

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

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:

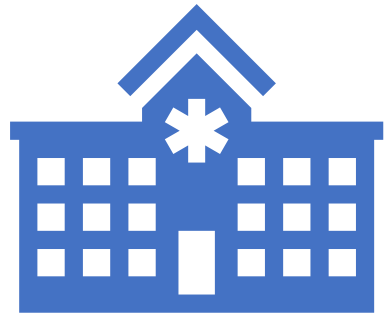
Participation in a company sponsored bureau:

Stock shareholder:

Spouse / partner:

Other support / potential conflict of interest:

Pre, during and post (?) the pandemic

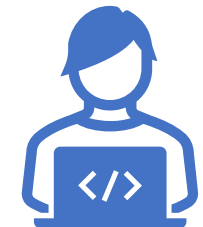
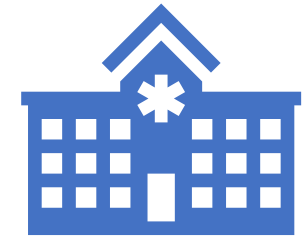
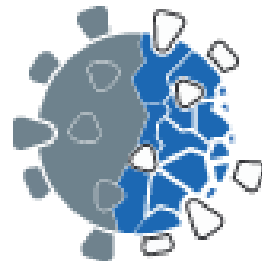


Strong evidence base
Guidance

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



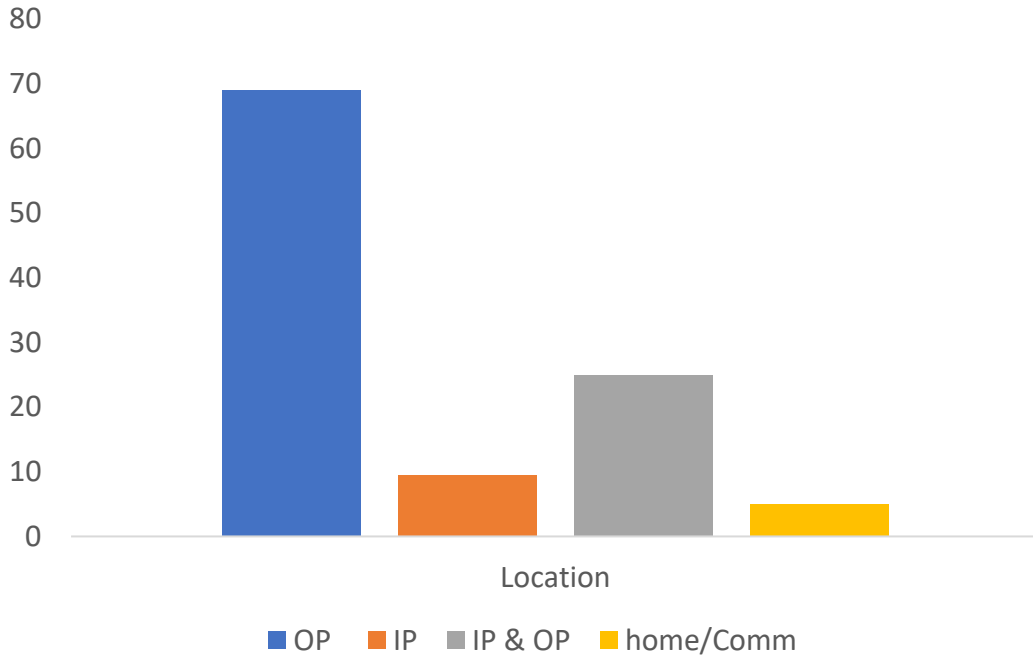
Limited evidence
Limited guidance



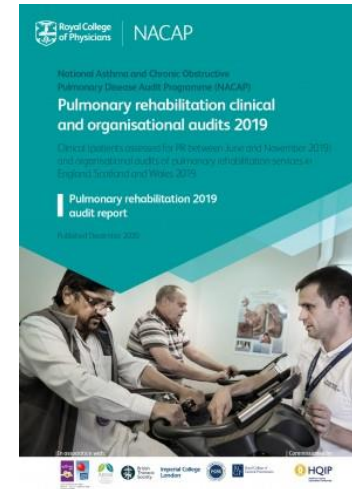
Potential to increase scope
Health inequalities/ digital competency



Pre COVID-19



430 centres from 40 countries¹



Programme location²

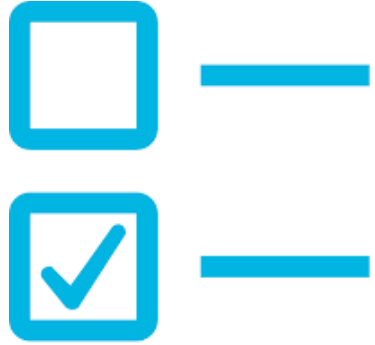
97.9% of PR programmes offered were centre-based.

