Dear Editor

In this letter to the editor, we would like to address return to work and functional recovery after hospitalisation for a COVID-19 infection. A recent review has shown that 3.4 months after hospitalisation for COVID-19, an average of 80% patients had returned to work [1]. Meanwhile, it has been reported that up to 68% of the hospitalised patients present still at least one symptom after 6 months [2]. In a Chinese population, those sequelae consisted mainly of fatigue or muscle weakness (63%), followed by sleep difficulties (26%) and anxiety/depression (23%) [3]. By now, the relationship between return to work and contributing factors has been little investigated and the influence of hospitalisation on ward versus intensive care unit on time to return to work remains unclear.

The objective of this prospective observational study is to describe return to work, resumption of hobbies and physical activities, presence of fatigue, depression, and restriction of participation at 7 months post hospitalisation due to COVID-19. Secondly, we aim to investigate correlation between the named factors and to examine the influence of hospitalisation on ward versus ICU (intensive care unit) and the length of hospital stay on the time to a complete return to work. Therefore, we included all working patients between 18 and 65y who survived a hospitalisation for COVID-19 infection as primary diagnosis in a tertiary hospital in Switzerland between 1 October and 31 December 2021, representing the second wave of the pandemic [4]. Non-French nor German speaking patients were excluded. Baseline characteristics were collected from the medical record system. The follow-up took place at 7 months post Covid and was done by phone once informed consent was obtained; relevant symptoms were then quantified by Fatigue Assessment Scale (FAS), Patient Health-related Questionnaire 2 (PHQ-2) and the Keele Assessment of Participation (KAP).

61 patients with a median age of 54 (IQR 50–59) years participated; 12 (19.7%) were female and the median BMI was 29.4 (IQR 25.9–32.8). 1 patient (1.2%) was an active smoker and 17 (27.9%) former smokers. Hypertension was present in 24 (39.3%) cases, diabetes in 11 (18.0%) cases, sleep apnoea in 8 (13.1%) cases, and asthma in 8 (13.1%) cases. The length of hospital stay amounted to a median of 8 (5.5–13) days. 42 patients (68.9%) were hospitalised on ward, 19 (31.1%) needed ICU care. The median length of ICU stay was 5 (3–11) days. 10 patients (11.9%) needed non invasive ventilation and 9 (10.7%) invasive ventilation.

At 7 months, 51 (83.6%) had returned completely to work 7 months after hospital admission. 5 patients (8.2%) had returned to work partially and 5 (8.2%) were not able to return to work at all after 7 months. The median time to complete return to work after hospital discharge amounted to 37 (14–69) days. The most frequently indicated cause for work impairment was fatigue in 37 (60.7%) cases, followed by dyspnoea in 12 (19.7%) and external reasons as workplace-related causes or medical certificate in 8 (13.1%) cases. 4 patients (6.6%) indicated other causes. At 7 months post COVID-19, 36 patients (59.0%) had resumed their hobbies and 32 (52.2%) physical activity; restriction of participation was present in 39 (64.4%) patients.

We found a strongly inverse relationship between complete return to work at 7 months and restriction of participation measured by the KAP at 7 months (OR=0.05, p = 0.001). For the other factors the relationships were weak. Rather, in the subgroup of the 51 patients having returned to work at 7 months, fatigue was still present in 17 (33.3%) and restriction of participation in 16 patients (31.4%). 3 patients (5.9%) had a positive depression score. 18 patients (35.3%) had returned to work but were not able to resume hobbies. Physical activity could not be resumed by 22 patients (43.1%) who had returned to work.

Secondly, this study shows a significant difference (p = 0.04) in time to complete return to work after hospital discharge between patients hospitalised on ward (median estimate 30 days, 95% CI 14.1 to 45.9) and patients needing ICU care (median estimate 128 days, 95%CI 24.2 to 231.8), as shown in Fig. 1.

