Virtual pulmonary and COVID-19 rehabilitation

Sally Singh
Department of Respiratory Sciences, University of Leicester, Leicester, U.K

Centre for Exercise and Rehabilitation Science, University Hospitals of Leicester NHS trust, Leicester, U.K

Your COVID Recovery

Conflict of interest disclosure

❑ X I have no real or perceived conflicts of interest that relate to this presentation.

❑ I have the following real or perceived conflicts of interest that relate to this presentation:

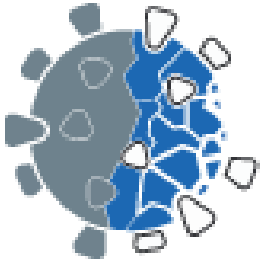
Affiliation / Financial interest	Commercial Company
Grants/research support:	
Honoraria or consultation fees:	
Participation in a company sponsored bureau:	
Stock shareholder:	
Spouse / partner:	
Other support / potential conflict of interest:	

Pre, during and post (?) the pandemic

Strong evidence base
Guidance

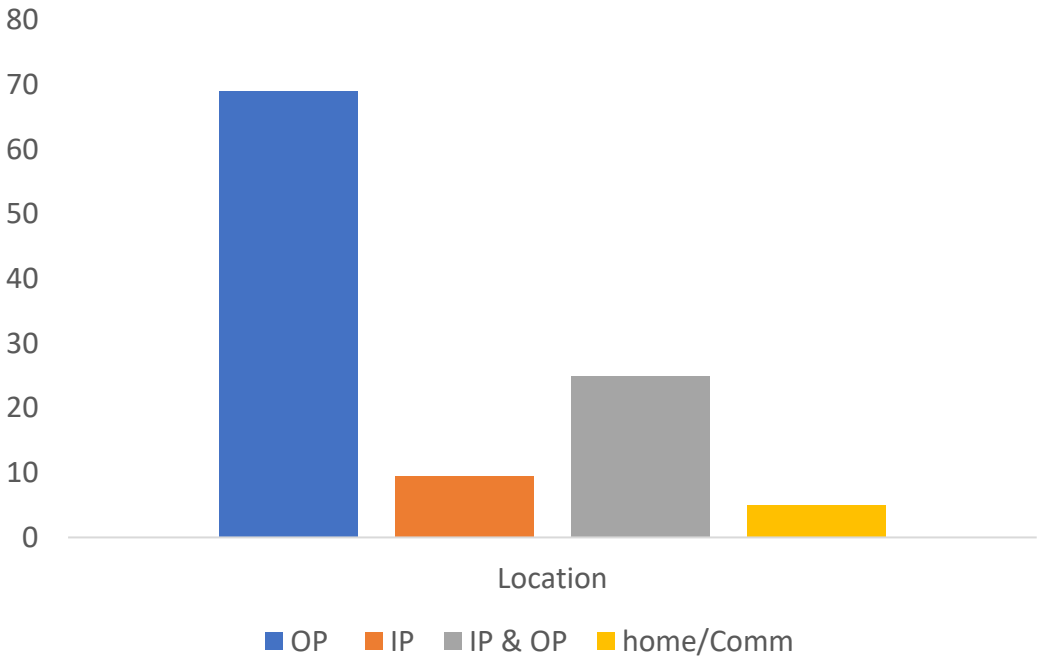
Package of individually prescribed and progressed exercise training and self management support

Limited evidence
Limited guidance

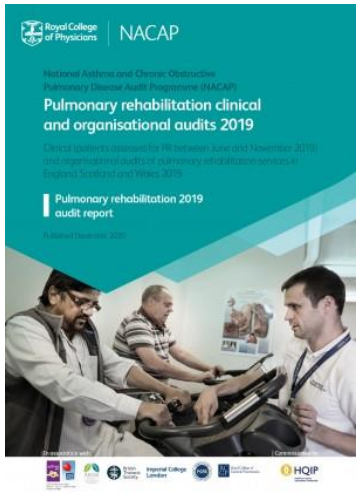


Potential to increase scope
Health inequalities/ digital competency

Pre COVID-19



430 centres from 40 countries[1]



Programme location[2]

97.9% of PR programmes offered were centre-based.

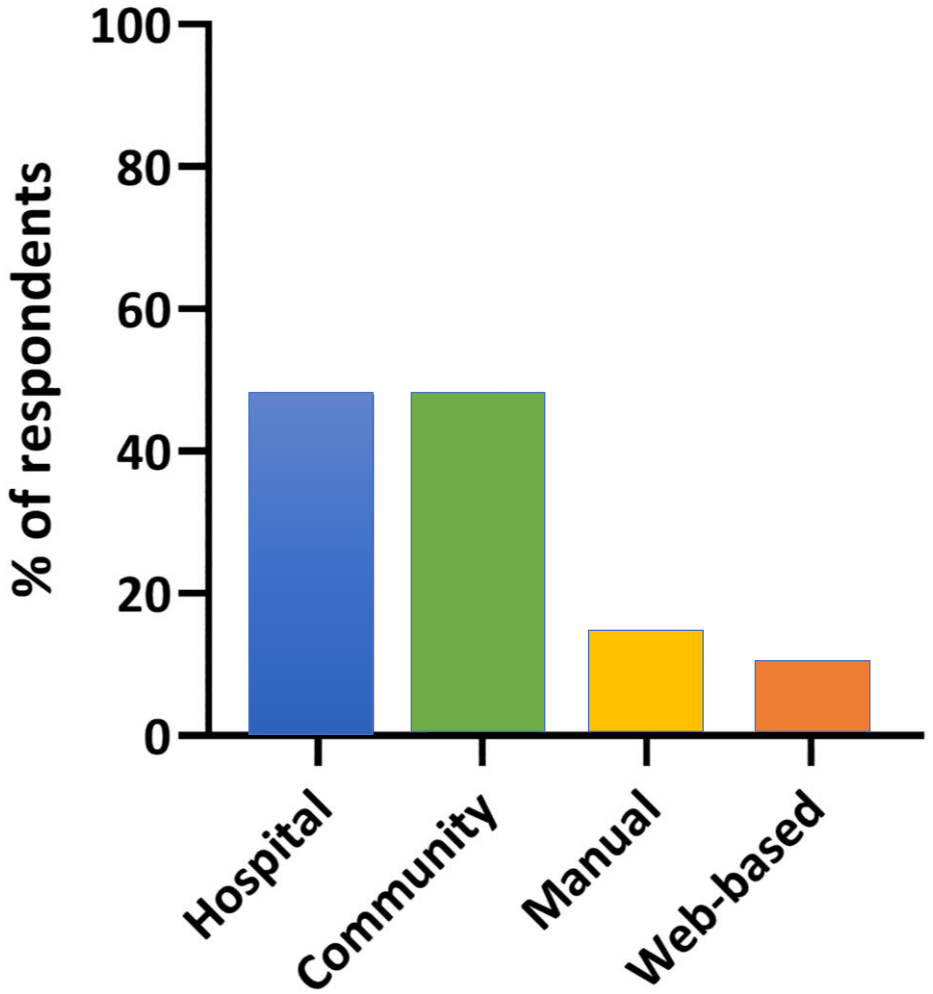
34.0% of services offered home-based PR but only **1.6%*** of PR programmes offered were home-based.

