Appendix 1: Search strategy

MEDLINE

1. fibromyalgia.ti,ab.
2. fibromyal*.ti,ab.
3. fibrositis.ti,ab.
4. fibromyositis.ti,ab.
5. (chronic adj1 widespread adj1 pain).ti,ab.
6. FMS.ti,ab.
7. arthritis.ti,ab.
8. (tennis adj1 elbow*).ti,ab.
9. (ehlers-danlos adj1 syndrom*).ti,ab.
10. (repetitive adj1 strain adj1 injur*).ti,ab.
11. RSI.ti,ab.
12. DISH.ti,ab.
13. (diffuse adj1 idiopathic adj1 skeletal adj1 hypertosis*).ti,ab.
14. CRPS.ti,ab.
15. (chronic adj1 region* adj1 pain adj1 syndrom*).ti,ab.
16. (chronic adj3 pain).ti,ab.
17. (persist* adj3 pain*).ti,ab.
18. (musculoskeletal adj3 pain*).ti,ab.
19. (musculo-skeletal adj3 pain*).ti,ab.
20. exp fibromyalgia/
21. exp arthritis/
22. exp tennis elbow/
23. exp Ehlers Danlos syndrome/
24. exp hyperostosis/
25. exp chronic pain/ or exp complex regional pain syndrome/
26. exp musculoskeletal pain/
27. exp Abdominal Pain/
28. (abdomin* adj1 pain*).ti,ab.
29. exp Headache/
30. headache*.ti,ab.
31. exp pain/
32. pain.ti,ab.
33. neuralgi*.ti,ab.
34. (pain adj1 sever*).ti,ab.
35. (pain adj1 interfer*).ti,ab.
36. (pain adj1 intens*).ti,ab.
37. dysmenorr**.ti,ab.
38. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37
39. exp adaptive behavior/
40. exp courage/
41. exp motivation/
42. exp self concept/
43. resilien*.ti,ab.
44. adapt*.ti,ab.
45. (bounc* adj1 back).ti,ab.
46. hardiness.ti,ab.
47. hardy.ti,ab.
48. courage.ti,ab.
49. (courag* adj1 engag*).ti,ab.
50. (goal* adj1 adjust*).ti,ab.
51. (goal* adj1 cognit*).ti,ab.
52. (goal* adj1 pursuit*).ti,ab.
53. (pain adj1 resist*).ti,ab.
54. (postive adj1 affect).ti,ab.
55. (inner adj1 strength).ti,ab.
56. (self adj1 efficac*).ti,ab.
57. (person* adj1 master*).ti,ab.
58. stoic*.ti,ab.
59. grit*.ti,ab.
60. "return to work".ti,ab.
61. RTW.ti,ab.
62. coping.ti,ab.
63. (self-regulation adj3 train*).ti,ab.
64. self-efficac*.ti,ab.
65. self-esteem.ti,ab.
66. mastery.ti,ab.
67. (psycholog* adj1 flexibil*).ti,ab.
68. flourish*.ti,ab.
69. self-determin*.ti,ab.
70. (benefit adj2 find*).ti,ab.
71. (positive adj1 self-talk).ti,ab.
72. benefit-find*.ti,ab.
73. (psychol* adj1 grow*).ti,ab.
74. (emotion* adj1 flex*).ti,ab.
75. (pain-relat* adj1 function*).ti,ab.
76. (positive adj1 adapt*).ti,ab.
77. exp resilience/
78. 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 71 or 72 or 73 or 74 or 75 or 76
79. exp workplace/
80. workplace*.ti,ab.
81. (work adj1 place*).ti,ab.
82. worksite*.ti,ab.
83. (work adj1 site*).ti,ab.
84. sicklist*.ti,ab.
85. (sick adj1 list).ti,ab.
86. (sickness adj1 certificat*).ti,ab.
87. (sick adj1 leave).ti,ab.
88. (medical adj1 certificat*).ti,ab.
89. (sickness adj1 absence*).ti,ab.
90. (work adj1 absence*).ti,ab.
91. 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90
92. 38 and 78 and 91

APPENDIX 2: Table 3: Full characteristics and main results of included studies

Study	*1st Author, Date, Country*	*Participants (key features) N = total Intervention (I) Control (CG) Randomised (analysed if per protocol) gender, Age, (mean, SD)*	*intervention*	*control/comparison group*	*baseline (BL) and assessment schedule*	*main outcomes of interest*	*main results (between group analysis)*	*other outcomes of interest*
1	Alaranta (1994), Finland (62)	Not working between 3 to 30 mths. Admitted to LBP rehab. prog. Age 30-47. N= 378 (293) **I:** 152 **CG:** 141 NB: 293 in analysis since 65 excluded after BL exam. but before allocation	**3 wk. programme of physical training** (endurance, strength, relaxation) **& CBT disability management** (gp and individual sessions; re-appraisal /coping for pain, work and life problems)	**3 wk in-house rehabilitation prog**: physical therapy, no stress management	-BL -3 mths -12 mths	- LoC and social adjustment using MHLC and SAS -SL: total no. of sick days in a 12 mth period (WHO occupational handicap)	- Only mild or no differences in changes between the study groups in psychological variables -No difference in overall reduction in sick days ($p>0.1$) -Greater pain decrease in intervention gp (17.1) vs control (9.1, $p<0.001$) -74% reduction in medical care usage in I gp compared to 67% reduction in CG ($p<0.001$)	-Pain and disability Million index -Depression (BDI) -Frequency of visits to medical services - measurements of flexibility, strength and endurance
2	Altmaier (1992), USA (61)	Not working between 3 to 30 mths. Admitted to LBP rehab. prog. Age 18-63. N: 45 **I:**N= 24 (21), mean age =41.25 (8.43), F= 25% **CG: N=** 21 (21), mean age = 38.38 (9.40), F= 40%	**Psychological Prog.** As for control, with added components; operant conditioning (2 exercise behaviours with praise); relaxation; adjunctive bio-feedback; gp sessions on CBT coping skills; daily home-work.	**Standard Treatment:** 3 wk MD inpatient prog. with physical therapy, aerobics, pain mechanisms and pain support education; gp vocational rehab; individual counselling.	-BL -Discharge (3 wks after admission) -6 mths	-RTW (if pt was working FT or PT training) -Confidence & self-efficacy via a 20 item self-efficacy scale, and WHYMPI self-control subscale	-RTW: No sign. effect (X^2 (1 N = 42 < 1) -No sign group difference for WHYMPI or LBPRS scores	-Self-reported pain (MPQ) -Pain interference (WHYMPI subscale) -Patient disability (LBPRS)
3	Andersen (2015), Denmark (51)	Sick-listed for up to max. 9 wks at inclusion due to pain related to the back/upper body. N = 141 (N =94 in relevant gps) **I1: (CPSMP)** N = 47, %M = 40%, Mean age: 44.3 (10.8) **I2: (TPA)** N = 46, %M = 50% Mean age 45.6 (10.0) **CG: (RE**F) N= 47, %M = 20% Mean age 45.8 (10.8)	**Chronic Pain Self-Management Prog. CPSMP):** health guidance plus health promotion activities: coping, problem solving, communication techniques to manage fatigue, exercises, use of medications **Tailored Physical Activity (TPA):** health guidance, plus standardised combination of aerobic fitness and strength training	**Reference group (REF):** health guidance only	-BL -End of 3 mth Int.	-Sick-listed status (yes/no) -Duration of sickness absence period	3 mth data: The proportion of ppts (50) who RTW after 3 mths was signly higher in TPA than in REF. The proportion (46.8%) that RTW in CPSMP was not sign higher than in REF (36.2%).	-General pain (VAS) -Work ability (VAS) -Kinesiophobia (TSK)
4	Asenlof (2005) and FU studies, Aslenlof	**2005 paper** 18-65 yrs, with recurrent MSK pain N=122	**Tailored Behavioural Treatment TBT:** 7 predetermined phases of treatment tailored to individual	**Exercise-based Physiotherapy Treatment EBPT:** physical therapy intervention consisting of 8-	-BL -3 mths -12 mths (2009 paper)	-Sickness related absence[1] -(Functional) self-efficacy[1] (SES, Swedish V)	**2005 paper:** Self-efficacy increased over time for both groups ($p=.001$). The IG experienced lower levels of	-Pain related disability (PDI) [2] -Pain (10 point Likert) -Fear of movement

