

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

to these criteria, and together a consensus agreement was reached as to an overall rating of 'Good', 'Fair', or 'Poor'.

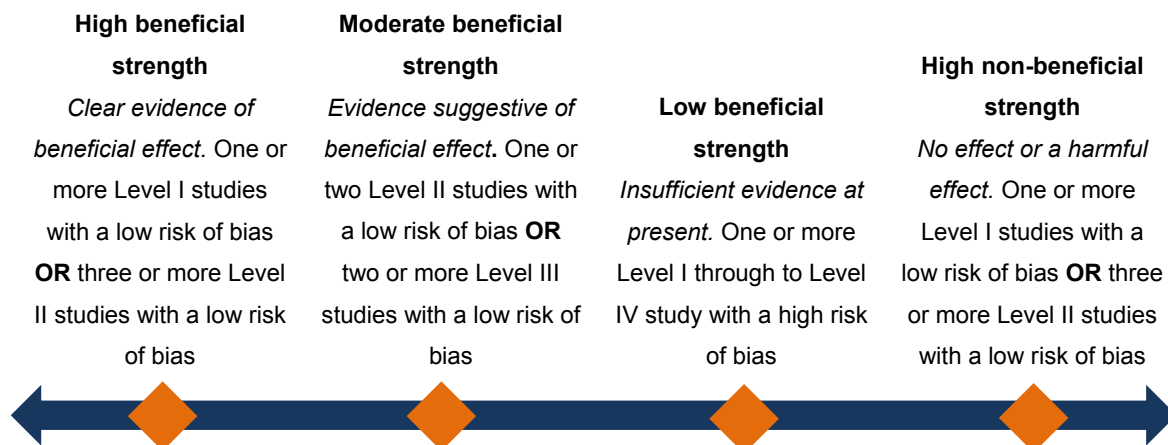
- b) **Quantity** of evidence reflected the number of studies that were included as the evidence base for each ranking. The quantity assessment also took into account the number of participants in relation to the frequency of the outcomes measures (i.e. the statistical power of the studies). Small underpowered studies that were otherwise sound may have been included in the evidence base if their findings were generally similar- but at least some of the studies cited as evidence must have been large enough to detect the size and direction of any effect.
- c) **Level of evidence** reflected the study design. The details of the study designs included in this REA, which are covered by a hierarchy of evidence commonly used in Australia²⁸:
- Level I: A systematic review of RCTs
 - Level II: An RCT

Studies such as pseudo-RCTs (i.e. a trial where a pseudo-random method of allocation is utilised, such as alternate allocation), non-randomised studies (e.g. cohort studies, pre-post studies, case-control studies), and case-series were excluded from this REA. This was due to the fact that a large volume of RCTs were identified in the initial search for this review. RCTs are considered to be studies with high level designs by Australian standards²⁸. As such, it was judged to be superfluous to include studies of lower level designs, given the rapid nature of this review.

Overall strength

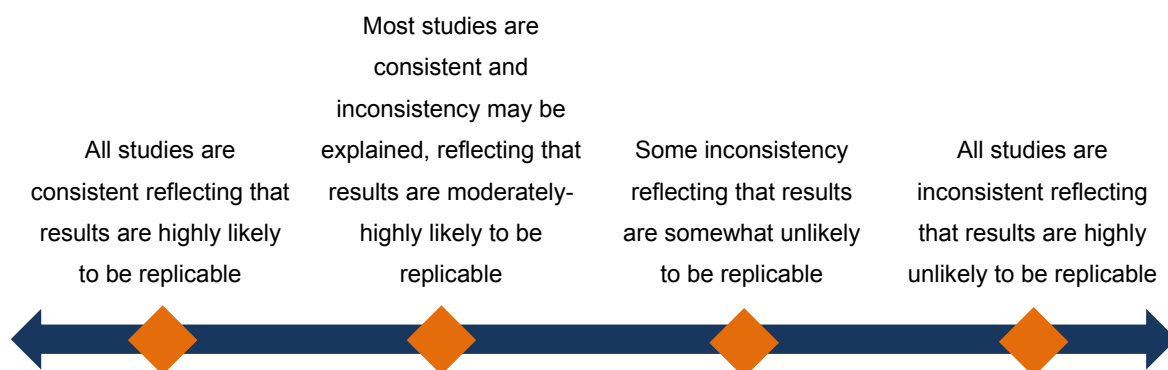
A judgement was made about the strength of the evidence base, taking into account the quality and risk of bias, quantity of evidence and level of evidence. Agreement was sought between three independent raters and consensus about the strength of the evidence based was obtained according to the following categories.