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

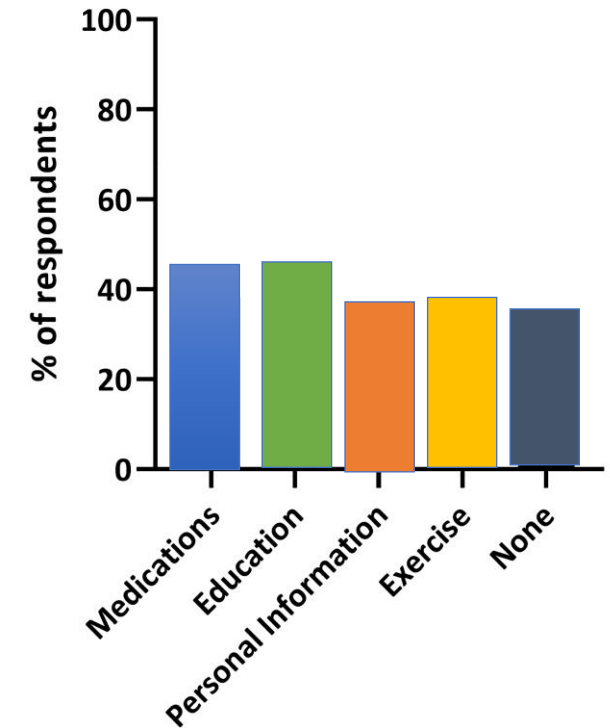
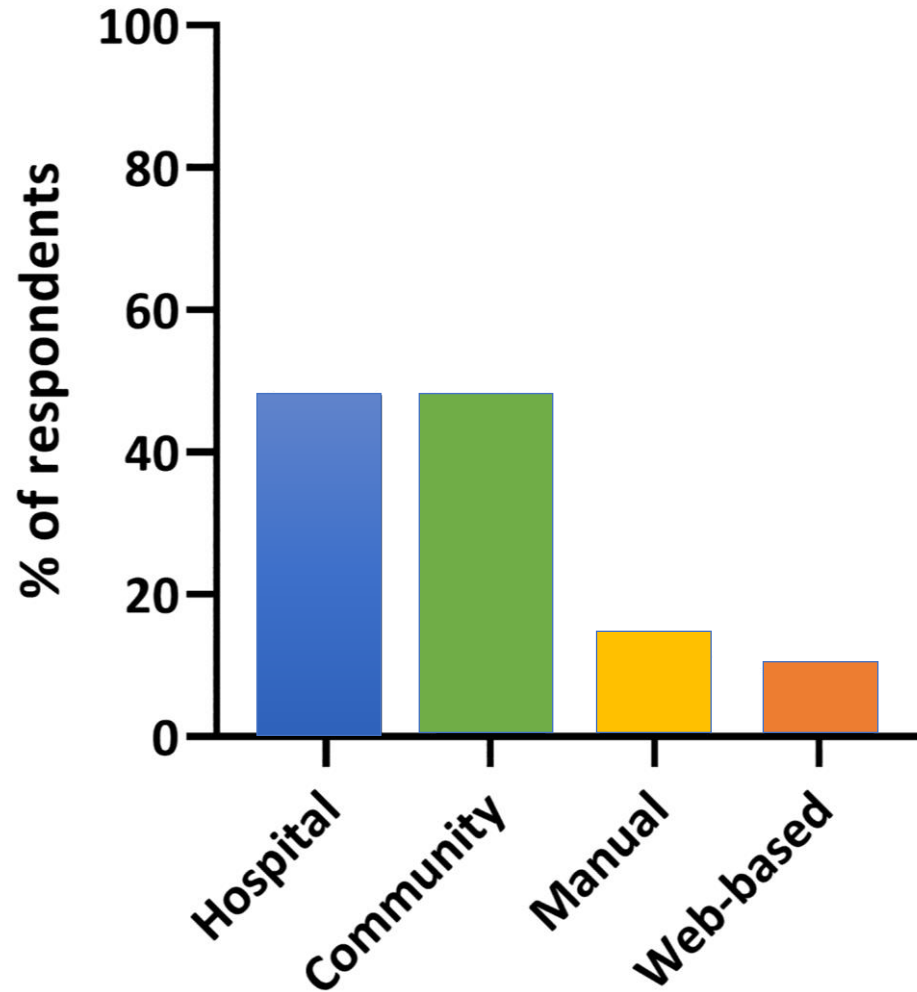
1. Spruit MA et al. Differences in content and organisational aspects of pulmonary rehabilitation programmes., *ERS Rehabilitation and Chronic Care, and Physiotherapists Scientific Groups., American Association of Cardiovascular and Pulmonary Rehabilitation., ATS Pulmonary Rehabilitation Assembly and 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

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).

