**Supplement 2.1. Comprehensive information of included studies that reported quantitative results**

| **Study** *(year)*<br>**Country** | **Study aim**<br>**Study period** | **Design**<br>**Comparison**<br>*(where relevant)* | **Target population**<br>**Sample size**<br>**Age** *(years)* | **Intervention description** | **Setting**<br>**Delivery format** | **Study outcomes and results** | |
|---|---|---|---|---|---|---|---|
| Al Moamary (2012) (1)<br>Saudi Arabia | Examine the effects of a PR program on healthcare utilisation.<br><br>1 Jul 2004 – 15 Jan 2008 | Pre-post study (retrospective audit) | ILD, bronchiectasis, severe asthma, scoliosis<br><br>32<br>ILD=21<br><br>Mean age (SD):<br>ILD=61.0 (9.4) | PR program<br>• Duration: 8-12 weeks<br>• Frequency: 2-3 times/week<br>• Number of sessions: 18-24<br><br>Components:<br>• Supervised exercise training<br>• Patient education<br>• Psychosocial support | Outpatient<br><br>• In person<br>*Unclear whether it was in group or individual setting* | Healthcare utilisation:<br>• ED visits – change not significant.<br>• Pulmonary outpatient department visits – number reduced 12 months after PR compared to 12 months pre-PR. |  |
| | | | | | | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>• Distances logged on treadmill, arm ergometer and bicycle – improved following PR. |  |
| | | | | | | Treatments:<br>• Short-acting bronchodilator inhalers – change not significant.<br>• Cumulative prednisone dose – change not significant.<br>• Antibiotics courses – change not significant. |  |
| Archibald *et al* (2021) (2)<br>Canada | Examine the effects of participant characteristics, components and timing of palliative care, and carer engagement on location of death.<br><br>1 Jan 2012 – 25 Apr 2019 | Cohort study (retrospective audit)<br><br>Participants died at home/hospice<br>vs<br>Participants died at hospital | Various ILD<br><br>92<br>Died at home/hospice=57<br>Died at hospital=35<br><br>Mean age (SD):<br>Died at home/hospice=73 (8.9) | Palliative care bundle including clinic/home visits and teleconferences<br>• Days between first visit and death: participants died at home/hospice= median 318 (ranged 121-728); participants died at hospital= median 492 (ranged 237-1001)<br>• Number of visits: mean 4.5 (4.2) visits at home/hospice; 4.3 (3.5) visits at hospital | Inpatient / outpatient / home<br><br>• In person/remote<br>• Individual | Treatments:<br>• Use of OT and opioids at death – significantly more of those who died at home/hospice used opioids for dyspnoea before death (88% vs 60%); but no difference between groups for OT (95% vs 91%).<br>• Time of OT initiation – those who died at home/hospice initiated OT 5 months earlier than those died at hospital, however, difference between groups not significant. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Died at hospital=68 (10.5) | Components:<br>• Palliative care<br>• Advance care planning<br>• Allied health home care program | | • Time of opioids initiation – those who died at home/hospice initiated opioids 2 months earlier than those died at hospital, however, difference between groups not significant. | |
| | | | | | | Healthcare utilisation:<br>• Home care enrolment – significantly more of those who died at home/hospice used home care before death (100% vs 86%).<br>• Time of home care enrolment – those who died at hospital enrolled in home care 1 month earlier than those died at home/hospice, however, difference between groups not significant. |  |
| | | | | | | EOL planning:<br>• ACP – significantly more of those who died at home/hospice discussed ACP, goals of care designation, place of care, place of death, and had carer engaging in ACP discussion compared to those who died at hospital.<br>• Time of ACP initiation – difference between groups not significant. |  |
| Arizono *et al* (2017) (3)<br>Japan | Compare the effects of a PR program in people with COPD and IPF on exercise capacity, dyspnoea and HR-QoL.<br><br>Apr 2008 - Mar 2012 | Pre-post study (prospective)<br><br>IPF<br>vs<br>COPD | IPF, COPD<br><br>52<br>IPF=24<br><br>Mean age (SD):<br>IPF=70.5 (5.9) | PR program<br>• Duration: 10 weeks<br>• Frequency: twice/week<br>• Number of sessions: 20<br><br>Components:<br>• Supervised exercise training<br>• Patient education | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD, ISWD, Wmax, endurance time, QF – improved following PR. |  |
| | | | | | | Symptoms:<br>• BDI – improved following PR. |  |
| | | | | | | HR-QoL:<br>• SGRQ – improved following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bajwah *et al* (2015) (4)<br>UK | Examine the effects of Hospital2Home program on palliative care concerns and evaluate the feasibility and acceptability of the intervention.<br><br>Oct 2011 - Dec 2013 | Mixed methods:<br>• Phase II fast-track RCT<br>• Semi-structured interviews<br><br>Case conference within 1 week (IG)<br>vs<br>Case conference at 4 weeks (CG) | IPF (82% in CG; 85% in IG), fibrotic non-specific interstitial pneumonia<br><br>98<br>CG – patients=27; carers=26<br>IG – patients=26; carers=19<br><br>Mean age (SD):<br>CG – patients=70.6 (10.3); carers=60.3 (13.1)<br>IG – patients=67.1 (10.9); carers=61.3 (14) | One case conference with 3 follow ups (Hospital2Home)<br>• Duration of intervention: 2 months<br>• Frequency of follow ups: at 2 weeks, 1 month and 2 months<br>• Duration of case conference: approximately 90min<br><br>Components:<br>• Palliative care<br>• Discussions of physical, psychological, social, spiritual concerns<br>• Individualised care plan<br>• EOL planning<br>• Goal setting<br>• Patient education | Home<br><br>• Remote<br>• Individual | HR-QoL:<br>• Palliative care outcome scale – palliative care concerns (symptom control, psychosocial needs, practical needs, communication and information needs) improved in IG following intervention; improvement sustained at week 8; also improved in CG once intervention was delivered.<br>• K-BILD – improved in IG following intervention; improvement sustained at week 8; also improved in CG once intervention was delivered.<br>• SGRQ – impact and total scores improved in IG following intervention; symptoms, impact and total scores also improved in CG once intervention was delivered; change in activity scores not significant. |  |
| | | | | | | Symptoms:<br>• D12 – change not significant in IG; scores improved in CG once intervention was delivered.<br>• MMRC – change not significant in both groups.<br>• Zarit Burden Inventory (measuring carer burden) – change not significant at week 4; but improved in CG once intervention was delivered. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – anxiety and depression improved in patients in IG following intervention; improvement |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | sustained at week 8; also improved in CG once intervention was delivered. For carers: borderline improvement in both groups. | |
| | | | | | | EOL planning:<br>• Preferred place of care – achieved in 100% of participants in IG compared to 84% in CG.<br>• Preferred place of death – achieved in 88% of participants in IG compared to 77% in CG. |  |
| Bassi *et al* (2021) (5)<br>Italy | Examine the effects of a multidisciplinary palliative care program on physical and psychological symptoms and HR-QoL.<br><br>Oct 2016 – Sep 2019 | RCT<br><br>Palliative care (IG)<br>vs<br>No palliative care (CG) | Various ILD (36% IPF)<br><br>50<br>CG=25<br>IG=25<br><br>Mean age (SD):<br>CG=77.4 (6.9)<br>IG=74.4 (8.6) | Multidisciplinary palliative care with rehabilitation program<br>• Duration: 12 months<br>• Frequency: meeting with HCPs every 6 weeks<br><br>Components:<br>• Palliative care<br>• Discussion regarding understanding of disease and prognosis<br>• Establishing goals of care<br>• Supervised exercise training<br>• Breathing control techniques<br>• Unsupervised home exercise with individualised instructions | Outpatient<br><br>• In person/remote<br>• Individual | Symptoms:<br>• Borg scale – change not significant at 6 and 12 months in IG; significantly declined in CG at both time points.<br>• Cough (VAS) – declined in both IG and CG at 12 months. |  |
| | | | | | | Psychological wellbeing:<br>• CES-D - change not significant at 6 and 12 months in IG; declined in CG at both time points. |  |
| | | | | | | HR-QoL:<br>• Maugeri Respiratory Questionnaire – change not significant at 6 and 12 months in IG; declined in CG at 12 months. |  |
| | | | | | | Exercise/functional capacity:<br>• Chair sit-and-reach test (lower body flexibility) – change not significant in both groups.<br>• 30s chair-stand test (strength) – change not significant in both groups. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bischoff *et al* (2021) (6)<br>USA | Examine the effects of a multidisciplinary palliative care model on access to palliative care including treatments and ACP.<br><br>May 2018 – Feb 2020 | Mixed methods:<br>• Longitudinal<br>• Open-ended interviews<br>• Focus group of clinicians | Various ILD (15% IPF)<br><br>31<br><br>Mean age (95% CI):<br>75.8 (72.4 – 79.2) | Multidisciplinary specialty palliative care model including meeting with a multidisciplinary healthcare team and follow up telephone calls<br>• Duration: median 9.9 months (ranged 2.7-19.7)<br>• Number of visits: median 3 (ranged 1-9)<br><br>Components:<br>• Palliative care<br>• Managing physical and psychological symptoms<br>• Assessing and promoting function including referral to PR<br>• Discussion of the disease, treatment options and prognosis<br>• Psychosocial support<br>• Managing medications<br>• ACP and advance directives | Outpatient / home<br><br>• In person/remote<br>• Individual | EOL planning:<br>• ACP and advance directives – documentation of ACP, advance directives and physician orders for life sustaining treatment increased following the intervention. | |
| | | | | | | Treatments:<br>• Opioids – prescription of opioids for dyspnoea increased from 0% to 51.6%. | |
| Brunetti *et al* (2021) (7)<br>Italy | Identify predictors of success from a PR program.<br><br>2010 -2019 | Pre-post study (retrospective audit) | Various ILD (45.8% IPF)<br><br>240<br><br>Mean age (SD):<br>71 (8.7) | PR program<br>• Duration: 3-4 weeks<br>• Frequency: 5 times/week, ≥2 sessions/day<br>• Number of sessions: mean 23 (11.3)<br><br>Components:<br>• Supervised exercise training<br>• Patient education<br>• Nutritional program<br>• Psychosocial counselling | Inpatient<br><br>• In person<br>• Individual | Exercise/functional capacity:<br>• 6MWD – improved following PR; improvement sustained in only 14 participants 10.3 (3.5) months after PR. | |
| | | | | | | Symptoms:<br>• Borg scale – dyspnoea and leg fatigue improved following PR.<br>• MMRC – improved following PR. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Cerdán-de-las-Heras *et al* (2021) (8)<br>Denmark | Investigate the effect of a tele-rehabilitation program on exercise capacity.<br><br>Sep 2017 - Apr 2018 | RCT<br><br>Tele-rehabilitation program (IG)<br>vs<br>No tele-rehabilitation program (CG) | IPF<br><br>29<br>CG=14<br>IG=15<br><br>Mean age (SD):<br>CG=72.4 (7.6)<br>IG=70.1 (8.8) | Tele-rehabilitation program<br>• Duration: 12 weeks<br>• Frequency: 3-5 times/week<br>• Number of sessions: 36-60<br><br>Components:<br>• Exercise training supervised by a virtual autonomous physiotherapist agent<br>• Recording of physical data and access to patient digital files<br>• Video consultation and chat sessions with a physiotherapist<br>• Patient education<br><br>Materials used:<br>• Mobile application<br>• Tablet<br>• E-learning packages | Home<br><br>• Remote<br>• Individual | Exercise/functional capacity:<br>• 6MWD – within group difference not significant in IG but declined in CG over the 9-month observation period. Between groups differences were significant at 3 and 6 months. |  |
| | | | | | | Physical activity:<br>• 7-day pedometry – difference between groups not significant over the observation period.<br>• 7-day vector magnitude counts per minute – difference between groups not significant over the observation period. |  |
| | | | | | | Psychological wellbeing:<br>• GAD-7 – difference between groups not significant over the observation period. |  |
| | | | | | | HR-QoL:<br>• SGRQ – difference between groups not significant over the observation period.<br>• K-BILD – difference between groups not significant over the observation period. |  |
| Chai *et al* (2022) (9)<br>Singapore | Examine the effect of a palliative care model on healthcare utilisation, allied healthcare referrals, ACP uptake and use of palliative medications. | Cohort study (retrospective audit)<br><br>Palliative care (IG)<br>vs<br>No palliative care (CG) | Various ILD (51% IPF)<br><br>63<br>CG=37<br>IG=26<br><br>Median age (range):<br>CG=76 (69-81) | Palliative care model including visits at a palliative care clinic and home care services<br>Duration: 1 year<br>Frequency of visits: *unclear*<br><br>Components:<br>• Palliative care<br>• Self-management strategies for | Outpatient / home<br><br>• In person<br>• Individual | Healthcare utilisation:<br>• Hospitalisation – difference between the numbers of participants with ≥1 hospitalisation in both groups not significant.<br>• Referral to allied healthcare support – significantly more participants in IG were referred to dieticians, medical social workers and PR services. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Feb 2016 – Mar 2021 | | IG=72 (67-78) | managing physical symptoms<br>• Understanding of disease | | EOL planning:<br>• ACP – significantly more participants in IG completed ACP discussions.<br>• Do not resuscitate order – significantly more participants in IG had an order in place. |  |
| | | | | | | Treatments:<br>• Opioids and benzodiazepines – significantly more participants in IG started on opioids and benzodiazepines during the study period. |  |
| Chéhère *et al* (2019) (10)<br>France | Investigate changes in cardiorespiratory responses during 6MWT; and identify characteristics of non-responders of a PR program.<br><br>Sep 2014 - Jun 2016 | Pre-post study (prospective) | Fibrotic IIP (63% IPF)<br><br>19<br><br>Mean age (SD):<br>65 (9) | PR program<br>• Duration: 8 weeks<br>• Frequency: weekly<br>• Number of home visits: 8<br><br>Components:<br>• Supervised exercise training<br>• Therapeutic patient educational sessions<br>• Psychosocial support<br>• Goal setting<br><br>Materials used:<br>• Interactive presentations with Q & A<br>• Card games<br>• Illustrated printed materials | Home<br><br>• In person<br>• Individual | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | Symptoms:<br>• BDI/TDI – improved following PR. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – change not significant in anxiety and depression. |  |
| | | | | | | HR-QoL:<br>• SF-36 – physical functioning improved following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| da Fontoura *et al* (2018) (11)<br>Brazil | Assess completion rate of a PR program and investigate the characteristics of PR completers and non-completers.<br><br>Jan 2008 - Oct 2010 | Pre-post study (retrospective audit) | Advanced IPF referred to lung transplantation<br><br>48<br><br>Mean age (SD):<br>57.1 (9.7) | PR program<br>• Duration: 12 weeks<br>• Frequency: 3 times/week<br>• Number of sessions: 36 (exercise training); 6 (patient education)<br><br>Components:<br>• Supervised exercise training<br>• Patient education | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | Symptoms:<br>• Borg scale – dyspnoea and leg fatigue improved following PR.<br>• MMRC – improved following PR. |  |
| | | | | | | HR-QoL:<br>• SF-36 – physical functioning, general health, vitality, role emotional, mental health and physical component summary scores improved following PR; change not significant in role physical, bodily pain, social functioning and mental component summary scores. |  |
| Deniz *et al* (2018) (12)<br>Turkey | Examine the impacts of PR and determine whether disease severity influences gains from a PR program.<br><br>Study period:<br>*unclear* | Pre-post study (prospective) | Various ILD (66% IPF)<br><br>57<br><br>Mean age (SD):<br>60 (10) | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week<br>• Number of sessions: 16<br><br>Components:<br>• Supervised exercise training<br>• Breathing, relaxation and stretching exercises<br>• Patient education<br><br>Materials used:<br>• Educational materials | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | Symptoms:<br>• MMRC – improved following PR.<br>• Borg scale – total scores improved following PR. |  |