	(2009) and Emilson (2017), Sweden (36, 37, 38)	TBT = 57 EBPTP = 65 **2009 paper**: 18-65 yrs, seeking physical therapy for recurrent or persistent MSD pain N= 122 (97) Intervention:65 Control:57 **2016 paper:** 43 (44%) ppts responded to FU survey, 20 in the tailored behavioural treatment (TBT) gp and 23 in the exercise-based physiotherapy treatment (EBT) gp.	patient needs according to pre-treatment assessments and goals. Strategies aimed at reducing fear of movement and improving self- efficacy.	10 therapist-led sessions, determined by physical condition and evidence of functioning	-24 mths (2009 paper) -10 yrs (2016 paper)		disability (p=.01), lower maximum pain intensity (p=.02), higher levels of pain control (p=.001), and lower fear of movement (p=.022) as a result of treatment condition. **2009 paper:** TBT group reported lower pain-related disability (p<0.01) and fear of movement (p<0.001). No diff for pain intensity, pain control, or self-efficacy (all p>0.05). **2017 paper:** No diff in gps for their primary outcome (p=0.17) of pain-related disability between the TBT gp (median: 2.5, Q1-Q3: -2.5-14.25), and the control gp (median: 0, Q1-Q3: -5-6). No sign. diffs for secondary outcomes except for total no. of sickness-related days' absence, lower in TBT gp cf EBPT at 10-yr FU (p=0.03) tho also at 3 mths before treatment (p= 0.02)	(TSK) -Treatment satisfaction (Likert scales)
5	Bendix (1995), (43) Denmark	CLBP pts 18-59 yrs, at least 6mths disabling BP, threatened job situation (incl. SL, no job) N = 132→ 123→106 **I1 (FR):** N = 46→44→40 Median age = 40; %F = 75 **12:** N= 43→40→31 Median age = 44;%F = 74 **I3:** N= 43→39→35 Median age = 42;%F = 77	**I1: Intensive, multidisciplinary functional restoration (FR):** aerobic fitness, progressive strength and endurance training, occupational therapy and psychological therapy (coping, goal-setting, changing negative pain sensations into more positive ways of thinking, in daily group therapy and individual counselling)	**I2**: active physical training (e.g. aerobics, weight training) **I3:** active combined psycho-physical program of psychological pain management, progressive weight training (less intense than I1)	-4 mths	-RTW defined as work readiness (having a job, being in education or seeking work) -SL (days)	-GP 1, FR intervention: sign. higher work readiness than the other two gps (p=.001) -For SL, there was a sign difference between gp 3 and the other two gps but no difference between gps 1 and 2 (p=0.5)	-No. of contacts with HC providers -Pain (VAS) & function/disability (study's own questions)
6	Bendix l (1996), (41) Denmark	CLBP pts 18-59 yrs, at least 6mths disabling BP, threatened job situation (incl. SL, no job) N = 106 (94) **I: (FR) N=**55 (45), %F = 71% Median age = 41; Able to work (%) =12(27%) **CG**: N =51 (49), F = 69% Median age = 40;% Able to work (%) =8(16%)	**I1 Intensive, MD functional restoration (FR):** as for Bendix et al (1995)	**CG: Not treated** – could go elsewhere for treatment.	-4 mths	-RTW defined as work readiness (having a job, being in education or seeking work) -SL (days)	-At the 4 mth FU, those exhibiting RTW: FR: 29(64%) V CG: 14(28%) (p < .001) -Treated patients had used fewer SL days (p <.02)	-No. of contacts with HC providers -Pain (VAS) & function (LBPRS)

7	Bernaards (2006, 2007, 2011) The Netherlands (52, 53, 54)	Computer workers with frequent or LT neck and upper limb symptoms with sickness absence of < 50% of the total working time N = 466 **I1: (WS)** N = 152, % M = 54.5 Mean age = 43.8 (8.5) **I2: (WSPA)** N = 156, %M = 53.8 Mean age = 43.6 (8.7) **CG: (UC)** N = 158, % M = 58.2 Mean age = 44.4 (8.5)	**Work Style, (WS)** = 6 gp meetings (behavioural change – based on Trans- theoretical model and Precaution Adoption Process (TTM & PAPM) using concepts such as stage of change, awareness, self-efficacy and decisional balance **Work Style/lifestyle Physical Activity, (WSPA)** = 6 gp meetings (behavioural change – based on TTM and PAPM) with additional PA at end	**Usual Care** (Dutch guidelines)	-BL -End of 6 mth int (ST pain). -12 mths after start (LT pain)	-Degree of recovery (self reported 7 pt scale) -Disability at work (0-11 scale, where 0 = no change and 10 = extreme change),	12 mth data (LT FU):: WS V control: 95%CI: 1.73 (0.75 to 3.99) WSPA V control:95%CI: OR 1.78 (0.77 to 4.10) Both interventions ineffective in improving recovery. WS but not WSPA intervention was effective in reducing all pain measures in neck and shoulder, not arm/wrist/hand, and only in LT (12 mo) pain For neck/shoulder only, WS showed increased recovery rate	- Pain intensity (0-11 scale, after Von Korff et al 1992) - No. days with neck & upper limb symptoms (DMQ) -No. mths without symptoms -Physical activity (SQUASH) -Health care use (self-report) -Body posture & workplace ergonomics (self-report and observed)
8	Bergbom (2014), Sweden (44)	People who experienced back pain, screened in workplaces and classified as at risk of LT pain-related disability. N=105 I1: 28 (18*) I2: 32 (24*) I3: 45 (37*) *Completed FUs The following are available for total N but not split by gp: %F = 80 Age 48.62 (8.93) Duration of problem % <12 mths 13.3 >12 mths 66.7	Half of ppts were assigned to an intervention by matching their psychological profile with the intervention; the other half were randomly assigned. There were 3 I groups: **-I1: Activity training:** 6 wkly sessions with a physical therapist or psychologist. Goal setting and individually designed activity programme. Matched with medium risk profile. -**I2: Graded exposure in vivo:** 7-9 sessions over 6 wks run by clinical psychologists. Goal setting graded for fear avoidance, with graded exposure to fear provoking movements. Matched with fear avoidant profile. - **I3: Broad CBT:** 7 weekly treatments with clinical psychologists Combination of CBT techniques: pacing, behavioural experiments, problem solving, etc. Matched with distress profile.	No true control group	-Before and after treatment -9 mths after treatment -1x wk through treatment.	Measured before and after treatment: -SL (self-report of 14 days or more)	-Main results relate to comparison between matched and unmatched gps for perceived disability and SL. -Ppts who are matched to treatment and those who are unmatched have equally good outcomes in terms of disability. -5 ppts (13%) in the gp matched to treatment were on SL at FU and 1 ppt (3%) on SL in unmatched gp. Fisher's exact test revealed no statistically sign. association between matching and SL (p>.05).	Measured before and after treatment: -HC use (self-report) -Generic health (EQ-5D) -Perceived disability (QBPDS)[2] -Fear and Avoidance (TSK and FABQ) Wkly measures: -Emotional Distress (HADS) -Pain intensity (11 point scale) -Pain catastrophising (PCS) -Back pain worry (after Von Korff 1998)
9	Brendbekken	People aged 20 to 60, sick listed (to a degree between 50 and	**MI: Interdisciplinary Structured Interview and**	**BI: Active control group**. Thorough medical,	-2 wks, and 3 mths (MI)	-RTW fully and also partly (if over 50% of work days per mth spent on SL)	No diffs between gps on FT RTW at 12 or 24 mth FU.	N/A