Nothing new

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

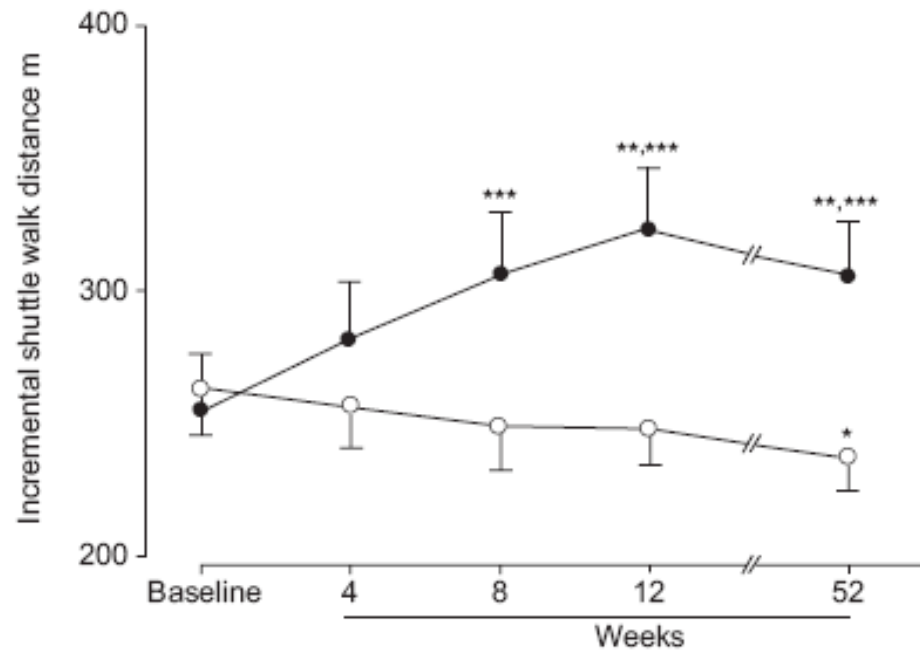
ISWT performed to identify speed of walking and music identified at correct tempo and installed on phone