| | | | | | | HR-QoL:<br>• SGRQ – all domains improved following PR.<br>• SF-36 – physical functioning, role physical, role emotional, mental health, bodily pain and vitality scores improved following PR; changes in social functioning and general health scores not significant. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – anxiety and depression improved following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Devani *et al* (2019) (13)<br>India | Determine the effects of a PR program.<br><br>Study period: *unclear* | Pre-post study (retrospective audit) | Various ILD (28% IPF)<br><br>100<br><br>Mean age (SD):<br>56.3 (14.2) | PR program<br>• Duration: 8 weeks<br>• Frequency: 3 times/week<br>• Number of sessions: 24<br><br>Components<br>• Supervised exercise training<br>• Breathing training<br>• Patient education<br>• Nutritional advice<br>• Psychosocial support | Outpatient<br><br>• In person<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>• Muscle strength – improved following PR. |  |
| | | | | | | HR-QoL:<br>• CRQ – all domains except mastery improved following PR. |  |
| Dowman *et al* (2017) (14)<br>Australia | Examine the impact of exercise training in various disease aetiology and severity; and identify the optimal time for training to reach maximal benefit.<br><br>Nov 2011 - Jun 2014 | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | Various ILD (43% IPF)<br><br>142<br>CG=68<br>IG=72<br><br>Mean age (SD):<br>CG=70 (11)<br>IG=69 (11) | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week<br>• Number of sessions: 16<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Optional educational lectures<br><br>Materials used:<br>• Home exercise diary<br>• Education manual | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD –improved in IG; improvement did not sustain 6 months after PR.<br>• Perceived walking ability – 50% of participants in IG reported improvement compared to 17% in CG.<br>• QF – change not significant. |  |
| | | | | | | HR-QoL:<br>• CRQ – all domains improved in IG following PR; improvement in mastery score did not sustain at 6 months.<br>• SGRQ – symptom, activity and total scores improved in IG following PR; impact and total scores declined at 6 months. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – change not significant in anxiety and depression |  |
| | | | | | | Symptoms:<br>• MMRC – improved in the IPF |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | subgroup following PR.<br>• UCSD-SOBQ score – change not significant.<br>• Perceived symptom improvement – 50% of participants in IG reported improvement compared to 12% in CG. | |
| Duck *et al* (2015) (15)<br>UK<br>Austria | Describe the structure and benefits of IPF Care program in two countries.<br><br>2013 - 2014 | Post intervention evaluation | IPF<br><br>UK=465<br>Austria=27<br><br>Mean age: *unclear* | Patient support program for people prescribed pirfenidone including meeting with a HCP and follow up telephone calls<br>• Frequency:<br>UK – 1 initial telephone call; then weekly or fortnightly for month 1; tailored to the participant thereafter.<br>Austria – 1 initial telephone call and 1 in person meeting; then weekly or fortnightly for month 1; monthly for month 2-4; once every 4-6 weeks thereafter with additional in person meeting once every 6-8 weeks as required<br><br>Components:<br>• Patient education and support<br>• IPF care meeting with other patients, family and friends, and IPF experts (Austria only)<br><br>Materials used:<br>• Information booklets<br>• 'My health journal' booklet<br>• Visit log (completed by nurse to document issues with the disease or treatment; | Outpatient / home<br><br>• In person/remote<br>• Individual | Treatments:<br>• Participant remaining on treatment – 49% of those in the UK successfully titrated treatment to a stable dose at 19 months; 96% of those in Austria stayed on treatment for ≥ 3 months. | N/A |
| | | | | | | Self-efficacy:<br>• Participants reported higher rating on statements: 'I feel in control of my condition'; 'I know what to expect from treatment'; and 'I feel confident about how my disease is managed' 4 weeks after taking part in the program. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | participants encouraged to bring the log to their clinic appointments) | | | |
| Edwards *et al* (2020) (16)<br>US<br>Ireland | Test the acceptability of using the patientMpower application with home spirometry and explore participants' 1-year experience of the intervention.<br><br>Study period: *unclear* | Post intervention evaluation | Fibrotic lung disease<br><br>US=27<br>Ireland=13<br><br>Mean age (range):<br>US=62 (31-79)<br>Ireland=64 (33-91) | Digital platform (patientMpower) to facilitate home-based spirometry and symptom monitoring<br>• Duration: ≥ 6 weeks<br>• Frequency: daily spirometry<br><br>Components:<br>• Self-monitoring and recording of FVC, breathlessness, step count, medication adherence, symptoms and impact of IPF on daily life<br>• Home spirometry<br><br>Materials used:<br>• Mobile application<br>• Spirometer<br>• YouTube video training on using the application and spirometer | Home<br><br>• Remote<br>• Individual | Treatments:<br>• 66% reported that the intervention helped them take the correct dose of medication at the prescribed time and achieve personal exercise goals. | N/A |
| | | | | | | HR-QoL:<br>• 93% reported positive effect of using the intervention on wellbeing and daily life.<br>• 86% reported that the intervention was useful for recording the impact of PF on wellbeing and daily life. | N/A |
| Elganady *et al* (2020) (17)<br>Egypt | Investigate the impact of a PR program on functional capacity, dyspnoea and HR-QoL.<br><br>Study period: *unclear* | Pre-post study (prospective) | Various ILD<br><br>20<br><br>Mean age (SD):<br>50.3 (8.7) | PR program<br>• Duration: 6 weeks<br>• Frequency: 3 times/week<br>• Number of sessions: 18<br><br>Components:<br>• Supervised exercise training<br>• Breathing exercise<br>• Patient education<br>• Instructions for disease self-management including | Outpatient<br><br>• In person<br>*Unclear whether it was in group or individual setting* | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>• Peripheral muscle strength and endurance – improved following PR. |  |
| | | | | | | Symptoms:<br>• MMRC – improved following PR. |  |
| | | | | | | HR-QoL:<br>• SGRQ – improved following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | prevention and early recognition of an exacerbation | | | |
| Ferreira *et al* (2006) (18)<br>USA | Compare outcomes of a PR program in participants with or without COPD to determine whether disease aetiology influences gains from the program.<br><br>Jan 2003 - Mar 2008 | Pre-post study (retrospective audit)<br><br>ILD<br>vs<br>COPD | ILD, non-COPD airway disease, COPD<br><br>422<br>Non-COPD=133<br>ILD=28 (included in pre/post analysis)<br><br>Mean age:<br>Non-COPD=65.7 | PR program<br>• Duration: 8 weeks<br>• Frequency: 3 times/week<br>• Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Patient education<br>• Psychosocial support | Outpatient<br><br>• In person<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>HR-QoL:<br>• CRQ – all domains improved following PR. |  <br>  |
| Ferreira *et al* (2009) (19)<br>USA | Test whether a PR program improves functional capacity and dyspnoea, and whether certain participant's characteristics predict improvement.<br><br>Aug 1999 - Apr 2004 | Pre-post study (retrospective audit) | Various ILD (44% IPF)<br><br>113<br><br>Mean age (SD):<br>66 (13) | PR program<br>• Duration: 6-8 weeks<br>• Frequency: 2-3 times/week<br>• Number of sessions: 12-24<br><br>Components:<br>• Supervised exercise training<br>• Pacing and breathing techniques<br>• Patient education | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>Symptoms:<br>• UCSD-SOBQ – improved following PR.<br>• Borg score – dyspnoea improved following PR.<br>Psychological wellbeing:<br>• CES-D – improved following PR. |  <br>  <br>  |
| Fuschillo *et al* (2018) (20)<br>Italy | Investigate the effects of a PR program on exercise capacity measured by 6MWT and arterial blood gas analysis.<br><br>2012 - 2015 | Pre-post study (retrospective audit) | Various ILD (79% IPF)<br><br>38<br><br>Mean age (SD):<br>68.4 (9) | PR program<br>• Duration: 4-6 weeks<br>• Frequency: 5 times/week<br>• Number of sessions: 20-30 (exercise training); 4-6 (patient education)<br><br>Components:<br>• Supervised exercise training<br>• Breathing techniques<br>• Patient education | Inpatient<br><br>• In person<br>*Unclear whether it was in group or individual setting* | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>Symptoms:<br>• Borg scale – dyspnoea and leg fatigue improved following PR. |  <br>  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gaunaurd *et al* (2014) (21)<br>USA | Test whether a PR program increases physical activity and improves symptoms and HR-QoL.<br><br>2014 | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | IPF<br><br>21<br>CG=10<br>IG=11<br><br>Mean age (SD):<br>CG=66 (7)<br>IG=71 (6) | PR program<br>• Duration: 3 months<br>• Frequency: twice/week<br>• Number of sessions: 24 (exercise training); 10 (educational lectures)<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Patient education<br><br>Materials used:<br>• Handouts<br>• PowerPoint presentations | Outpatient<br><br>• In person/remote<br>• Group/individual | Physical activity:<br>• IPAQ – physical activity levels significantly higher in IG during the intervention period; however difference between groups not significant at 3-month follow-up. |  |
| | | | | | | Symptoms:<br>• BDI – change not significant. |  |
| | | | | | | HR-QoL:<br>• SGRQ – symptom scores improved in IG following PR while scores worsened in CG; change not significant in other domains. |  |
| Grongstad *et al* (2020) (22)<br>Norway | Examine the impact of a PR program on exercise capacity and fatigue; and examine the relationship between baseline fatigue and changes in peak oxygen uptake.<br><br>Apr 2016 – Jun 2017 | Pre-post study (prospective) | Sarcoidosis<br><br>41<br><br>Mean age (SD):<br>53 (11) | PR program<br>• Duration: 4 weeks<br>• Frequency: 2-4 times/week<br>• Number of sessions: 20 (individual exercise training); 16 (group exercise training); 19 (group education)<br><br>Components:<br>• Individual exercise training (supervision provided ≥ once/week)<br>• Group exercise training<br>• Group education and discussions | Inpatient<br><br>• In person<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | Symptoms:<br>• Borg scale – dyspnoea improved following PR.<br>• FAS – fatigue improved following PR. |  |
| Guler *et al* (2022) (23)<br>Canada, USA, | Determine the relationship between improvement in | Cohort study (retrospective audit) | Fibrotic ILD (64% IPF)<br><br>701 | PR programs across 12 international sites<br>• Duration: 2-4 weeks | Inpatient / outpatient | Exercise/functional capacity:<br>• 6MWD – improved in all PR programs with larger change from |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Australia, Germany and Switzerland | 6MWT following a PR program and survival.<br><br>2000 – 2022 | | Inpatient=196<br>Outpatient=505<br><br>Mean age (SD):<br>Inpatient=70 (11)<br>Outpatient=69 (12) | (inpatient); 6-12 weeks (outpatient)<br>• Frequency: 2-3 sessions/day; 5-6 days/week (inpatient); 2-3 sessions/week (outpatient)<br><br>Components:<br>• Supervised exercise training<br>• Educational sessions<br>• Psychological support<br>• Counselling on smoking cessation<br>• Nutritional support | *Unclear whether each program was delivered In person or remotely; and whether it was in an individual or group setting* | baseline following inpatient PR. | |
| Holland *et al* (2008) (24)<br>Australia | Assess the safety of an exercise training program; examine its effects on exercise capacity, HR-QoL and dyspnoea; and determine whether training response differs between those with IPF and other ILDs.<br><br>Feb 2005 - Nov 2006 | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | Various ILD (60% IPF)<br><br>57<br>CG=27<br>IG=30<br><br>Mean age (SD):<br>CG=67 (13)<br>IG=70 (8) | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week<br>• Number of sessions: 16<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Optional education and self-management program<br><br>Materials used:<br>• Exercise diary | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD, walk velocity – improved in IG.<br>• Wmax – change not significant.<br>• Perceived walking ability – 68% of participants in IG reported improvement compared to 20% in CG.<br><br>HR-QoL:<br>• SF-36 – vitality scores improved in IG.<br>• CRQ – dyspnoea and fatigue improved in IG; change in emotion and mastery not significant.<br><br>Symptoms:<br>• MMRC – improved in IG. | |
| Holland *et al* (2012) (25)<br>Australia | Investigate the impact of disease aetiology and severity on | Pre-post study (prospective) | Various ILD (57% IPF)<br><br>44 | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week | Outpatient<br><br>• In person/remote | Exercise/functional capacity:<br>• 6MWD – improved following PR; improvement not significant 6 months after PR compared to | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | response to a PR program.<br><br>Jan 2007 - Dec 2008 | | Mean age (SD):<br>IPF subgroup=72.9 (6.8)<br>Other ILD=68.1 (8.4) | • Number of sessions: 16<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Optional education and self-management program<br><br>Materials used:<br>• Exercise diary | • Group/individual | baseline.<br>HR-QoL:<br>• CRQ – dyspnoea improved following PR; improvement not significant 6 months after PR compared to baseline. |  |
| Huppmann *et al* (2013) (26)<br>Germany | Investigate the effect of a PR program on functional capacity and QoL.<br><br>Jan 1999 - May 2010 | Pre-post study (prospective) | Various ILD (50% IPF)<br><br>402<br><br>Mean age (SE):<br>59.9 (0.6) | PR program<br>• Duration: 30 days<br>• Frequency: 4-5 times/week (exercise training); 3 times/week (patient education)<br>• Number of sessions: 17-21 (individual exercise training); 12 (group patient education)<br><br>Components:<br>• Supervised exercise training<br>• Breathing exercises<br>• Patient education | Inpatient<br><br>• In person<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>HR-QoL:<br>• SF-36 – all domains improved following PR.<br>Symptoms:<br>• VAS (pre/post 6MWT) – change in dyspnoea rating not significant. |  <br>  <br>  |
| Igai *et al* (2022) (27)<br>Japan | Evaluate the effects of a dignity-centred palliative care program on self-esteem, QoL, anxiety, depression, dyspnoea, cough, program satisfaction and the acceptability of the | Mixed methods:<br>• Pre-post study (prospective)<br>• Semi-structured interviews | IPF<br><br>12<br><br>Mean age (SD):<br>77.3 (4.6) | Dignity-centred palliative care program including clinic and home visits<br>• Duration: 45 days<br>• Frequency: 2 clinic visits; 1 home visit<br><br>Components:<br>• Palliative care<br>• Discussion of various topics | Outpatient / home<br><br>• In person<br>• Individual | Psychological wellbeing:<br>• Rosenberg Self-esteem scale – change not significant.<br>• HADS – change in anxiety and depressions not significant.<br>HR-QoL:<br>• SGRQ – symptom scores improved; change not significant in other domains.<br>• Scoring for the program – highest |  <br>  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | program.<br><br>18 Apr 2018 – 18 Mar 2019 | | | including self-management, symptom management and observation, daily activities and life review<br><br>Materials used:<br>• Booklet | | rating in question 1) this program relieves the suffering of my illness; 2) this program will make my life better; 3) this program makes me aware of the meaning of life. | |
| | | | | | | Symptoms:<br>• MMRC – change not significant.<br>• CAT– change in cough domain not significant. |  |
