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To the Editor:

Since the outbreak of the coronavirus disease 2019 (COVID-19) pandemic, most attention has focused on containing transmission of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and addressing the surge of critically ill patients in acute care settings. Indeed, as of 29 April 2020, over 3 million confirmed cases have been accounted for globally [1]. In the coming weeks and months, emphasis will gradually involve also post-acute care of COVID-19 survivors. It is anticipated that COVID-19 may have a major impact on physical, cognitive, mental and social health status, also in patients with mild disease presentation [2]. Previous outbreaks of coronaviruses have been associated with persistent pulmonary function impairment, muscle weakness, pain, fatigue, depression, anxiety, vocational problems, and reduced quality of life to various degrees [3–5].

Given the heterogeneity of COVID-19 in terms of clinical and radiological presentation, it is pivotal to have a simple tool to monitor the course of symptoms and the impact of symptoms on the functional status of patients, i.e. a scale that can measure the consequence of the disease beyond binary outcomes such as mortality. In view of the massive number of COVID-19 survivors that require follow-up, an easy and reproducible instrument to identify those patients suffering from slow or incomplete recovery would help in guiding considered use of medical resources and will also standardise research efforts.

The optimal instrument for this purpose is an ordinal scale assessing the full range of functional limitations to capture the heterogeneity of post-COVID-19 outcomes. Ordinal scales rank patients in meaningful categories and do not differentiate between underlying causes to be of general value. These scales can be used to track improvement over time and answer meaningful clinical questions (e.g. "How will I come out of this corona infection?") or for research purposes. They may be either self-reported or assessed in a formal standardised interview [6].

Recently, our group proposed an ordinal scale for assessment of patient-relevant functional limitations following an episode of venous thromboembolism (VTE): the post-VTE functional status (PVFS) scale [7, 8]. It covers the full spectrum of functional outcomes, and focuses on both limitations in usual duties/activities and changes in lifestyle in six scale grades. In short, grade 0 reflects the absence of any functional limitation, and the death of a patient is recorded in grade D. From grade 1 upwards, symptoms, pain or anxiety are present to an increasing degree. This has no effect on activities for patients in grade 1, whereas a lower intensity of the activities is required for those in grade 2. Grade 3 accounts for inability to perform certain activities, forcing patients to structurally modify these. Finally, grade 4 is reserved for those patients with severe functional limitations requiring assistance with activities of daily living. This scale was developed after discussion with international experts (via a Delphi analysis) with input from patients (via patient focus groups). The inter-observer agreement of scale grade assignment was shown to be good-to-excellent with kappas of 0.75 (95% CI 0.58–1.0) and 1.0 (95% CI 0.83–1.0) between self-reported values and independent raters, respectively [7].

The idea of using ordinal scales for COVID-19 research is not new. The World Health Organization proposed the "Ordinal Scale for Clinical Improvement" on 18 February 2020 [9], with categories mainly based on the type of treatment, to be used as the primary end-point in acute-phase trials.
FIGURE 1 Patient self-report methods for the Post-COVID-19 Functional Status (PCFS) scale. a) Flowchart. b) Patient questionnaire. Instructions for use: 1) to assess recovery after the SARS-CoV-2 infection, this PCFS scale covers the entire range of functional limitations, including changes in lifestyle, sports and social activities; 2) assignment of a PCFS scale grade concerns the average situation of the past week (exception: when assessed at discharge, it concerns the situation of the day of discharge); 3) symptoms include (but are not limited to) dyspnoea, pain, fatigue, muscle weakness, memory loss, depression and anxiety; 4) in case two grades seem to be appropriate, always choose the highest grade with the most limitations; 5) measuring functional status before the infection is optional; 6) alternatively to this flowchart and patient questionnaire, an extensive structured interview is available. The full manual for patients and physicians or study personnel is available from https://osf.io/qgpdv/ (free of charge).
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