In an explorative manner, we created two groups by choosing the median length of hospital stay, namely 9 days, as cut-off. The Kaplan-Meier curve showed a significant difference (p = 0.000) in time to complete return to work between patients hospitalised for <9 days (median estimate 23 days, 95% CI 14.2 to 31.8) and those for ≥9 days (median estimate 128 days, 95%CI 74.8 to 181.2). The most important difference occurred at 3 months (90 days) after hospital discharge. In order to predict return to work status at 3 months, we modelled an ROC curve, which showed that the best cut-off value was at 9.5 days of length.
of hospital stay (AUC=0.814, \( p = 0.000 \), sensitivity=0.825, specificity=1-0.190).

The results of our study are in line with the results of a recent review, summarising that after 3.4 months, 69.1–100% of patients had returned to work completely but still suffering from fatigue (16.36–61%), dyspnoea (14.55–42%) and other symptoms up to 3 months after hospitalisation [1]. Studies with longer follow-up showed even an increase in those symptoms from 6 to 12 months after Covid-19 [2,5].

Our data reinforce the results of Garrigues et al., who indicated a non-significant trend towards a reduced proportion of patients returning to work amongst ICU patients after 110.9 days (46.7% versus 77.5%) [6]. Huang et al. reported that more severely ill patients had an increased risk of fatigue or muscle weakness and anxiety or depression at 6 months as well as a more disturbed result of the 6-min walking test. They conclude also, that more severely ill patients are the main target population for interventions of long-term recovery [3]. Concerning the influence of the length of hospital stay on time to return to work, we have found no other studies.

Limitations of this study include the single-centre nature and the relatively small sample size. Nevertheless, we included all consecutive patients in employment before over a short period of time, supporting the generalisability of the results. Resumption of hobbies as well as restriction of participation may be biased by the national COVID-19 restrictions [7] and we didn’t dispose of comparative data from the time before hospitalisation. Return to work, resumption of hobbies and physical activity were dichotomised in order to calculate odds. This may result in overrepresentation of work impairment, but as we are interested in complete recovery, we suggest this decision is justified.

In conclusion, our study shows that return to work 7 months after hospital discharge for COVID-19 infection is common, but often at the expense of hobbies and physical activity, and despite fatigue and restriction of participation. This indicates that recovery is not complete when the patient returns to work. Therefore, we propose to take resumption of hobbies and physical activity into consideration when evaluating recovery in a rehabilitation setting. In addition, fatigue and other remaining symptoms should be assessed continuously, as several studies showed that they may even increase with time [2,5] and prolong return to work. More research needs to be done to precise the influence of the named factors.

Secondly, our results indicate that patients hospitalised on ICU take longer to return completely to work. We also developed a predictive tool for return to work at 3 months: if the length of hospitalisation exceeds 9.5d, return to work will probably not take place at 3 months after discharge. This tool - showing a very good sensitivity and specificity - should be re-evaluated in further studies, as our analysis was explorative. These two results can be important for clinicians to estimate the time to return to work and to plan a rehabilitation program.

We recommend systematic screening of all COVID-19 patients having needed ICU care and those, whose hospital stay exceeds 9.5 days for eligibility for a rehabilitation program. We do so because the prevalence of post-COVID-19 sequelae is high and adequate measures may accelerate return to work. This could lead to less socio-economic costs and a higher degree of patient satisfaction.

1. Author contributions

The design of the study, data collection, statistical analysis and drafting of the manuscript was done by OH. The study was under the direction of JMA and under the supervision of PD and MM, who supervised the development of design, data collection and statistical analysis, contributed to the interpretation of data and revised the manuscript critically for shaping the final manuscript. All contributors have approved the final manuscript.

Declaration of competing interests

Orlando Hürlimann has nothing to declare. Pierre Decavel is employed at the HFR Fribourg Cantonal Hospital, Switzerland. Jean-Marie Annoni is employed at the HFR Fribourg Cantonal Hospital, Switzerland and the University of Fribourg, Switzerland. Marco Mancinetti is employed at the HFR Fribourg Cantonal Hospital, Switzerland and the University of Fribourg, Switzerland.

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References


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