| Igarashi *et al* (2018) (28)<br>Japan | Evaluate the effects of a PR program and compare absolute 6MWD and percentage of the predicted value of 6MWD.<br><br>Jul 2014 – Jun 2016 | Non-randomised controlled study<br><br>PR (IG)<br>vs<br>No PR (CG) | Various ILD<br><br>40<br>CG=23<br>IG=17<br><br>Mean age (SD):<br>CG=72.8 (5)<br>IG=75 (6.4) | PR program<br>• Duration: 3 months<br>• Frequency: weekly (exercise training); monthly (patient education)<br>• Number of sessions: 12 (exercise training); 3 (patient education)<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Patient education<br><br>Materials used:<br>• Exercise and symptom diary | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – change in absolute distance not significant different between groups; improvement in 6MWD %predicted significantly larger in IG.<br>• Muscle strength – change not significant. |  |
| | | | | | | Symptoms:<br>• MMRC – improved in IG. |  |
| | | | | | | HR-QoL:<br>• SGRQ – symptom scores improved in IG; no significant difference between groups in other domains. |  |
| Jackson *et al* (2014) (29)<br>USA | Test whether a PR program is effective in improving 6MWD, treadmill | RCT<br><br>PR (IG) | **Same sample as Gaunaurd et al (2014)* | ** Same intervention as Gaunaurd et al (2014)*<br><br>PR program | Outpatient<br><br>• In person/remote | Exercise/functional capacity:<br>• Treadmill exercise intensity – improved in IG.<br>• 6MWD – change not significant. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | exercise, dyspnoea, exercise oxygen uptake and respiratory muscle strength.<br><br>2014 | vs<br>No PR (CG) | IPF<br><br>21<br>CG=10<br>IG-11<br><br>Mean age (SD):<br>CG=66 (7)<br>IG=71 (6) | • Duration: 3 months<br>• Frequency: twice/week<br>• Number of sessions: 24 (exercise training); 10 (educational lectures)<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Patient education<br><br>Materials used:<br>• Handouts<br>• PowerPoint presentations | • Group/individual | Symptoms:<br>• BDI – change not significant. | |
| Janssen *et al* (2020) (30)<br>USA | Assess the feasibility of conducting a RCT to investigate the effect of palliative care on QoL, anxiety and depression.<br><br>Sep 2017 - Jul 2018 | RCT<br><br>Palliative care program (IG)<br>vs<br>No palliative care program (CG) | IPF<br><br>22<br>CG=11<br>IG=11<br><br>Mean age (SD):<br>CG=69.5 (7.2)<br>IG=72.7 (8) | Palliative care program<br>• Duration: 6 months<br>• Frequency: 1 initial clinic visit; 1 follow up visit at 3 months; ≥1 visit in between<br>• Number of visits: ≥3<br><br>Components:<br>• Palliative care<br>• Discussions of symptoms, QoL, support network and understanding of disease<br>• Future planning<br>• Care goals setting<br>• Patient education | Outpatient<br><br>• In person<br>• Individual | HR-QoL:<br>• SGRQ – difference between groups not significant in impact, activity and total scores; symptom scores trended towards significant worsening in IG but not CG at 6 months.<br>• PHQ-9 – difference between groups not significant at 6 months. | |
| | | | | | | Psychological wellbeing:<br>• HADS – difference in anxiety and depression between groups not significant. | |
| | | | | | | Healthcare utilisation:<br>• Hospitalisation – no difference between groups. | |
| | | | | | | Treatments:<br>• Lung transplantation – no difference between groups. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Jarosch *et al* (2020) (31)<br>Germany | Evaluate the short term and 3-month effect of a PR program on exercise capacity and HR-QoL<br><br>Study period: *unclear* | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | IPF<br><br>54<br>CG=18<br>IG=36<br><br>Mean age (SD):<br>CG=65 (10)<br>IG=68 (9) | PR program<br>• Duration: 3 weeks<br>• Frequency: 5-6 days/week (exercise training); twice/week (patient education)<br>• Number of sessions: 15-18 (exercise training); 6 (patient education)<br><br>Components:<br>• Supervised exercise training<br>• Breathing therapy<br>• Patient education<br>• Psychological support<br>• Goal setting<br><br>Materials used:<br>• Handouts to facilitate physical activity at home | Inpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved in IG following PR; difference between groups not significant 3 months after PR. |  |
| | | | | | | HR-QoL<br>• CRQ – all domains improved in IG; improvement sustained 3 months after PR.<br>• SF-36 – difference between groups in physical component not significant. Mental component improved in IG following PR; different between groups not significant 3 months after PR. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – difference between groups not significant in anxiety. |  |
| | | | | | | Physical activity:<br>• Steps/day – change not significant 1 week after PR. |  |
| Kalluri *et al* (2018) (32)<br>Canada | Explore the relationship between the use of early integrated palliative care and acute care utilisation in the last year of life and location of death.<br><br>2009 - 2016 | Cohort study (retrospective audit)<br><br>Multidisciplinary care (MDC; IG)<br>vs<br>Non-MDC care (CG) | IPF<br><br>32<br>IG=22<br>CG=10<br><br>Mean age at first visit (SD):<br>IG=73 (12.3)<br>CG=66 (11.4) | Multidisciplinary care model that adopts an early integrated palliative approach focusing on early symptom management and ACP with emphasis on community-based care<br>• Duration: mean month between first visit and death (SD) – IG=14.4 (13.3); CG=17.4 (17)<br>• Frequency: once every 3 months (clinic visits); in between clinic visits (community care team visits)<br><br>Components: | Outpatient / home<br><br>• In person<br>• Individual | Healthcare utilisation:<br>• ER visits and hospitalisation – IG were 24.2 times and 2.32 times less likely to have respiratory-related ER visits and hospitalisation compared to CG respectively. |  |
| | | | | | | EOL planning:<br>• ACP – 100% of IG compared to 40% of CG completed ACP.<br>• Location of death – 85% of IG died in their preferred location; 90% of CG did not document preferred place of death. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | • Palliative care<br>• Patient education<br>• ACP<br>• Action plans (written/verbal)<br>• Goal setting | | | |
| Kalluri *et al* (2020) (33)<br>Canada | Compare healthcare resource use and costs of EOL care between those receiving early integrated palliative care, specialist care and non-specialist care.<br><br>2012 - 2018 | Cohort study (retrospective audit)<br><br>MDC<br>vs<br>Specialist care (SC)<br>vs<br>Non-specialist care (NSC) | IPF<br><br>2768<br>MDC=78<br>SC=2166<br>NSC=524<br><br>Median age at death (range):<br>MDC=73 (67-83)<br>SC=79 (71-86)<br>NSC=86 (80-91) | ** Same intervention as Kalluri et al (2018)* | Outpatient / home<br><br>• In person<br>• Individual | Healthcare utilisation:<br>• Hospitalisation – MDC group was 33% less likely to die in hospital compared to SC and NSC group; but differences in length of stay were not significant between groups.<br>• Time in intensive care units – lower in MDC group compared to SC group.<br>• ED visits – MDC group had the smallest increase in quarterly rate of ED visit; highest in NSC group.<br>• Outpatient visit – highest in MDC group.<br>• General practitioner claims – lowest in MDC group.<br>• EOL associated costs – median costs in the last 3 months of life and for terminal hospitalisation were lowest in MDC group.<br>• PR – MDC group was almost 2 times more likely to have undergone PR compared to NSC group (81% vs 37%).<br>• Long term care – MDC group was one-third as likely to be in long term care facility compared to NSC group (9% vs 30%). |  |
| | | | | | | Treatments:<br>• Antifibrotic – MDC group was 3 times more likely to have received |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | antifibrotic treatment compared to SC group.<br>• Opioid – MDC group was 40% more likely to be prescribed opiates during their last year of life. | |
| Kalluri *et al* (2021) (34)<br>Canada | Explore the effects of self-management education and action planning on self-efficacy, perceptions of symptoms and symptom management strategies.<br><br>Aug 2018 - Jan 2019 | Mixed methods:<br>• Post intervention evaluation<br>• Semi-structured interviews | IPF<br><br>Questionnaires=12<br>Semi-structured interviews=13<br><br>Mean age (range): 71 (59-83) | ** Same intervention as Kalluri et al (2018) with additional focus on patient education and action planning* | Outpatient / home<br><br>• In person<br>• Individual | Self-efficacy:<br>• COPD self-efficacy scale – 80% reported being confident in self-management; 43% reported being confident in managing or avoiding breathing difficulties; 20% reported not feeling confident. | N/A |
| | | | | | | Symptoms:<br>• Measure Yourself Medical Outcome Profile – majority reported mild to moderate symptoms; 5 reported dyspnoea, 3 reported fatigue and dyspnoea, 1 reported fatigue only, 1 reported cough only, and 5 reported symptoms other than dyspnoea, cough or fatigue. | N/A |
| Kaymaz *et al* (2013) (35)<br>Turkey | Evaluate the effects of a PR program on exercise capacity, dyspnoea perception, HR-QoL and body composition.<br><br>2006-2009 | Pre-post study (retrospective audit) | Various ILD (50% IPF)<br><br>10<br><br>Mean age (SD):<br>51.3 (16.5) | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week (exercise training); monthly (patient education)<br>• Number of sessions: 16 (exercise training); 2 (patient education)<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Patient education<br>• Nutritional intervention | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• ISWD, ESWD – change not significant. |  |
| | | | | | | Symptoms:<br>• MRC – improved following PR. |  |
| | | | | | | HR-QoL:<br>• SGRQ – impact domain improved following PR; change not significant in other domains. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – anxiety and depression improved following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | • Psychological counselling | | | |
| Kerti *et al* (2018) (36)<br>Hungary | Assess the relationship between exercise capacity and other functional markers as a response to a PR program in ILD and IPF.<br><br>Study period: *unclear* | Pre-post study (prospective)<br><br>IPF<br>vs<br>Non-IPF ILD | Various ILD (43% IPF)<br><br>53<br>ILD subgroup (excluding IPF)=30<br>IPF subgroup=23<br><br>Mean age (SD):<br>ILD subgroup=54 (8)<br>IPF subgroup=45 (9) | PR program<br>• Duration: 4 weeks<br>• Frequency: 2-3 times/day<br>• Number of sessions: 56-84<br><br>Components:<br>• Supervised exercise training<br>• Breathing and stretching techniques | Inpatient<br><br>• In person<br>• Individual | Exercise/functional capacity:<br>• 6MWD – improved following PR in both groups.<br>• Grip strength – improved in ILD subgroup excluding IPF; change not significant in IPF subgroup.<br>HR-QoL:<br>• CAT – improved following PR in both groups. |  |
| | | | | | | Symptoms:<br>• MMRC – improved following PR in both groups. |  |
| Keyser *et al* (2015) (37)<br>USA | Investigate the cardiorespiratory response to a PR program including aerobic exercise training.<br><br>Feb 2009 - Jul 2012 | Pre-post study (prospective) | Various ILD (23% IPF)<br><br>13<br><br>Mean age (SD):<br>57 (9.1) | PR program<br>• Duration: 10 weeks<br>• Frequency: 3 times/week<br>• Number of sessions: 24-30<br><br>Components:<br>• Supervised exercise training<br>• Educational lectures | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD, treadmill CPET duration, Wmax – improved following PR. |  |
| Khor *et al* (2021) (38)<br>Australia | Test the feasibility and acceptability of conducting a RCT to evaluate the use of a hand-held fan for dyspnoea management.<br><br>Study period: *unclear* | Mixed methods:<br>• RCT<br>• Semi-structured interviews<br><br>Hand-held fan (IG)<br>vs<br>No hand-held fan (CG) | Fibrotic ILD (33% IPF)<br><br>30<br>CG=15<br>IG=15<br><br>Mean age (SD):<br>CG=71.7 (7.3)<br>IG=73.7 (10.5) | Use of hand-held fan<br>• Duration: 2 weeks<br>*Frequency and number of times use depends on the participant*<br><br>Components:<br>• Participants received instructions to use the fan at home and during outing for symptom management | Community / Home<br><br>• Remote<br>• Individual | Symptoms:<br>• D12 – change not significant. |  |
| | | | | | | HR-QoL:<br>• K-BILD – change not significant. |  |
| | | | | | | Self-efficacy:<br>• Self-efficacy for Managing Chronic Disease 6-item scale – change not significant. |  |
| | | | | | | Exercise/functional capacity:<br>• Manchester Respiratory Activities of |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | Materials used:<br>• Hand-held fan | | Daily Living questionnaire – change not significant.<br>• UAB Study of Aging Life-Space Assessment – change not significant. | |
| | | | | | | Physical activity:<br>• Steps/day, total energy expenditure, time spent in ≥3 METs/day – change not significant. |  |
| Kozu *et al* (2011) (39)<br>Japan | Examine the effects of a PR program on exercise capacity, dyspnoea and health status in IPF; and compare the responses between IPF and COPD.<br><br>Study period: *unclear* | Pre-post study (prospective)<br><br>IPF<br>vs<br>COPD | IPF, COPD (as comparison group)<br><br>90<br>IPF=45<br>COPD=45<br><br>Mean age (SD):<br>IPF=67.5 (7.8) | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week<br>• Number of sessions: 16<br><br>Components:<br>• Supervised exercise training<br>• Breathing retraining<br>• Unsupervised home exercise program<br>• Patient education<br><br>Materials used:<br>• Exercise diary | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR; improvement did not sustain at 6-month.<br>• Muscle strength – improved following PR; improvement did not sustain at 6-month.<br>• ADL – improved following PR; improvement sustained at 6-month follow up. |  |
| | | | | | | Symptoms:<br>• MRC – improved following PR; change not significant at 6-month follow up compared to baseline.<br>• TDI – change not significant. |  |
| | | | | | | HR-QoL:<br>• SF-36 – change not significant in all domains following PR; bodily pain, general health and social function were significantly worse at 6-month follow up compared to baseline. |  |
| Ku *et al* (2017) (40)<br>India | Investigate the effects of a PR program on exercise capacity, HR-QoL and | RCT<br><br>PR (IG)<br>Vs | Various ILD (63% IPF)<br><br>40<br>CG=20 | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week<br>• Number of sessions: 16 | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved in IG. |  |
| | | | | | | HR-QoL<br>• SGRQ – total score improved in IG. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | dyspnoea.<br><br>Sep 2012 - Sep 2014 | No PR (CG) | IG=20<br><br>Mean age (SD):<br>CG=62.1 (14.5)<br>IG=59.1 (10.4) | Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Patient education<br>• Nutritional counselling<br>• Psychosocial rehabilitation<br><br>Materials used:<br>• Exercise diary | | Symptoms:<br>• MRC – difference between groups not significant. | |
| Lindell *et al* (2010) (41)<br>USA | Test whether participation in a disease management program improves symptom burden and perceptions of QoL in people with IPF and their carers.<br><br>Study period: *unclear* | Mixed methods:<br>• RCT<br>• Open-ended interviews<br><br>PRISM program (IG)<br>vs<br>No PRISM program (CG) | IPF<br><br>21 patient/carer dyads<br>CG=11<br>IG=10<br><br>Mean age (SD):<br>CG – patients=67.1 (11.9); carers=67 (8.6)<br>IG – patients=65.2 (10.3); carers=63.3 (12.7) | Disease management program (PRISIM: Program to Reduce Symptoms and Improve Lifestyle Management)<br>• Duration: 6 weeks<br>• Frequency: weekly<br>• Number of sessions: 6<br><br>Components:<br>• Patient education<br><br>Materials used:<br>• A book – 'Feeling good: the new mood therapy' for both groups; IG used the book in group education sessions | Community<br><br>• In person<br>• Group | Symptoms:<br>• UCSD-SOBQ – difference between groups not significant.<br>• BDI – difference between groups not significant. | |
| | | | | | | HR-QoL:<br>• SF-36 – physical component worsened in patients in IG; difference between groups not significant for the mental component. For carers, difference between groups not significant in both physical and mental components. | |