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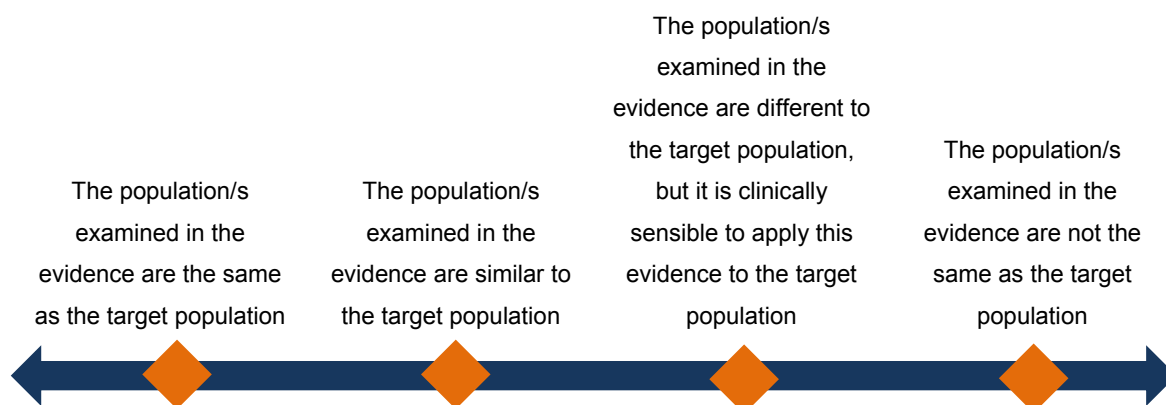
Consistency

The consistency component of the ranking system of the body of the evidence assessed whether the findings were consistent across the included studies (including across a range of study populations and study designs). It was important to determine whether study results were consistent to ensure that the results were likely to be replicable or only likely to occur under certain conditions.



Generalisability

This component covered how well the participants and settings of the included studies could be generalised to the target population. Population issues that might influence this component included gender, age or ethnicity, or level of care (e.g. community or hospital).

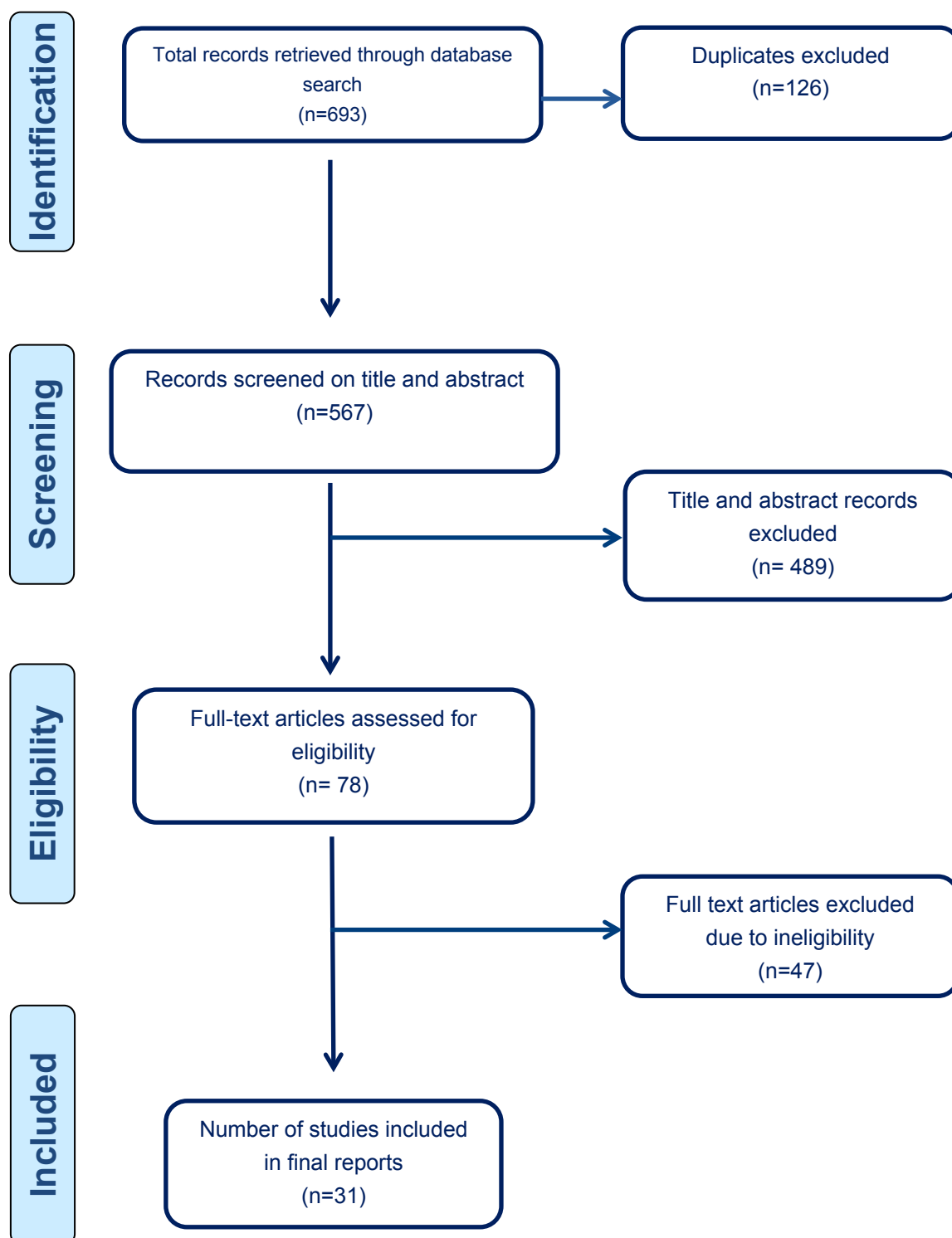


Applicability

This component addressed whether the evidence base was relevant to the Australian context, or to specific local settings (such as rural areas or cities). Factors that may reduce the direct application of study findings to the Australian context or specific local settings include organisational factors (e.g. availability of trained staff) and cultural factors (e.g. attitudes to health issues, including those that may affect compliance).



