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Rehabilitation and COVID-19: update of the rapid living systematic review by Cochrane Rehabilitation Field as of April 30, 2021

The present update follows the methodology defined in the 2nd edition of the rapid living systematic review 2020 conducted as part of the Cochrane Rehabilitation REH-COVER (Rehabilitation COVID-19 Evidence-based Response) Action.[1] Table I lists the main characteristics of this update.

PRISMA flow diagram is presented in Figure 1.[2] The synthesis of results is depicted below in Table II, III, IV, V.[3-55] The current update output is compared to the total number of studies selected in all editions of this rapid living systematic review, including this one.

The main novelty from the current bimonthly update is represented by the increased number of experimental studies published during this edition data collection period. This included three randomized controlled trials (RCT)[39, 44, 49] and two pilot controlled trials,[6, 42] investigating the efficacy of rehabilitative treatments on COVID-19 patients, either in the acute[39, 42] or in the postacute phase.[6, 44, 49] One pilot controlled clinical study enrolled 42 severe COVID-19 patients immediately after weaning from intubation, showing that two weeks of inspiratory muscle training improved functional capabilities of the lung.[42] Adly *et al.*[39] reported in their RCT higher efficacy in respiratory function of oxygen therapy with bilevel positive airway pressure compared to osteopathic manipulative respiratory and physical therapy techniques in 60 acute COVID-19 patients, treated at home using telemedicine.

Liu *et al.*[49] and Liu *et al.*,[44] respectively, studied 72 and 140 postacute patients, showing that respiratory techniques not only improve pulmonary function, but also endurance, quality of life and anxiety, especially in combination with group psychological interventions.[44] In a small pilot-controlled trial, Mateo *et al.*[6] reported the superiority of 20 sessions of FES-cycling compared to stationary cycling alone, in reducing sedentary behavior and increasing time spent walking or running in 14 postacute COVID-19 cases.

About one-half of the papers included in this update focus on the natural history of COVID-19. The data from several hundred cases collected at 5-6 months from symptom on-

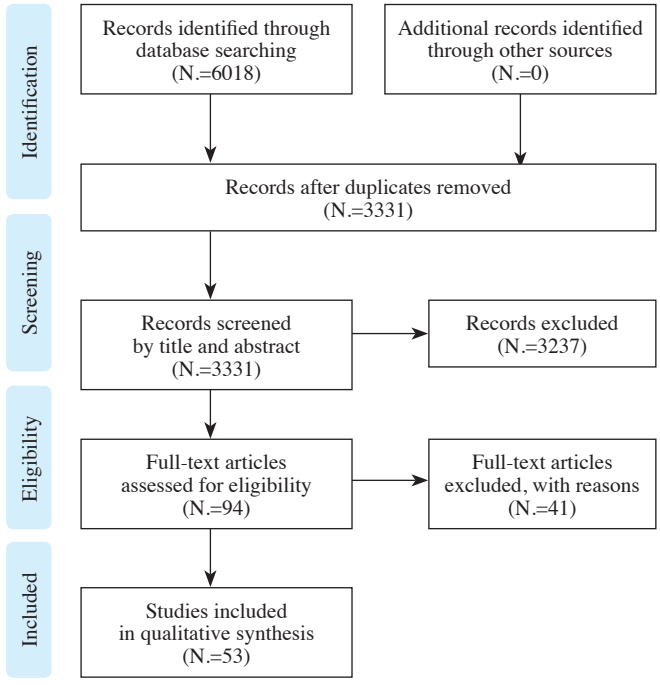

Figure 1.—PRISMA flow diagram.[2]

TABLE I.—*Main characteristics of this update.*

Date of search	May 4, 2021, looking for papers published from March 1, up to April 30, 2021
Methods	No changes to the 2nd edition of the Rehabilitation and COVID-19 rapid living systematic review.[1]
Consolidated online table of papers of all editions	https://tr.im/rr_dyn
Table of the present update	https://tr.im/rr0304_21
Interacting living evidence map	https://tr.im/rr_dyn

TABLE II.—*Studies included.*

Systematic review search results	Current edition	Total (all editions)
Identified and screened	3331	10415
Included	53	319

TABLE III.—*World Health Organization (WHO) regions and countries where studies were performed.*

WHO Region	Current edition	Total all editions	Country	Subtotal current edition (study citations)
Europe	24	162	Austria	2[3, 4]
			Belgium	1[5]
			France	4[6-9]
			Italy	5[10-14]
			Norway	1[15]
			Republic of Ireland	1[16]
			Serbia	1[17]
			Spain	4[18-21]
			Switzerland	3[22-24]
			UK	2[25, 26]
Americas	11	85	Brazil	1[27]
			Canada	1[28]
			Mexico	1[29]
			USA	8[30-37]
Eastern Mediterranean	5	16	Egypt	2[38, 39]
			Pakistan	2[40, 41]
			Saudi Arabia	1[42]
Western Pacific	11	46	Australia	1[43]
			China	8[44-51]
			Japan	2[52, 53]
South-East Asia	2	10	India	2[54, 55]

TABLE IV.—*Distribution of studies by limitations of functioning of rehabilitation interest (LFRI), disease phase and rehabilitation setting.*