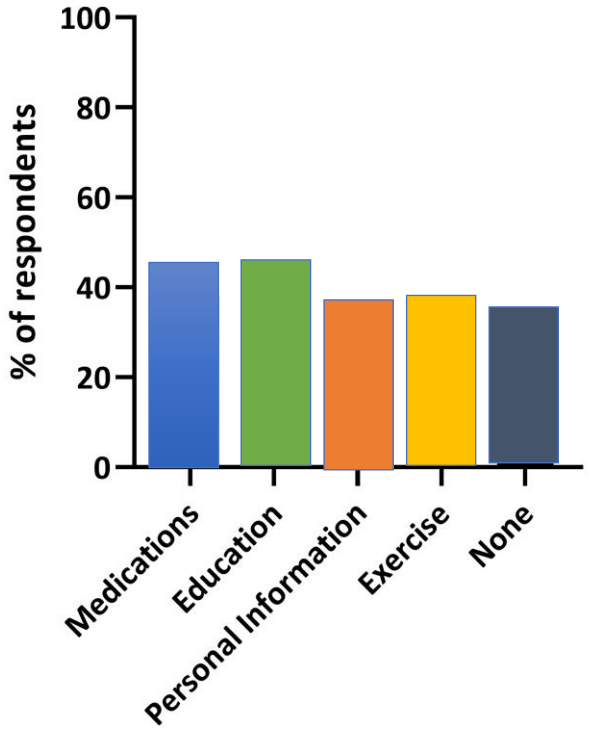
1. *Spruit MA et al.* Differences in content and organisational aspects of pulmonary rehabilitation programmes.,, *ERS Rehabilitation and Chronic Care, and Physiotherapists Scientific Groups., American Association of Cardiovascular and Pulmonary Rehabilitation., ATS Pulmonary Rehabilitation Assembly and the ERS COPD Audit team. Eur Respir J. 2014 May; 43(5):1326-37*

2. Singh S, et al. . National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP). Pulmonary rehabilitation audit report 2019. Combined clinical and organisational audit of pulmonary rehabilitation services in England, Scotland and Wales. London: RCP, 2020.

Digital habits of PR service-users

N=193, 68% COPD
51% used the Internet daily
31% had never accessed it

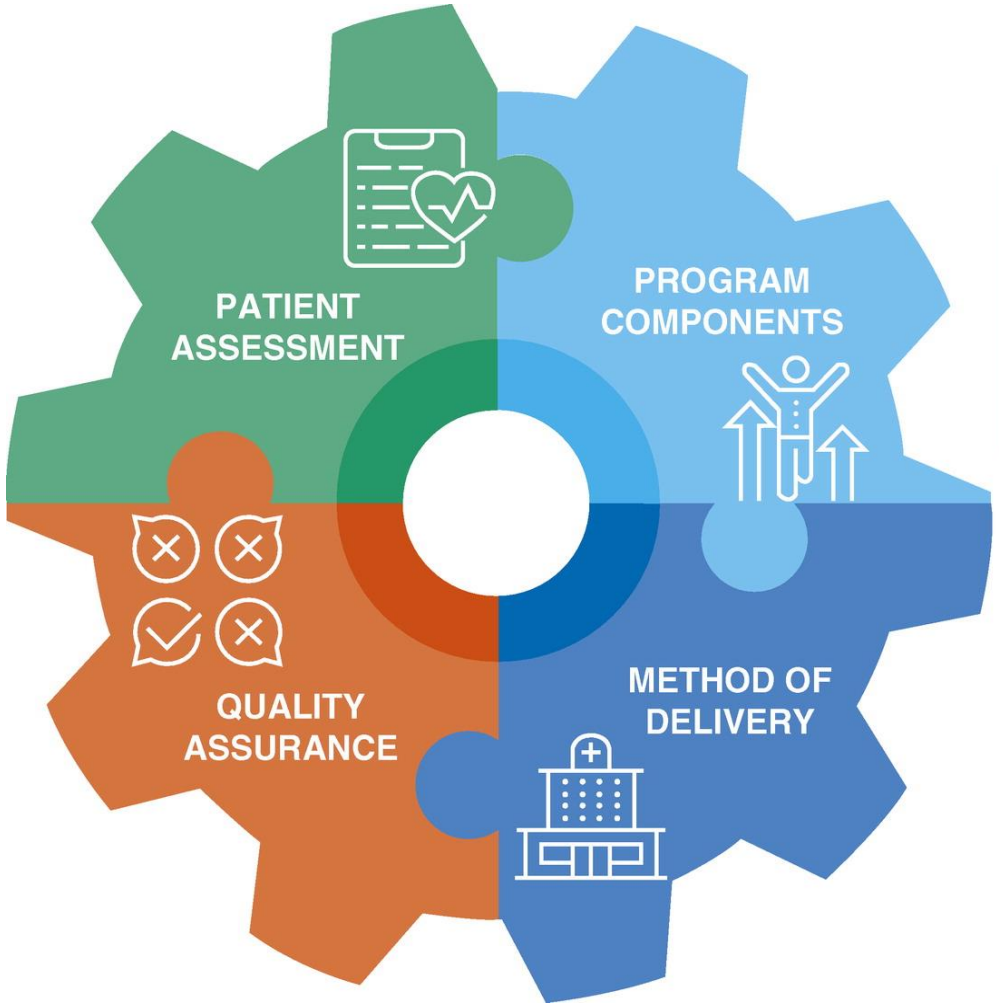




- 79% preferred PR delivered face to face in a hospital or community setting
- 11% preference for an exercise manual at home supervised by weekly telephone calls
- 9% a Web-based app with no supervision

Polgar O et al. Digital habits of PR service-users: Implications for home-based interventions during the COVID-19 pandemic. *Chronic Respiratory Disease*. January 2020.

Defining modern pulmonary rehabilitation - essential



1. An initial center-based assessment by a health care professional
2. An exercise test at the time of assessment
3. A field exercise test
4. Quality of life measure
5. Dyspnea assessment
6. Nutritional status evaluation
7. Occupational status evaluation

8. Endurance training
9. Resistance training

10. An exercise program that is individually prescribed
11. An exercise program that is individually progressed
12. Team includes a health care professional with experience in exercise prescription and progression

13. Health care professionals are trained to deliver the components of the model that is deployed

Essential components of pulmonary rehabilitation. Essential components of the pulmonary rehabilitation model were identified through a Delphi process. An essential component was defined as having a median score ≤2 (strongly agree or agree it is essential) and high consensus (interquartile range, 0).