Control group - advice only

RESULTS

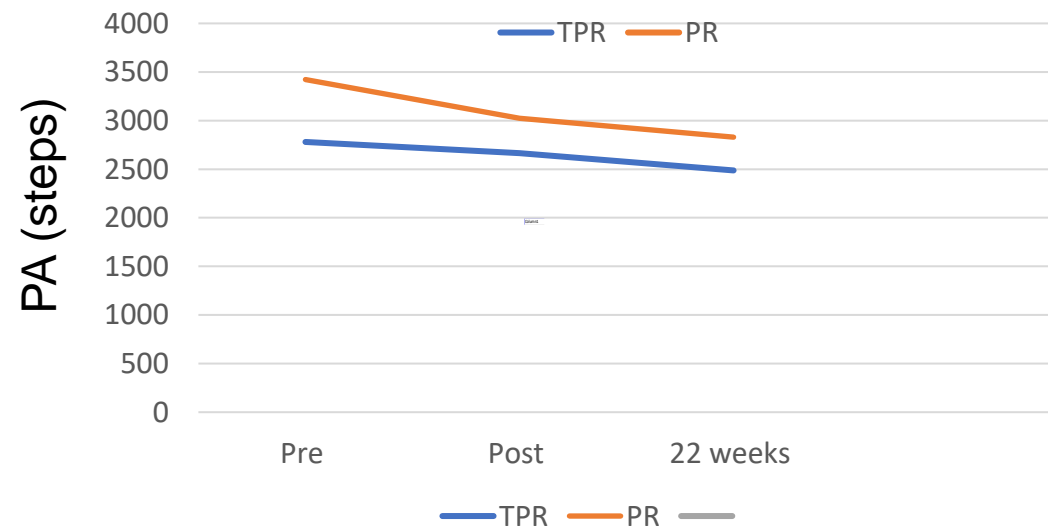
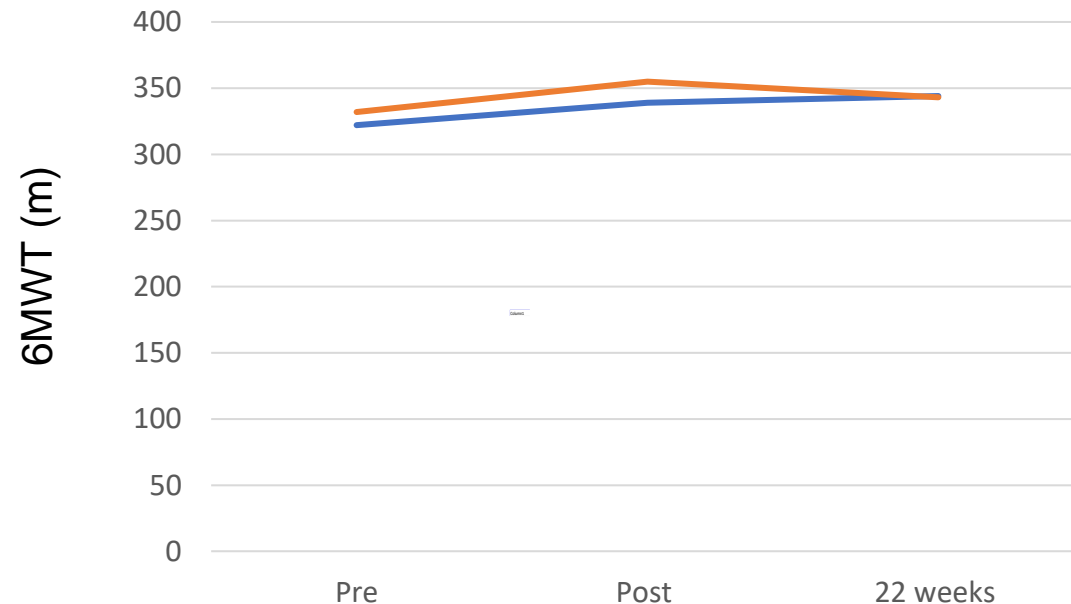
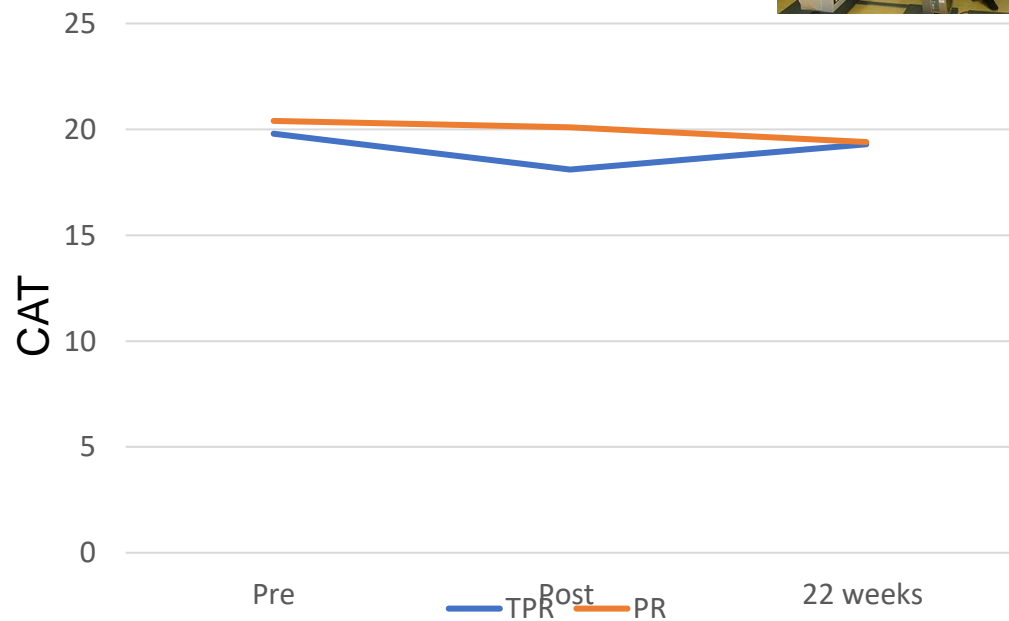
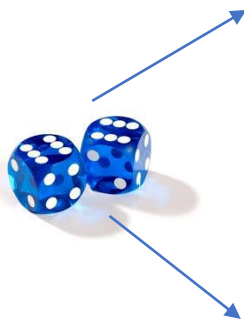
Significant increase in distance at 8/52, 12/52 (255.8m – 307.1m-324.2m)

Improvements in QOL (SF-12)