	(2017) Norway (34)	100%) for with MS pain < 12 mths and referred to a specialist clinic in physical rehab. Author emailed to confirm only 18.3% of the 284 were on SL less than 3 mths. The rest had been off work due to pain for over 3 mths. Mean values of days on SL by inclusion was 146 (SD 59.8) N: 284, F=53.9%, Age: 41.3, **I:** 141 **CG:** 143	**Visual Education Tool (ISIVET),** to facilitate patient-therapist communication about a holistic picture of pts' work and home lives, and designed to strengthen motivation and coping -Comprehensive focus on psychosocial factors, particularly working conditions, with pt-centred approach	educational exam, a brief cognitive assessment based on non-injury model, emphasising recommendation for normal activity resumption.	-2 wks (BI) -Mthly for 24 mths (all)		-MI pts had higher probability to partly RTW during first 7 mths of FU c.f. BI gp (the highest RR was at mth 7, RR = 2.31, 95% CI 1.19-4.51, p = 0.01)	
10	De Buck (2005), The Netherlands, (40)	Chronic rheumatic disease. All had a paid job (working FT or PT or on SL, either with/ without partial disability pension) and were having a self-perceived, disease-related problem at work that threatened ability to work. Randomized N= 140 **I:** N=74, F =55% Mean age =43 **CG: (UC):**N= 66, F =58% Mean age =44 (24-58yrs) Lost to FU (intervention) N=13, Control N= 12.	**Job retention vocational rehab. Program:** Intervention lasted 4-12 mths. Delivered by MD team. Systematic assessment followed by education, vocational counselling, guidance, medical & non-medical treatment.	**Usual care:** treated and referred to other HC professionals in relation to their working problem if rheumatologist felt it necessary.	-BL -6 mths -12 mths -18 mths -24 mths	-Occurrence of job loss (complete work disability or unemployment). -Emotional status (HADS Dutch V) -Quality of life (HAQ) & RAND-36)	No diff between gps on proportion of pts losing their job at any time point over 24 mth period. Analysis on I: 74; CG: 66 (ITT). Job loss in %: 6 mths I: 9; CG: 5 (p = 0.39) 12 mths I: 19, CG19 (p = 0.97) 18 mths I: 19, CG 24 (p = 0.51) 24 0.89) (patients in VR gp had a significantly greater improvement of the fatigue visual analog scale and of emotional status (all *P* values < 0.05).	-Job satisfaction -Pain functional status (VAS) Pain and functional ability did not differ between groups
11	Eijk-Hustings (2013), The Netherlands (42)	Pts with fibromyalgia (FM) not involved in work litigation Total randomised N=203 Total started (dropped out post randomisation) N= 134 **Intervention 1 (MD):** N=108 (started N: 67; 94% F, 6% M, mean age 41.6(8.8)) **Intervention 2** (AE): N=47 **(started** N=19; F= 100%, mean age = 43.9(7.6)) **UC:** N=48 (F = 97.9%, mean age = 42.9 (11.0))	**I: 2 phases, multidisciplinary (MD) then aerobic exercise (AE) for 12 wks.** **Phase 1**: sociotherapy, physiotherapy, psychotherapy, creative art therapy on 3 days/wk **Phase 2:** aerobic & resistance exercises (2 hrs' wkly).	**UC:** Individualised education about FM, lifestyle advice by a rheumatologist or specialist rheumatology nurse within one or two consultations. May include other treatments e.g. physiotherapy or social support from rheumatology nurse.	-12 wks -18 mths	-HR-Qol, using EQ-5D -Participation (includes work productivity and hours of unpaid tasks and chores. Contractual hrs paid work and hrs SL were measured by a self-developed Q) -Impact of FM on daily functioning assessed using via FIQ[1] (has a workability subscale)	No sign. between-gp diffs in outcome measures which had small ns diffs at study endpoint between MD and CG e.g.: , 95% CI (−0.21, 0.47)	N/A

12	Ewert (2009), Germany, (39)	Nurses/equivalent professional status with history of BP: at least 1 episode of LBP in last 2 yrs. 18-65 yrs. Fit enough to do GPE. Not on SL as result of pain. Total N = 202 (169) **I1 (MP)** N= 92 (83), F = 91.3% Mean age = 37.9(11.6) Co-morbidity* score = 1.3 (1.5) **Control (EP)** N = 91(86) F = 93.4%, Mean age = 41.1 (10.8) Co-morbidity* score = 1.5 (1.7) *perception of impact on function	**I: 13 wk programme - Multimodal secondary prevention (MP)** full exercise programme (EP) of 11 sessions, plus 18 sessions (17 gp sessions of 1.75 hrs and 1 face-to-face session of 45 mins had these units: x 5 psychological; x 7 SSEs (segmental stabilization exercise)); x 8 ergonomic and workplace. Psychological sessions included causes of pain, ppts' own theories about pain; communication skills such as expressing needs.	**13 wk exercise prog. (EP)** Individualised training prog. on circuits (for home too plus optional additional 10 wk course)	-BL -Post-intervention -3 mth -12 mth	-Pain intensity including changed ability to work (WHYMPI) [1] -Coping (CSQ) [1] -Back pain specific self efficacy (Basler's Questionnaire) [1] -Self-efficacy (GSE) [1] -Functioning; physical and mental health status (SF36 (PCS) and SF36 (MCS)) [1] -	No sign. diffs at any time between gps Pain Intensity: F value (DF1/2); p value F = 0.91 (3/487/14) p=0.436 Pain interference: F value (DF1/2); p value F = 1.46(3/485.2) p= 0.225 From psychological variables, largest ES from specific self-efficacy at 3 and 12 FU (-.060). - FABQ had a small ES between gps e.g. FABQ-work ES 0.06 (CI: -0.25 - 0.37)	-Pain interference (WHYMPI)[2] -Beliefs about pain affecting ability (FABQ-W and FABQ-PA, German V, omitted the work subscale) -Depression (CESDS, German V) -Job satisfaction and stress (JDI) -Daily Hassles (DHS) -Muscle strength -Lumbar lifting -Trunk extension endurance
13	**Haldorsen (1998a, b)** And 12 mth FU Haldorsen (1998c) , Norway (57, 58, 59)	Employed, had 8 wks sickness certificate for MSK pain including more than 50% for ICPC diagnoses including back, neck, shoulder and generalised pain pts "had pain for at least 3 mths, many for yrs" (author correspondence) N: 469, M = 171(36%) F=298 (64%), Age = 43 (10.6) **I (MMCBT)** N= 312 (293, 94%) M =112 (36%) F= 200 (64%), Age=43 (10.6) **CG: TAU**:N=157 (94, 60%) M = 59 (38%) F= 98 (62%) Age = 43 (10.6) (ages as reported)	**I: Multi-modal CBT (MMCBT)** 6 hr session 5 days/ wk for 4 wks. Cognitive behavioural modification (including coping strategies), education, exercise, workplace interventions.	**TAU** GP Care	-BL -4 wks -2 mths -6 mths -10 mths -1 yr FU	-RTW (using Norwegian National Health Insurance Register data)	No sign. diffs in RTW between MMCBT (163, 52%) and control (84, 53%) but the MMCBT gp had improved in most other outcomes investigated	-Pain location, type, intensity and discomfort (a VAS & a drawing where pain felt) -Subjective health (USI) -Subjective workability (GRWL) -Anxiety (STAI I-II, Norwegian V) -Psychological distress HSCL (Norwegian V) -Health LOC (MHLC)
	Haldorsen 1998c Norway (Bergen study) (59)	LBP pts on SL for 8 wks N = 223 Age = 43 M =105 F =118 **I: (MMCBT)** N = 142, M = 70 (49%) F= 72 (51%), Age =43 (10.5) **CG: TAU** N = 81, M =35 (43%) F =46 (57%) Age =43 (11.4)	**I: Multi-modal CBT (MMCBT)** 6 hr session 5 days/ wk for 4 wks. Cognitive behavioural modification (including coping strategies), education, exercise, workplace interventions.	**TAU** GP care	-BL -4 wks -2 mths -6 mths -10 mths -1 yr	-RTW (using Norwegian National Health Insurance Register data)	No sign. diffs between the gps on RTW	-Pain location, type, intensity & discomfort (a VAS & a drawing where pain felt) -Subjective health (USI) -Subjective workability (GRWL) -Health LOCl (MHLC) -Anxiety (STAI I-II,

