of COPD Exacerbation have a Single Measurement Scale with Multiple Domains? Exploratory and Confirmatory Factor Analysis of the Exacerbations of Chronic Pulmonary Disease Tool (EXACT)

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Background: Exacerbation of COPD has been defined as an acute worsening of the patient's condition (including dyspnea, cough, and sputum) beyond normal daily variability and requiring a change in treatment. This implies a single concept (exacerbation) with multiple component parts. **Objective:** To determine the measurement scale of a new patient-reported outcome, the EXACT, and explore the presence of multiple domains. **Methods:** Data from a prospective, two-group, observational validation study (N=410; 222 with confirmed exacerbation and 188 stable). Exploratory factor analyses (EFA) were conducted on the 23-item EXACT item pool using Day 1 split-half pooled sample and total sample by group. Five factors were pre-specified, consistent with the qualitative data underlying tool development. This was followed by confirmatory factor analyses (CFA) using the 2nd split-half sample on Day 1 and total sample Day 7. A post-hoc EFA was conducted to re-evaluate the dimensionality of the final 14 item instrument (item reduction reported elsewhere). **Results:** The initial EFA showed the factor structures were very similar across the pooled, acute and stable patients. Day 1 CFA results: CFI = 0.939, RMSEA = 0.076, SRMR = 0.057; Day 7: CFI = 0.946, RMSEA = 0.081, SRMR = 0.054, demonstrating the same structure when assessed at different time points during an exacerbation. Post-hoc EFA on Day 1 data revealed three prominent domains addressing breathlessness, cough and sputum, and chest symptoms, together accounting for 68% of the variance. **Conclusions:** Results suggest the EXACT captures exacerbations along a single measurement scale with multiple domains.

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