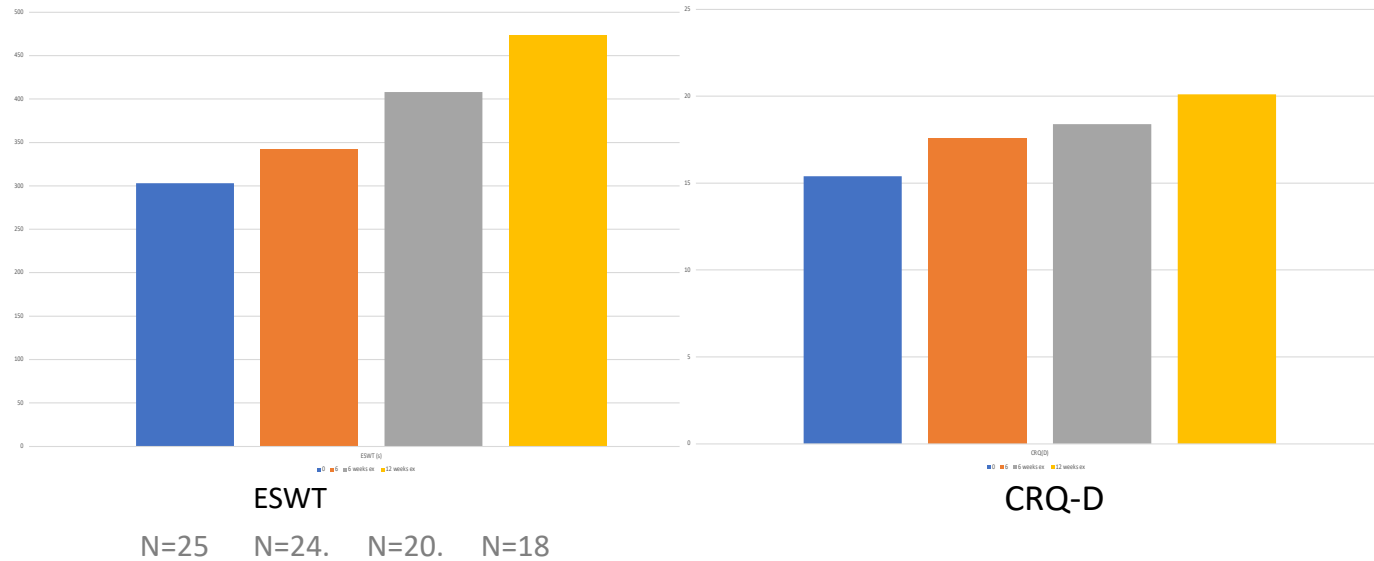
Supervised pulmonary tele-rehabilitation versus PR

N=134
 FEV₁= 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.

