Records identified through database searching
(n = 12488)

## Screening

## Included

## Eligibility

## Identification

Additional records identified through other sources
(n = 33)

Records after duplicates removed
(n = 4285)

Records after non-peer reviewed articles removed

(n = 3,676)

Records screened
(n = 3,676)

Records excluded
(n =3396)

Full-text articles assessed for eligibility
(n = 280)

Full-text articles excluded, with reasons
(Ineligible intervention n = 97)

(Inadequate or no control group n = 52)

(Wrong outcome n= 37)

(Not eligible population n = 7)

(Not RCT n = 12)

(Wrong publication type n = 4)

Papers included in qualitative synthesis (systematic review)
n = 71 papers from 70 studies)

Studies included in quantitative synthesis (meta-analysis) (n =63)

Supp Figure 1: PRISMA diagram for selection of papers included in the systematic review and meta-analysis



Supp Figure 2 Forest plot demonstrating effect size for intervention relative to control on Distress symptoms overall and by health condition

Supplementary Table 1: Mean scores on depression and anxiety at baseline for intervention and control groups by measure used, health condition and author

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Intervention** | **Control** |
| **First Author Year (intervention conditionξ)** | **Health Condition** | **Mean****Depression** | **SD (range)** | **Mean Anxiety** | **SD (range)** | **Mean****Depression** | **SD (range)** | **Mean Anxiety** | **SD (range)** |
|  |  | **HADS-D and HADS-A (elevated scored 8+ for each scale)** |
| *Atema et al., 2019 (guided)* | *Cancer* | 4.79  | 3.54 | 7.06 | 4.01 | 4.50 | 3.54 | 6.85 | 4.01 |
| *Atema et al., 2019 (self managed)* | *Cancer* | 4.40 | 3.54 | 6.36 | 4.01 | - | - | - | - |
| *Børøsund et al., 2014,**(webchoice)* | *Cancer* | 1.5 | 0-11 | 4.0 | (0-16) | 2 | 0-14 | 4 | 0-15 |
| *Børøsund et al., 2014**(iPatient provider communication)* | *Cancer* | 2.0 | 0-10 | 5.0 | (0-17) | - | - | - | - |
| *Petzel et al., 2018* | *Cancer* | 3.9 | 2.5 | 7.9 | 3.3 | 3.7 | 2.8 | 7.4 | 3.1 |
| *Ritterband et al., 2012* | *Cancer* | 5.2 | 3.6 | 9.4 | 4.3 | 5.4 | 2.7 | 8.6 | 3.3 |
| *Willems et al., 2017* | *Cancer* | 3.5 | 3.0 | 4.8 | 3.7 | 3.4 | 3.41 | 4.5 | 3.7 |
| *Zhu et al., 2018* | *Cancer* | 12.6 | 2 | 10.3 | 2.4 | 12.6 | 2.4 | 9.5 | 2.3 |
| *Buhrman et al., 2004* | *Chronic Pain* | 6.9 | 4.8 | 7.4 | 4.5 | 6.6 | 4.1 | 7 | 3.3 |
| *Buhrman et al., 2011* | *Chronic Pain* | 6.3 | 4.2 | 7.6 | 3.7 | 6.3 | 4.2 | 7.6 | 5.1 |
| *Trompetter et al., 2015**(online ACT intervention)* | *Chronic Pain* | 6.1 | 3.4 | 7.2 | 3.3 | 6.1 | 3.4 | 6.9 | 3.3 |
| *Trompetter et al., 2015**(online expressive writing)* | *Chronic Pain* | 6.5 | 3.4 | 7.5 | 3.3 | - | - | - | - |
| *Peters et al., 2017 (Web (iCBT))* | *Mixed Pain* | 7.3 | 3.4 | 9.1 | 4.1 | 7.2 | 3.3 | 7.31 | 3.8 |
| *Peters et al., 2017, (positive psychology)* | *Mixed Pain* | 7.8 | 4.2 | 8.0 | 4.7 | - | - | - | - |
| Murray et al., 2017 | Diabetes | 4.4 | 3.5 | 4.9 | 3.7 | 3.91 | 3.73 | 4.49 | 3.7 |
| *Friesen^ et al., 2017* | *Fibromyalgia* | 9.9 | 3. | 11.6 | 4.0 | 10.0 | 3.8 | 10.2 | 4.0 |
| *Habibović et al., 2014* | *Heart Disease* | 3.6 | 3.0 | 4.6 | 4.9 | 3.5 | 3.0 | 4.0 | 4.0 |
| *Norlund^ et al., 2018* | *Heart Disease* | 9.9 | 2.2 | 10.9 | 2.4 | 10.3 | 2.5 | 10.8 | 2.5 |
| *Younge et al., 2015* | *Heart Disease* | 3.8 | 2.9 | 8.2 | 3.6 | 3.8 | 2.9 | 9 | 3.4 |
| *Everitt et al., 2013 (website and support)* | *IBS* | 5.3 | 3.7 | 9.5 | 3.9 | 5.3 | 3.6 | 10 | 4.1 |