| | | | | | | Psychological wellbeing:<br>• Beck Anxiety and Depression Inventory – anxiety worsened in patients in IG; differences between groups not significant for depression. For carers, difference between groups not significant in both anxiety and depression.<br>• Perceived stress scale – improved in carers in IG; differences among | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | patients not significant. | |
| Lindell *et al* (2021) (42)<br>USA | Assess the feasibility, acceptability and efficacy (disease knowledge, confidence and preparedness, patient reported outcomes and completion of ACP) of an early palliative care program in people with IPF and their carers.<br><br>Mar 2017 - Dec 2020 | RCT<br><br>SUPPORT program (IG)<br>vs<br>No SUPPORT program (CG) | IPF<br><br>76 patient/carer dyads<br>CG=26<br>IG=50<br><br>Median age (range):<br>CG – patients=73 (68-76); carers=68 (55-73)<br>IG – patients=70 (67-74); carers=67 (62-72) | Early palliative care program (SUPPORT: S-symptom management; U-understanding the disease; P-pulmonary rehabilitation; P-palliative care; O-oxygen therapy; R-research considerations; T-transplantation)<br>• Duration: 6-8 months<br>• Frequency: once every 3 months (patient education); weekly (feedback sessions); biannual (group booster trainings)<br>• Number of sessions: 3 (patient education)<br><br>Components:<br>• Palliative care<br>• Discussions of different topics included in the SUPPORT booklet<br>• Feedback sessions and group booster trainings<br><br>Materials used:<br>• Educational (SUPPORT) booklet<br>• Weblink with audio<br>• Educational materials routinely distributed | Community<br><br>• In person/remote<br>• Individual/group | Symptoms/psychological wellbeing:<br>• PROMIS-29 – difference between groups in anxiety, depression, fatigue, pain, physical, satisfaction with social roles and sleep not significant.<br>• Perceived stress scale – difference between groups not significant in both patients and carers. |  |
| | | | | | | HR-QoL:<br>• A Tool to Assess Quality of Life in IPF – difference between groups not significant in total, symptom and impact scores. |  |
| | | | | | | Disease knowledge/self-efficacy:<br>• Confidence and disease preparedness – improved in carers following SUPPORT; differences among patients not significant.<br>• Knowledge – improved in both patients and carers following SUPPORT. |  |
| | | | | | | EOL planning:<br>• ACP – more patients completed ACP in IG compared to CG (62% vs 33%). |  |
| Lingner *et al* (2017) (43)<br>Germany | Examine the effects of a PR program on HR-QoL and other clinical outcomes; and investigate whether specific | Pre-post study (prospective) | Sarcoidosis<br><br>296<br><br>Mean age (SD): | PR program<br>• Duration: 3 weeks<br>• Frequency: 3-5 times/week<br>• Number of sessions: 9-15 | Inpatient<br><br>• In person<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | HR-QoL:<br>• SGRQ – all domains improved following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | subgroups would particularly benefit from the program.<br><br>Jan 2011 - Jan 2012 | | 49.1 (9.7) | Components:<br>• Supervised exercise training<br>• Respiratory physiotherapy<br>• Patient education<br>• Social counselling<br>• Nutritional counselling<br>• Psychological support<br>• Smoking cessation program<br>• Ergotherapy and advice on the use of aids and appliances<br><br>Materials used:<br>• Printed educational materials | | • SF-36 – physical health and mental health total scores improved following PR. | |
| | | | | | | Psychological wellbeing:<br>• HADS – anxiety and depression improved following PR. | |
| | | | | | | Symptoms:<br>• MMRC – improved following PR.<br>• FAS – improved following PR.<br>• Clinical symptoms – number of participants reporting exercise intolerance, fatigue, dyspnoea, joint pain and cough reduced following PR. | |
| Magnani *et al* (2017) (44)<br>Italy | Investigate the effects of a support group on the psychological wellbeing of people with IPF and their carers.<br><br>Jan 2015 - Jun 2015 | Pre-post study (prospective) | IPF<br><br>18<br>Patients=10<br>Carers=8<br><br>Mean age (SD):<br>Whole cohort=66.5 (10.9) | Support group facilitated by an expert nurse<br>• Duration: 6 months<br>• Frequency: monthly<br>• Number of meetings: 6<br><br>Components:<br>• Peer support<br>• Patient education | Outpatient<br><br>• In person<br>• Group | Psychological wellbeing:<br>• Psychological General Wellbeing Index – change not significant in all domains (anxiety; depression; positivity and wellbeing; self-control; general health; vitality; total score); anxiety scores had the largest improvement; self-control had the smallest improvement. | |
| Matsuo *et al* (2021) (45)<br>Japan | Identify predictors of short term benefits of a PR program including timing of initiation of PR after diagnosis.<br><br>Oct 2013 – Oct 2020 | Pre-post study (retrospective audit) | Fibrotic ILD (75% IPF)<br><br>28<br><br>Median age (range):<br>77.5 (75.0 – 81.0) | PR program<br>• Duration: 6-10 weeks<br>• Frequency: 5 days/week (inpatient); twice/week (outpatient)<br>• Number of sessions: 30-50 (inpatient); 12-20 (outpatient)<br><br>Components:<br>• Supervised exercise training | Inpatient / outpatient<br><br>• In person<br>*Unclear whether it was delivered in group or individual setting* | Exercise/functional capacity:<br>• 6MWD – change not significant. | |
| | | | | | | HR-QoL:<br>• SGRQ – change not significant. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | • Breathing techniques | | | |
| Moor *et al* (2020) (46)<br>Netherlands | Determine whether a home monitoring program improves QoL and medication use.<br><br>Jan 2018 - Jan 2019 | RCT<br><br>IPF online (IG)<br>vs<br>No IPF online (CG) | IPF<br><br>90<br>CG=44<br>IG=46<br><br>Median age (range):<br>CG=72 (58-84)<br>IG=70 (53-83) | Home monitoring program (IPF Online) aimed at facilitating home-based spirometry, symptom monitoring and medication management<br>• Duration: 24 weeks<br>• Frequency: daily (home spirometry); weekly (reporting of symptoms)<br><br>Components:<br>• Home spirometry<br>• Self-monitoring of symptoms and medication side effects<br>• Access to daily and overview of spirometry results<br>• Patient education<br>• Medication coach<br>• eConsultation<br><br>Materials used:<br>• Mobile application<br>• Hand-held spirometer<br>• Tablet<br>• Video and weblink providing information about IPF and medication use | Home<br><br>• Remote<br>• Individual | HR-QoL:<br>• K-BILD – difference between groups not significant.<br>• EQ-5D-5L– difference between groups not significant.<br>• Global rating of change – IG trended towards more change, but not significant compared to CG. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – difference between groups not significant in anxiety and depression. |  |
| | | | | | | Treatments:<br>• Patient experiences and satisfaction medication questionnaire – difference between groups not significant regarding satisfaction with medication efficacy, side effect and ease of use.<br>• Medication adjustments – more adjustments in IG; all adjustments were due to side effects. |  |
| | | | | | | Healthcare utilisation:<br>• Hospitalisation – difference between groups not significant.<br>• Extra hospital/general practitioner visits – difference between groups not significant. |  |
| Moor *et al* (2021) (47)<br>Netherlands | Investigate the feasibility of an online home monitoring application and optimal frequency of home | Pre-post study (prospective) | Sclerosis-associated ILD<br><br>10<br><br>Mean age (SD): | Home spirometry and monitoring application (ILD-online)<br>• Duration: 3 months<br>• Frequency: daily home spirometry for the first 6 weeks; 3 times/week for the | Home<br><br>• Remote<br>• Individual | HR-QoL:<br>• K-BILD – total scores decreased.<br>• EQ-5D-5L – change not significant. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – change not significant in |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | spirometry.<br><br>Study period: *unclear* | | 60.3 (9.9) | second 6 weeks<br><br>Components:<br>• Home spirometry<br>• Self-monitoring and online reporting of symptoms<br>• Access to an overview of spirometry results<br>• Patient education<br>• eConsultation<br><br>Materials used:<br>• Mobile application<br>• Hand-held spirometer<br>• Tablet<br>• Video and weblink providing information about IPF and medication use | | anxiety and depression. | |
| Naji *et al* (2006) (48)<br>Ireland | Examine the effects of a PR program on exercise tolerance, dyspnoea, HR-QoL and hospital admission rate; and determine whether the effects differ between ILD and restrictive lung disease with skeletal abnormalities.<br><br>Study period: *unclear* | Pre-post study (retrospective audit) | Various ILD (80% IPF), restrictive lung disease with skeletal abnormalities<br><br>46<br>ILD=35<br><br>Mean age (SD):<br>ILD=66.5 (11.3) | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week<br>• Number of sessions: 16<br><br>Components:<br>• Supervised exercise training<br>• Breathing and relaxation techniques<br>• Unsupervised home exercise program<br>• Patient education<br>• Nutritional counselling | Inpatient/ outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• Shuttle test distance and treadmill test duration – improved following PR. |  |
| | | | | | | Symptoms:<br>• CRQ – dyspnoea score improved following PR. |  |
| | | | | | | HR-QoL:<br>• CRQ – total score improved following PR.<br>• SGRQ – improved following PR. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – anxiety and depression improved following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | Materials used:<br>• Educational video on breathing and exercise training<br>• Exercise diary<br>• Comprehensive educational manual | | Healthcare utilisation:<br>• Hospital admission days – reduced in the year following PR compared with previous year. | |
| Nasrat *et al* (2021) (49)<br>Egypt | Investigate the effects of a PR program combined with IMT and upper extremities exercises on exercise capacity, dyspnoea, HR-QoL and pulmonary function.<br><br>Sep 2016 – Dec 2019 | Non-randomised controlled study<br><br>PR combined with IMT and upper extremities exercises (IG)<br>vs<br>PR only (CG) | Various ILD<br><br>60<br>CG=30<br>IG=30<br><br>Mean age (SD):<br>CG=42.5 (7.2)<br>IG=43.2 (9.1) | PR program with/without ITM and upper extremities exercises associated with breathing<br>• Duration: 8 weeks<br>• Frequency: 3 times/week<br>• Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Controlled breathing exercises<br>• Lung hygiene in the form of posture<br>• Cough training<br>• Percussion<br>• IMT combined with upper limb exercises | Outpatient<br><br>• In person<br>*Unclear whether it was delivered in group or individual setting* | Exercise/functional capacity:<br>• 6MWD – improved in both groups with larger improvement in IG.<br><br>Symptoms:<br>• VAS – dyspnoea improved in both groups with larger improvement in IG.<br><br>HR-QoL:<br>• SF-36 – improved in both groups with larger improvement in IG. | |
| Naz *et al* (2018) (50)<br>Turkey | Examine the effects of an exercise program on functional capacity, muscle strength, perception of dyspnoea, fatigue, , HR-QoL, anxiety, depression and lung function. | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | Sarcoidosis<br><br>18<br>CG=9<br>IG=9<br><br>Median age (range):<br>CG=51 (45-57)<br>IG=59 (52-64) | PR program<br>• Duration: 12 weeks<br>• Frequency: twice/week<br>• Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Breathing exercises<br>• Unsupervised home exercise | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD, leg and back strength– significantly more improvement in IG.<br><br>Symptoms:<br>• MMRC – significantly more improvement in IG.<br>• Borg scale – significantly more improvement in dyspnoea in IG.<br>• FSS – significantly more | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | May 2013 - Feb 2015 | | | program<br><br>Materials used:<br>• Exercise diary | | improvement in IG. | |
| | | | | | | HR-QoL:<br>• SGRQ – significantly more improvement in symptom, activity and total scores in IG; while symptom score worsened in CG.<br>• SF-36 – difference between groups not significant. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – significantly more improvement in anxiety in IG; difference between groups not significant in depression. |  |
| Near *et al* (2021) (51)<br>USA | Examine the impact of a patient support program on nintedanib persistence.<br><br>1 Apr 2015 – 31 Jan 2018 | Cohort study (retrospective audit)<br><br>Enrolled in support program<br>vs<br>Not enrolled in support program | IPF<br><br>12502<br>Not enrolled=9388<br>Enrolled=3114<br><br>Mean age (SD):<br>Not enrolled=71.7 (9.3)<br>Enrolled=72.5 (8.3) | Patient support program for people with IPF treated with nintedanib<br>*Duration of program enrolment and frequency of support depends on the participant*<br><br>Components:<br>• Support in learning about the disease and medication including managing disease progression, side effects, financial assistance and local resources for support | Community<br><br>• Individual<br>*Unclear whether it was delivered in person or remotely* | Treatments:<br>• Number of participants remained on nintedanib – significantly higher proportion of participants enrolled in the program remained persistent at 6, 12, 18 and 24 months.<br>• Mean time to medication discontinuation – significantly longer in participants enrolled in the program (10.9 ± 10.0 months vs 9.3 ± 9.4 months).<br>• Number of nintedanib prescription refills before discontinuation – significantly higher in participants enrolled in the program (10.9 ± 9.8 vs 9.0 ± 9.0).<br>• Change of dosage – significantly more participants enrolled in the program had a dose decrease compared to participants not-enrolled (61.8% vs 58.1%) during the observation period. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Nishiyama *et al* (2008) (52)<br>Japan | Investigate the effects of a PR program on functional exercise capacity, HR-QoL and pulmonary function.<br><br>2000 - 2004 | RCT<br><br>PR<br>vs<br>No PR | IPF<br><br>28<br>CG=15<br>IG=13<br><br>Mean age (SD):<br>CG=64.5 (9.1)<br>IG=68.1 (8.9) | PR program<br>• Duration: 10 weeks<br>• Frequency: twice/week<br>• Number of sessions: 20<br><br>Components:<br>• Supervised exercise training<br>• Educational lectures | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved in IG. |  |
| | | | | | | HR-QoL:<br>• SGRQ – total scores significantly improved in IG. |  |
| | | | | | | Symptoms:<br>• BDI – difference between groups not significant. |  |
| Nolan *et al* (2022) (53)<br>UK | Compare the responses to a PR program between those with IPF and a matched group of people with COPD.<br><br>Jun 2013 – Jul 2018 | Pre-post study (prospective)<br><br>IPF<br>vs<br>COPD | IPF, COPD (as comparison group)<br><br>326<br>IPF=163<br>COPD=163<br><br>Mean age (SD):<br>IPF=73 (9)<br>COPD=73 (8) | PR program<br>• Duration: 8 weeks<br>• Frequency: twice/week<br>• Number of sessions: 16<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Educational sessions<br><br>Materials used:<br>• A book covering all topics addressed in the educational sessions | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• ISWD – improved in both groups following PR; difference between groups not significant. |  |
| | | | | | | Symptoms:<br>• MRC – improved in both groups following PR; difference between groups not significant. |  |
| | | | | | | HR-QoL:<br>• CRQ – all domains improved in both groups following PR; difference between groups not significant.<br>• 88% of those with IPF reported feeling “much better” or “a little better” following PR compared to 91% of those with COPD. |  |
| Ochmann *et al* (2012) (54)<br>Germany | Examine the short- and long term effects of a PR program.<br><br>2007 - 2010 | Longitudinal study | Asbestosis, silicosis, asthma, COPD<br><br>263<br>Asbestosis=66<br>Silicosis=42<br><br>Mean age (range):<br>Whole cohort=64 | PR program at 2 sites<br>• Duration: 4 weeks<br>• Frequency: *unclear*<br>• Number of sessions: 68<br><br>Components:<br>• Supervised exercise training<br>• Breathing exercises | Inpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved in silicosis subgroup following PR; improvement sustained 3 months after PR. Did not improve in asbestosis subgroup and significantly reduced 12 months after PR compared to baseline.<br>• Muscle strength – improved in both silicosis and asbestosis subgroups |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | (35-77) | • Relaxation techniques<br>• Nutritional education | | following PR; improvement sustained in both subgroups 3 and 12 months after PR.<br>• Wmax – improved in both silicosis and asbestosis subgroups following PR; improvement sustained in silicosis subgroup 3 and 12 months after PR but only sustained up to 3 months in asbestosis subgroup. | |