Holland A E et al ;Defining Modern Pulmonary rehabilitation ; *Annals ATS* 18e12-e29.2021

Nothing new

N=48, 3/12 month programme with review at 9/12

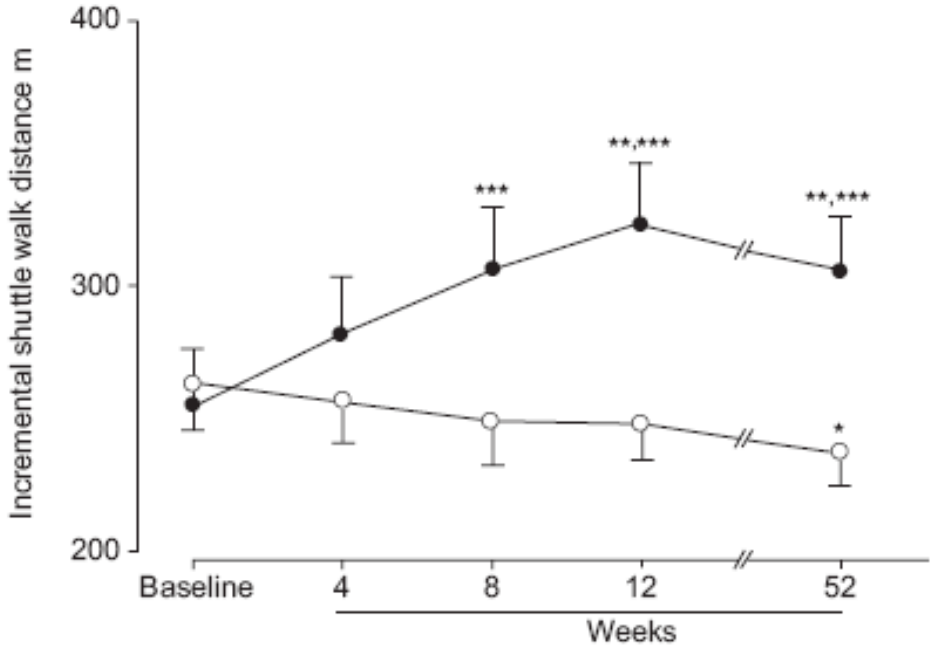
ISWT performed to identify speed of walking and music identified at correct tempo and installed on phone

Control group - advice only

RESULTS

Significant increase in distance at 8/52, 12/52 (255.8m – 307.1m-324.2m)

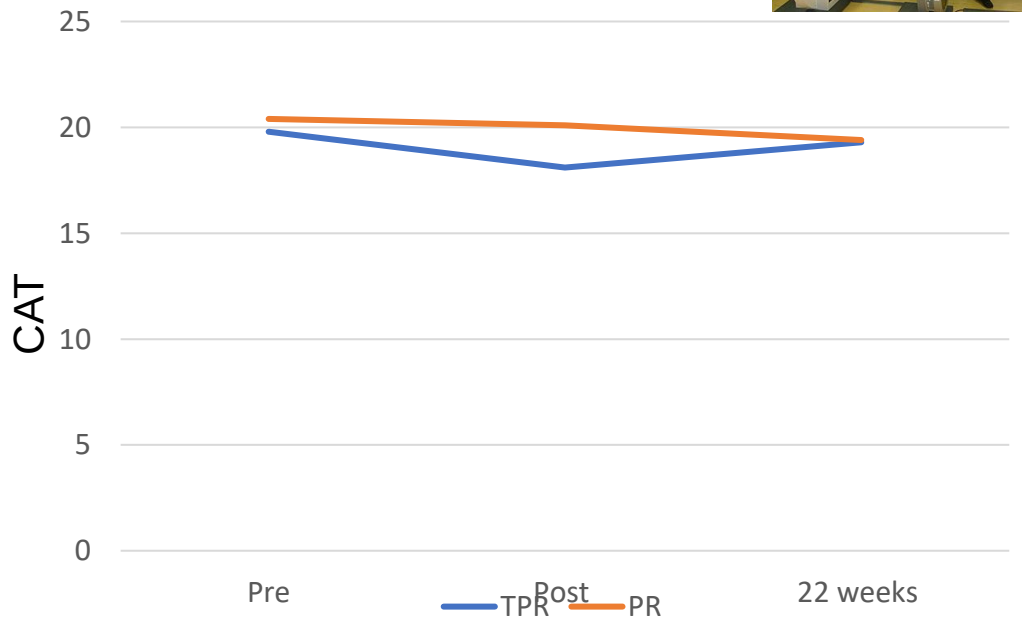
Improvements in QOL (SF-12)

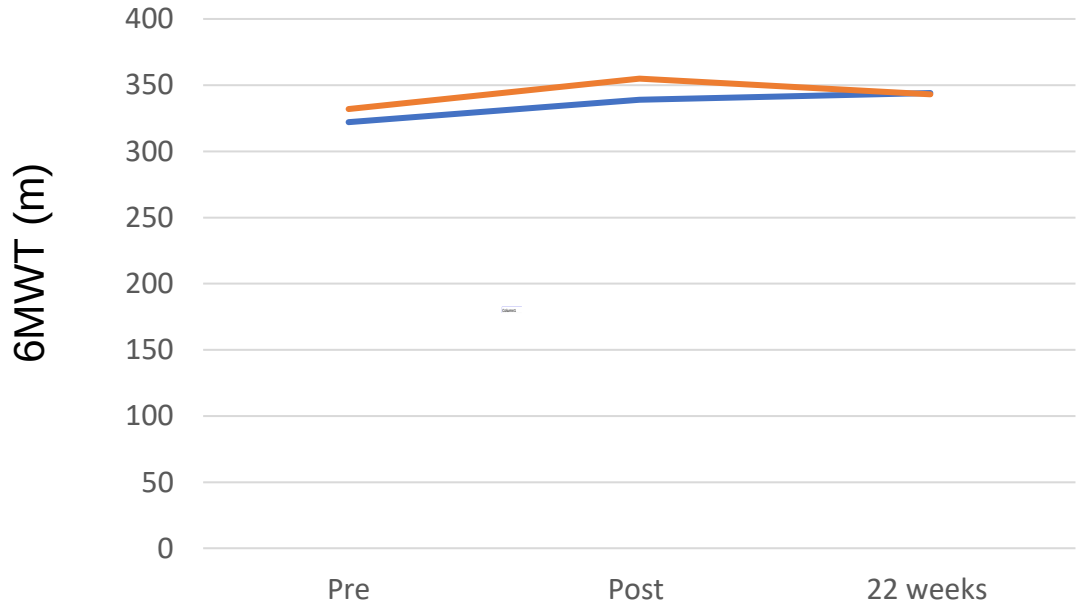


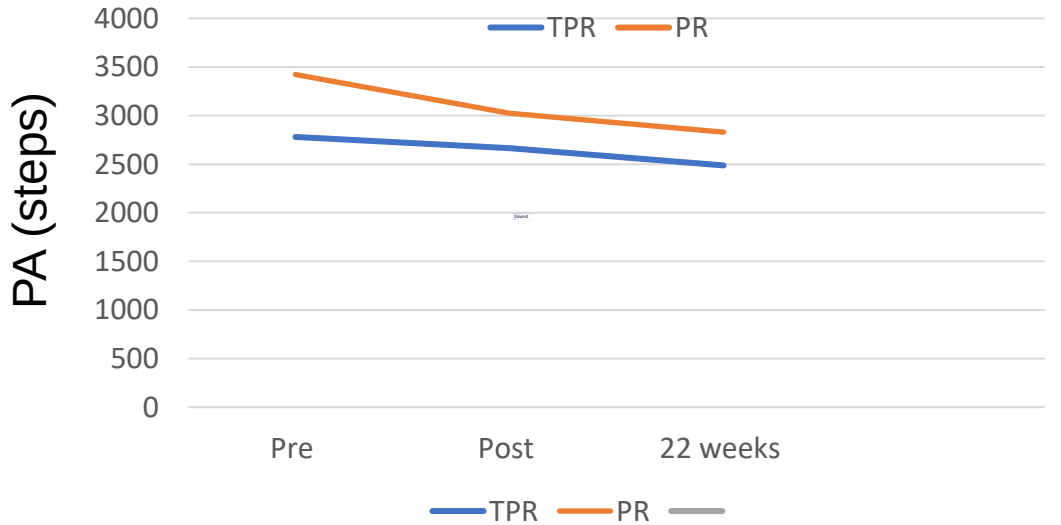
Lui W-T et al Eur Resp J 2008;32:651-659