Figure 2: Flowchart representing the number (n) of records retrieved at each stage of the rapid evidence assessment



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to also consider MPMPs as a treatment for chronic pain in adult populations, which is supported by the findings of this REA. As noted above non-inferiority trials comparing MPMP, mindfulness-based and behavioural interventions with CBT should be a research priority. Given the heterogeneity of the pain conditions and pain domains studied, it is important that direct comparisons of treatments are made within populations with the same chronic pain condition. In addition, the exact component(s) of therapies or the specific combinations that are most effective remain unknown. For example, MPMP needs to be standardised and tested more rigorously. Further dismantling studies are also needed to determine which components of the multi-modal interventions are most effective in treating adults with chronic pain.

Although there is some uncertainty around the efficacy of individual treatment components, the improvements in chronic pain across different modalities demonstrated for the CBT interventions (i.e., face-to-face, group-based and telecommunication-based) indicate that the treatment itself is fairly adaptable and effective in several modes. This may prove to be very useful for clients who are remotely located from service providers, limited in mobility, and have a varying range of treatment preferences. However, this was not systematically explored therefore these findings should be taken cautiously and re-assessed in light of future studies.

Limitations of this rapid evidence assessment

The findings from this REA should be considered alongside its limitations. The first set of limitations refers to the 'rapid review' process, which imposed some restrictions on our methodology. These limitations included: the omission of potentially relevant papers that were published prior to or after the defined search period; the omission of non-English language papers; and reference lists of included papers were not hand-searched to find other relevant studies. Similarly, although we did evaluate the evidence in terms of its strength, consistency, and generalisability, these evaluations were not as exhaustive as in a systematic review methodology nor did it use a meta-analysis methodology to combine or synthesise the results in a statistical way. We made a qualitative judgement based on the level of evidence about the certainty of our estimates of prevalence.

A second set of limitations results from the fact that this REA utilised previously published treatment Guidelines, with the literature search for this review conducted from the period of time after the SIGN Guidelines data cut-off. Thus, if the SIGN Guidelines missed any important studies, this review would also not have included these studies. In addition, the

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recommendations within this review are based on the literature search from 2012 and the recommendations by the SIGN Guidelines. However, the evidence included in the SIGN Guidelines and as such the accuracy of their recommendations was not reviewed or assessed. Nonetheless, the SIGN Guidelines covered psychologically-based interventions and were the most recently published systematic review that utilised a well-developed and publicised methodology.

Lastly, the information presented in this REA is a summary of information presented in available papers. We recommend readers source the original papers if they would like to know more about a particular intervention or study.

Conclusion

The findings of this REA build upon the evidence presented in the SIGN Guidelines, outlining the effective treatments for chronic pain in an adult population. The evidence from this REA was consistent with the SIGN Guidelines, demonstrating strong evidence for efficacy of CBT in the treatment of chronic pain. Specifically, the results of this REA indicated support for the use of face-to-face individual and group-based CBT, but not those that are self-managed or delivered over the internet. Additional data for MPMP and mindfulness-based therapies were identified in the post-SIGN Guidelines literature. Further studies are needed to determine whether the trends for positive outcomes identified for these treatments will remain for larger non-inferiority studies which include evidence-based therapies such as CBT as the comparison condition.

Appendix 1

Population Intervention Comparison Outcome (PICO) framework

This question was formulated within a Population Intervention Comparison Outcome (PICO) framework. Application of a PICO framework helps to structure, contain and set the scope for the research question. Inclusion of intervention and comparison components is dependent on the question asked, and may not be appropriate for all question types.

- **What are effective psychological or multi-modal interventions for adults experiencing chronic pain?**
 - **PICO format:** In adults diagnosed with persistent or chronic pain, which psychological or multimodal interventions are effective for reducing the symptoms pain?

P Patient, Problem, Population	I Intervention	C Comparison (<i>optional</i>)	O Outcome <i>when defining "more effective" is not acceptable unless it describes how the intervention is more effective</i>
Patient: Adults Problem: Chronic pain (excluding headaches)	<ul style="list-style-type: none"> • Any psychological intervention • Multi-modal interventions that include a psychological component 		Changes in: <ul style="list-style-type: none"> • pain • physical functioning • emotional functioning • self-reported overall improvement

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Appendix 2

Example search strategy

The following is an example of the search strategy conducted in the Embase database:

Step	Search Terms	No of records
S1	"chronic pain" or "persistent pain" or "ongoing pain"	49667
S2	chronic pain/	34419
S3	"psychological intervention" or nonpharmacologic or "behavi* therapy" or "cognitive therapy" or "cognitive behav* therapy" or psychotherapy or "psychological therapy" or "multi*modal intervention" or multidisciplinary or "pain management program*" or biopsychosocial or relaxation or biofeedback or mindfulness or meditation or "acceptance therapy" or "commitment therapy" or "acceptance commitment therapy" or psychoeducation or education	1186950
S4	cognitive therapy/ or psychotherapy/ or behavior therapy/	133232
S5	relaxation training/ or meditation/ or mindfulness/ or controlled clinical trial/ or psychotherapy/	477193
S6	psychoeducation/ or education/	319130
S7	"randomi*ed control trial" or "random control trial" or "randomi*ed controlled trial" or RCT or "clinical trial" or "control trial" or "control study" or "clinical study"	3248961
S8	controlled clinical trial/	385695
S9	1 or 2	49667
S10	3 or 4 or 5 or 6	1548494
S11	7 or 8	3248961
S12	9 and 10 and 11	4146
S13	limit 12 to (english language and yr="2012 -Current")	522