| | | | | | | Symptoms:<br>• MRC – change not significant in both subgroups at all time points.<br>• BDI/TDI – change not significant in both subgroups at all time points. |  |
| | | | | | | HR-QoL:<br>• SF-36 – physical component did not improve in silicosis subgroup at all time points. Change was only significant 3 months after PR in asbestosis subgroup compared to baseline. Change not significant in mental component in both subgroups at all time points.<br>• SGRQ – change in total scores not significant in both subgroups at all time points. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – anxiety improved in both subgroups following PR; change not significant in both subgroups 3 and 12 months after PR compared to baseline. Change not significant in depression in both subgroups at all time points. |  |
| | | | | | | Healthcare utilisation:<br>• Physician consultations – change not significant in both silicosis and |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | asbestosis.<br>• Hospital admission – change not significant in both silicosis and asbestosis. | |
| | | | | | | Treatments:<br>• Antibiotic courses – change not significant in both silicosis and asbestosis. |  |
| Ozalevli *et al* (2010) (55)<br>Turkey | Examine the effects of a home-based PR program on functional outcome measures.<br><br>Study period: *unclear* | Pre-post study (prospective) | IPF<br><br>15<br><br>Mean age (SD):<br>62.8 (8.5) | PR program<br>• Duration: 12 weeks<br>• Frequency: weekly (telephone supervision; daily (exercise query)<br>• Number of telephone supervision: 12<br><br>Components:<br>• Home exercise program<br>• Breathing and relaxation training<br><br>Materials used:<br>• Booklet including exercise instructions | Home<br><br>• Remote<br>• Individual | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | Symptoms:<br>• MMRC – improved following PR. |  |
| | | | | | | HR-QoL:<br>• SF-36 – general health, physical role and emotional role improved following PR; change not significant in other domains. |  |
| | | | | | | | |
| Perez-Bogerd *et al* (2018) (56)<br>Germany | Investigate the short- and long term effects of a longer PR program on exercise tolerance, muscle strength, HR-QoL and physical activity. | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | Various ILD (23% IPF)<br><br>60<br>CG=30<br>IG=30<br><br>Mean age (SD):<br>CG=64 (8) | PR program<br>• Duration: 6 months<br>• Frequency: 3 times/week in the first 3 months; twice/week in the second 3 months<br>• Number of sessions: 60<br><br>Components: | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD, Wmax, QF – improved following PR in IG; improvement sustained after 1 year. |  |
| | | | | | | HR-QoL:<br>• SGRQ, CRQ – all domains improved in IG; improvement sustained in all domains of both measures except for CRQ (fatigue) after 1 year. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Mar 2009 - Sep 2011 | | IG=64 (13) | • Supervised exercise training<br>• Patient education<br>• Occupational therapy<br>• Nutrition counselling<br>• Psychosocial support | | Symptoms:<br>• MRC – difference between groups not significant. |  |
| | | | | | | Physical activity:<br>• Steps/day – difference between groups not significant.<br>• Time spent in >3 METs/day – difference between groups not significant. |  |
| Prajapat *et al* (2016) (57)<br>India | Test whether a PR program improves functional status, muscle mass and systemic inflammation.<br><br>Study period: *unclear* | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | Various ILD<br><br>38<br>CG=20<br>IG=18<br><br>Mean age (SE):<br>CG=47.6 (2.1)<br>IG=52.2 (2.4) | PR program<br>• Duration: 8 weeks<br>• Frequency: 3 days/week<br>• Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Patient education | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – significantly more improvement in IG at 12 weeks. |  |
| Rammaert *et al* (2011) (58)<br>France | Examine the effects of a home-based PR program on exercise tolerance, dyspnoea and HR-QoL.<br><br>Apr 2007 - Feb 2008 | Pre-post study (prospective) | IPF<br><br>17<br><br>Mean age (SD):<br>67 (13) | PR program<br>• Duration: 8 weeks<br>• Frequency: weekly (home visits); daily (monitoring of heart rate)<br><br>Components:<br>• Home exercise program<br>• Self-monitoring of heart rate during exercise<br>• Patient education<br><br>Materials used:<br>• Picture folder and fact sheets | Home<br><br>• In person/remote<br>• Individual | Exercise/functional capacity:<br>• 6MWD – change in distance not significant with a significant decrease in maximum heart rate.<br>• 6MST – steps increased following PR.<br>• Cycle ergometer endurance time – improved following PR.<br>• Timed 'up & go' test – change not significant.<br>• Test of 10 chair stands – change not significant. |  |
| | | | | | | Symptoms:<br>• MMRC – change not significant.<br>• BDI – change not significant. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | for self-learning<br>• Heart rate monitor | | HR-QoL:<br>• SF-36 – perceived physical limitation during exercise improved following PR.<br>• SGRQ – change not significant. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – change not significant. |  |
| Rifaat *et al* (2014) (59)<br>Egypt | Investigate the effects of a PR program on functional status and dyspnoea.<br><br>Study period: *unclear* | Pre-post study (prospective) | IPF<br><br>30<br><br>Mean age (SD):<br>54.4 (6.1) | PR program<br>• Duration: 8 weeks<br>• Frequency: 3 times/week<br>• Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Breathing exercises<br>• Patient education<br>• Psychological support | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | Symptoms:<br>• Borg score – dyspnoea improved following PR. |  |
| | | | | | | HR-QoL:<br>• SGRQ – total scores improved following PR. |  |
| Ryerson *et al* (2014) (60)<br>Canada | Determine the short- and long term effects of PR program on functional and symptomatic outcomes; define the predictors of functional change; evaluate the relationship of changes in HR-QoL to changes in function and symptom scores.<br><br>2010 - 2012 | Cohort study (prospective) | Various ILD (41% IPF)<br><br>54<br><br>Mean age (SD):<br>69.4 (10.8) | Similar PR programs across 3 sites<br>• Duration: 6-9 weeks<br>• Frequency: twice/week<br>• Number of sessions: 12-18<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Educational sessions | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR; improvement sustained at 6-month follow up.<br>• Global change in exercise/functional capacity – 81% of participants reported improvement following PR; minimal change at 6-month follow up compared to baseline. |  |
| | | | | | | Symptoms:<br>• UCSD-SOBQ – improved following PR; change not significant at 6-month follow up compared to baseline. |  |
| | | | | | | Physical activity:<br>• Rapid Assessment of Physical Activity questionnaire – physical |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | activity levels improved following PR; improvement sustained at 6-month follow up. | |
| | | | | | | HR-QoL:<br>• SGRQ – improved following PR; improvement sustained at 6-month follow up.<br>• Global change in QoL – 81% of participants reported improvement following PR; minimal change at 6-month follow up compared to baseline. |  |
| | | | | | | Psychological wellbeing:<br>• GDS – improved following PR; improvement sustained at 6-month follow up. |  |
| Salhi *et al* (2010) (61)<br>Germany | Test whether a PR program improves 6MWD, exercise tolerance, muscle force, dyspnoea and HR-QoL.<br><br>2000 - 2004 | Pre-post study (retrospective audit) | ILD, chest wall disease<br><br>31<br>ILD=11<br><br>Mean age (SD):<br>ILD=54 (19) | PR program<br>• Duration: 12 or 24 weeks<br>• Frequency: *unclear*<br>• Number of sessions: ≤ 60 sessions over 24 weeks<br><br>Components:<br>• Supervised exercise training<br>• Patient education<br>• Occupational therapy including advice on ADL<br>• Nutritional support<br><br>Materials used:<br>• Informational materials | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD, Wmax – improved at both 12 and 24-week.<br>• QF – change not significant at both time points compared to baseline. |  |
| | | | | | | Symptom:<br>• CRQ – dyspnoea and fatigue improved at both 12 and 24-week. |  |
| | | | | | | HR-QoL:<br>• CRQ – mastery and emotion improved at both 12 and 24-week. |  |
| Sanchez-Ramirez (2022) (62) | Examine the impact of a PR program on exercise capacity, | Pre-post study (retrospective audit) | ILD, COPD, asthma, bronchiectasis, lung cancer, pulmonary | PR program across 3 sites<br>• Duration: 8 weeks | Outpatient | Exercise/functional capacity:<br>• 6MWD – improved in the ILD subgroup following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Canada | HR-QoL and self-efficacy; and explore whether effects vary across different lung diseases.<br><br>2016 – 2019 | | hypertension, other restrictive lung diseases<br><br>682<br>ILD=127<br><br>Mean age (SD):<br>Whole cohort=71.6 (9.3) | • Frequency: twice/week<br>• Number of sessions: 16<br><br>Components<br>• Supervised exercise training<br>• Breathing exercise<br>• Patient education | • In person<br>• Group | Symptoms:<br>• VAS – fatigue improved in the ILD subgroup following PR.<br>• MRC – change not significant. |  |
| | | | | | | HR-QoL:<br>• SGRQ – change not significant.<br>• Clinical COPD questionnaire – improved in the ILD subgroup following PR. |  |
| | | | | | | Self-efficacy:<br>• Self-efficacy for Managing Chronic Disease 6-item scale – improved in the ILD subgroup following PR. |  |
| Satsuma *et al* (2020) (63)<br>Japan | Assess the usefulness of an ambulatory care pharmacy practice on pirfenidone persistence.<br><br>Jan 2012 – Jan 2019 | Non-randomised controlled study<br><br>Collaborative pharmacist-physician management (IG)<br>vs<br>Conventional management (CG) | IPF<br><br>76<br>CG=61<br>IG=15<br><br>Median age (range):<br>CG=74 (68-80)<br>IG=76 (71-80) | Pharmacist-physician collaborative management for people treated with pirfenidone<br>• Duration: 3 months<br>• Number of consultations with pharmacist: ≥ 2<br><br>Components:<br>• Education and support at the ambulatory care pharmacy practice to enhance effective management of medication<br><br>Materials used:<br>• Patient education book | Outpatient<br><br>• In person/remote<br>• Individual | Treatment:<br>• Discontinuation rate – lower in IG at 3 and 6 months, but differences were not significant.<br>• Time to discontinuation – longer in IG. |  |
| Sciriha *et al* (2019) (64)<br>Malta | Investigate the effects of a PR program on functional and HR-QoL measures. | Non-randomised controlled study<br><br>Active group<br>vs<br>Non-active group | Various ILD (>70% IPF)<br><br>120<br>Active group=60<br>Inactive group=60 | PR program<br>• Duration: 12 weeks<br>• Frequency: twice/week<br>• Number of sessions: 24 | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved following PR in the active group. |  |
| | | | | | | Symptoms:<br>• Borg score – dyspnoea improved in active group following PR. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Study period: *unclear* | | Mean age: *unclear* | Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Patient education<br><br>Materials used:<br>• Exercise diary | | • MMRC – improved in active group following PR. | |
| | | | | | | HR-QoL:<br>• SGRQ – impact and total scores improved in active group following PR; change not significant for the activity and symptoms domains. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – change in anxiety and depression not significant compared to baseline. |  |
| Sgalla *et al* (2015) (65)<br>Italy | Evaluate the safety and feasibility of a mindfulness based stress reduction program and investigate its impact on mood, HR-QoL and pulmonary function.<br><br>Nov 2012 - Nov 2013 | Pre-post study (prospective) | Various ILD (63% IPF)<br><br>19<br><br>Mean age (SD):<br>65 (8) | Mindfulness based stress reduction program<br>• Duration: 8 weeks<br>• Frequency: weekly (during intervention period); quarterly (during post-intervention observation period)<br>• Number of sessions: 12<br><br>Components:<br>• Mindfulness techniques with a focus on controlled breathing<br>• Unsupervised home practise<br><br>Materials used:<br>• Mindfulness CDs | Outpatient<br><br>• In person<br>• Group | Psychological wellbeing:<br>• Profile of mood state – fatigue, depression, anger and vigour improved at study completion; change not significant in tension.<br>• Perceived stress scale – control of irritation, uncontrollable anger, anger, irritability, and self-control improved over the study period. |  |
| | | | | | | Symptoms:<br>• UCSD-SOBQ – change not significant.<br>• Cough and Sputum Assessment Questionnaire – change not significant. |  |
| | | | | | | Exercise/functional capacity:<br>• 6MWD – change not significant. |  |
| Sharp *et al* (2017) (66)<br>UK | Determine the sustained benefits of a PR program; identify baseline characteristics associated with the responses; and evaluate PR | Mixed methods:<br>• Pre-post study (retrospective audit)<br>• Semi-structured focus group | Various ILD (35% IPF)<br><br>79<br><br>Mean age (SD):<br>68.8 (11.9) | PR program<br>• Duration: 6 weeks<br>• Frequency: twice/week<br>• Number of sessions: 12<br><br>Components:<br>• Supervised exercise training | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• ISWD – improved following PR; change not significant at 6 and 12-month follow up compared to baseline. |  |
| | | | | | | HR-QoL:<br>• CRQ – total scores improved following PR; change not significant |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | experiences using qualitative assessment.<br><br>Study period: *unclear* | | | • Unsupervised home exercise program<br>• Educational sessions<br><br>Materials used:<br>• PowerPoint presentation<br>• Handouts | | at 6 and 12-month follow up compared to baseline.<br><br>Psychological wellbeing:<br>• HADS – change not significant compared to baseline. | |
| Shen *et al* (2021) (67)<br>China | Investigate the impact of breathing exercise on HR-QoL and lung function.<br><br>Jan 2015 – May 2017 | RCT<br><br>Breathing exercise (IG)<br>vs<br>No breathing exercise (CG) | IPF<br><br>82<br>CG=43<br>IG=39<br><br>Mean age (SD):<br>CG=65.0 (8.0)<br>IG=65.3 (6.1) | Breathing exercise training<br>• Duration: 12 months<br>• Frequency: twice/week for 2 weeks before trial started (supervised exercise); 3 times/day (unsupervised exercise); monthly (self- video recording of exercise)<br>• Number of sessions: 4 (supervised exercise)<br><br>Components:<br>• Supervised breathing exercise training<br>• Unsupervised breathing exercise training<br>• Self- video recording of exercise provided to HCP to ensure correct techniques<br><br>Materials used:<br>• Adverse events diary | Outpatient / home<br><br>• In person/remote<br>• Individual | HR-QoL:<br>• SGRQ – improved in IG while CG worsened with significant differences in change comparing both groups at both 6 and 12 months.<br><br>Exercise/functional capacity:<br>• 6MWD – decreased in both groups at both 6 and 12 months but the decline was not significant in IG over time while CG had a significantly larger decline compared to IG at 12 months. | |
| Shimoda *et al* (2021) (68)<br>Japan | Test whether a PR program improves ADLs in people with remaining symptoms and not yet recovered their | Pre-post study (prospective) | Interstitial pneumonia, COPD, asthma, nontuberculous mycobacterial pulmonary infection, | PR program<br>• Duration: median 9 days (ranged 6-12)<br>• Frequency: 5 days/week | Inpatient<br><br>• In person<br>• Individual | Exercise/functional capacity:<br>• ISWD – improved following PR.<br>• Barthel index – improved following PR.<br>• Nagasaki University Respiratory ADL questionnaire – improved following | |