Novel technology



“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

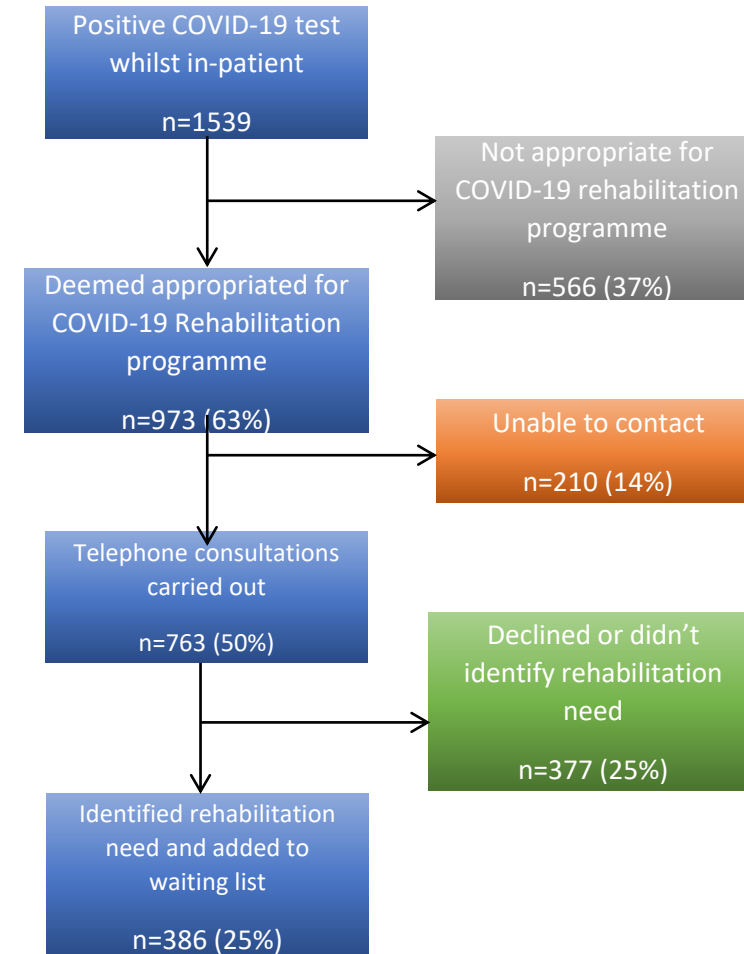
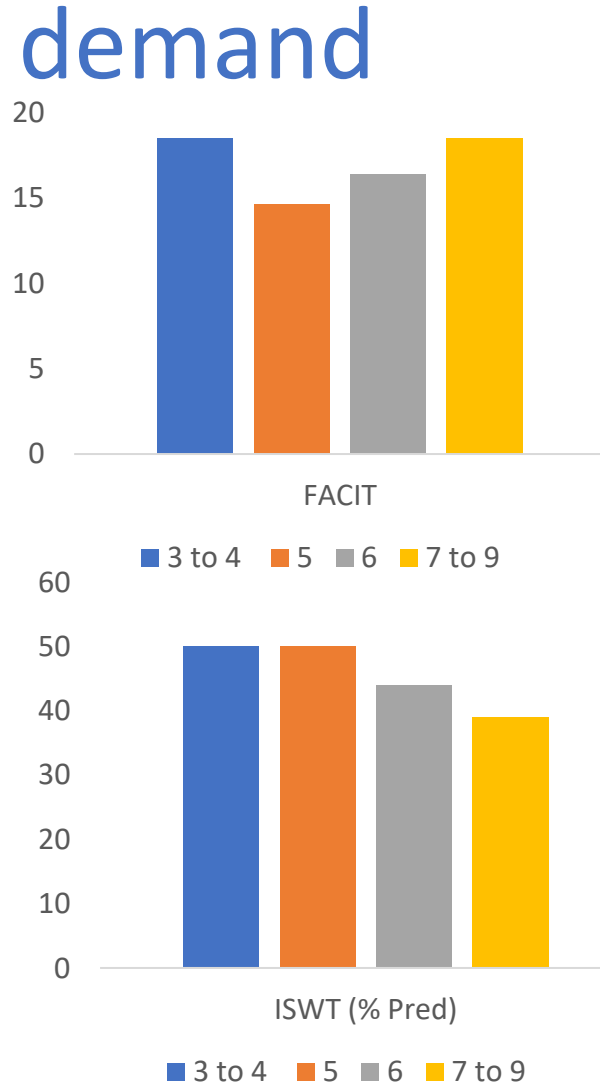


1,170 patients
 35.7% female
 mean [SD] age 58 [13]yrs
 68.6% white ethnicity

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

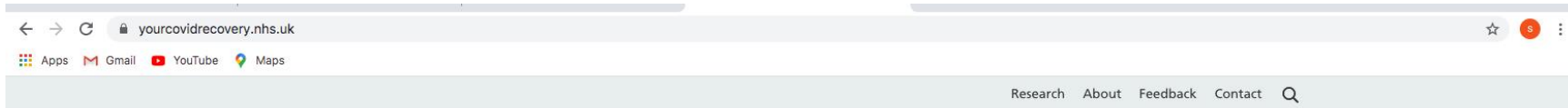


WHO = World Health Organisation. Category 3-4 = no continuous supplemental oxygen needed, 5= continuous supplemental oxygen only, 6= Continuous or Bi-level Positive Airway Pressure ventilation or High Flow Nasal O₂, 7-9 = Invasive Mechanical Ventilation or other organ support

1. Evans R.A et al Physical, cognitive and mental health impacts of COVID-19 following hospitalisation – a multi-centre prospective cohort study. Medrxiv 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



What is
COVID-19?

Managing
The Effects

Your
Wellbeing

Your Road To
Recovery



Supporting your recovery after COVID-19

As you find yourself recovering from COVID-19 you may still be coming to terms with the impact the virus has had on both your body and mind.

These changes should get better over time, some may take longer than others, but there are things you can do to help.

Your COVID Recovery helps you to understand what has happened and what you might expect as part of your recovery.