| *Everitt et al., 2013, (website Only)* | *IBS* | 4.2 | 2.9 | 8.7 | 3.4 | - | - | - | - |
| *McCombie et al., 2016* | *IBS* | 4.6 | 3.5 | 7.0 | 4.1 | 4.9 | 4.4 | 6.9 | 4.1 |
| *Boeschoten^ et al., 2017* | *Multiple Sclerosis* | - | - | 10.4 | 3.2 | - | - | 10.5 | 3.2 |
| *Moss-Morris et al., 2012* | *Multiple Sclerosis* | 8.0 | 3.6 | 8.3 | 4.3 | 6.8 | 2.72 | 9.6 | 4.5 |
| *Bundy et al., 2013* | *Psoriasis* | 5.1 | 3.7 | 8.1 | 4.2 | 5.2 | 3.5 | 8.6 | 3.9 |
|  | **PHQ (10+ for elevated) and GAD (10+ elevated) scales** |
|  |  | ***PHQ*** | **GAD** | ***PHQ*** | **GAD** |
| *O'Moore^ et al., 2018* | *Arthritis* | 14.0 | 4.8 | - | - | 12.8 | 4.8 | - | - |
| *Bantum et al., 2014* | *Cancer*  | 6.5 | 95% CI: 5.9-7.1 | - | - | 7.7 | 95% CI: 7.0-8.3 | - |
| *Smith^^ et al., 2019* | *Cancer* | 10.3 | 5.6 | - | - | 10.3 | 6.1 | - |
| *Dear et al., 2013*  | *Chronic Pain* | 11.6 | 4.7 | 10.1 | 5.2 | 12.1 | 5.8 | 8.7 | 4.6 |
| *Dear et al., 2015 (website+ regular contact)* | *Chronic Pain* | 11.6 | 5.9 | 8.4 | 5.5 | 10.4 | 5.5 | 8.2 | 5.9 |
| *Dear et al., 2015 (website+ optional contact)* | *Chronic Pain* | 10.6 | 5.3 | 8.0 | 4.7 | - | - | - | - |
| *Dear et al., 2015 (website, no contact)* | *Chronic Pain* | 10.9 | 4.8 | 8.3 | 4.6 | - | - | - | - |
| *Scott^ et al., 2018* | *Chronic Pain* | 14.19 | 6.16 | - | - | 13.19 | 5.31 | - | - |
| *Wilson et al., 2015* | *Chronic Pain* | 13.0 | 6.2 | - | - | 12.1 | 5.6 | - | - |
| *Lorig et al., 2010* | *Diabetes*  | 7.3 | 5.6 | - | - | 8.0 | 6.5 | - | - |
| *Newby^ et al., 2017* | *Diabetes*  | 15.9 | 5.1 | - | - | 14.3 | 5.5 | - | - |
| *Meyer^ et al., 2019* | *Epilepsy* | 14.74  | 3.00 | 10.33 | 4.39 | 15.27 | 3.35 | 11.62 | 4.19 |
| *Friesen^ et al., 2017* | *Fibromyalgia* | 14.1 | 4.7 | 10.9 | 4.7 | 14.1 | 4.9 | 9.9 | 4.9 |
| *Molander^ et al., 2018* | *Hearing problems* | 9.3 | 5.2 | 6.4 | 4.8 | 7.4 | 4.3 | 5.6 | 4.4 |
| *Habibović et al., 2014* | *Heart Disease*  | 5.9 | 5.1 | 4.6 | 5.0 | 5.4 | 4.5 | 4.0 | 4.0 |
|  |  | **DASS (normal D 0-9; A 0-7)** |
|  |  | **DASS-D** | **DASS-A** | **DASS-D** | **DASS-A** |
| *Trudeau et al., 2015* | *Arthritis* | 9.26 | 0.86Ŧ | 7.86 | 0.79 Ŧ | 10.00 | 0.83 Ŧ | 8.42 | 0.75 Ŧ |
| *Chiauzzi et al., 2010* | *Chronic Pain* | 13.2 | 1.1 | 9.7 | 0.9 | 12.6 | 1.1 | 8.6 | 0.8 |
| *Ruehlman et al., 2012* | *Chronic Pain* | 8.3 | 6.3 | 5.1 | 4.8 | 7.3 | 5.9 | 4.7 | 4.5 |
| *Bromberg et al., 2012* | *Migraine* | 22.8 | 1.0 | 20.4 | 0.8 | 21.4 | 1.0 | 19.5 | 0.8 |
| *Ghahari et al., 2010* | *Multiple Sclerosis* | 33.0 | 4.8 | 25.5 | 3.9 | 35.0 | 5.8 | 26.0 | 4.6 |
| *Migliorini et al., 2016* | *Spinal cord injury* | 19.7 | 10.7 | 12.7 | 8.7 | 19.1 | 10.8 | 9 | 8.4 |
|  |  | **CES-D (cut off 16 or 22?)** |
| *Boele^ et al., 2018* | *Cancer*  | *22.0* | *5.9* | - | - | *25.0* | *6.9* | - | - |
| *Owen^ et al., 2017* | *Cancer* | *22.3* | *(0.9)* | - | - | *21.5* | *(0.92)* | - | - |
| *Ruland et al., 2013* | *Cancer*  | *15.6* | *5.8* | - | - | *15.5* | *4.8* | - | - |
| *Ruehlman et al., 2012* | *Chronic Pain* | *25.6* | *13.3* | - | - | *21.8* | *13.1* | - | - |
| *van Bastelaar^ et al., 2011* | *Diabetes* | *29.0* | *7.0* | - | - | *28* | *7.0* | - | - |
| *Simister et al., 2018* | *Fibromyalgia* | *26.6* | *12.4* | - | - | *27.8* | *12.4* | - | - |
| *Williams et al., 2010* | *Fibromyalgia* | *15.1* | *10.1* | - | - | *17.1* | *11.5* | - | - |
| *Devineni & Blanchard, 2005* | *Headache, Migraine* | *15.8* | *11.2* | - | - | *13.9* | *9.5* | - | - |
| *Lee et al., 2019* | *IBS* | *22.42* | *10.67* | *-* | *-* | *20.37* | *10.99* | *-* | *-* |