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Appendix 3

Quality and bias checklist

Chalmers Checklist for appraising the quality of studies of interventions⁷²

Completed		
Yes	No	
		1. Method of treatment assignment
		<ul style="list-style-type: none"> • Correct, blinded randomisation method described OR randomised, double-blind method stated AND group similarity documented
		<ul style="list-style-type: none"> • Blinding and randomisation stated but method not described OR suspect technique (eg allocation by drawing from an envelope)
		<ul style="list-style-type: none"> • Randomisation claimed but not described and investigator not blinded
		<ul style="list-style-type: none"> • Randomisation not mentioned
		2. Control of selection bias after treatment assignment
		<ul style="list-style-type: none"> • Intention to treat analysis AND full follow-up
		<ul style="list-style-type: none"> • Intention to treat analysis AND <25% loss to follow-up
		<ul style="list-style-type: none"> • Analysis by treatment received only OR no mention of withdrawals
		<ul style="list-style-type: none"> • Analysis by treatment received AND no mention of withdrawals OR more than 25% withdrawals/loss-to-follow-up/post-randomisation exclusions
		3. Blinding
		<ul style="list-style-type: none"> • Blinding of outcome assessor AND patient and care giver (where relevant)
		<ul style="list-style-type: none"> • Blinding of outcome assessor OR patient and care giver (where relevant)
		<ul style="list-style-type: none"> • Blinding not done
		<ul style="list-style-type: none"> • Blinding not applicable
		4. Outcome assessment (if blinding was not possible)

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		<ul style="list-style-type: none">• All patients had standardised assessment
		<ul style="list-style-type: none">• No standardised assessment OR not mentioned
		5. Additional Notes
		<ul style="list-style-type: none">• Any factors that may impact upon study quality or generalisability

Appendix 4

Evidence Profile

Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
COGNITIVE BEHAVIOURAL THERAPIES								
Andersson et al. (2012)	RCT	Swedish older adults experiencing chronic back or neck pain Mean age 72 (4.60) Male 24%	(I): Cognitive behavioural therapy (C): Waitlist	6 weekly 2hr sessions <i>(Group based)</i>	-Pain severity (MPI) -Disability (PAIRS) Anxiety and depression (HADS) -Quality of life (QOLI) -Pain intensity (VAS)	n/a	N=11	N=10
In comparison to a waitlist control group, cognitive behavioural therapy was not more effective in reducing pain severity, pain intensity, depression, anxiety or improving quality of life overtime. It was, however significantly more effective than the waitlist condition, in reducing the disability associated with pain.								
Buhrman et al. (2013a)	RCT with 6-month follow-up	Swedish adults with chronic pain who have previously undergone a multidisciplinary CBT-based rehabilitation program Mean age 40.10 (8.94) Male 28%	(I): Guided internet delivered cognitive behavioural therapy (iCBT) (C):Attention control (i.e., Moderated weekly online discussions)	8 weekly online modules <i>(Clinician guided individual)</i>	-Clinical overall improvement (CSQ)	-Depression and anxiety symptoms (HADS) -Pain severity (MPI) -Quality of life (QOLI) -Disability (PAIRS)	N=36	N=36

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Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
<p>Significant differences with small effect sizes¹ were reported between the guided internet delivered CBT (iCBT) and the attention control group, with those that received the iCBT intervention reporting greater improvement at post-treatment on catastrophizing ($d=0.16$) and diverting attention ($d=0.20$). These treatment effects were sustained at 6-month follow-up. Significant differences with small effect sizes were reported between the groups in favour of the iCBT for depression ($d=0.32$), anxiety ($d=0.45$) and disability ($d=0.32$) in favour of the iCBT, with improvements remaining at 6-month follow-up. There were no significant differences in pain severity or quality of life between the groups or over time.</p>								
Carmody et al. (2013)	RCT	US older military veterans experiencing chronic pain Mean age (I): 66 (9), (C): 69 (10) Male (I) 96% and (C) 98%	(I): Telephone delivered Cognitive Behavioural therapy (T-CBT) (C): Telephone delivered pain education (T-EDU)	12 telephone sessions over 20 weeks <i>(Individual)</i>	-Mental and physical health (SF-12) -Depression (BDI) -Pain intensity (PI)	n/a	N=50	N=51
<p>There were no statistically significant differences between the groups on any of the primary outcomes. There were, however statistically significant improvements over time for both groups in terms of physical health ($\beta=0.16$, 95% CI=0.03 to 0.29, $p=0.01$), mental health ($\beta=0.05$, 95% CI=0.00 to 0.10, $p=.04$), depressive symptoms ($\beta=0.20$, 95% CI=-0.31 to -0.09, $p=.0003$) and pain intensity ($\beta=0.03$, 95% CI=-0.05 to -0.01, $p=.0035$).</p>								
Castel et al. (2012)	RCT with 3-month and 5-month follow-up	Spanish adults with chronic pain related to fibromyalgia diagnosis Mean age 49.6 (6.8) Male 3%	(I1): Multicomponent cognitive behavioural therapy (CBT) (I2): Multicomponent cognitive behavioural therapy with hypnosis	12 weekly 2hr sessions <i>(Individual and Group based)</i>	-Pain intensity (NRS) -Psychological distress (HADS)	n/a	(I1) N=34 (I2) N=29	N=30

¹ Effect size is a quantitative measure that measures the magnitude of the difference between two groups with the proposed degree of difference corresponding to small (e.g. $d=0.3$), medium (e.g. $d=0.5$) or large (e.g. $d=0.8$) effect sizes.