Supervised pulmonary tele-rehabilitation versus PR

N=134
FEV_1= 31.1 (9.4)%
Age =68.3 (9.0) yrs
Female 55%



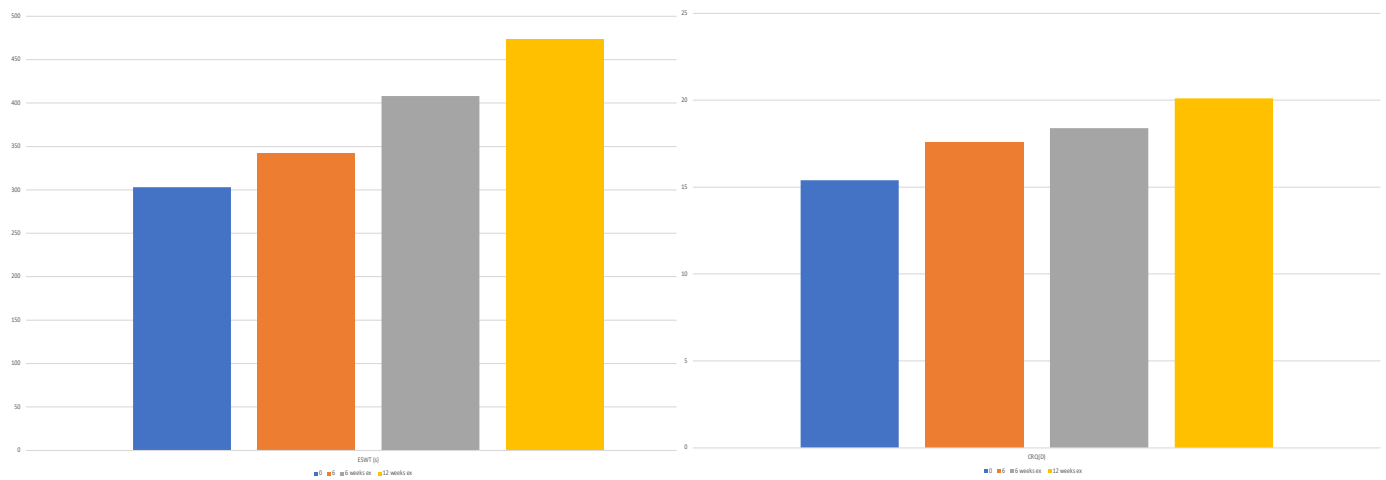




None of the group improvements exceeded the MCID at any measurement time point.

Hansen H, *et al*. *Thorax* 2020;**75**:413–421. doi:10.1136/thoraxjnl-2019-214246

Novel technology



ESWT

N=25 N=24. N=20. N=18

CRQ-D

"VR is more akin to my needs. I did not feel like traditional classes were doing anything for me".

"I prefer to do it at home, partly because of getting to the venue".

"Because it was at home, I think I did it more. Whereas I would have been ringing the class to tell them I cannot make it because I don't feel well enough".

1. Albores, J et al The Use of a Home Exercise Program Based on a Computer System in Patients With Chronic Obstructive Pulmonary Disease Journal of Cardiopulmonary Rehabilitation and Prevention: January/February 2013 - Volume 33 - Issue 1 - p 47-52

2. Jung T, et al . A Virtual Reality–Supported Intervention for Pulmonary Rehabilitation of Patients With Chronic Obstructive Pulmonary Disease: Mixed Methods Study. J Med Internet Res 2020;22(7):e14178

Post COVID rehabilitation the need and the demand

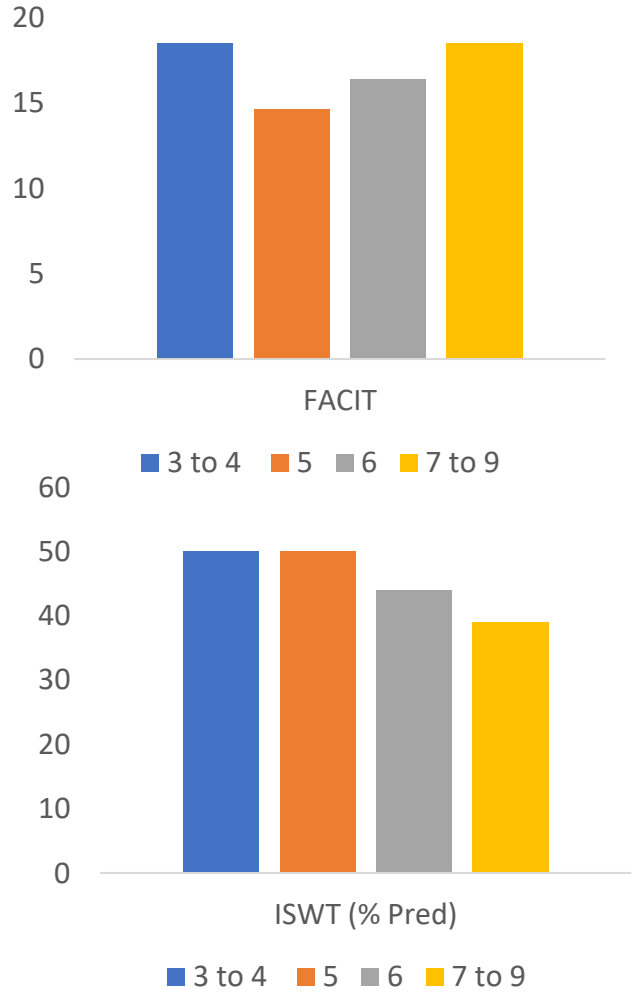
PHOSP-COVID
Improving long-term health outcomes