^ participants screened in based on depression or distress scores. ^^Smith PHQ-8; Standard error

IBS irritable/inflammatory bowel disease

Supplementary Table 2: For studies using Cognitive Behaviour Therapy (CBT) as basis of intervention, the CBT elements reported to be used in the intervention.

|  |  |  |  |
| --- | --- | --- | --- |
| First Author, year | Patient group | **CBT** | **CBT elements/techniques** |
| *Abrahams et al., 2017* | *Cancer Breast* | Yes | *Addressed dysfunctional cognitions regarding fatigue.**Fatigue perpetuating factors: poor coping with breast cancer; high fear of cancer recurrence; dysfunctional fatigue related cognitions deregulated sleep wake rhythm deregulated activity patterns negative social interactions and low social support* |
| Andersson et al., 2002 | Tinnitus | Yes | *Applied relaxation (tense-relax), positive imagery, controlled breathing (as part of applied relaxation) and cognitive therapy, which was adjusted to deal with negative thoughts and beliefs relating to tinnitus. Differential relaxation and behavioral sleep management skills, rapid relaxation, exercises of concentration (mindfulness), and advice on physical activity and relapse prevention.**All modules involved homework assignments and weekly reports on a report Web page to be submitted weekly* |
| *Atema et al., 2019* | Cancer Breast | Yes | *Goal setting; psycho-education relaxation techniques, interplay of thoughts, feelings and psychical symptoms, cognitive restructuring of unhelpful thoughts, identification of stressors and goal setting to reduce stressors; cognitive and behavioural precipitants*Homework*: diarising, practice relaxation techniques, monitoring triggers and apply helpful thoughts, pursuing goals,* |
| *Beukes et al., 2017* | *Tinnitus* | Yes | *Goal setting, a clear structure, active participation, relapse prevention and setting a time frame for completing course. CBT content included: Applied relaxation, thought analysis, cognitive restructuring imagery, exposure techniques**No specific mentioned of homework activities.* |
| *Boeschoten et al., 2017* | *MS* | Yes | *Not specified* |
| *Bromberg et al., 2012* | *Migraine* | Yes | *Psycho-education, headache diary, recognizing and managing headache triggers, relaxation and biofeedback, and managing migraine-related nausea; reducing migraine-related anxiety, managing negative thinking, increasing social support, and controlling catastrophizing; communication skills; and medication safety.* |
| *Buhrman et al., 2004* | *Chronic Pain* | Yes | *Pain diary; information about: pain; physical exercise, stretching activity pacing, ergonomics; external focusing and cognitive restructuring, stress management, problem solving and maintaining coping strategies* |
| *Buhrman et al., 2011* | *Chronic Pain* | Yes | *Pain diary; information about: pain; physical exercise, stretching activity pacing, ergonomics; activity planning, cognitive restructuring, stress management, problem solving, sleep disorders, communication skills and conflict resolution, and maintaining coping strategies* |
| *Bundy et al., 2013* | *Psoriasis* | Yes | *Self-esteem management; thinking styles, low mood and depression, stress and tension, enhancing coping, information and general management of psoriasis.**Techniques not provided.* |
| *Chiauzzi et al., 2010* | *Chronic Pain* | Yes | *Self-efficacy, manage thoughts and mood, set goals, work on problem solving life situations and prevent pain relapses**Techniques not specified.* |
| *Cooper et al., 2011* | *Multiple Sclerosis* | Yes | *Not specified* |
| *David et al., 2013*  | *Cancer Haematological* | Yes | *Psycho-education;**Truncate stress and avoid escalation through: distraction techniques, physical outlets, positive self-verbalisation and positive self-instruction;* *Scheduled worry time, guided imagery, relaxation techniques, progressive muscle relaxation,* |
| *Dear et al., 2013* | *Chronic Pain* | Yes | *Symptom identification, symptom formulation, thought monitoring, thought challenging structured problem solving, challenging beliefs; controlled breathing, pleasant activity scheduling, attention management, assertive communication, pacing, graded exposure relapse prevention, goal setting.* |