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Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
			(CBT-H) (C): Standard pharmacological treatment (SPC)					
<p>At post-treatment those in the multicomponent cognitive behavioural therapy (CBT) were found to have significantly lower levels of pain intensity and psychological distress than those receiving standardised pharmacological treatment (SPC). Significant lower levels of pain intensity and psychological stress were also reported for those receiving multicomponent cognitive behavioural therapy with hypnosis (CBT-H). In addition, significantly lower levels of psychological distress were found for those receiving CBT-H compared to those receiving only CBT. Over time, significant reductions in psychological distress were found for those in both CBT and CBT-H, and the effects remained significant at both 3-month and 5-month follow-up. No significant reductions over time were identified for pain intensity.</p>								
Castro et al. (2012)	RCT	Brazilian adults with chronic musculoskeletal pain Mean age (I): 45.9 (8.1), (C): 48.7 (14.3) Male 11%	(I): Cognitive behavioural therapy (CBT) (C): Standard care	10 weekly 2hr sessions <i>(Individual)</i>	-Pain intensity (VAS) -Depression and anxiety symptoms (HADS) -Quality of life (SF-36)	n/a	N=48	N=47
<p>At post-treatment, 54% of participants in the CBT group compared to 28.9% of participants in the standard care group reported a significant reduction in pain intensity (RR=1.88; 95%CI 1.11-3.19). Significant reductions in depressive symptoms were reported by participants in the CBT group compared to standard care group, while there were no significant differences reported between the groups on symptoms of anxiety. Significant improvements on quality of life indices were reported by those who received CBT compared to standard care recipients on three of the eight quality of life subscales: physical limitations, general state of health and emotional limitations.</p>								
Dear et al. (2013)	RCT with 3-month follow-up	Australian adults experiencing chronic pain	(I): Clinician guided Internet-delivered cognitive behaviour	5 online lessons delivered over 8 weeks, including	-Disability (RMDQ) -Depression (PHQ-9) -Anxiety (GAD-7)	-Pain (WBPAQ)	N=31	N=31

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							I	C
		Mean age 49 (13) Male 14%	therapy (iCBT) (C): Waitlist	telephone and email contact with clinician on a weekly basis <i>(Individual and self-managed)</i>				
<p>Significant improvements were reported for the clinician guided internet-delivered CBT (iCBT) group compared to waitlist control group on disability, depression, anxiety and pain. These improvements corresponded to moderate to large effect sizes for levels of disability ($d=0.88$), depression ($d =0 .66$), and average pain ($d=0.64$), and a small effect size for anxiety ($d=0 .38$). These treatment effects were sustained at 3-month follow-up.</p>								
Dunne et al. (2012)	RCT with 6-month follow-up	Australian adults with Whiplash-associated disorders and MVA-related PTSD Mean age 32.54 (7.09) Male 50%	(I): Trauma-focused cognitive behavioural therapy (TF-CBT) (C): Waitlist	10 weekly 1 hr sessions <i>(Individual)</i>	- PTSD symptom severity (SCID) - Disability (NDI)	- PTSD self-reported symptom severity (PDS, IES-R) -Negative affect (DASS-42) - Quality of life (SF-36) - Pain intensity and negative affect (NRS)	N=13	N = 13
<p>At post-treatment significantly fewer participants in the trauma-focused cognitive behavioural therapy (TF-CBT) met criteria for a PTSD diagnosis compared to the waitlist control group ($\eta^2=0.57$). In addition greater reductions on disability were found for the TF-CBT group compared to the controls ($\eta^2=0.27$). Both these improvements were maintained at 6-month follow-up. There were no significant differences in pain intensity recorded between groups or over-time. At post-treatment significant reductions for the TF-CBT group compared to waitlist were recorded for self-reported PTSD, negative affect and four out of eight quality of life subscales (i.e., physical functioning, bodily pain, general health and social functioning and mental health). Each of these effects, except physical functioning, were maintained at 6-month follow-up.</p>								