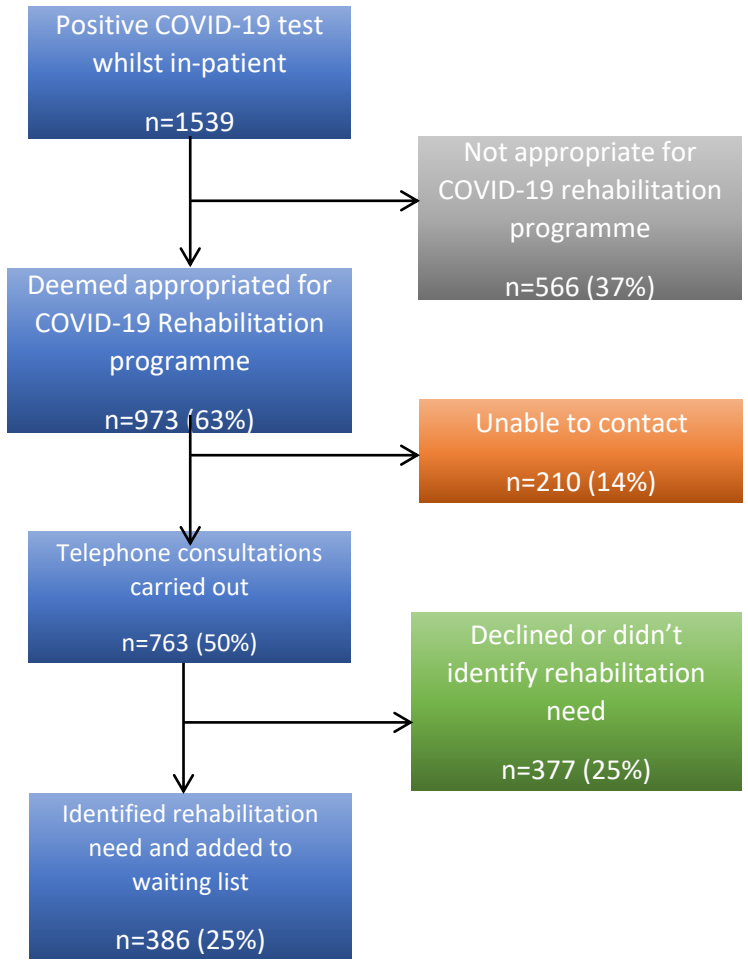
1,170 patients
35.7% female
mean [SD] age 58 [13]yrs
68·6% white ethnicity

29.3%, 20.6%, 50.1% of the cohort had none, one, or at least two co-morbidities.

Mean follow up 5 months.

92.8 % had at least one persistent symptom with a median (IQR) number of 9 (4 to 16) symptoms

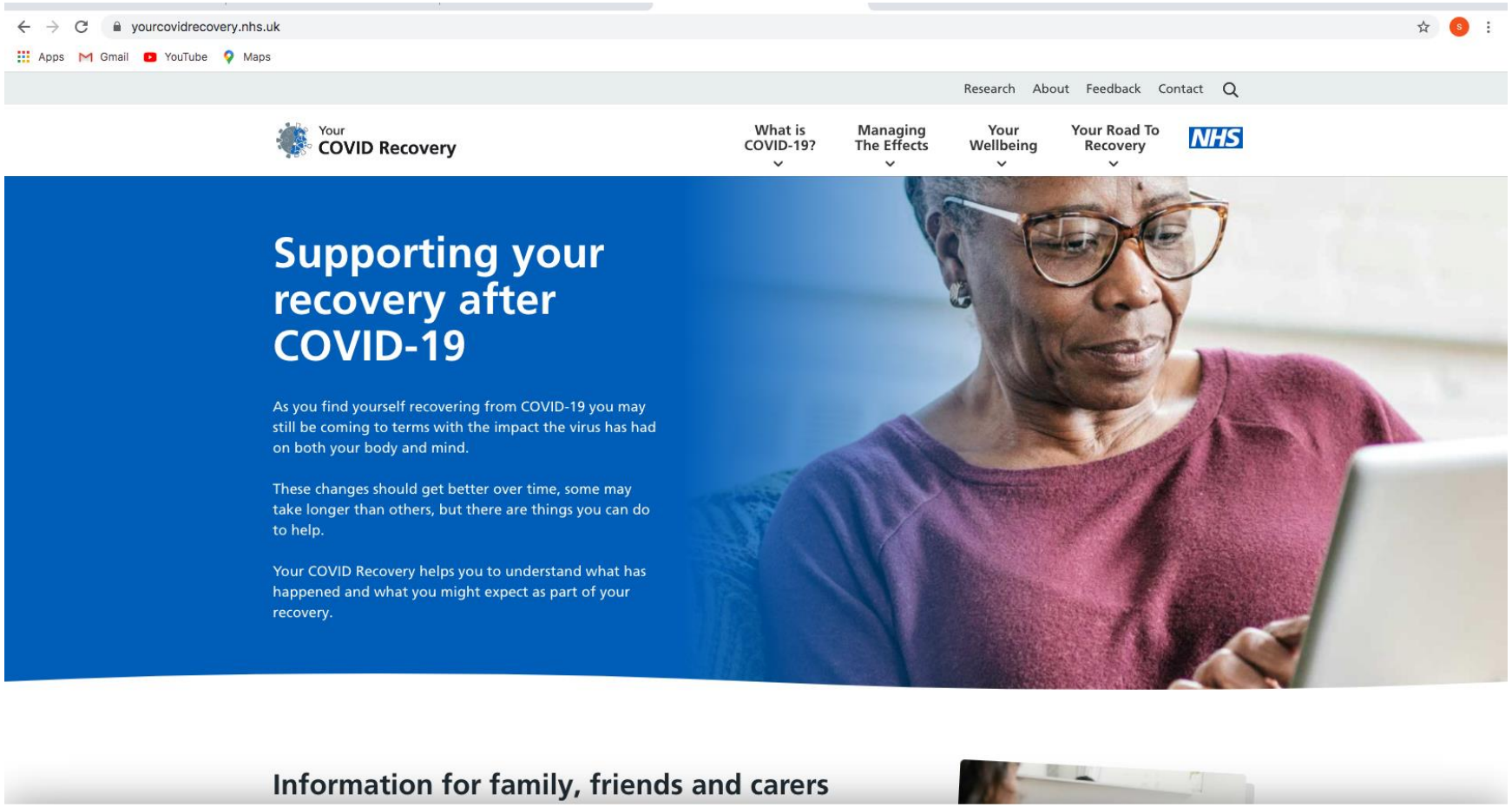




WHO = World Health Organisation. Category 3-4 = no continuous supplemental oxygen needed, 5= continuous supplemental oxygen only, 6= Continuous or Bi-level Positive Airway Pressure ventilation or High Flow Nasal O_2 , 7-9 = Invasive Mechanical Ventilation or other organ support

1. Evans R.A et al Physical, cognitive and mental health impacts of COVID-19 following hospitalisation – a multi-centre prospective cohort study. Medrvix 2021.
2. Daynes E et al . A call to action for rehabilitation services for the post COVID-19 population . Physiotherapy (in press)