								Norwegian V) -Psychological distress HSCL (Norwegian V)
14	**Haldorsen (2002),** (35) Skouen (2002), (65) Skouen (2006a) (66) Norway:	Ppts on SL for at least 8 wks with MSK pain Total = 654 (627) as RTW data not available on gov. workers (n = 27) **I1: (EMD**): N=169(165), F% = 68.6 Mean age = 43 (10.5) 57 (Skouen et al 2002) 42 (Skouen et al 2006) **I2: (LMD):** N= 222(214),F% = 67.6 Mean age = 43 (10.3) 52 (Skouen et al 2002) 81 (Skouen et al 2006) **CG (TAU):** N = 263(249),F% = 63.2 Mean age = 44 (10.9) 86 (Skouen et al 2002) 85 (Skouen et al 2006)	**I1: Extensive MD treatment (EMD)** 6 hr session 5 days /wk for 4 wks. Cognitive behavioural modification, education, exercise, workplace interventions. Ppts developed their own rehab. Prog. at the end. **I2: Light MD treatment (LMD)** 1 hr lecture on exercise, lifestyle and fear-avoidance advice graded exercise programme (1 session followed by up to 12 additional sessions)	**TAU** GP advice (called OT, ordinary treatment)	-BL testing (screening for prognosis) -Treatment (1-2 mths later) -Every mth for 14 mths	-RTW (absence of sick pay per mth)	LMD & EMD increases the possibility of RTW after 14 mths by about 10%. LMDT vs TAU (χ^2 = 3.6 df = 1 P = 0.05) EMDT vs TAU (χ^2 = 4.6 df = 1 P<0.04) **Good prognosis:** No diffs in RTW **Medium prognosis:** Diffs between LMD (n = 71 v n= 48)(χ^2 =5.5 df = 1 P <0.02) and EMD v TAU (N = 55 V n = 54) (χ^2 = 3.9, df = 1 P < 0.05) **Poor prognosis:** NS effects of LMD But EMD v TAU (N = 28 V n = 26) (χ^2 = 3.79, df = 1 P < 0.05)	-Cost-benefit analysis
	Haldorsen (2002), (35) **Skouen (2002),** (65) Skouen (2006a) (66) Norway: -subgroup analyses of LBP pain Haldorsen (2002) (35)	Ppts – as for Haldorsen 2002, but subgp diagnosed with LBP using IDC-9 criteria N – 664, 211 were pts with LBP using IDC-9 diagnosis Randomised to: **LI1: LMD:** N- 52; M=21 F=31 mean age 43,7(11.5) **I2: EMD:** N – 57,M=17 F= 40, mean age 42.9 (10.5) **CG (TAU)** (N – 86,M=31 F= 55, mean age 44 (11.7)	As for Haldorsen (2002)	As for Haldorsen (2002)	-BL -26 mths Mthly, proportions presented by noncumulative curve, with p values reported at 12, 18 & 24 mths after treatment	-RTW (proportion of pts back at FT work, recorded every mth -Women and men analysed separately	-For men, no diffs found between EMD and TAU (e.g. at 24 mth FU, ANOVA to c.f. the mean values of no. of mths at work from after treatment attained p = 0.02, where TAU mean mths at work was 11.1 and LMD mean mths at work was 16.9) -LLD increased RTW in men c.f. TAU –diff at 12, 18 and 24 mth FU - No sign. Diffs between any of the two MD treatment programs and CG for women	-Cost-effectiveness
14	Haldorsen (2002), (35) Skouen (2002), (65) **Skouen (2006a), (66)** Norway: subgroup of CWP	Pts (as for Haldorsen 2002, but subgp defined as having CWP using IDC-9) N – 664 (in this article, data are reported on the 215 who had CWP using ICD-9. These are pts on SL for 3 mths on average. The study finished with 208 pts as RTW data was not available on gov. employees).	As for Haldorsen (2002)	As for Haldorsen (2002)	-54 mth FU from end of treatment	-Proportion of pts who fully RTW for each mth in FU period. -Days absent from work. -Women and men analysed separately	-Women: main effect of extensive treatment v TAU on total no. days absent was -206.95, SE 86.29, p = 0.02, thus sign reducing lost days (EMD was more effective until 40 mth FU, then there was no diff) -Men: LMD associated with sign more days absence (182.47, SE 90.60, p = 0.05) -MMD was less effective than TAU	N/A