| *Dear et al., 2015* | *Chronic Pain* | Yes | *Symptom identification, symptom formulation, thought monitoring, thought challenging structured problem solving, challenging beliefs; controlled breathing, pleasant activity scheduling, attention management, assertive communication, pacing, graded exposure relapse prevention, goal setting.* |
| *Everitt et al., 2013* | *IBS* | Yes | *Self-assessment: thoughts feelings and behaviours, behavioural management of symptoms, goal setting, identifying activity patterns; identifying thought patterns; alternatives to unhelpful thoughts, stress management breathing techniques, relaxation techniques, guided imagery managing flare-ups**Homework tasks: diarising symptoms, stress levels, eating routines, goal setting, recording unhelpful thoughts, developing realistic alternative thoughts, practice relaxation techniques, good sleep habits,*  |
| *Ferwerda et al., 2017* | *Arthritis* | Yes | *Cognitive restructuring of dysfunctional thoughts, problem solving goal setting identification of pain provoking cues attention diversion, behaviourally oriented strategies such as activity pacing, stimulation of physical exercises, progressive relaxation techniques.* |
| *Fischer et al., 2015* | *MS* | Yes | *Psychoeducation, behavioural activation, cognitive modification, mindfulness and acceptance, interpersonal skills, relaxation, physical exercise and lifestyle modification, problem solving, expressive writing and forgiveness, positive psychology, and emotion-focus interventions—plus an introduction and a summary module**no specific details provided* |
| *Janse et al., 2018* | *Chronic fatigue* | *Yes* | *Goal setting, regulate sleep/wake patterns, cognitive restructuring, formulation of helpful beliefs, attention shifting, social support, communication techniques, activity pacing.*Homework: *not specified.* |
| *Lee et al., 2019* | *IBS* | *Yes* | Sessions 1–4: *behavioral strategies, abdominal breathing, and progressive muscle relaxation training.* Sessions 5–7: *emotional strategies, performing, and recording pleasant activities.* Sessions 8–13 *cognitive strategies that teach participants how to recognize negative thoughts and record the recognition process.*  |
| *McCombie et al., 2016* | *IBD* | *Yes* | *Goal setting, recognising symptoms, recognising stress, relaxation techniques, stress management; stress awareness diary, progressive muscle relaxation, breathing techniques, thoughts, feeling and cognitive distortion awareness; Downward arrow technique, challenging negative thoughts using the ABCDE approach, replace cognitive distortions with more helpful ways of thinking, systematic desensitisation, imagery desensitisations; coping strategies; social support; effective communication strategies; attention and distraction techniques;*  |
| *Meyer et al., 2019* | *Epilepsy* | *Yes* | *Identifying negative automatic thoughts and cognitive distortions, challenging or refuting unhelpful thoughts, activity scheduling, behavioural activations, and cognitive bias modification for interpretation techniques. Exposure, avoidance behaviour, cognitive restructuring, acceptance of aversive emotions, mindfulness and relaxation exercises, value of pursuing goals in face of anxiety, symptom tracking, coping techniques.* |
| *Migliorini et al., 2016* | *Spinal cord injury* | Yes | *Altered thinking; challenging unhelpful behaviour; problem solving building resiliency, scheduling pleasant events, setting goals, relaxation,**Specific techniques not specified.* |
| *Moss-Morris et al., 2012* | *Multiple Sclerosis* | Yes | *Diarising, goal setting, sleep hygiene, setting aside worry time recording thoughts, identifying cognitive errors, generating possible alternative thoughts, stress management, social support, managing difficult emotions, working to prevent relapse.*Homework tasks*: diarising, developing and monitoring goals, recording somatic symptoms generate alternative attributions, recording unhelpful thoughts and possible alternatives, building tool set for long term management.* |