Your COVID Recovery



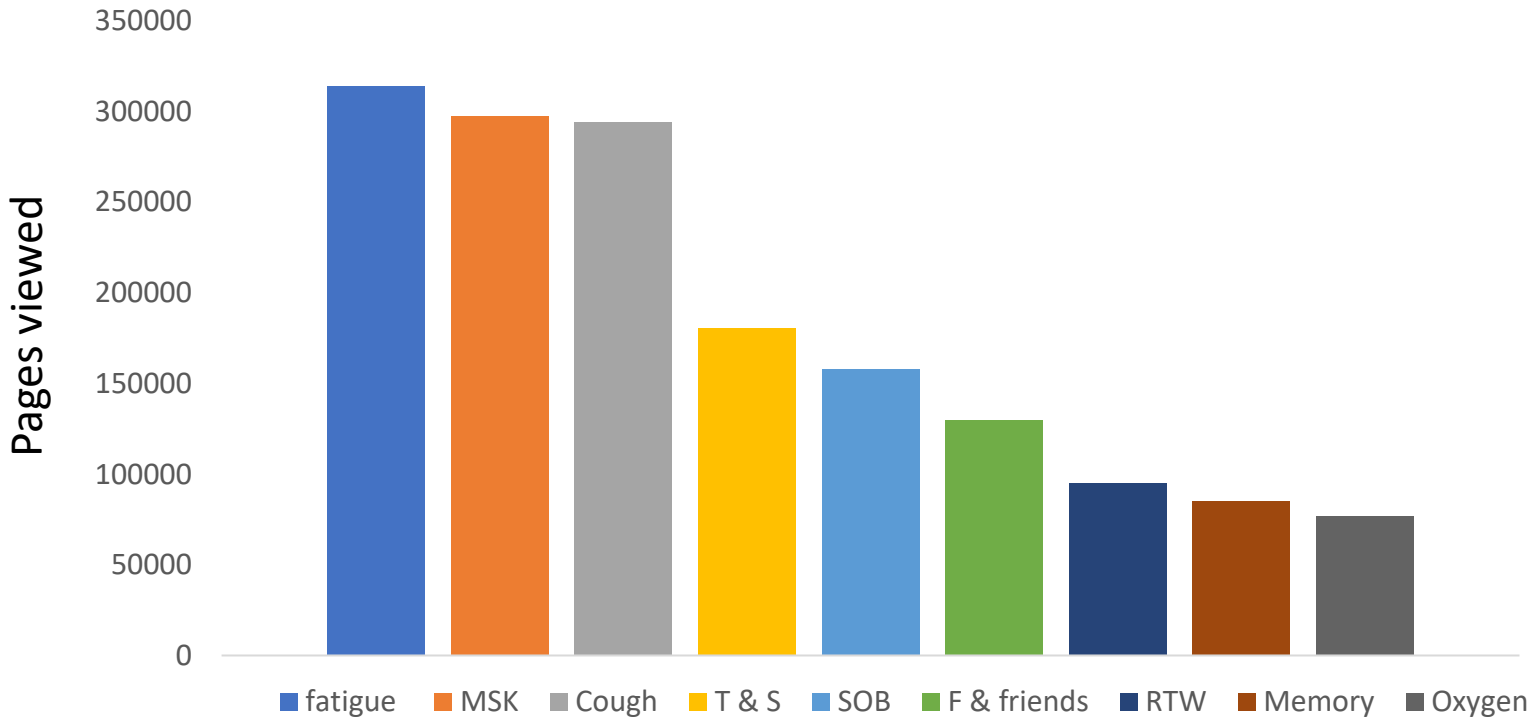
www.yourcovidrecovery.nhs.uk

Health seeking behaviours of the post Covid-19 population (Data from YourCovidRecovery)

Total users to date (1/5/20): 1,387,942
Total individual page views: 3,278,436

UK: 70%
USA: 15%
India: 4%

England city breakdown:
London: 15%
Birmingham: 2%
Manchester: 1.5%



Your COVID Recovery

Early tele-rehabilitation

- Post discharge
- 4/52 home based
- 1 hour aerobic ex/day

- 2 x week physio video call

- Daily monitoring by nurse for first 2/52

- N=25 (24 completed)