	only from Haldorsen et al (2002) (35) by comparing RTW in 3 gps during first 54 mths after treatment	Randomised to: **TAU** N=88 (n =85; 26 M, 59 F, mean age 43.1, SD 10.7) **LMD** N= 83 (n= 81, 25 M, 56 F, mean age 43.2, SD 10.9) **EMD** N = 44 (n = 42, 12 M, 30 F, mean age 42.6, SD 11.0)					during whole FU -Higher age sign increased absence only for women (7.98 days, SE 3.17, p = 0.01) -For all pts, independent of treatment type, pts with poorer health prognosis were absent from work more than pts with good prognosis (223.72 days, SE 109.23, p = 0.04)	
15	Hutting (2013, 2015), The Netherlands (48, 49)	Employees with Complaints of the arm, neck and shoulder (CANS) N=123 **I**: **(SG):** N= 66 (64), M = 17.2%, F = 82.8% mean age = 44.98(11.15), **CG: (UC):** N= 57 (53), M = 32.1%, F = 67.9% Mean age = 47.69(10.50)	**Self-management of CANS programme (SG):** 6 wkly gp sessions, moderated and supported by an e-module	**Usual Care + information available within the ppts' organisation:** They could also access all care outside of their organisation.	-BL -3 mths -6 mths -12 mths	-Absenteeism (SPS-6 Dutch V & WLQ) [1] -Self-efficacy at work (SEWS) [1] - Participation and autonomy at work (VBBA[1], Dutch version) -Self-efficacy (GSES[1] Dutch V) -	-No sig diff on absenteeism (p=0.56) On the general module of the Disabilities of the arm, shoulder and hand (DASH), no sign. diff between SG and CG was found[2] -No sign between-gp diffs were found on most outcome measures -However, there were 3 between gp sign. diffs, 1 was in sporting activities and the other 2: -In the DASH work module, the between-gp effect was −3.82 (95% CI −7.46 to −0.19, p=0.04), indicating that the SG had a 3.83 lower average score compared with the CG. -For limitations experienced in job-related activities the between-gp effect at 12 mths was −1.01 (95% CI −1.97 to −0.04, p=0.04)	-Fatigue (CIS) -Burnout (UBOS) -Work style (WSF) -QoL (SF-12v2) - Disabilities of upper limb (DASH[2], Dutch V) -Pain catastrophizing (PCS) -Pain in the previous wk (NPRS)
16	Jensen (1997a), Sweden (60)	Women aged 20- 55, suffering NS spinal pain without neurological signs, sick-listed for min 1 mth max. 12 mths during previous yr, currently employed. N = 63 (54) **I1: (EI):** N= 33 (29), mean age = 45(8) **I2: (RI):** N= 30 (25), mean age = 44(8)	**EI:** Multi-modal CBT programme specifically designed for women suffering from a moderate degree of learned helplessness. Same as RI, but less physical training and instead given psychologist-led gp sessions on different pain related topics using gender-oriented approach, e.g. stress /gendered response to stress. Mthly phone/mail FU up by	**RI:** Conventional inpatient multi-modal CBT program for neck and back pain, bio-psycho-social approach. Included exercise therapy, CBT, problem-solving, goal-setting, self-efficacy.	-1 wk before treatment -Last day of treatment -6 mths post-treatment -18 months post treatment	-SL (over 14 days) -Coping Strategies (CSQ, Swedish V) -Subjective Health Status (GSI)	-No sign. diffs between EI and RI gps for SL, coping or subjective health status (our prime interests) -Sign. decrease in disability in EI gp, compared with increase in disability for RI gp -Sign decrease in depression in EI gp over RI gp at 6 mths F (1,50) = 4.52, p = 0.05 –Sign. diff in perceived helplessness at 18 mth FU favouring EI (p = 0.05)	-Pain intensity and anxiety (self-report diary) [2] -Depression (BDI) [2] -Perceived helplessness (RAI, modified) [2] -Disability (self-reported index of activities) [2]

			psychologist for 6 mths.					
17	**Jensen (2001, 2005)** Bergström (2012), Sweden (47, 67, 68) (2005 paper includes 36 mo FU and cost effect-iveness: 2012 paper is 10 yr FU)	Blue-collar and service/care workers on SL with LT NS spinal pain, currently sick-listed for 1-6 mths, 18-60 yrs. N=214 (97 men, 117 women) **IG1 BMR**: 63 (49; 47 at 36 mo FU*) F = 48% mean age =42.5(11.8), **IG2 PT 2**: 54 (48; 50 at 36 mo FU) F= 68%, mean age = 43.3 (9.4) **IG 3 CBT**: 49 (41; 35 at 36 mo FU) F = 45%, mean ge =43.8(9.6), **CG:** 48 (0; 28 at 36 mo FU) F= 58%, mean age = 43.9(10.8) *Numbers analysed varies over 4 assessment/FU points and between different measures.	-All 3 IGs included workplace visits & work managers & rehab officials participated in discharge sessions when a rehab plan was agreed & all had 1 yr boosters: MD to include PT &CBT. **I1: Behavioural medicine rehabilitation (BMR):** MD to include PT &CBT. **I2: Behavioural-oriented physiotherapy (PT):** to enhance functioning, promote sustainable behaviour change. Individual, tailored programmes. **I3: CBT:** to improve ability to manage pain & resume normal activities. Scheduled activities & tailored homework.	**Usual Care**	-Pre-treatment -Post-treatment -6 mths -18 mths -36 mths (2005 paper only)	-SL (part of absence from work concept) - early retirement (part of absence from work concept) -Health-related QoL (SF-36)	-**2001 paper:** Risk of early retirement lower for females in PT and CBT compared to CG over 18 mth FU (odds ratio CBT=0.1, 95% CI 0.0-0.6; BM=0.1, 95CI 0.0-0.8). -Decrease in work absence higher for females in treatment gps vs CG -Total absence from work (including SL) was not sign diff in CG compared with treatment gps but male absence rate in BM higher cf other conditions (parameter estimate from covariance analysis 65, 95CI 39-169, ns). -For QoL (SF36) women in CBT and BM reported better QoL than those in CG. No sign. diffs for men. **-2005 paper:** FT behavioural medicine prog. is effective in increasing health and decreasing costs for women with spinal pain. -Not supported for male ppts. -Combined intervention (BM) more effective than either CBT or PT alone, or TAU.	-Perceived relevance of rehabilitation -Adherence to treatment plan -Cost effectiveness and healthcare utilisation analyses at 36 mth FU.
17	**Bergström (2012),** Sweden (10 yr FU of Jensen 2001) (68)	Continuous sickness absence for 1-6 mths due to NS spinal pain, aged 18-60. Ppts were classified into 1 of 3 subgroups based on the MPI (Swedish) or MPI-S: (interpersonally distressed ID, dysfunctional DYS, adaptive copers AC) N = 194 (187) Mean age = 43(10.4) **IG1 BMR:** N = 50 (48) (AC 13, ID15, DYS 22) **IG2 PT:** N= 54 (53) (AC 18, ID13, DYS 23) **IG3 CBT**: N = 44 (42) (AC 18, ID8, DYS 18)	As for Jensen et al (2001, 2005) above	UC	-10 yrs	-Registered sickness absence after rehab. over a 10-yr FU	Trends for AC gp to benefit from all prog. compared to CG gp, but not sign. (p=0.146 for BM; p=0.960 for PT; p=0.416 for CBT, adjusted) Development of sickness absence after intervention among ID and DYS ps were similar across all I gps as well as CG. BMR is most beneficial for DYS and AC gps; CBT and PT didn't benefit any gp.	-Interaction between MPI-S groups, age, sickness absence prior to interventions.