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Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
Ferrando et al. (2012)	RCT with 9-month follow-up	Spanish adults with chronic pain related to temporomandibular disorders with muscular diagnosis Mean age (I): 39.57 (13.82), (C): 38.38 (16.57) Male (I) 13%, (C) 9%	(I): Cognitive Behavioural Therapy plus hypnosis (CBT+H) (C): Standard therapy	Six 1hr sessions over 2.5 months (Individual)	-Pain frequency (non-standardized) -Pain intensity (PMQ) -Pain severity (MPI) -Emotional distress (BSI-18)	n/a	N=41	N=31
<p>Significant differences with small effects sizes were reported at post-treatment between the cognitive behavioural therapy plus hypnosis (CBT-H) group and standard therapy (ST), with those that received CBT-H intervention reporting greater improvements for pain frequency (effect size = 0.18), pain intensity (effect size = 0.18), pain severity (effect size = 0.15) and emotional distress (effect size = 0.15). The majority of participants in the CBT+H group reported significant clinical improvements in pain frequency (90%), pain intensity (77%) pain severity (83%) and emotional distress (69%). These improvements remained at 9-month follow-up.</p>								
Jensen et al. (2012)	RCT	Swedish adults with fibromyalgia related chronic pain Mean age 45.6 (6.4) Male 0%	(I): Cognitive behavioural therapy (CBT) (C): Waitlist	12 weekly 1.5hr sessions (Group based)	-Subjective impression of clinical improvement (PGIC)	-Depression (BDI) -Anxiety (STAI-S) -Pain intensity (VAS)	N=25	N=18
<p>At post-treatment significantly larger improvements were reported for the CBT group compared to waitlist for subjective impression of clinical improvement, depression [$F(2, 32) = 8.6, P = 0.001$] and anxiety symptoms [$F(2, 52) = 3.31, P = 0.044$]. There were no significant differences between the groups in pain intensity.</p>								
Kip et al. (2014)	RCT	US veterans with PTSD and chronic pain	(I): Accelerated Resolution Therapy	2 to 5, 1h - 1.25hr sessions	n/a	-Pain (POQ)	N=29	N=28

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							I	C
		Mean age 41 (12.4) Male 80%	(ART)(exposure based therapy) (C): Attention control (AC) - (i.e., fitness assessment and planning)	<i>(Individual)</i>				
<p>At post-treatment significantly larger treatment effects were reported for the Accelerated Resolution Therapy (ART) compared to attention control group for overall pain (effect size=1.04). In terms of the subscales of the pain measure those in the ART reported greater improvements for pain intensity (effect size=1.81), pain-related impairment in mobility (effect size=0.69) and negative affect (effect size=1.01).</p>								
Nicholas et al. (2013)	RCT with 1-month follow-up	Australian older adults experiencing chronic pain Mean age 73.9 (6.5) Male 37%	(I1): Self-managed pain program (PSM) based on CBT (I2): Exercise attention control (EAC) (C): Waitlist	8 twice-weekly 2hr sessions <i>(Group based)</i>	-Disability (RMDQ)	-Pain intensity and distress (0-10 numerical scale) -Depression (DASS-21)	(I1) N=49 (I2) N=53	N=39
<p>At post-treatment significant improvements were reported for the self-managed pain program (PSM) group compared to exercise attention control (EAC) group for measures of disability (d=0.47, 95% CI (0.04–0.89)), pain distress [d= 0.68, 95% CI (0.26–1.11)] and depression [d= 0.51, 95% CI (0.07–0.93)]. At 1-month follow-up, treatment effects were maintained for disability and pain distress. When PSM and EAC interventions were compared to the waitlist condition, similar treatment effects were identified for PSM group on disability [d= 0.76, 95% CI (1.2–0.3)] and pain distress [d=0.56, 95% CI (1.01–0.11)]. There were no significant differences between EAC and waitlist conditions on any of the outcomes. Clinical improvements in physical disability assessment at 1-month follow-up were achieved by 44% of the patients in the PSM group, 22% in the EAC and 20% in the waitlist group.</p>								

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							I	C
Nicholas et al. (2014)	RCT with 1, 6 and 12-month follow-up	Australian older adults experiencing chronic pain Mean age (I): 42.05 (12.33), (C): 43.22 (11.08) Male (I): 23%, (C): 26%	(I): CBT plus interoceptive exposure (CBT+IE) (C): CBT plus distraction/relaxation (CBT+D/R)	Daily 8hr sessions over 3 weeks (Group based)	-Pain intensity (MPI) -Depression (DASS-42) -Disability (MRDQ)	n/a	N=66	N=74
At post-treatment significant improvements were found in both CBT plus interoceptive exposure (CBT+IE) and CBT plus distraction/relaxation (CBT+D/R) conditions for pain intensity (CBT+IE d=-0.50; CBT+D/R d=-0.54), depression (CBT+IE d=-0.50; CBT+D/R d=-0.42) and disability CBT+IE d=-0.64; CBT+D/R d=-0.58). These treatment effects were sustained at the 1, 6 and 12-month follow-up.								
Otis et al. (2013)	RCT with 4-month follow-up.	US veterans with chronic neuropathic pain Mean age (I): 62.50 (10.98), (C): 63.38 (11.69) Male 100%	(I): Cognitive-behavioural therapy (CBT) (C): Treatment as usual (TAU)	11 weekly 1hr sessions (Individual)	-Pain severity (WHYMPI-PS) -Pain interference -Depression (BDI)	n/a	N=12	N=8
Significant differences were reported between the groups with participants in the cognitive behavioural therapy (CBT) reporting significantly larger reductions on pain severity (B = -.54, 95% CI=-.09 to -.99) and pain interference (B = -.77, 95% CI=-.24 to -1.30) compared to participants in the treatment as usual (TAU) group. These treatment effects were sustained at 4-month follow-up. There were no significant differences in depressive symptoms between the groups or over time.								