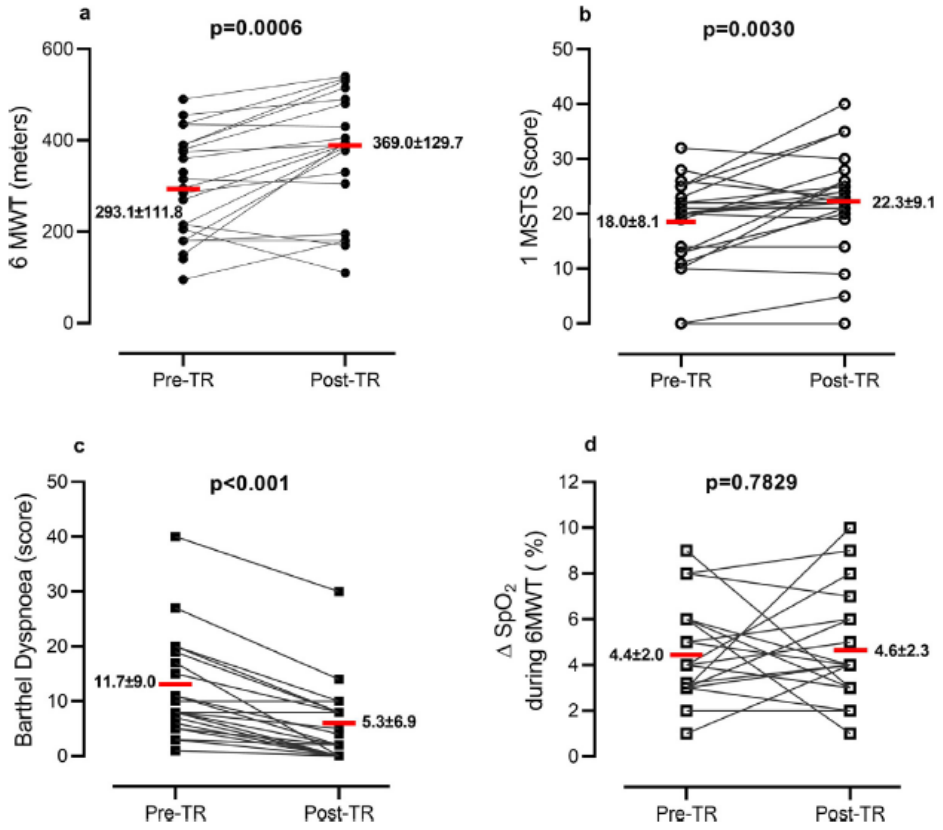
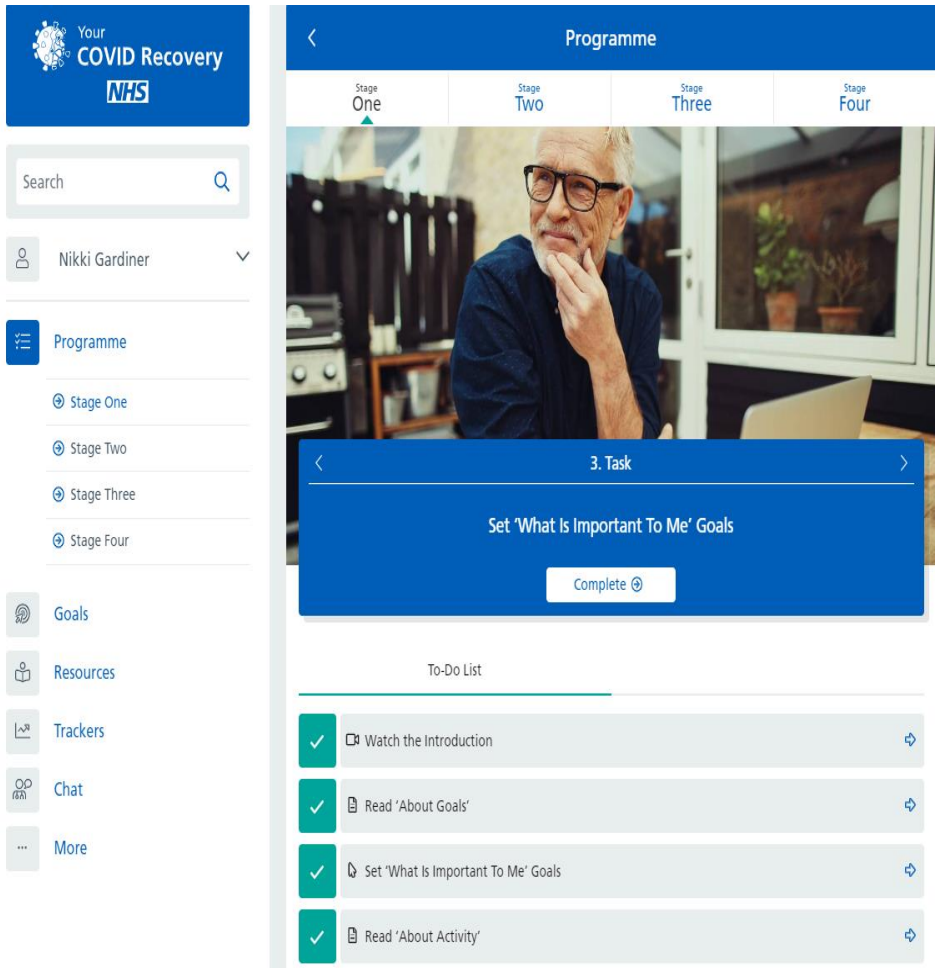
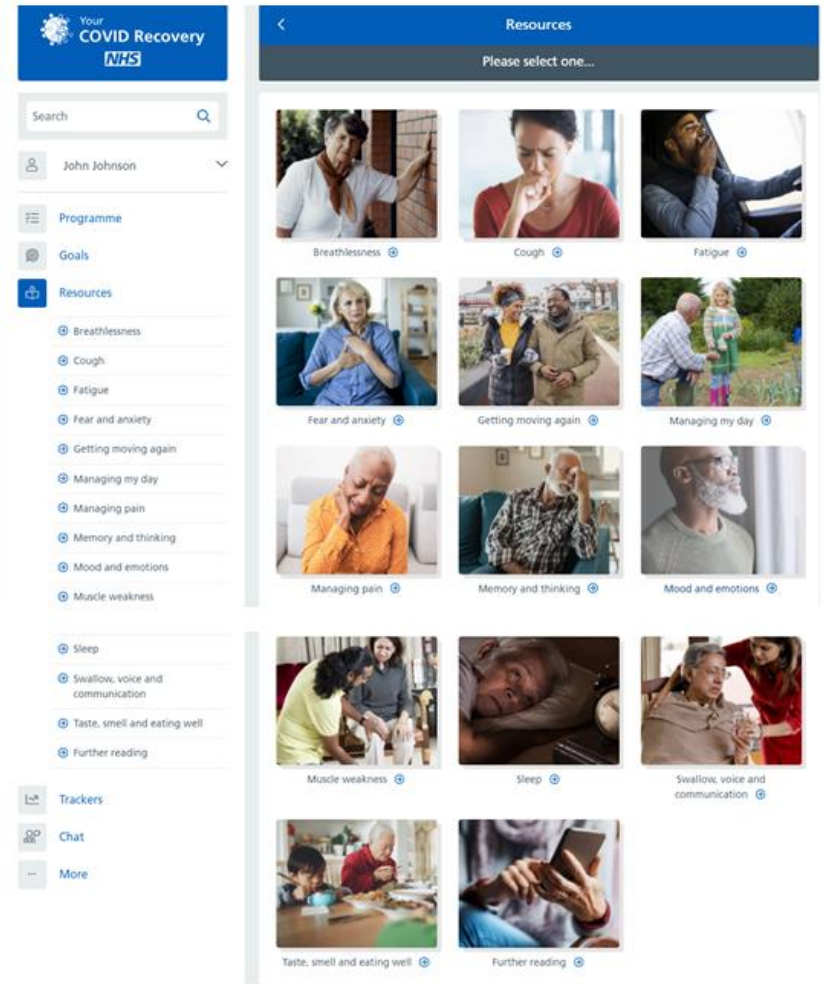


Figure 1 Individual changes in outcome measures between admission (pre-TR) and discharge from (post-TR) the program. Red bar represents the mean data.
Legend: 6MWT = 6 min Walking Distance; 1MSTS = 1 min Sit-to-Stand.