| *Newby et al., 2017* | *Diabetes* | Yes | *Psychoeducation, activity monitoring; thought monitoring, cognitive distorting education, shifting attending, sleep; activity planning, thought challenging/cognitive restructuring hallenging positive and negative metacognitions about negative thinking, hunt for positives, problem solving, assertive communications, relapse prevention.*Homework: *Identifying symptoms; activity monitoring, thought monitoring activity planning, thought challenging, hunt for positives. Facing fears to overcome avoidance, relapse prevention plan.* |
| *Norlund et al., 2018* | *Heart Disease* | Yes | *Worry awareness; worry exposure; desensitisation, behavioural activation, problem solving skills communication skills, relaxation training cognitive restructuring sleep hygiene, personal values, relapse prevention*Homework: *define problem and goals; exposure for worry with response prevention, graded exposure in situations related to cardiac or other fears, self-monitoring mood/activities. Practice relaxation, plan daily activities, apply problem solving skills /communication and relationship strengthening skills, practice relaxation skills, self-monitor thoughts and apply cognitive restructuring skills. Monitor sleep and apply sleep hygiene formulate personal values and create action plan, identify preventive strategies.* |
| *O'Moore et al., 2018* | *Arthritis* | Yes | *Behavioural activation, cognitive restructuring, problem solving assertiveness skills**Homework tasks not detailed* |
| *Petzel et al., 2018* | *Cancer ovarian* | Yes | *Problem solving, goal setting self-reward tools, reframing negative attitudes, positive actions positive reinforcement* |
| *Ritterband et al., 2012* | *Cancer mixed* | Yes | *Identification and restructuring of unhelpful beliefs about sleeps* |
| *Schröder et al., 2014* | *Epilepsy* | Yes | *As per Meyer et al* |
| Shigaki et al., 2013 | Arthritis | Yes | Topics covered included: *Overview and Rationale, RA Stressors, Effective Coping, Life Goals, Pain Management, Emotional Responses, Managing Change, Self-Esteem, Relationships, and Community Participation.**CBT techniques not detailed*Homework*: Self-monitoring tool to track pain and stress* |
| *Smith et al., 2019* | *Cancer breast* | *Yes* | *Solution focused thinking about stressors; cognitive reframing, guided imagery, meditation. n/a* |
| *Trudeau et al., 2015* | *Arthritis* | *Yes* | *Limited details:**Increase positive cognitions, reduce catastophising, restructure thoughts, goal setting* |
| *Urech et al., 2018* | *Cancer* | Yes | *Psychoeducation;* *thought awareness, identifying negative thought patterns, progressive muscle relaxation, positive activities, thinking styles and reflections, social support* |
| *Vallejo et al., 2015* | *Fibro-myalgia* | *Yes* | *Progressive relaxation training; emotional training, including breathing techniques; increasing and adjusting daily activities to improve pain and symptomatology; techniques for insomnia and sexual dysfunctions; problem solving; cognitive restructuring and managing of negative thoughts, attentional control and illness behaviors; intellectual problems and difficulties related to cognitive processing and memory; relapse prevention.*Homework related to content of session |
| *van Bastelaar et al., 2011* | *Diabetes* | Yes | *Cognitions, behaviours, emotions associations, pleasant activities, recognising automatic thoughts, stress and relaxation, physical activity, thinking mistakes, identifying non-helpful cognitions, anti-ruminating techniques, assertiveness skills communication skills relapse prevention.* |
| *Van Den Berg et al., 2015* | *Cancer breast* | Yes | *Psycho-education, cognitive reframing, goal planning/setting process evaluation* |
| *Willems et al., 2017* | *Cancer mix* | Yes | *CBT principles: psycho-education, monitoring thoughts and behaviours, challenging dysfunctional cognitions, encouraging new goals.* Homework: *activities based on session learnings* |
| *Williams et al., 2010* | *Fibro-myalgia* | Yes | *Psycho-education, exercise, sleep hygiene, relaxation techniques, pleasant activities, goal setting problem solving, graded activities reframing communication skills* |
| *Yun et al., 2012* | *Cancer mix* | Yes | *Education sessions based on CBT model (general introduction, energy conservation nutrition, distress management)**Details not provided.* |