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							I	C
Pigeon et al (2012)	RCT	US adults experiencing chronic pain and insomnia Mean age 50.7 (8.3) Male 33%	(I1): Cognitive behavioural therapy for pain (CBT-P) (I2): Cognitive behavioural therapy for insomnia (CBT-I) (I3): Cognitive behavioural therapy for combined pain and insomnia (CBT-P/I) (C): Waitlist	10 weekly sessions <i>(Individual)</i>	-Pain (MPI) -Depression (CES-D)	-Disability (PDI)	(I1) N=5 (I2) N=6 (I3) N=6	N=4
<p>Compared to the waitlist condition, cognitive behavioural therapy for pain (CBT-P) was not associated with significant improvement on any of the outcomes. Both cognitive behavioural therapy for insomnia (CBT-I) and cognitive behavioural therapy for pain and insomnia (CBT-I/P) however, were associated with reduced depression severity (CBT-I $g=1.64$; CBT-P/I $g=2.99$) when compared to the waitlist condition. There were no significant differences in pain or disability between the groups. All groups experienced moderate to large improvements in pain over time (CBT-P $g=1.21$; CBT-I $g=0.83$; CBT-I/P $g=0.49$), although these were not significantly different compared to waitlist control ($g=0.44$).</p>								
Siemonsma et al. (2013)	RCT	Dutch adults experiencing chronic lower back pain Mean age (I): 45.6 (12.9), (C): 47.1 (11.1) Male (I) 46%, (C) 40%	(I): Cognitive treatment of illness perception (C): Waitlist	10-14 weekly 1hr sessions <i>(Individual)</i>	n/a	-Physical disability (QBPDs) -Patient relevant physical activities (PSC)	N=104	N=52

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							I	C
<p>At post-treatment, there were no statistically significant differences between those who received cognitive treatment of illness perception and those on the waitlist in terms of physical disability. However, significant differences were found between the groups in favour of the cognitive treatment of illness perception on measure of patient relevant physical activity.</p>								
Sleptsova et al (2013)	RCT with 12-month follow-up	Turkish adult immigrants with chronic low back pain Mean age (I): 44 (7.4), (C): 43.8 (7.1) Male (I) 30%, (C) 32%	(I): Culturally sensitive cognitive behavioural therapy (Cs-CBT) (C): Culturally sensitive exercise therapy (Cs-ET)	Twenty five 1.5hr sessions over 6 months (Group based)	-Physical functioning (SF-36) -Mental functioning (SF-36) -Anxiety and depression (GHQ) -Disability (PDI) -Pain intensity (VAS)	n/a	N=62	N=54
<p>There were no significant differences identified between the groups for physical or mental functioning, anxiety, depression, disability or pain intensity at post-treatment or at 12-month follow-up.</p>								
Tang et al. (2012)	RCT with 1-month and 6-month follow-up	UK adults with chronic non-malignant pain and clinical insomnia Mean age (I): 45.7 (9.3), (C): 51.3 (7.9) Male 10%	(I): Hybrid cognitive behavioural therapy (H-CBT) for insomnia and pain (C): Monitoring group	4 weekly 2hr sessions (Individual)	n/a	-Pain intensity (BPI) -Pain interference (BPI) -Anxiety (HADS-A) -Depression (HADS-D)	N=12	N=12
<p>Significant differences were reported between the hybrid cognitive behavioural therapy for insomnia and pain (H-CBT) and the monitoring control group, with those that received H-CBT intervention reporting greater improvements at post-treatment on pain interference (d=1.92) anxiety (d=1.44) and depression (d=0.94). These treatment effects were sustained at 1-month and 6-month follow-up. There were no significant differences in pain intensity between the groups.</p>								
Zonneveld et al. (2012)	RCT	Dutch adults with undifferentiated	(I): Cognitive behavioural therapy (CBT)	13 weekly 2hr sessions	-Physical functioning (SF-36)	-Quality of life (SF-36) -Depression, anxiety	N=84	N=78

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
		somatoform disorder or a chronic pain disorder Mean age (I): 46 (38-53), (C): 44 (35-52) Male (I): 20%, (C): 18%	(C): Waitlist	<i>(Group based)</i>	-Mental functioning (SF-36)	(SCL-90-R)		
<p>Significant differences were reported between the cognitive behavioural therapy (CBT) and the waitlist condition, with those that received the CBT intervention reporting greater improvements at post-treatment for physical functioning ($d = 0.38$). There were no significant differences in mental functioning between the groups or overtime. On the secondary outcome measures, significant differences were found between the groups in favour of the CBT intervention on four out of eight quality of life subscales including role functioning physical ($d=0.43$), bodily pain ($d=0.51$), social functioning, ($d=0.36$) and role functioning emotional ($d=0.44$). There were no significant differences in depression or anxiety symptoms between the groups, or over time.</p>								
MULTIDISCIPLINARY PAIN MANAGEMENT INTERVENTIONS								
Abbasi et al. (2012)	RCT	Iranian adults with chronic low back pain Mean age 45 (10) Males 14%	(I1): Spouse assisted - multidisciplinary pain management programme (SA-MPMP) (I2): Patient-oriented multidisciplinary pain management programme (P-MPMP) (C): Standard medical care (SMC)	7 weekly 2hr sessions <i>(Group based)</i>	-Disability (RDQ) -Pain severity (VAS)	n/a	(I1) N=10 (I2) N=12	N=11