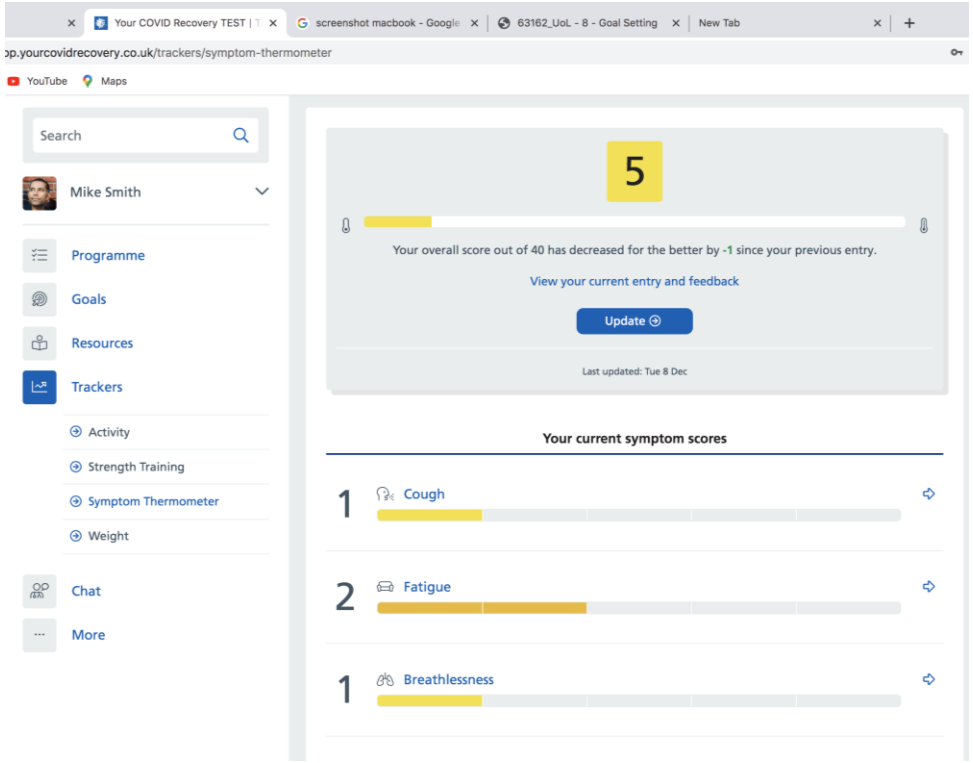
Paneroni M et al. Pulmonology 2021

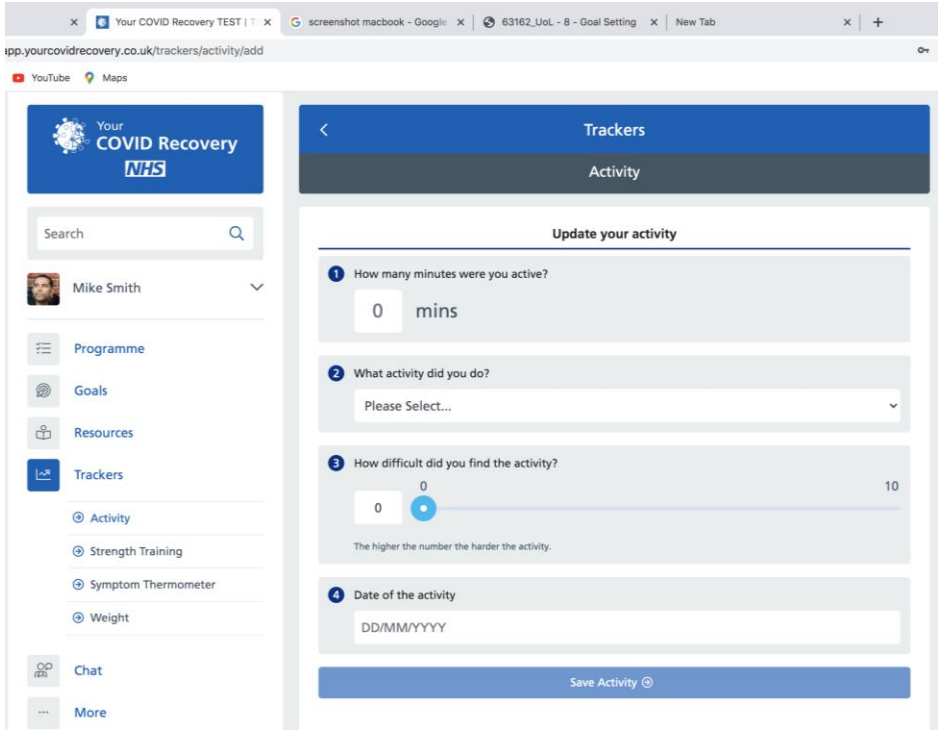
Your
COVID Recovery



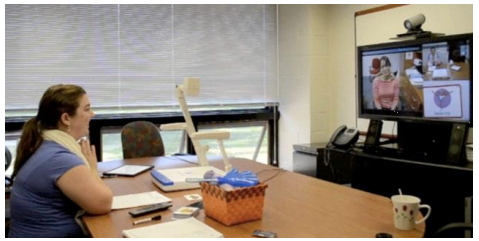


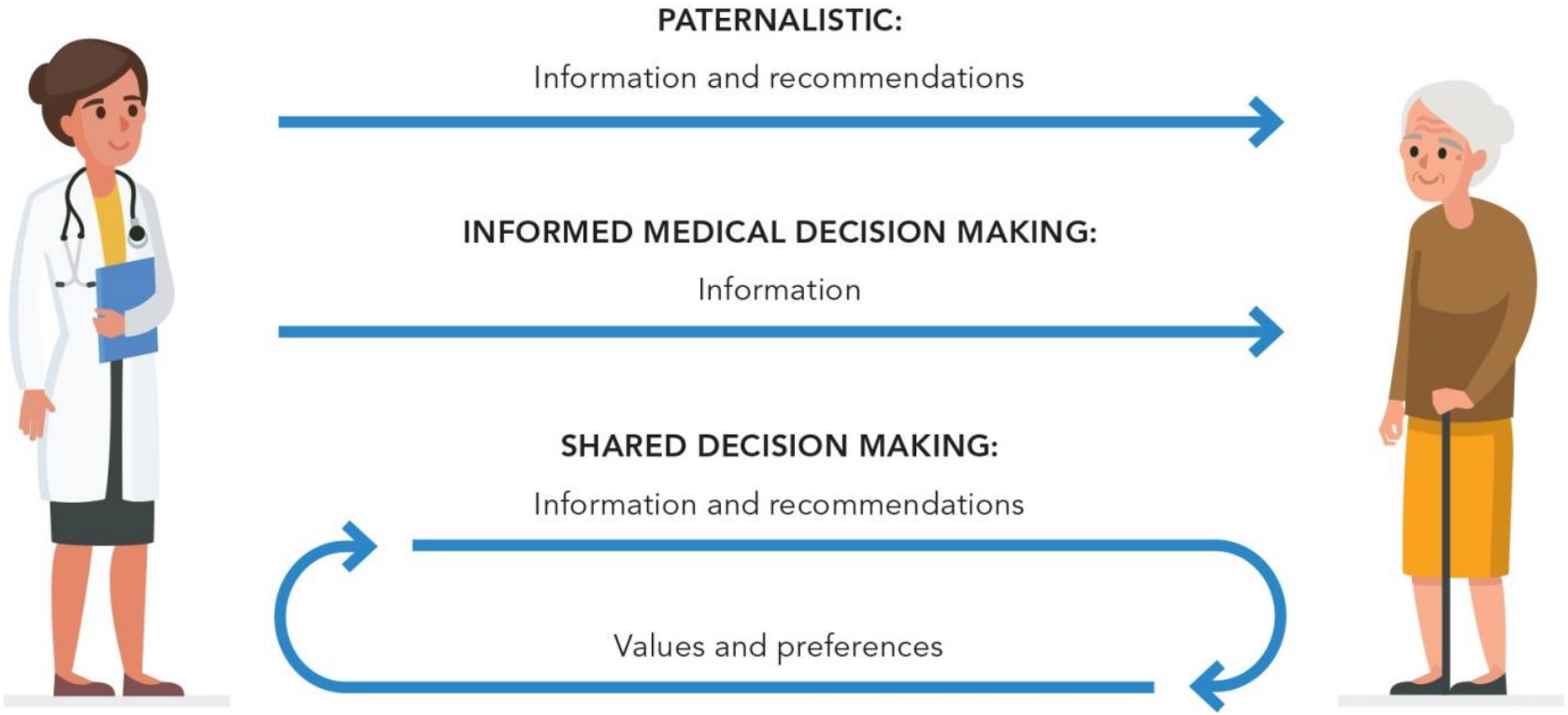
Symptom monitoring and trackers





Shared Decision Making





Summary

The COVID-19 pandemic

Promoted the development of digital models of delivery of pulmonary rehabilitation - the evidence base needs to be strengthened.

challenged rehabilitation services to accommodate the post COVID-19 population.

Services need to accommodate personal preferences of the individuals and develop a ‘menu of options.

Research needed to develop engaging digital interventions to support symptom reduction and behavior change.