Supplementary Table 3: Participation and completion rates for interventions in each study.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **First Author** | **Year** | **Health****condition** | **Reported adherence rates for intervention?** | **N for intervention** |
| *Abrahams* | *2017* | *Cancer* | 8% did not complete intervention. The mean duration of iCBT was 25 weeks (SD, 4 weeks). The mean number of electronic consultations was 11, with an average of 10 E-mail and 1 telephone/video consultation. Of the three modules all participants were indicated to complete 93-98% of participants opened the module | *66* |
| *Admiraal* | *2017* | *Cancer* | 2 participants never visited the program. 61% logged in more than once. Three patients contacted the research psychologist to discuss problems and/or health care needs. | *70* |
| *Alleva* | *2018* | *Arthritis* | 17% didn't complete the entire course | *54* |
| Andersson | 2002 | Tinnitus | Completed treatment and questions n=23failed to respond after module 1 n=10after module 2 n=8after module 3 n=2after module 4 n=5after module 5 n=1 | *53* |
| *Atema* | 2019 | Cancer Breast | All six modules of the iCBT program were completed by 85.9% and 62.4% of participants in the guided and the self-managed intervention groups, respectively.Completing at least 3 modules: 90.6% for the guided and 78.8% for the self-managed intervention groups. | *85**85* |
| *Bantum* | *2014* | *Cancer* | Not reported | *352* |
| *Beukes* | *2017* | *Tinnitus* | Not reported | *73* |
| *Boele* | *2018* | *Cancer* | In glioma patients, intervention adherence was 85% for the introduction and 77%, 52%, 40%, 37% and 35% for modules 1 through 5, respectively. | *45* |
| *Boeschoten* | *2017* | *Multiple Sclerosis* | 67% completed at least three modules and were considered treatment completers (mean number of modules for treatment completers was 4.58 ± 0.78 versus 1.07 ± 0.77 for non-completers). | *85* |
| *Borosund* | *2014* | *Cancer* | In WebChoice group, 77% logged on at least once during the 6 months, and 39% sent messages. Reading blogs component most highly accessed( total684; range 0-58, median14).The advice components were accessed (total317; range 0-62;median5) Median login was 7 for IPPC, median email sent was 3.5 | *64* |
| *Bouma* | *2017* | *Cancer* | 4 patients visited the website 2-5 times, 2 visited 6-10 times; 3 visited 11-15 times and 1 visited 16-20 times | *10* |
| *Bromberg* | *2012* | *Migraine* | 50% spent less than 153 minutes on the intervention during study period | *95* |
| *Buhrman* | *2004* | *Chronic Pain* | not reported | *22* |
| *Buhrman* | *2011* | *Chronic Pain* | 31% failed to complete all modules | *26* |
| *Bundy* | *2013* | *Psoriasis* | All patients completed at least one of the six course modules | *61* |
| *Chiauzzi* | *2010* | *Chronic Pain* | not reported | 95 |
| Compen | *2018* | Cancer mixed | 8 didn't start intervention, 19 less than 4 sessions; 71 completed 4+ sessions with average of 8.6 sessions. 17% did not complete post intervention survey | *90* |
| *Cooper* | *2011* | *Multiple Sclerosis* | 75% (n=9) completed at least 4 sessions50% (n=6) completed all 8 sessions: took mean 15 weeks (IQR 13-20 weeks) | *12* |
| *David* | *2013* | *Cancer* | 86% completed at least the first program module (i.e., working through all pages of the module, assessed via log analysis). Module 2 was completed by 62%, while 50% completing Module 3, and 21 (20%) completing all four modules.Average was 2.20 completed modules (SD = 1.38). | *105* |
| *Dear* | *2013* | *Chronic Pain* | 93% completed all 5 lessons. | *31* |
| *Dear* | *2015* | *Chronic Pain* | Completed 5 lessons: 78% in main group, 74% and 68% in two remaining experimental conditions. | *139, 135, 123 for experimental groups* |
| *Devineni* | *2005* | *Headache Migraine* | 61% completed treatment across intervention and waitlist control group | *139* |
| *Drozd* | *2014* | *HIV* | 25% did not engage with intervention | *36* |