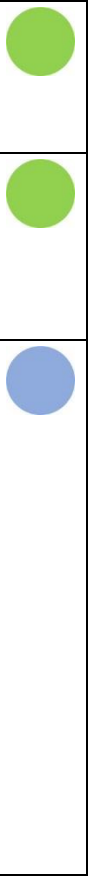
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ability to perform ADLs.<br><br>Oct 2018 – Oct 2019 | | old healed pulmonary tuberculosis, comorbidity without respiratory diseases<br><br>24<br>Interstitial pneumonia=8<br><br>Median age (range):<br>IP=79.0 (76.5 – 84.8) | Components:<br>• Supervise exercise training<br>• Patient education | | PR.<br>• Short Physical Performance Battery – improved following PR. | |
| | | | | | | Symptoms:<br>• MMRC – improved following PR.<br>• CAT – change not significant. |  |
| | | | | | | Psychological wellbeing:<br>• CES-D – change not significant. |  |
| Stanziola *et al* (2022) (69)<br>Italy | Evaluate the impact of a Telemedicine Service on the management of IPF including hospitalisation and death.<br><br>11 Mar – 4 May 2020 | Post intervention evaluation<br><br>2020 cohort (when service was available)<br>vs<br>2019 cohort (when service was not available) | IPF<br><br>371<br>2020 cohort=189<br>2019 cohort=182<br><br>Mean age (SD):<br>2020 cohort=71.8 (7.4)<br>2019 cohort=70 (8.1) | Telemedicine service during COVID-19 outbreak<br>• Frequency: ≥3 times/week (monitoring of clinical parameters)<br>*Duration of service use and number of contacts depend on the participant*<br><br>Components:<br>• Access to email, telephone and videoconference services<br>• General measures to prevent COVID-19 diffusion (i.e.. handwashing, use of face masks in public, social distancing, isolation)<br>• Self-monitoring of clinical parameters (e.g. blood pressure, oxygen saturation)<br><br>Materials used:<br>• Mobile applications for chat and videoconference | Community / home<br><br>• Remote<br>• Individual | Healthcare utilisation:<br>• Participants in the 2020 cohort were significantly less likely to experience hospitalisation compared to the 2019 cohort. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Swigris *et al* (2011) (70)<br>USA | Test whether a PR program improves functional capacity, fatigue, sleep, anxiety, depression and HR-QoL.<br><br>2008-2009 | Pre-post study (prospective)<br><br>IPF<br>vs<br>COPD | IPF, COPD (as comparison group)<br><br>77<br>IPF=21<br>COPD=56<br><br>Mean age (SD):<br>IPF: 71.5 (7.4) | Similar PR programs across 6 sites<br>• Duration: 6-8 weeks<br>• Frequency: 2-3 times/week<br>• Number of sessions: 18<br><br>Components:<br>• Supervised exercise training<br>• Breathing techniques<br>• Patient education | Outpatient<br><br>• In person<br>• Group | Exercise/functional capacity:<br>• 6MWD – improved following PR. |  |
| | | | | | | Symptoms:<br>• FSS – improved following PR.<br>• Pittsburgh Sleep Quality Index – change not significant. |  |
| | | | | | | Psychological wellbeing:<br>• GAD-7 – change not significant in all domains of the anxiety scale.<br>• PHQ-8 (measuring depression) – change not significant in all domains. |  |
| | | | | | | HR-QoL:<br>• SF-36 – change not significant in all domains. |  |
| Talwar *et al* (2014) (71)<br>USA | Examine the effects of a PR program on fatigue measured by the Fatigue Severity Scale.<br><br>Study period: *unclear* | Pre-post study (retrospective audit) | Advanced ILD/IPF, COPD<br><br>21<br>ILD/IPF=5<br><br>Mean age (SD):<br>Whole cohort=64.5 (10.9) | PR program<br>• Duration: 6-8 weeks<br>• Frequency: 3 times/week (exercise training); twice/week (patient education)<br>• Number of sessions: 18-24 (exercise training); 12-16 (patient education)<br><br>Components:<br>• Supervised exercise training<br>• Patient education | Outpatient<br><br>• In person<br>• Group | Symptoms:<br>• FSS – improved following PR. |  |
| | | | | | | Psychological wellbeing<br>• GDS – change not significant. |  |
| Thombs *et al* (2021) (72)<br>Canada, Australia, France, Mexico, Spain, UK and USA | Assess the effects of the Scleroderma Patient-centred Intervention Network COVID-19 Home-isolation Activities Together program on anxiety | RCT<br><br>SPIN-CHAT (IG)<br>vs<br>Waitlist SPIN-CHAT (CG) | Systemic sclerosis<br><br>172<br>CG=86<br>IG=86<br><br>Mean age (SD): | Scleroderma Patient-centred Intervention Network COVID-19 Home-isolation Activities Together (SPIN-CHAT) program in 7 countries – a multi-faceted education and support program for mental health during COVID-19 outbreak including videoconferences | Community / home<br><br>• Remote<br>• Group | Psychological wellbeing:<br>• PROMIS – change not significant in anxiety immediately post intervention but improved at 6 weeks.<br>• PHQ – change not significant in depression immediately post intervention but improved at 6 |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | and other mental health outcomes on people with at least mild anxiety symptoms.<br><br>9 Apr 2020 – 27 Apr 2020 | | CG=54.0 (10.9)<br>IG=56.0 (11.9) | • Duration: 4 weeks<br>• Frequency: 3 sessions/week<br>• Number of sessions: 12<br><br>Components:<br>• Patient education<br>• Home exercises<br>• Peer support<br><br>Materials used:<br>• Resource materials to support topics covered | | weeks.<br>• COVID-19 Fears questionnaire – change not significant over the 6-week period.<br>• Multidimensional State Boredom scale – change not significant over the 6-week period.<br>• UCLA Loneliness Scale – change not significant over the 6-week period. | |
| | | | | | | Physical activity:<br>• IPAQ – change not significant in physical activity levels over the 6-week period. |  |
| Tonelli *et al* (2017) (73)<br>Italy | Confirm the benefits of PR program delivered in both in- and outpatient setting; and investigate the influences of baseline exercise capacity, disease severity and aetiology on clinical outcomes.<br><br>Jan 2013 - Jan 2015 | Pre-post study (prospective) | Various ILD (63% IPF)<br><br>41<br>Inpatient=30<br>Outpatient=11<br><br>Mean age (SD):<br>66.9 (10.9) | Similar PR program across 2 sites<br>• Frequency: 6 days/week – daily in the first week then twice/day thereafter (exercise training); 3 sessions/week (educational sessions)<br>• Number of sessions: ≥24 (exercise training)<br><br>Components:<br>• Supervised exercise training<br>• Breathing training<br>• Educational sessions<br>• Psychosocial support | Outpatient (27%) / inpatient (73%)<br><br>• In person<br>• Individual/group | Exercise/functional capacity:<br>• 6MWD – improved following PR.<br>• Endurance test – cycle endurance time and power improved following PR. |  |
| | | | | | | Symptoms:<br>• MMRC – improved following PR. |  |
| | | | | | | HR-QoL:<br>• SGRQ – all domains improved following PR. |  |
| Trivedi (2017) (74) | Investigate the effects of a PR | Non-randomised controlled study | Silicosis | Disease specific education program with/without PR exercise training | Outpatient | Symptoms:<br>• MRC – improved in both groups but |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| India | program on dyspnoea and lung capacities.<br><br>Study period: *unclear* | PR with education program<br>vs<br>Education program only | 48<br>PR with education program=24<br>Education program only=24<br><br>Mean age:<br>52 | • Duration: 4 weeks<br>• Frequency: 4 days/week (exercise training); weekly (education program)<br>• Number of sessions: 16 (exercise training); 4 (education program)<br><br>Components:<br>• Supervised exercise training<br>• Education program<br><br>Materials used:<br>• Audio-visual tape<br>• Pamphlets | • In person<br>• Group | higher significance level in group receiving both PR exercise training and education program. | |
| Tsang *et al* (2018) (75)<br>Hong Kong (China) | Evaluate the clinical benefits of a community-based rehabilitation program and a home-based rehabilitation program.<br><br>2008 - 2011 | Pre-post study (retrospective audit) | Pneumoconiosis<br><br>181<br>Community based rehabilitation program (CBRP)=155<br>Home based rehabilitation program (HBRP)=26<br><br>Mean age (SD):<br>CBRP=70.7 (8)<br>HBRP=74.5 (8.3) | Community or home-based rehabilitation program<br>• Duration: 4-6 weeks (CBRP)<br>• Frequency: twice/week (CBRP); 8 home visits (HBRP)<br>• Number of sessions/visits: 8-12 group sessions (CBRP); 8 home visits (HBRP)<br><br>Components:<br>CBRP<br>• Breathing retraining<br>• Home exercise conditioning<br>• Patient education<br>• Walking aids and exercise apparatus prescription<br>•<br>HBRP<br>• Breathing retraining | Community / home<br><br>• In person<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – improved in both CBRP and HBRP.<br><br>HR-QoL:<br>• CRQ – emotion and mastery improved in CBRP; change in all domains not significant in HBRP.<br>• SF-12 – physical component improved in CBRP; change in both physical and mental components not significant in HBRP.<br><br>Psychological wellbeing:<br>• HADS – anxiety and depression improved in CBRP; change not significant in HBRP.<br><br>Disease knowledge:<br>• Disease knowledge test – improved in both CBRP and HBRP. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | • Home exercise conditioning<br>• Patient education<br>• Aid/adaptive device prescription<br>• Carer training<br>• Psychological support<br><br>** Both programs were complemented with adjunctive programs depending on needs including:*<br>1) Comprehensive Post Discharge Program; 2) Comprehensive Home Care Program; 3) PR Program; 4) Healthy Lifestyle Program; 5) Self-Management Program; 6) Respiratory Hygiene Program; 7) Maintenance Rehabilitation Program | | | |
| Vainshelboim *et al* (2014) (76)<br><br>Vainshelboim *et al* (2015) (77)<br><br>Vainshelboim *et al* (2016) (78)<br><br>Israel | *Vainshelboim et al (2014):* Examine the effects of a PR program on exercise tolerance, functional capacity, dyspnoea, HR-QoL and pulmonary function.<br>Jan - Dec 2012<br><br>*Vainshelboim et al (2015):* Evaluate the long term effects of a PR program on clinical outcomes over 11 months. | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | ** Same sample in all 3 studies*<br><br>IPF<br><br>32<br>CG=17<br>IG=15<br><br>Mean age (SD):<br>CG=66 (9)<br>IG=68.8 (6) | ** Same intervention in all 3 studies*<br>PR program<br>• Duration: 12 weeks<br>• Frequency: twice/week<br>• Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Unsupervised home exercise program<br>• Patient education | Outpatient<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD, Wmax – improved in IG following PR but did not sustain at 11-month.<br>• 30s chair-stand test – improved in IG following PR; improvement sustained at 11-month. |  |
| | | | | | | Symptoms:<br>• MMRC – improved in IG following PR but did not sustain at 11-month. |  |
| | | | | | | HR-QoL:<br>• SGRQ – total score improved in IG following PR; improvement sustained at 11-month. |  |
| | | | | | | Physical activity:<br>• IPAQ – physical activity levels improved in IG following PR but did |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Jan 2012 - July 2014<br><br>*Vainshelboim et al (2016):* Investigate the effects of a PR program on physical activity and body composition over 11 months.<br>Jan 4, 2012 - Nov 30, 2013 | | | | | not sustain at 11-month. | |
| Wallaert *et al* (2019) (79)<br>France | Investigate the long term effects of a home-based PR program.<br><br>Dec 2011 - Dec 2017 | Pre-post study (retrospective audit) | Fibrotic idiopathic interstitial pneumonia (54% IPF)<br><br>112<br><br>Mean age (SD):<br>66.8 (10.2) | PR program<br>• Duration: 2 months<br>• Frequency: weekly<br>• Number of sessions: 8<br><br>Components:<br>• Supervised in-home exercise training<br>• Unsupervised home exercise program<br>• Training in resumption of daily life physical activity<br>• Therapeutic patient education<br>• Psychosocial support<br>• Motivational communication to facilitate behavioural change and self-management<br><br>Materials used:<br>• Exercise diary<br>• Interactive presentations, Q&A, card games and an illustrated folder | Home<br><br>• In person/remote<br>• Individual | Exercise/functional capacity:<br>• 6MST – improved in IG following PR; improvement sustained at 6 and 12-month.<br><br>HR-QoL:<br>• VSRQ – improved in IG following PR; improvement sustained at 12-month.<br><br>Psychological wellbeing:<br>• HADS – anxiety improved in IG following PR; improvement sustained at 12-month. Difference between groups not significant for depression. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Wallaert *et al* (2020) (80)<br>France | Assess the long term impact of a PR program on daily life physical activity.<br><br>Jul 2012 - Apr 2016 | RCT<br><br>PR (IG)<br>vs<br>No PR (CG) | Sarcoidosis<br><br>38<br>CG=18<br>IG=20<br><br>Median age (range):<br>CG=57.5 (49-65)<br>IG=57.5 (48-63.5) | PR program<br>• Duration: 2 months<br>• Frequency: 3 times/week<br>• Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Training in resumption of daily life physical activity<br>• Therapeutic patient education<br>• Psychosocial support<br>• Motivational communication to facilitate behavioural change and self-management | Outpatient<br><br>• In person<br>• Individual/group | Physical activity:<br>• 12-month change in time spent in activities above an estimated energy expenditure of 2.5 METs – change not significant.<br>• Steps/day, total daily energy expenditure/day, total energy expenditure above 2.5 METs/day – change not significant at 6 and 12-month. |  |
| | | | | | | Exercise/functional capacity:<br>• 6MST – improved in IG at following PR, improvement sustained at 12-month. |  |
| | | | | | | Symptoms:<br>• MMRC – improved in IG following PR; improvement sustained at 6-month but difference between groups not significant at 12-month.<br>• FAS – no immediate improvement following PR but improved in IG at 12-month. |  |
| | | | | | | HR-QoL:<br>• VSRQ – improved in IG following PR; difference between groups not significant at 6 and 12-month. |  |
| | | | | | | Psychological wellbeing:<br>• HADS – difference between groups not significant in anxiety and depression over the 12-month observation period. |  |
| Zaki *et al* (2021) (81)<br>India | Examine the benefits of IMT added to a PR program on | RCT<br><br>PR with IMT (IG) | ILD (IPF: CG=32%; IG=30%) | PR program with/without IMT<br>• Duration: 8 weeks<br>• Frequency: 3 times/week | Outpatient<br><br>• In person | Exercise/functional capacity:<br>• 6MWD – improved in both groups with significantly larger improvement in IG. |  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | inspiratory muscle strength, functional capacity, HR-QoL, dyspnoea and pulmonary function.<br><br>5 May 2019 – 28 Sep 2019 | vs<br>PR alone (CG) | 51<br>CG=25<br>IG=26<br><br>Mean age (SD):<br>CG=53.1 (13.3)<br>IG=53.4 (13.6) | • Number of sessions: 24<br><br>Components:<br>• Supervised exercise training<br>• Dyspnoea coping strategies<br>• Nutritional guidance<br>• Psychological counselling | *Unclear whether it was delivered in group or individual setting* | HR-QoL:<br>• SGRQ – improved in all domains in both groups with significantly larger improvement in activity domain and total scores in IG.<br><br>Symptoms:<br>• MMRC – improved in both groups with significantly larger improvement in IG. |  <br>  |
| Zhang *et al* (2022) (82)<br>China | Investigate the effects of a PR program combined with conventional drugs on BODE and pulmonary function indexes.<br><br>Apr 2020 – Apr 2021 | Pre-post study (retrospective audit)<br><br>PR with conventional drugs (IG)<br>vs<br>Conventional drugs alone (CG) | Interstitial pneumonia<br><br>89<br>CG=41<br>IG=48<br><br>Mean age (SD):<br>CG=65.6 (3.1)<br>IG=66.0 (3.0) | PR combined with conventional drug treatment<br>• Duration: 3 months<br>• Frequency: 3-4 times/day; twice/day<br><br>Components:<br>• Supervised exercise training<br>• Breathing training<br>• Patient education<br>• Psychological intervention<br>• Relaxation training | Outpatient<br><br>*Unclear whether it was delivered in person or remotely; and whether it was in an individual or group setting* | Exercise/functional capacity:<br>• BODE (exercise ability) –improved in both groups with significantly larger improvement in IG.<br><br>Symptoms:<br>• BODE (airflow obstruction and dyspnoea) –improved in both groups with significantly larger improvement in IG. |  <br>  |
| Zhou *et al* (2021) (83)<br>China | Compare the effectiveness and safety of a pulmonary Daoyin rehabilitation program with usual care.<br><br>Apr 2017 – Aug 2018 | RCT<br><br>Pulmonary Daoyin (PD) rehabilitation program<br>vs<br>Exercise training (ET)<br>vs<br>Usual activity (CG) | IPF<br><br>96<br>CG=33<br>ET=31<br>PD=32<br><br>Mean age (SD):<br>CG=67 (10)<br>ET=64 (9)<br>PD=66 (11) | Pulmonary Daoyin rehabilitation program – a traditional Chinese medicine rehabilitation program<br>• Duration: 2 months<br>• Frequency: 5 days/week<br><br>Components:<br>• Intensive supervised exercise<br>• Unsupervised home exercise<br>• Mediative technique and mind regulation<br>• Posture and movements | Outpatient / home<br><br>• In person/remote<br>• Group/individual | Exercise/functional capacity:<br>• 6MWD – the PD group had significantly larger improvement than both ET group and CG at 2 and 6 months from baseline.<br><br>HR-QoL:<br>• SGRQ – the PD group had significantly larger improvement in the activity, impact domain and total score compared to CG 2 months following baseline; improvement in the impact domain and total score remained significant at 6 months; differences in change in all domains |  <br>  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | • Breathing exercises<br><br>Materials used:<br>• Written instructions<br>• CD to facilitate self-practice<br>• Diary to record frequency of home sessions | | not significant when compared to ET group. | |
| | | | | | | Symptoms:<br>• MMRC – the PD group had significantly larger improvement than both ET group and CG at 2 and 6 months from baseline. |  |