Information for family, friends and carers

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%

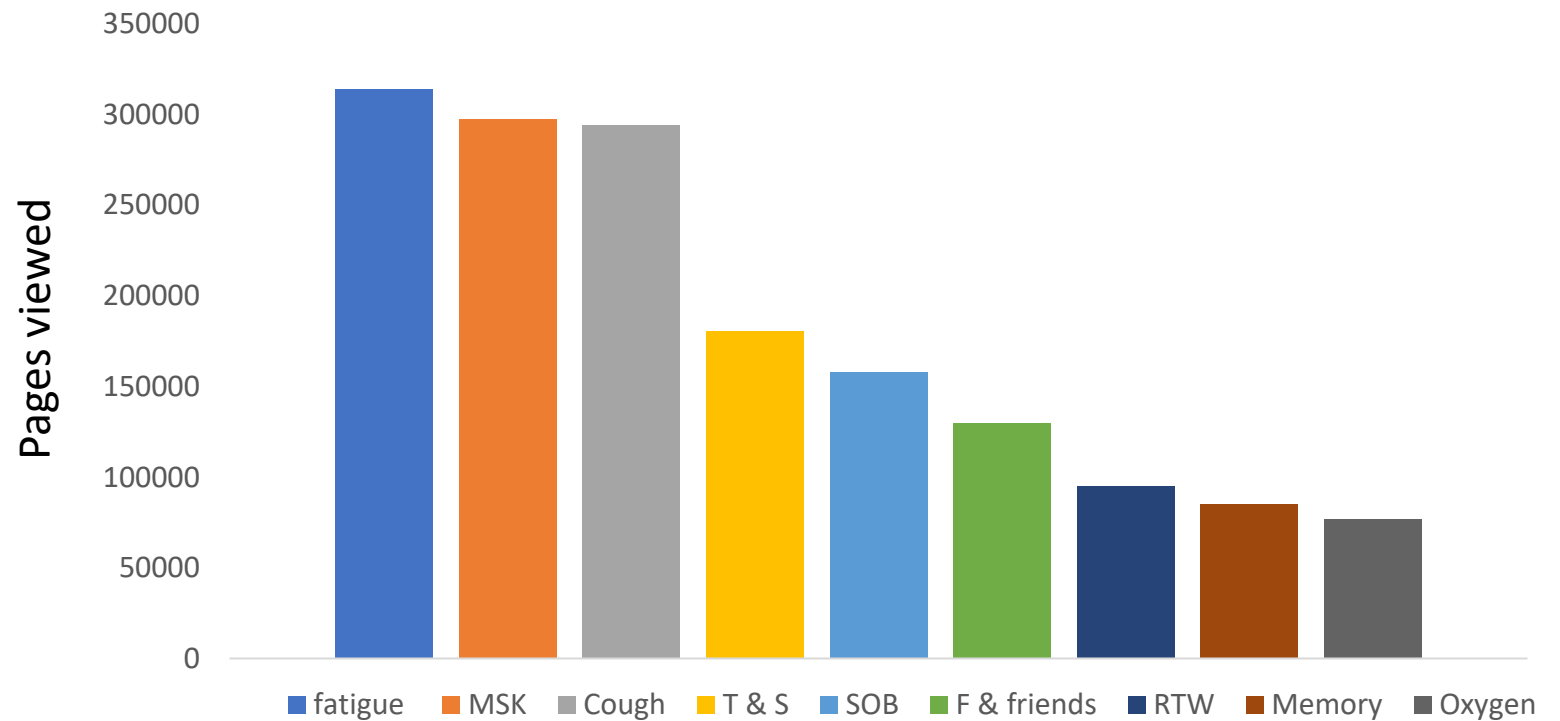
India: 4%

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)

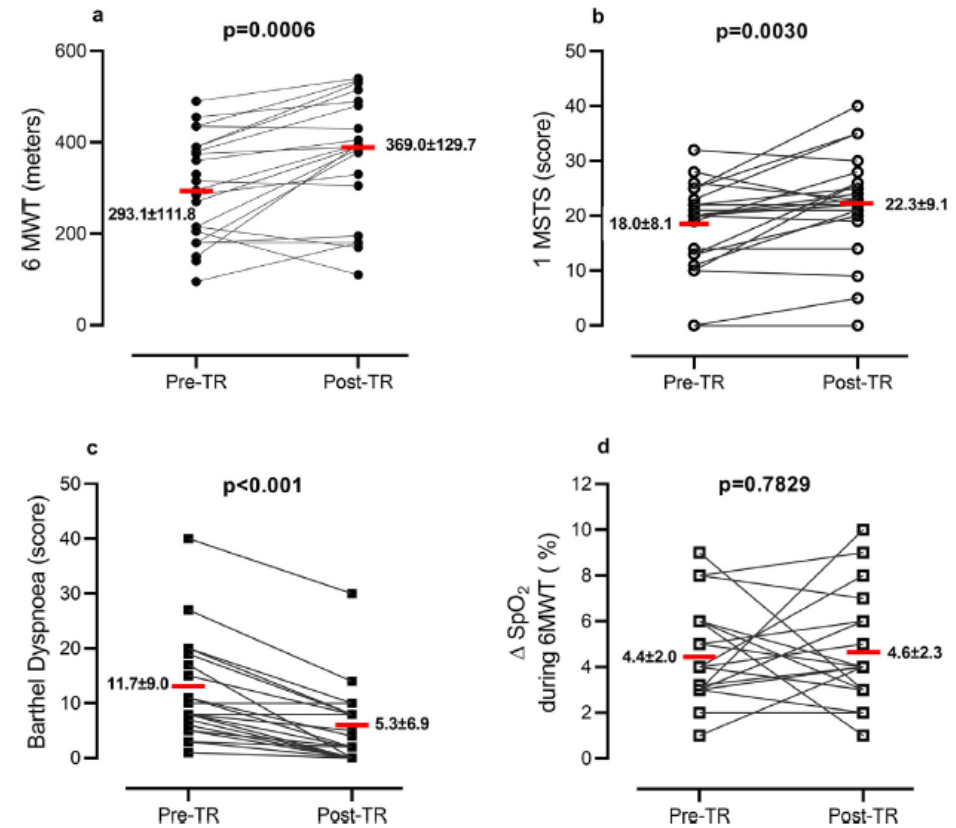
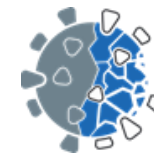