| *Everitt* | *2013* | *IBS* | Compliance was defined as completing 4 or more sessions. Overall, 56% completed 4+ sessions (51% participants randomised to website only and 61% randomised to the website plus telephone support).The number of sessions undertaken by participants ranged from 0 to 8 (all sessions), with 7 participants completing no sessions and 21 completing 8 sessions, the median was 4 sessions completed. | *91 (45 website only; 46 website plus telephone support)* |
| *Ferwerda* | *2017* | *Arthritis* | 62% completed the intervention. The duration of the intervention varied between 9 and 65 weeks (M 5 26.07, SD 5 12.22). Twenty-five percent of patients completed the treatment within 17 weeks and 75 percent of patients completed the intervention in 32 weeks. | *61* |
| *Fischer* | *2015* | *Multiple Sclerosis* | All received allocated intervention. Median time spent was 310 minutes | *45* |
| *Friesen* | *2017* | *Fibro-myalgia* | 97% complete lesson 1; 87% completed lesson 5, 100% started intervention | *30* |
| *Ghahari* | *2010* | *Multiple Sclerosis* | 74% completed the intervention | *34* |
| *Habibovic* | *2014* | *Heart Disease* | 23% completed the full six lessons of the intervention. | *146* |
| *Janse* | *2018* | *Chronic fatigue* | 39 (49%) patients in the protocol-driven condition emailed fortnightly and opened all modules. Those in the on-demand condition, 74 (93%) opened all modules. Only 16 and 19%, respectively opened all modules in relapse condition | *80**80* |
| *Kraaij* | *2010* | *HIV* | not reported | *16* |
| *Lee* | *2019* | *IBS* | not reported | *48* |
| *Lorig* | *2008* | *Arthritis* | 13 never logged in to their assigned class. | *433* |
| *Lorig* | *2010* | *Diabetes* | not reported | *396* |
| *Manchaiah* | *2014* | *Hearing problems* | Not clear. Treatment participation reported as a problem for the study | *40* |
| *McCombie* | *2016* | *IBS* | 88.5% downloaded at least 1 of 62 resources. 25.7% completed the intervention. | *113* |
| *Meyer* | *2019* | *Other Epilepsy* | 18 did not register to use the intervention. Of 82 participants registering, average use over the first 3 months was 355.06 minutes (SD = 357.59). Average session duration was 25.84 minutes (SD = 13.91). Attrition: 3 month 27%; 6 month 40% | *100* |
| *Migliorini* | *2016* | *Spinal cord injury* | Most completed half the ePACT modules, only a few completed all. 19% dropped out on intervention | *34* |
| *Molander* | *2018* | *Hearing problems* | 97% completed intervention | *31* |
| *Moss-Morris* | *2012* | *Multiple Sclerosis* | Average number of sessions completed (mean=4.91). Only 1 person finished the 8 sessions and 3 finished 7 sessions. 15 finished 5+ sessions. 1 person didn't do any sessions21 people completed initial support call (lasting 52 minutes on average)19 completed the second support call (30 minutes) 15 competed final support call (46 minutes) | 23 |
| *Murray* | *2017* | *Diabetes* | 18.7 logins per participant, 10.5 pages viewed each login and website access on an average of 10 days | *185* |
| *Newby* | *2017* | *Diabetes* | 66% completed all 6 lessons of the program. Of the non-completers, 4 participants completed 1 lesson only, 3 completed 2 lessons, 2 completed 4 lessons, and 3 completed 5 lessons. | *41* |
| *Norlund* | *2018* | *Heart Disease* | 46.2% of iCBT group did not complete first module; 38.4% only completed intro module; 15.4% completed additional modules. Only 1 participant completed the recommended 14 steps within the 14 week treatment period. | *117* |
| *O'Moore* | *2018* | *Arthritis* | 84% completed all 6 modules | *44* |
| *Owen* | *2017* | *Cancer* | Encouraged to spend 12-24 hours: total average engagement across the 12 weeks of intervention was 7.3 hours | *176* |
| *Peters* | *2017* | *Mixed pain* | 29% didn't complete intervention | 112 |
| *Petzel* | *2018* | *Cancer* | not reported | *20* |
| *Rini* | *2015* | *Mixed pain* | 91% participants completed all 8 training modules. | *58* |
| *Ritterband* | *2012* | *Cancer* | 100% of intervention participants logged in once, ranging from 15 to 61 times (mean=36, SD-16)module completion: 86% completed all modules. | *14* |
| *Ruehlman* | *2012* | *Chronic Pain* | 81% received allocated intervention | *165* |