 – Change not significant compared to baseline or no significant difference between groups.

 – Mixed results.

 – Significant improvement from baseline, or better when compared to other group/s.

 – Significant worsening compared to baseline, or worse when compared to other group/s

N/A – Descriptive data with no comparison made.

ILD: interstitial lung disease; PR: pulmonary rehabilitation; EOL; end-of-life; OT: oxygen therapy; RCT: randomised controlled trial; IPF; idiopathic pulmonary fibrosis; COPD: chronic obstructive pulmonary disease; HR-QoL: health related – quality of life; IG: intervention group; CG: control group; HCP: healthcare professional; VAS: visual analogue scale; IIP: idiopathic interstitial pneumonia: ADL: activity of daily living; IMT: inspiratory muscle training.

**References**


1. Al Moamary MS. Impact of a pulmonary rehabilitation programme on respiratory parameters and health care utilization in patients with chronic lung diseases other than COPD. *East Mediterr Health J*. 2012; 18: 120-126.

2. Archibald N, Bakal JA, Richman-Eisenstat J, et al. Early integrated palliative care bundle impacts location of death in interstitial lung disease: a pilot retrospective study. *Am J Hosp Palliat Care*. 2021; 38: 104-113.

3. Arizono S, Taniguchi H, Sakamoto K, et al. Pulmonary rehabilitation in patients with idiopathic pulmonary fibrosis: comparison with chronic obstructive pulmonary disease. *Sarcoidosis Vasc Diffuse Lung Dis*. 2017; 34: 283-289.

4. Bajwah S, Ross JR, Wells AU, et al. Palliative care for patients with advanced fibrotic lung disease: a randomised controlled phase II and feasibility trial of a community case conference. *Thorax*. 2015; 70: 830-839.

5. Bassi I, Guerrieri A, Carpano M, et al. Feasibility and efficacy of a multidisciplinary palliative approach in patients with advanced interstitial lung disease. A pilot randomised controlled trial. *Pulmonology.* 2021; https://doi.org/10.1016/j.pulmoe.2021.11.004.

6. Bischoff KE, Choi S, Su A, et al. Better together: a mixed-methods study of palliative care co-management for patients with interstitial lung disease. *J Palliat Med*. 2021; 24: 1823-1832.

7. Brunetti G, Malovini A, Maniscalco M, et al. Pulmonary rehabilitation in patients with interstitial lung diseases: correlates of success. *Respir Med*. 2021; 185: 106473.

8. Cerdán-de-las-Heras J, Balbino F, Løkke A, et al. Tele-rehabilitation program in idiopathic pulmonary fibrosis - a single-center randomized trial. *Int J Environ Res Public Health.* 2021; 18: 10016.

9. Chai GT, Neo HY, Abisheganaden J, et al. Impact of palliative care in end-of-life of fibrotic interstitial lung disease patients. *Am J Hosp Palliat Care*. 2022; 39: 1443-1451.

10. Chéhère B, Bougault V, Chenivesse C, et al. Cardiorespiratory adaptation during 6-minute walk test in fibrotic idiopathic interstitial pneumonia patients who did or did not respond to pulmonary rehabilitation. *Eur J Phys Rehabil Med*. 2019; 55: 103-112.

11. da Fontoura FF, Berton DC, Watte G, et al. Pulmonary rehabilitation in patients with advanced idiopathic pulmonary fibrosis referred for lung transplantation. *J Cardiopulm Rehabil Prev*. 2018; 38: 131-134.

12. Deniz S, Sahin H, Yalniz E. Does the severity of interstitial lung disease affect the gains from pulmonary rehabilitation? *Clinical Respir J*. 2018; 12: 2141-2150.

13. Devani P, Pinto N, Jain P, et al. Effect of pulmonary rehabilitation (PR) program in patients with interstitial lung disease (ILD) - Indian scenario. *J Assoc Physicians India*. 2019; 67: 28-33.

14. Dowman LM, McDonald CF, Hill CJ, et al. The evidence of benefits of exercise training in interstitial lung disease: a randomised controlled trial. *Thorax*. 2017; 72: 610-619.

15. Duck A, Pigram L, Errhalt P, et al. IPF Care: a support program for patients with idiopathic pulmonary fibrosis treated with pirfenidone in Europe. *Adv Ther*. 2015; 32: 87-107.

16. Edwards C, Costello E, Cassidy N, et al. Use of the patientMpower app with home-based spirometry to monitor the symptoms and impact of fibrotic lung conditions: longitudinal observational study. *JMIR Mhealth Uhealth*. 2020; 8: e16158.

17. Elganady A, El Hoshy M, Eshmawey H, et al. Value of pulmonary rehabilitation in interstitial lung diseases. *Egypt J Chest Dis Tuberc*. 2020; 69: 542-548.

18. Ferreira G, Feuerman M, Spiegler P. Results of an 8-week, outpatient pulmonary rehabilitation program on patients with and without chronic obstructive pulmonary disease. *J Cardiopulm Rehabil*. 2006; 26: 54-60.

19. Ferreira A, Garvey C, Connors GL, et al. Pulmonary rehabilitation in interstitial lung disease: benefits and predictors of response. *Chest*. 2009; 135:442-447.

20. Fuschillo S, De Felice A, Elia A, et al. Effect of pulmonary rehabilitation on functional exercise capacity and hypoxemia in patients with interstitial lung diseases: a retrospective study. *Sarcoidosis Vasc Diffuse Lung Dis*. 2018; 35:245-251.