		CG: N = 46 (44) (AC 18, ID11, DYS 17)						
18	Jensen (2011), Denmark (45)	Aged 16-60, partly or fully sick-listed for 3-16 wks because of LBP. N=351 (344 participated in all consultations) **I1 (MDI):** N=176 (176*, 124**) F= 54%, mean age=42.1 (10.5), **I2 (BI):** N=175 (175*, 120**) F = 50.3%, mean age = 41.9(10.4) *No.s analysed are for primary outcomes only. ** No.s analysed for secondary outcomes	**Hospital based MD intervention (MDI):** Clinical exam; advice on rehab and return to work by rehab. physician and physiotherapist. Assigned case manager or designed rehab. plan with MD team.	**Brief intervention (BI):** Clinical exam; advice on rehab. and RTW by rehab. physician and physiotherapist No true CG.	-BL -12 mths	-RTW (the 1st 4 wk period within the 1st yr after inclusion during which ppts received no social transfer payments)	RTW achieved by 71% (n=125) of MD intervention gp compared with 76% (n=133) of brief intervention. Hazard ratio of 0.84 after adjustment for age, sex, smoking, compensation claims, disability score and diagnosis.	-Pain (LBPRS) -Disability (RMDS, Danish V) -SF36 (Danish V) -Fear avoidance (OMPSQ)
19	Li (2006), Hong Kong (64)	Diagnosed as MS injuries -Injuries due to work -SL >6 mths -Completed process of medical rehab. in hospitals/rehab. centres -Ages 20-59 yrs N: 64 **I:**34 **CG: (WL)** 30 Gender demographics for treatment groups unavailable due to reporting error	**-3-wk prog. consisting of individual vocational counselling and gp-based training**. Included pain and stress management, job acquisition, and pre-employment training. Individual sessions aimed to reduce anxiety and re-establish life roles and establish LT action plan.	**Waiting List (WL)** (completed training post-data collection which matched I gp)	-BL -3 mths	-Readiness to work. (C-LASER). Also, progression through stages of change model from pre-contemplation for RTW to action. Progression towards readiness to work was inferred using the other measures, i.e., people with low pain were considered closer to RTW -Efficacy of treatment for improved self-perception of physical ability (tested by self-report) -Improved overall health (C-LASER, SF-36 – latter to show self-perceived HRQoL)	-Reported progression to action stage of "stages of change" model for treatment gp, compared to regression through stages for control gp ($F=7.99$, $p<0.01$). -Sign. improved physical function for intervention gp over control gp ($p=0.039$). -Sign. reduced stress and anxiety over time for intervention gp ($F=2.68$, $p<0.01$).	-Reduced stress and anxiety (STAI[2], Chinese V)
20	Lindell (2008) Sweden (55)	-Working age up to 59 yrs -Sick listed between 6 wks and 2 yrs with NS back/neck pain (stratified into sub-acute/chronic in results so chronic only results reported) Initial N= 147 Excluded= 22 N for analysis: 125 **I: CBT:** N=63, F=33 M= 30 mean age= 42.2 **CG:** N= 62, F=35 M= 27, Mean age= 42.6 years	**CBT rehabilitation prog.** aimed to achieve work ability lasting for at least 30 consecutive days. **-Phase 1** (2-8 wks) included mapping medical barriers to work and establishing sick listing, as well as mapping biomechanical obstacles to RTW. -**Phase 2** (2-8 mths) involved completion of graded PA, education in relaxation, written rehab plan and regular check-ups on progress.	**Primary care treatment** Controls were unable to access treatment centre during FU.	-6 mths -12 mths -18 mths	-RTW share (30 consecutive days RTW) -RTW chance (hazard ratio of ability to return to work in 18 mths) -Net days SL	-No sign. diff between gps in RTW share , RTW chance or net days SL between control and rehab. gp ($p>0.05$) -No sign diff between gps in visits at BL although rehab gp showed faster decline in visits.	-HC visits over 18 mth period[2]

			-Pps could access alternative care during FU					
21	Linton (2005), Sweden (56)	Pts seeking care for NS back or neck pain who were employed and at risk for developing LT disability, aged 20-60. N = 185 **I1: CBT + (MT).** N=69 (14 at 1 Yr FU), 81% F 19% M. Mean age = 49.1(6.8), **I2: CBT + PT:** N=69 (61 at 1 Yr FU), 80% F 20% M. Mean age = 48.7(7.3 **CG: UC (MT):** N=47 (43 at 1 Yr FU), 94% F, 6% M, mean age =46.7(9.4)	**I1: CBT + medical treatment (as for UC).** CBT included personalised problem solving and personalised coping skills training. **I2: CBT+Physical Therapy, PTh) focusing on exercise.** PTh was aimed at preventing future problems. Tailored intervention – personalised exercise progs. as well as treatments to reduce pain and prepare the ppt to become more active	**UC: Medical Treatment** Free medical examination. Given 16-page booklet '*Managing acute neck and back pain'* and verbal advice.	-BL -12 mths	Work absenteeism split into SL and risk of being off work in the LT/developing LT sick disability leave -SL (no days SL per mth during the 6 mths previous to intervention and also during the previous 6 mth period at FU) -risk of developing SL and LT SL (amount of SL taken during past year at pre-test and at 1 yr FU)	SL MT group had the highest % of SL (9-14%); CBT (6-8%); CBT +PTh (2-5%) -Risk of developing LT SL: -MT gp had 6-fold increased risk of being off work for 15-days or more compared to CBT (OR 6.10, 95% CI=1.29-28.77). -MT gp had an increased risk of being off work 15-days or more, compared to CBT+PTh. (OR=4.80: 95% CI =1.1.9-19.32). However, no sig between the treatment gps CBT and CBT/PTh on SL (OR=1.27; 95% CI =0.25-5.56).	-Depression and anxiety (HADS) -Fear avoidance (FABQ-M, 4 items on physical activity; TSK) -Physical Function: 5 items relating to daily living from the OMPSQ -LBP functional disability, (RDMQ) -Future HC utilization (no. of visits to a HC provider during past year, no visits - >10 visits)[2] -Pain intensity ratings (0-10 scales) -Pain catastrophising (PCS)
22	Macedo (2009), England (50)	Employed pts (RA) with increased disability risk identified by the RA Work Instability Scale (RA-WIS), stratified into medium and high risk gps then randomised. Assessed for eligibility: N = 136 Randomised: N = 32 (no drop outs) **I: OT & UC :**N= 16 ratio of F:M = 15:1, Mean age = 48.63 (11.56) **CG: (UC):** N= 16 ratio of F:M = 15:1, Mean age = 52.56(7.65)	**Occupational Therapy (OT) & UC together:** Individualised assessment & treatment plan Including education on RA, medication, management within RA clinics, self-advocacy, work-place rights &responsibilities, ergonomic review & discussions with employees re. reasonable work adjustments, pacing, stress management, assertiveness, & exercise.	**Usual Care:** in RA centre consisted of routine reviews by rheumatologist. Focus of treatment was on early, aggressive medical management to achieve remissions	-BL -6 mths	*Function measures:* -Functional and psychosocial aspects (COPM) *Work productivity measures:* -work days missed per month[1] *Coping measures:* -with arthritis, AIMS2[1] and AHI[1] -health states (EQ-5D) [1]	At 6 mths, improvement in the I gp was sign. higher for: -all functional /psychosocial outcomes: COPM performance p = < 0.001; COPM satisfaction *p* = < 0.001; HAQ DI p = 0.02 -and most work outcomes: RA WIS p = 0.04; VAS work satisfaction p < 0.001; VAS work performance p = 0.01. and: AHI (*p* =0.02); AIM Scales II pain subscale (p = 0.03); VAS pain (p = 0.007); EuroQol Index (p = 0.02); DAS28 (p = 0.03) No sign diffs between the two grps for work days missed per month or percentage of days missed per	*Function measures:* -Disability Index (DI) of the Health Assessment Questionnaire (HAQ) *Work productivity measures:* - increased disability risk (RA Work Instability Scale, RA-WIS) -Work satisfaction (VAS) -Work performance (VAS) *Disease activity measures:* -Disease Activity Score in 28 joints (DAS28) -Pain (VAS)