| *Ruland* | *2013* | *Cancer* | 77% logged onto WebChoice at least once.64% used WebChoice more than once, with an average use of 60 times over the 1-year study period(range, 2-892)e-forum and e-communication with expert nurses were most frequently used elements62 patients wrote personal messages to the nurse (total=385; range, 1-49; average, 6.2), and 50 patients posted messages to forum (total, 506; per person range, 1-58; average, 10.15) | *125* |
| *Schroder* | *2014* | *Epilepsy* | 55% defined as completers (finished 9 week program) | *38* |
| *Scott* | *2018* | *Chronic**Pain* | 1 did not do any sessions; 19 (61.3%) completed at least 7 of 10 treatment sessions (considered completers); 13 completed all 10 sessions. On average, participants completed 6.90 (SD = 3.49) sessions. | *31* |
| Shigaki | 2013 | Arthritis | 9 dropped out during intervention phase; | *55* |
| *Simister* | *2018* | *Fibro-myalgia* | 100% participants accessed the treatment program during the treatment period. In terms of homework submission: unit 1 (31.3%), unit 2 (26.5%), unit 3 (20.5%), unit 4 (18.1%), unit 5 (15.7%), and unit 6 (14.6%) | *33* |
| Smith | *2019* | Cancer | Attrition over the 18-week intervention period was 27%. More withdrawals in intervention: 10 lost to follow-up; 14 withdrew | *61* |
| *Strom* | *2000* | *Headache* | 56% dropped out of study, with 20% dropouts in intervention arm leaving before seeing the training program. | *20* |
| *Syrjala* | *2018* | *Cancer* | Median number of page views was 9 [IQR: 0-23] . A third (32%) didn't view any pages or only visited the home page of the site. | *108, 114* |
| *Trompetter* | *2015* | *Chronic Pain* | 72% completed 6-9 modules. | *82* |
| Trudeau | 2015 | Arthritis | Only three participants did not use the website.Page views: of a total of 44682 pages viewed: 8.6% were completing assessments (e.g. pain tracker), 28% looking at content 59% reviewing program content.57.5% used the site for at least 160 minutes | *113* |
| *Urech* | *2018* | *Cancer* | 80% of the intervention group used at least 6 of the 8 modules, 75.4% used all 8 modules. Psychologists spent a median time of 165 minutes (IQR 127-210 mins) administering the intervention (13.3 mins IQR 9.5-17.9 mins) per patient each week. | *65* |
| *Vallejo* | *2015* | *Fibro-myalgia* | not reported | *20* |
| *van Bastelaar* | *2011* | *Diabetes* | 53 (42%) completed the entire eight-lesson course, 30 (24%) completed no lesson at all, and 7 (6%) never logged into the course. | *126* |
| *Van Den Berg* | *2015* | *Cancer* | Frequency of logins ranged from 0 to 45, total duration ranged from 0 to 2,324 minutes, and activity ranged from 0 to 104 intervention components opened. | *70* |
| *Willems* | *2017* | *Cancer* | Participants completing the 6-month assessment used 2.2 (SD =1.6) modules on average. 89% used at least one module, average time between first login and last module use was 10.7 weeks (SD =6.8). | *188* |
| *Williams* | *2010* | *Fibromyalgia* |

|  |  |
| --- | --- |
| 89-94% of participants used at least 1 module each month top skills used were:Modules most commonly used:exercise: 76% Month 2 to 64% month 6relaxation: 63% month 1 to 78% month 5 and 73% month 6sleep hygiene: 44% month 1, 59% month 6pleasant activity scheduling: 48% month 1 to 52% month 6least used was reframing: 12% month 1 to 19% month 6 |  |

 | 59 |
| *Wilson* | *2015* | *Chronic Pain* | 38% engaged in at least half the modules. 27% (n=12) showed engagement in all 4 modules, and 29% (n=13) did not use beyond the PCP report. | *44* |
| *Younge* | *2015* | *Heart Disease* | 5 patients did not complete any assignment, with 53% completing at least 50% of the assignments. | *215* |
| *Yun* | *2012* | *Cancer* | Course completed by 83% of intervention participants | *136* |
| *Zhu* | *2018* | *Cancer* | Login frequency ranged from 0 to 774 times (mean 54.7; SD 131.4; median 11; IQR 5-27), and the total usage duration ranged from 0 to 9371 min (mean 1072.3; SD 2359.5; median 100; IQR 27-279). | *57* |  |

IBS irritable/inflammatory bowel disease