Parameters	Classification	Current update		Total all editions	
		N.	%	N.	%
LFRI	Nervous system structures/functions[3, 4, 8, 15, 25, 34, 44, 45]	8	15.0%	124	38.9%
	Respiratory structures/functions[7, 12, 17, 19, 20, 22, 26, 27, 36, 39, 42, 46-51, 54]	18	34.0%	78	24.5%
	Digestive functions[5, 52]	2	3.8%	11	3.4%
	Cardiovascular functions[16, 18]	2	3.8%	6	1.%
	Any other body structures and function[6, 10, 18, 23, 29, 32, 33, 38, 41, 43, 53, 55]	12	22.6%	38	11.9%
	Any activity limitation and participation restriction[11, 13, 14, 18, 24, 28, 30, 31, 35, 37, 40]	11	20.7%	37	11.6%
	Health services, systems and policies	0	0	4	1.3%
	Products and technologies	0	0	2	0.6%
	N/A	0	0	19	6.0%
Disease phase	Acute[25, 33, 34, 36, 39, 42, 53, 54]	8	15.1%	116	36.4%
	Postacute[3-6, 8, 11, 13, 14, 17, 19, 20, 22-24, 26-32, 35, 37, 40, 41, 43-50, 55]	34	64.2%	139	43.6%
	Chronic[7, 9, 12, 15, 16, 18, 21, 38, 51]	9	17.0%	20	6.3%
	Late-onset consequences	0	0	8	2.5%
	Impact on people with disability[10, 52]	2	3.8%	18	5.6%
	N/A	0	0	18	5.6%
Rehabilitation setting*	Acute[36, 42, 53, 54]	4	7.5%	41	12.9%
	Post-acute specialised[4, 14, 24, 41, 50]	5	9.4%	31	9.7%
	Post-acute general[6, 28, 30-32, 44]	6	11.3%	33	10.3%
	Specialized outpatient[12, 13, 23, 40, 49]	5	9,4%	10	3.1%
	Homecare[27, 39]	2	3.7%	7	2.2%
	Social assistance[37]	1	1,9%	1	0.3%
	N/A[3, 5, 7-11, 15-22, 25, 26, 29, 33-35, 38, 43, 45-48, 51, 52, 55]	30	56.6%	196	61.4%

N/A: not applicable.
*With respect to the setting, a high proportion of studies was conducted without reference to involvement of a rehabilitation programme and mainly focused on COVID-19 clinical presentation in the acute phase or on the outcome at hospital discharge.

set,[7, 9, 12, 15, 16, 18, 21, 38, 51] identified dyspnea as the most prevalent symptom (>70% cases),[7, 9, 38] followed by fatigue (>60%),[38] myalgia and arthralgia (>30%),[18] altogether leading to reduced independence in ADL[18] and impaired quality of life.[15]

This edition demonstrates a growth in the amount of rehabilitation research meeting inclusion criteria and an increase in the proportion of higher levels of evidence available. So far, we did not evaluate the methodological quality of the studies and cannot com-

TABLE V.—*Distribution of studies by research question and levels of evidence according to the Oxford Center for Evidence Based Medicine*[56] *(level 5 studies were excluded by choice).*

Level of evidence	Current update (N., %)					Total all editions (N., %)				
	1	2	3	4	Total	1	2	3	4	Total
Research question										
Epidemiology: clinical presentation	0	0	0	0	0	0	0	5 (1.6%)	56 (17.6%)	61 (19.1%)
Epidemiology: prevalence	0	0	13 (24.5%)	2 (3.8%)	15 (28.3%)	0	0	38 (11.9%)	10 (3.1%)	48 (15.0%)
Epidemiology: natural history, determining and modifying factors	0	0	8 (15.1%)	18 (34.0%)	26 (49.0%)	0	0	49 (15.4%)	113 (35.4%)	162 (50.8%)
Micro-level: individuals	0	3 (5.7%)	7 (13.2%)	0	10 (18.9%)	0	4 (1.3%)	19 (6.0%)	2 (0.6%)	25 (7.8%)
Meso-level: health services	0	0	1 (1.9%)	1 (1.9%)	2 (3.8%)	0	0	6 (1.9%)	17 (5.3%)	23 (7.2%)
Macro-level: health systems	0	0	0	0	0	0	0	0	0	0
Total	0	3 (5.7%)	29 (54.7%)	21 (39.6%)	53 (100%)	0	4 (1.3%)	117 (36.7%)	198 (62.1%)	319 (100%)

ment on the quality of evidence. Therefore, our synthesis should not be used to blindly inform clinical practice and clinicians should evaluate the quality of the reported trials before adopting them to treat patients. Notably, information about short and long-term sequelae of COVID-19 indicating a need for rehabilitation is increasing. Further, evidence of trends in common post-COVID impairments, activity limitations and participation restrictions is growing, as is evidence regarding the effect of treatments for symptom relief, quality of life, increasing capacity and function. More than a year since the outbreak of the COVID-19 pandemic, it is clear that rehabilitation services aid clinical management of COVID-19 survivors in short and long term. Further research evidence characterizing post-COVID recovery trajectories, the impact of targeted and comprehensive treatments and the efficacy of different rehabilitation service models of care is needed in the year ahead.

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Conflicts of interest.—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Authors' contributions.—Francesco Negrini and Alessandro de Sire equally contributed to this work as first authors, Stefano G. Lazzarini and Michele Patrini have given substantial contributions to database searching, Alessandro de Sire, Elisa Andrenelli, Francesco Negrini, Stefano G. Lazzarini and Michele Patrini to study selection, Francesco Negrini, Alessandro de Sire and Elisa Andrenelli to data extraction, Francesco Negrini and Alessandro de Sire to data analysis and interpretation, and manuscript writing, Maria G. Ceravolo to study supervision, Francesco Negrini, Alessandro de Sire, Elisa Andrenelli, Stefano G. Lazzarini, Michele Patrini, Maria G. Ceravolo, and the International Multiprofessional Steering Committee of Cochrane Rehabilitation REH-COVER action to study submission, Elisa Andrenelli to study submission. All authors read and approved the final version of the manuscript.

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