							month.	
23	Marhold (2001), Sweden (63)	25-60 yr old females, diagnosis of MSD, employed, on SL. Total N=72 N = 36 on LT SL (over 12 mths, mean 26 mths) N = 36 on ST SL (mean 3 mths) Mean age =46(9) %F= 100 Neck/shoulder pain = 58% LBP=29% **I CBT:**N = 36 **CG: TAU** N= 36 Both gps divided into ST and LT SL, so I LT SL N = 18, ST SL N = 18 Control LT SL N = 18, ST SL N = 18	**I: CBT RTW prog. (plus TAU):** 12 gp sessions 1-6 = pain coping skills and 6-12 = RTW applying pain coping skills including social skills training and general coping such as managing social anxiety at work (2.5 hrs plus phone calls). Then 2 booster sessions (1 and 3 mths after treatment)	**TAU** no CBT, but contact with various health professionals	-BL -Post programme -6 mths	-No. SL days out of 60 days -Coping (CSQ)	-IG for ST SL ppts was more effective than TAU in reducing no. of days on SL (p= < 0.05). -IG for LT SL ppts was not more effective than TAU in reducing no,. of days SL -IG helped ST SL ppts to control & decrease pain; to decrease experience of disability and impairment; and to increase general activity level. -No sign interaction effects for LT SL or ST SL ppts for CSQ. -A sign effect of treatment x time was found for ST SL ppts on how much control they felt over their pain (p= < 0.05).	-Pain and disability (WHYMPI, PAIRS, DRI) -Depression (BDI)
24	Myhre (2014), Norway (46)	Pts listed as sick for 1-12 mths with neck/back pain, employed (high and low blue collar workers), referred to secondary care spine clinic. Aged 18-60. Total N = 413 **I :** N= 209 (203), %F = 44.3 Mean age = 40.2(9.7) Pain (NRS, 0-10 pain intensity) = 6.1 (2.3); FABQ-W = 28.6 (8.8) **CG(MD Rehab):** N = 204(202) %F = 48.5, Mean age = 41(10) Pain intensity (NRS, 0-10); FABQ-W = 26.7 (10.1)	**I: Work-focused rehabilitation (at Oslo & Trondheim):** -Part 1: Clinical exam, imaging, reassurance. Removing fear avoidance, restoring activity, enhancing self-care and coping -Part 2: 2-3 individual appts with case worker: work history, family life, RTW obstacles, creating RTW schedule (Varied slightly between Oslo and Trondheim sites)	**CG: multi-disciplinary rehab:** either brief (Oslo) or comprehensive (Trondheim): -Part 1: Clinical exam, imaging, reassurance. Removing fear avoidance, restoring activity, enhancing self-care and coping. No case-worker contact	-BL -12 mths	-RTW (defined as 1st 5 wk period that ppts did not received sickness or workplace benefits)	N (% RTW within 12 mths: Work-focused: 142(70%) Control 152 (75%) **Trondheim site**: Median days before RTW: I = 176; C = 157, p = 0.178 ns **Oslo site**: Median days before RTW:I = 150; C = 158, p = 0.750 ns **Both sites:** Median days before RTW :I = 161; C = 158, p=.045, ns	-BL data only for pain intensity (numeric scale) - Disability via ODI and neck disability index -Emotional distress (HSCL) -fear avoidance beliefs (FABQ using work and physical activity subscales)

[1] This was a secondary outcome of the study (so may be underpowered, although it is one of our primary outcomes)
[2] This was a main outcome measure of the study (although one of our secondary outcomes)

Key
ATW = able to work; BL = baseline; CBT = Cognitive Behavioural Therapy; CG = control group; CLBP = chronic lower back pain; diffs = difference; FT = full time (work); gp = group; HC = healthcare; HR QoL = health-related quality of life; IG – intervention group; LBP= lower back pain; LOC – locus of control; MD= multi-disciplinary; MSK = musculoskeletal; mth = month; ns = non-significant; ppts = participants; PT = part time (work); prog = programme; Qol = quality of life; RTW= return to work; sign = significant; SL = sick listed; V = version; VAS = visual analogue scale; yr = year.

Scales:

AHI Arthritis Helplessness Index (83); **AIMS2** Arthritis Impact Measurement Scales II (84); **Basler** Basler's questionnaire for back pain specific pain efficacy (85); **BDI** Beck Depression Inventory (86);

CESDS Centre for Epidemiologic Studies Depression Scale (87; 88 German version); **CIS** Checklist Individual Strength (89); **C-LASER** Chinese Lam Assessment on Stages of Employment Readiness (unpublished, 64) **COPM** Canadian Occupational Performance Measure (90); **CSQ** Coping Strategies Questionnaire (91; 92 Swedish version); **DAS-28** Disease Activity Score in 28 joints (93); **DASH** Disabilities of the Hand, Arm and Shoulder (94; 95 Dutch version); **DHS** Daily Hassles Scale (96); **DRI** Disability Rating Index (97); **EQ5D** EuroQol (98); **FABQ** Fear Avoidance Beliefs Questionnaire (99) (PA – physical activity scale; W – work scale; 100 FABQ-PA German version); **FABQ-M** Fear Avoidance Beliefs Questionnaire Modified (101) **FIQ** Fibromyalgia Impact Questionnaire (102; 103); **GRWL** Graded Reduced Workability Scale (from 57; constructed therein); **GSES** General Self Efficacy Scale (Dutch version, 104); **GSE** General Perceived Self-Efficacy (105); **GSI** Global Self-rating index (60); **HADS** Hospital and Depression Scale (106; 107 Dutch version); **HAQ** Health Assessment Questionnaire (108; 109); **HSCL** Hopkins Symptom Check List (110) (111 for Norwegian version); **JDI** Job Description Index (112); **LBPRS** Lower Back Pain Rating Scale (113; 114) **MHLC** Multidimensional Health Locus of Control (115); **MPQ** Melzack Pain Questionnaire (116); **NDI**neck disability index (117); **NPRS** Numeric Pain Rating Scale (0-10 scale within 49); ODI Oswestry Disability Index (118); **OMPSQ** Orebro Musculoskeletal Pain Screening Questionnaire (119, 120 for 5 items relating to daily living; 121 for fear avoidance); **PAIRS** Pain and Impairment Rating Scale (122); **PCS** Pain Catastrophizing Scale (123); **PDI** Pain Disability Index (124; 125); **QBPDS**Quebec Back Pain Disability Scale (126); **RAI** Rheumatology Attitudes Index (127; 128); **RAND** 36 item Health Survey (129); **RA-WIS** RA Work Instability Scale (130); **RMDS** Roland Morris Disability Score (131 Danish version); **RMDQ** Roland Morris Disability Questionnaire (132 modified version of the RMDS); **SAS** Social Adjustment Scale (133); **SES** Self-Efficacy Scale (134; 135); **SEWS** Self efficacy at work scale (136); **SF12-v2** Short Form Health Survey 12 item (137); **SF36** Short Form Health Survey (138) (MSC – Mental component summary scale; PSC – physical component summary scale; Danish version 139); **SHC** Subjective Health Complaints (scoring system, 140); **SPS-6** Stanford Presenteeism Scale (141; 142); **STAI** State Trait Anxiety Inventory (Chinese version 143); **STAI I-II** Spielberger State-Trait Anxiety Inventory (144); **SQUASH** Short Questionnaire to Access Enhancing Physical Activity (145); **TSK** Tampa Scale of Kinesiophobia (146); UBOS Utrecht Burnout Scale (147); **USI** Ursin's Health Inventory (148); **VBBA** Questionnaire on experiencing and assessing stress at work (Dutch version 149); **WHYMPI** West-Haven Yale Multidimensional Pain Inventory (150; 151); **WLQ** Work Limitations Questionnaire (152); **WSF** Workstyle Short Form (153). References for all scales in Table 3 are available from the lead author on request