21. Gaunaurd IA, Gomez-Marin OW, Ramos CF, et al. Physical activity and quality of life improvements of patients with idiopathic pulmonary fibrosis completing a pulmonary rehabilitation program. *Respir care*. 2014; 59: 1872-1879.

22. Grongstad A, Spruit MA, Oldervoll LM, et al. Pulmonary rehabilitation in patients with pulmonary sarcoidosis: impact on exercise capacity and fatigue. *Respiration*. 2020; 99: 289-297.

23. Guler SA, Hur SA, Stickland MK, et al. Survival after inpatient or outpatient pulmonary rehabilitation in patients with fibrotic interstitial lung disease: a multicentre retrospective cohort study. *Thorax.* 2022; 77: 589-595.

24. Holland AE, Hill CJ, Conron M, et al. Short term improvement in exercise capacity and symptoms following exercise training in interstitial lung disease. *Thorax*. 2008; 63: 549-554.

25. Holland AE, Hill CJ, Glaspole I, et al. Predictors of benefit following pulmonary rehabilitation for interstitial lung disease. *Respir Med*. 2012; 106: 429-435.

26. Huppmann P, Sczepanski B, Boensch M, et al. Effects of inpatient pulmonary rehabilitation in patients with interstitial lung disease. *Eur Respir J*. 2013; 42: 444-453.

27. Igai Y, Porter SE. Development and applicability of a dignity-centred palliative care programme for people with idiopathic pulmonary fibrosis: a qualitative-driven mixed methods study. *Nurs Open*. 2022; 10: 8-23.

28. Igarashi A, Iwanami Y, Sugino K, et al. Using 6-min walk distance expressed as a percentage of reference to evaluate the effect of pulmonary rehabilitation in elderly patients with interstitial lung disease. *J Cardiopulm Rehabil Prev*. 2018; 38: 342-347.

29. Jackson RM, Gómez-Marín OW, Ramos CF, et al. Exercise limitation in IPF patients: a randomized trial of pulmonary rehabilitation. *Lung*. 2014; 192: 367-376.

30. Janssen K, Rosielle D, Wang Q, et al. The impact of palliative care on quality of life, anxiety, and depression in idiopathic pulmonary fibrosis: a randomized controlled pilot study. *Respir Res*. 2020; 21: 2: https://doi.org/10.1186/s12931-019-1266-9.

31. Jarosch I, Schneeberger T, Gloeckl R, et al. Short-term effects of comprehensive pulmonary rehabilitation and its maintenance in patients with idiopathic pulmonary fibrosis: a randomized controlled trial. *J Clin Med*. 2020; 9: 1567.

32. Kalluri M, Claveria F, Ainsley E, et al. Beyond idiopathic pulmonary fibrosis diagnosis: multidisciplinary care with an early integrated palliative approach is associated with a decrease in acute care utilization and hospital deaths. *J Pain Symptom Manage*. 2018; 55: 420-426.

33. Kalluri M, Lu-Song J, Younus S, et al. Health care costs at the end of life for patients with idiopathic pulmonary fibrosis. Evaluation of a pilot multidisciplinary collaborative interstitial lung disease clinic. *Ann Am Thorac Soc*. 2020; 17: 706-713.

34. Kalluri M, Younus S, Archibald N, et al. Action plans in idiopathic pulmonary fibrosis: a qualitative study—'I do what I can do'. *BMJ Support Palliat Care*. 2021: http://doi.org/10.1136/bmjspcare-2020-002831.

35. Kaymaz D, Ergun P, Candemir I, et al. Pulmonary rehabilitation in interstitial lung diseases. *Tuberk Toraks*. 2013; 61: 295-302.

36. Kerti M, Kelemen K, Varga J. The effectiveness of pulmonary rehabilitation in comparison interstitial lung diseases and idiopathic pulmonary fibrosis. *J Pulm Respir Med*. 2018; 8: 1000475.

37. Keyser RE, Woolstenhulme JG, Chin LMK, et al. Cardiorespiratory function before and after aerobic exercise training in patients with interstitial lung disease. *J Cardiopulm Rehabil Prev*. 2015; 35: 47-55.

38. Khor YH, Saravanan K, Holland AE, et al. A mixed-methods pilot study of handheld fan for breathlessness in interstitial lung disease. *Sci Rep*. 2021; 11: 6874.

39. Kozu R, Senjyu H, Jenkins SC, et al. Differences in response to pulmonary rehabilitation in idiopathic pulmonary fibrosis and chronic obstructive pulmonary disease. *Respiration*. 2011; 81: 196-205.

40. Ku V, Janmeja AK, Aggarwal D, et al. Pulmonary rehabilitation in patients with interstitial lung diseases in an outpatient setting: a randomised controlled trial. *Indian J Chest Dis Allied Sci*. 2017; 59: 75-80.

41. Lindell KO, Olshansky E, Song M-K, et al. Impact of a disease-management program on symptom burden and health-related quality of life in patients with idiopathic pulmonary fibrosis and their care partners. *Heart Lung*. 2010; 39: 304-313.

42. Lindell KO, Klein SJ, Veatch MS, et al. Nurse-led palliative care clinical trial improves knowledge and preparedness in caregivers of patients with idiopathic pulmonary fibrosis. *Ann Am Thorac Soc*. 2021; 18: 1811-1821.

43. Lingner H, Buhr-Schinner H, Hummel S, et al. Short-term effects of a multimodal 3-week inpatient pulmonary rehabilitation programme for patients with sarcoidosis: the ProKaSaRe study. *Respiration*. 2018; 95: 343-353.

44. Magnani D, Lenoci G, Balduzzi S, et al. Effectiveness of support groups to improve the quality of life of people with idiopathic pulmonary fibrosis a pre-post test pilot study. *Acta Biomed*. 2017; 88: 5-12.

45. Matsuo S, Okamoto M, Ikeuchi T, et al. Early intervention of pulmonary rehabilitation for fibrotic interstitial lung disease is a favorable factor for short-term improvement in health-related quality of life. *J Clin Med*. 2021; 10: 3153.

46. Moor CC, Mostard RLM, Grutters JC, et al. Home monitoring in patients with idiopathic pulmonary fibrosis: a randomized controlled trial. *Am J Respir Crit Care Med*. 2020; 202: 393-401.

47. Moor CC, Leuven SIv, Wijsenbeek MS, et al. Feasibility of online home spirometry in systemic sclerosis–associated interstitial lung disease: a pilot study. *Rheumatol*. 2021; 60: 2467-2471.

48. Naji NA, Connor MC, Donnelly SC, et al. Effectiveness of pulmonary rehabilitation in restrictive lung disease. *J Cardiopulm Rehabil*. 2006; 26: 237-243.

49. Nasrat SA, El-Hady AAA, Hafiz HA, et al. The efficacy of pulmonary rehabilitation combined with threshold inspiratory muscle training and upper extremities exercises in patients with interstitial lung diseases. *Syst Rev Pharm*. 2021; 12: 527-533.

50. Naz I, Ozalevli S, Ozkan S, et al. Efficacy of a structured exercise program for improving functional capacity and quality of life in patients with stage 3 and 4 sarcoidosis: a randomized controlled trial. *J Cardiopulm Rehabil Prev*. 2018; 38: 124-130.

51. Near AM, Burudpakdee C, Viswanathan S, et al. Effect of a patient support program for idiopathic pulmonary fibrosis patients on medication persistence: a retrospective database analysis. *Adv Ther*. 2021; 38: 3888-3899.

52. Nishiyama O, Kondoh Y, Kimura T, et al. Effects of pulmonary rehabilitation in patients with idiopathic pulmonary fibrosis. *Respirology*. 2008; 13: 394-399.

53. Nolan CM, Polgar O, Schofield SJ, et al. Pulmonary rehabilitation in idiopathic pulmonary fibrosis and COPD: a propensity-matched real-world study. *Chest*. 2022; 161: 728-737.

54. Ochmann U, Kotschy-Lang N, Raab W, et al. Long-term efficacy of pulmonary rehabilitation in patients with occupational respiratory diseases. *Respiration*. 2012; 84: 396-405.

55. Ozalevli S, Karaali HK, Ilgin D, et al. Effect of home-based pulmonary rehabilitation in patients with idiopathic pulmonary fibrosis. *Multidiscip Respir Med*. 2010; 5: 31-37.

56. Perez-Bogerd S, Wuyts W, Barbier V, et al. Short and long-term effects of pulmonary rehabilitation in interstitial lung diseases: a randomised controlled trial. *Respir Res*. 2018; 19: 182.

57. Prajapat B, Sandhya AS, Menon B, et al. Effect of pulmonary rehabilitation on systemic inflammation muscle mass and functional status in interstitial lung diseases. *Int J Sci Res*. 2016; 5: 760-766.

58. Rammaert B, Leroy S, Cavestri B, et al. Home-based pulmonary rehabilitation in idiopathic pulmonary fibrosis. *Rev Mal Respir*. 2011; 28: e52-57.

59. Rifaat N, Anwar E, Ali YM, et al. Value of pulmonary rehabilitation in patients with idiopathic pulmonary fibrosis. *Egypt J Chest Dis Tuberc*. 2014; 63: 1013-1017.

60. Ryerson CJ, Cayou C, Topp F, et al. Pulmonary rehabilitation improves long-term outcomes in interstitial lung disease: a prospective cohort study. *Respir Med*. 2014; 108: 203-210.

61. Salhi B, Troosters T, Behaegel M, et al. Effects of pulmonary rehabilitation in patients with restrictive lung diseases. *Chest*. 2010; 137: 273-279.

62. Sanchez-Ramirez DC. Impact of pulmonary rehabilitation services in patients with different lung diseases. *J Clin Med*. 2022; 11: 407.

63. Satsuma Y, Ikesue H, Kusuda K, et al. Effectiveness of pharmacist-physician collaborative management for patients with idiopathic pulmonary fibrosis receiving pirfenidone. *Front Pharmacol*. 2020; 11: 529654.

64. Sciriha A, Lungaro-Mifsud S, Fsadni P, et al. Pulmonary rehabilitation in patients with interstitial lung disease: the effects of a 12-week programme. *Respir Med*. 2019; 146: 49-56.

65. Sgalla G, Cerri S, Ferrari R, et al. Mindfulness-based stress reduction in patients with interstitial lung diseases: a pilot, single-centre observational study on safety and efficacy. *BMJ Open Respir Res*. 2015; 2: e00065.

66. Sharp C, McCabe M, Hussain MJ, et al. Duration of benefit following completion of pulmonary rehabilitation in interstitial lung disease-an observational study. *QJM.* 2017; 110: 17-22.

67. Shen L, Zhang Y, Su Y, et al. New pulmonary rehabilitation exercise for pulmonary fibrosis to improve the pulmonary function and quality of life of patients with idiopathic pulmonary fibrosis: a randomized control trial. *Ann Palliat Med.* 2021; 10: 7289-7297.

68. Shimoda M, Takao S, Kokutou H, et al. In-hospital pulmonary rehabilitation after completion of primary respiratory disease treatment improves physical activity and ADL performance: a prospective intervention study. *Medicine*. 2021; 100: e28151.

69. Stanziola AA, Salzano A, D'Angelo R, et al. Idiopathic pulmonary fibrosis telemedicine management during COVID-19 outbreak. *Open Med*. 2022; 17: 689-693.

70. Swigris JJ, Fairclough DL, Morrison M, et al. Benefits of pulmonary rehabilitation in idiopathic pulmonary fibrosis. *Respir Care*. 2011; 56: 783-789.

71. Talwar A, Sahni S, John S, et al. Effects of pulmonary rehabilitation on fatigue severity scale in patients with lung disease. *Pneumonol Alergol Pol*. 2014; 82: 534-540.

72. Thombs BD, Kwakkenbos L, Levis B, et al. Effects of a multi-faceted education and support programme on anxiety symptoms among people with systemic sclerosis and anxiety during COVID-19 (SPIN-CHAT): a two-arm parallel, partially nested, randomised, controlled trial. *Lancet Rheumatol*. 2021; 3: e427-437.

73. Tonelli R, Cocconcelli E, Lanini B, et al. Effectiveness of pulmonary rehabilitation in patients with interstitial lung disease of different etiology: a multicenter prospective study. *BMC Pulm Med*. 2017; 17: 130.

74. Trivedi SJ. Effect of pulmonary rehabilitation on functional capacity of lungs and dyspnea in patient with silicosis in Anand district of Gujarat. *Indian J Physiother Occup Ther*. 2017; 11: 207-209.

75. Tsang EW, Kwok H, Chan AKY, et al. Outcomes of community-based and home-based pulmonary rehabilitation for pneumoconiosis patients: a retrospective study. *BMC Pulm Med*. 2018; 18: 133.

76. Vainshelboim B, Oliveira J, Yehoshua L, et al. Exercise training-based pulmonary rehabilitation program is clinically beneficial for idiopathic pulmonary fibrosis. *Respiration*. 2014; 88: 378-388.

77. Vainshelboim B, Oliveira J, Fox BD, et al. Long-term effects of a 12-week exercise training program on clinical outcomes in idiopathic pulmonary fibrosis. *Lung*. 2015; 193: 345-354.

78. Vainshelboim B, Fox BD, Kramer MR, et al. Short-term improvement in physical activity and body composition after supervised exercise training program in idiopathic pulmonary fibrosis. *Arch Phys Med Rehabil*. 2016; 97: 788-797.

79. Wallaert B, Duthoit L, Drumez E, et al. Long-term evaluation of home-based pulmonary rehabilitation in patients with fibrotic idiopathic interstitial pneumonias. *ERJ Open Res*. 2019; 5: 00045-2019.

80. Wallaert B, Kyheng M, Labreuche J, et al. Long-term effects of pulmonary rehabilitation on daily life physical activity of patients with stage IV sarcoidosis: a randomized controlled trial. *Respir Med Res*. 2020; 77: 1-7.

81. Zaki S, Moiz JA, Mujaddadi A, et al. Does inspiratory muscle training provide additional benefits during pulmonary rehabilitation in people with interstitial lung disease? A randomized control trial. *Physiother Theory Pract.* 2022; 39: 518-528.

82. Zhang Z, Tian Y, Yang J. Effects of pulmonary rehabilitation therapy combined with conventional drugs on BODE and pulmonary function indexes in elderly patients with interstitial pneumonia. *Pak J Med Sci*. 2022; 38: 1703-1707.

83. Zhou M, Zhang H, Li F, et al. Pulmonary Daoyin as a traditional Chinese medicine rehabilitation programme for patients with IPF: a randomized controlled trial. *Respirology.* 2021; 26: 360-369.