Figure 1 Individual changes in outcome measures between admission (pre-TR) and discharge from (post-TR) the program. Red bar represents the mean data.

Legend: 6MWT = 6 min Walking Distance; 1MSTS = 1 min Sit-to-Stand.



Your COVID Recovery



Search

Nikki Gardiner

Programme

Stage One

Stage Two

Stage Three

Stage Four

Goals

Resources

Trackers

Chat

More

Programme

Stage One

Stage Two

Stage Three

Stage Four



3. Task

Set 'What Is Important To Me' Goals

Complete

To-Do List

- Watch the Introduction
- Read 'About Goals'
- Set 'What Is Important To Me' Goals
- Read 'About Activity'



Search

John Johnson

Programme

Goals

Resources

Breathlessness

Cough

Fatigue

Fear and anxiety

Getting moving again

Managing my day

Managing pain

Memory and thinking

Mood and emotions

Muscle weakness

Sleep

Swallow, voice and communication

Taste, smell and eating well

Further reading

Trackers

Chat

More

Resources

Please select one...



Breathlessness



Cough



Fatigue



Fear and anxiety



Getting moving again



Managing my day



Managing pain



Memory and thinking



Mood and emotions



Muscle weakness



Sleep



Swallow, voice and communication



Taste, smell and eating well



Further reading

Symptom monitoring and trackers

The screenshot shows the 'Symptom Thermometer' page for user Mike Smith. At the top, a large yellow box displays the score '5'. Below it, a progress bar shows the score is 1/40. A message states: 'Your overall score out of 40 has decreased for the better by -1 since your previous entry.' There is a 'View your current entry and feedback' link and an 'Update' button. The page is last updated on Tue 8 Dec. Below this is a section titled 'Your current symptom scores' with three items:

- 1 Cough: Progress bar is approximately 1/10.
- 2 Fatigue: Progress bar is approximately 2/10.
- 1 Breathlessness: Progress bar is approximately 1/10.

The left sidebar contains navigation options: Programme, Goals, Resources, Trackers (selected), Activity, Strength Training, Symptom Thermometer, Weight, Chat, and More.

The screenshot shows the 'Activity Tracker' page for user Mike Smith. The page is titled 'Trackers' and 'Activity'. It features a section 'Update your activity' with four steps:

- 1 How many minutes were you active? Input: 0 mins.
- 2 What activity did you do? Dropdown menu: Please Select...
- 3 How difficult did you find the activity? Slider: 0 to 10. Text below: 'The higher the number the harder the activity.'
- 4 Date of the activity: Input field: DD/MM/YYYY.

At the bottom is a 'Save Activity' button. The left sidebar is identical to the previous screenshot.

Shared Decision Making



PATERNALISTIC:

Information and recommendations



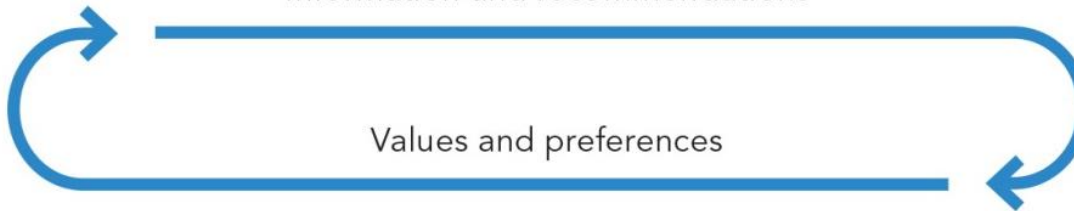
INFORMED MEDICAL DECISION MAKING:

Information



SHARED DECISION MAKING:

Information and recommendations



Values and preferences

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.