APPENDIX 3: Table 4: Quality assessment of included studies (key to abbreviations is found after Table 3)

Study	*First Author*	*No. of withdrawals/ dropouts mentioned? If so was this by group?*	*Reasons for withdrawals/dropouts given? If so was this by group?*	*Practitioner training level satisfactory?*	*Therapeutic time equivalent between groups?*	*Power calculation conducted?*	*Groups similar on prognostic indicators?*
1	Alaranta (1994)	Yes: Yes	No	Yes	Yes	No	Yes
2	Altmaier (1992)	No	No	Yes	Yes	Yes	Yes
3	Andersen (2015)	Yes: Yes	No: No	Yes	No	Yes	Yes
4	Asenlof (2005, 2009) Emilson 2017	Yes: Yes	Yes – reasons across groups not specified to group included	Yes	Yes	Yes (power requirement of 140 not met as 122 recruited)	Yes
5	Bendix (1995)	Yes: No	Yes: No	Yes	No	Unclear	Yes
6	Bendix (1996)	Yes: No	Yes: No	Yes	No	Unclear	Yes
7	Bernaards (2006, 2007, 2011)	Yes: Yes	Yes: Yes	Yes	No	Yes	Yes
8	Bergbom (2014)	Yes: Yes	No	Yes	Yes	Yes	Yes
9	Brendbekken (2017)	Yes: Yes	No: No	Yes	No	Yes	Yes
10	De Buck (2005)	Yes: Yes	Yes: Yes in some cases only	Yes	Yes	Yes	Yes
11	Eijk-Hustings (2013)	Yes: Yes	Yes: Yes	Yes	Yes	Yes	Yes (except education)
12	Ewert (2009)	Yes: Yes	Yes: No	Yes	No	No	Yes
13	Haldorsen (1998a, b) Haldorsen (1998c)	Yes: Yes	No: No	Yes	No	No	Yes[1]
14	**Haldorsen (2002),** Skouen (2002),(2006a)	No: No	No: No	Unclear	No	No	No
14	Haldorsen (2002), **Skouen (2002),** (2006a)	Yes: Yes	No	Yes	No	No	Yes
14	Haldorsen (2002), Skouen (2002), **(2006a)**	Yes: Yes	No	Yes	No	No	Yes
15	Hutting (2013, 2015)	Yes: Yes	Yes: Yes	Yes	Yes	Yes	Yes
16	Jensen (1997a)	Yes: Yes	Yes, see left	Yes	Yes	Yes	Yes
17	**Jensen (2001)** (2005)	Yes: Yes	No	Yes	No (Combined BM group	Yes (but statistical power was low	Yes

	Bergström (2012)				was double therapeutic time of the component groups CBT and PT)	increasing risk of type II error)	
17	Jensen (2001) **(2005)** Bergström (20 12)	Yes: Yes	Yes: Yes	Yes	No	Yes	Yes
17	Jensen (2001) (2005) **Bergström (2012)**	Yes: Yes	No	Yes	Yes	Not stated	Unclear
18	Jensen (2011)	Yes: Yes	Yes: Yes	Yes	Yes	Unclear	Yes
19	Li (2006)	No	No	Yes	Yes	Yes (NB study is underpowered by its own estimation)	Yes
20	Lindell (2008)	Yes: Yes	No	Yes	Yes	Yes (NB study is underpowered by its own estimation)	Yes
21	Linton (2005)	Yes: Yes	Yes: No	Yes	No	Not stated	Not stated
22	Macedo (2009)	Yes: No withdrawals	N/A	Yes	Yes	Yes	Yes except for work status e.g. IG: FT working 94%, UC FT working =56%
23	Marhold (2001)	Yes: Yes	No: No	Yes	No	Yes	Yes
24	Myhre (2014)	Yes: Yes	No: No	Yes	No	Yes	Yes

[1] Groups were similar on demographics (see paper's Table 3) but analysis of pre-test scores showed patients in treatment group were working more full time, reported more pain and less workability

Appendix 4: Deviations from protocol on Prospero

Title

Prospero: What do we know about resilience for chronic pain sufferers at work?
Change: As we became more knowledgable about all the pain, work and resilience literature, we did want to change our title to reflect the fact that resilience may or may not be a useful 'secret ingredient' in trying to analyse work participation for pain sufferers. Also, due to journal requirements that the title be a maximum of ten words, combined with Prisma's requirement that we must have the words "systematic review" in the title, we had to condense our title.

Aim

Prospero: The aim was to systematically review the effectiveness of interventions with resilience components in promoting work participation and reducing work absence in adults with chronic pain.
Change: We added to the aim that we would consider if resilience was a useful concept by which to group work participation interventions, as we became more entrenched in the complexities of the resilience literature.

Participants

Prospero: Participants had to have chronic pain (diagnosed or labelled using any recognised criteria).
Change: Following author correspondence, we included two RCTs in which 80% of participants had chronic pain and 20% sub-acute pain (36-38; also 34).

Comparator

Prospero: Comparator stated groups would be comprised of "workers" [getting UC/TAU etc.)
Change: We removed the word "worker" since some participants may not technically be a worker at the time of trial entry, but a person wishing to re-enter work.

Primary outcomes

Prospero: stated simply 'resilience'.
Change: We added "any validated scales measuring the following aspects of resilience: self-efficacy, active coping, positive affect, positive growth, positive reinforcement, optimism, purpose in life, and acceptance, all per se and in relation to pain." since these were the key resilient aspects arising from our increasingly in-depth knowledge of the literature and conversations with key authors
Prospero: pain disability was a primary outcome and coping was a secondary outcome.
Change: We re-ordered our primary and secondary outcomes so that only outcomes to do with work and resilience were primary and all other outcomes were secondary. Therefore, pain disability became a secondary outcome and coping a primary one. This was simply a question of more coherent ordering of concepts as we went through the resilience literature as described above.

Between group differences for secondary outcomes

Prospero: We planned to report baseline to last available follow up between group differences for secondary as well as primary outcomes.
Change: We only reported these in abbreviated form in Table 3 due to the large number of outcomes. We do also briefly discuss secondary outcomes in the text.

Appendix 5: Methodological quality assessment (following 32-33)

This addresses the following issues, assessed simply by 'yes' or 'no':

- Was the number of withdrawal dropouts mentioned? By group?
- Were reasons given? By group?
- Was practitioner training level satisfactory?
- Was the therapeutic time equivalent between groups?
- Was a power calculation conducted?
- Were groups similar on prognostic indicators?

Any additional notes?