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
<p>At post-treatment, there were no significant differences in disability or pain severity between the groups. However, significant small to moderate improvements were noted across all groups on disability (SA-MPMP $\eta^2=0.48$; P-MPMP $\eta^2=0.33$; SMC $\eta^2=0.43$) and for both intervention on pain severity [SA-MPMP $\eta^2= 0.43$; P-MPMP $\eta^2=0.27$].</p>								
Angeles et al. (2013)	RCT with 6-month follow-up	Canadian adults with chronic musculoskeletal or neuropathic pain Age range 40-59 years Male 37%	(I): Early pain management intervention (EI) (C): Delayed Intervention (DI)	8 weekly 2hr sessions <i>(Group based)</i>	-Quality of life – physical and social/emotional functioning - (SF-36)	n/a	N=31	N=32
<p>There were no significant differences between groups in terms of quality of life total score. When quality of life subscales were examined separately, there was a significant difference between the groups for two out of 10 quality of life subscales in favour of the early intervention in role physical (EI: mean change = -15.3; DI: mean change = + 3.4) and bodily pain (EI: mean change=9.2; DI: mean change =-3.9) domains. These treatment effects were maintained at 6-month follow-up.</p>								
Fersum et al. (2013)	RCT with 3-month and 12-month follow-up	Norwegian adults with chronic lower back pain Mean age 42.9 (12.5) Male 51%	(I):Classification based cognitive functional therapy (CB-CFT) (C): Traditional manual therapy and exercise	12 weekly 30-45 min sessions <i>(individual)</i>	-Disability (ODI) -Pain intensity (PIRNS) -Anxiety and depression (HSCL-25)	n/a	N=62	N=59
<p>Significantly larger improvements were reported at post treatment for the classification based cognitive functioning therapy (CB-CFT) compared to the traditional manual therapy and exercise control group on disability [mean difference -9.7; 95% CI -12.7 to -6.7], pain intensity [mean difference -2.1; 95% CI -2.7 to -1.4] and anxiety and depression symptoms [mean difference -0.12; 95% CI -0.19 to -0.04]. These treatment effects were maintained at both 3-month and 12-month follow-up.</p>								
Makino et al. (2014)	RCT	Japanese adults experiencing craniocervical chronic	(I1): Exercise therapy plus psychological intervention (ET+PI)	One session on psycho-education and jaw muscle	Pain intensity: (NRS)	n/a	(I1) N=13 (I2) N=13	N=13

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
		pain Mean age (I): 53 (27-75), (I): 42 (32-73), (C): 40 (17-66) Male (I) 15%, (I) 46%, (C) 31%	(I2): Exercise therapy (ET) (C): Pharmacological treatment	relaxation				
<p>At post-treatment, there were no significant differences in pain intensity between the groups or over time. At follow-up, there was a significant improvement over time in pain intensity found at T4 (day 70) and T5 (day 98) for exercise therapy plus psychological intervention (ET+PI). There was no improvement noted for the exercise therapy alone or pharmacological control group over time. In addition, at T5 (day 98) there was a significant difference between the groups with participants in the ET+PI intervention reporting significantly lower levels of pain intensity than the other two groups.</p>								
Tse et al. (2013)	RCT	Chinese older adults with chronic musculoskeletal pain Mean age 76.5 (5.9) Male 6%	(I): Motivational interviewing and physical exercise program (MI+PE) (C): Treatment as usual (TAU)	8 weekly 1.5hr sessions (Group based)	-Pain intensity (NRS) -Anxiety (STAI) -Depression (GDS-SF) -Functioning (SF-12)	n/a	N=31	N=25
<p>At post-treatment participants in the motivational interviewing and physical exercise program (MI+PE) reported a significant reduction in pain intensity [-1.18, 95% CI (-1.92, -0.45)] and state anxiety [-18.11, 95% CI (-30.72, 5.5)]. There were no significant reductions reported by the treatment as usual (TAU) control group on any of the outcome measures. Comparing the two groups at post-treatment, participants in the MI+PE intervention reported significantly lower pain intensity, depression and anxiety state levels than those in the TAU group.</p>								
MINDFULNESS AND ACCEPTANCE AND COMMITMENT THERAPIES								
Brown and Jones (2013)	RCT	UK adults with chronic musculoskeletal pain	(I): Mindfulness-based pain management	8 weekly 2.5hr sessions	-Mental and physical health (SF-36)	n/a	N=15 at completion	N=13 at completio

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
		Mean age (I) 48 (10), (C): 45 (12) Male 33%	program (MBPMP) (C): Treatment as usual (TAU)	<i>(Individual)</i>	-Pain intensity (sensory/affective pain) (MPQ)		(pre-treatment N not provided)	n (pre-treatment N not provided)
<p>Those in the mindfulness based pain management program group reported significantly greater improvements in mental health compared to TAU. There were no significant differences reported for physical health between the groups or over time. There was no significant difference between the groups in terms of pain. There was however, a significant difference over time for affective pain in favour of the mindfulness based pain management program group.</p>								
Buhrman et al. (2013b)	RCT with 6-month follow-up	Swedish adults experiencing chronic pain Mean age 49.1 (10.3) Male 41%	(I): Internet delivered acceptance and commitment therapy (I-ACT) (C): Attention placebo (online discussion forum)	7 weekly online modules <i>(Clinician guided, individual)</i>	n/a	-Depression and anxiety symptoms (HADS) -Pain severity (MPI) -Quality of life (QOLI) -Disability (PAIRS)	N=38	N=38
<p>At post-treatment, significant differences were reported between the groups in favour of the internet ACT intervention for depression (d =0.18) and anxiety (d = 0.44) symptoms. These treatment effects were sustained at 6-month follow-up. There were no significant differences in pain severity, quality of life or disability between the groups or over time.</p>								
Garland et al. (2014)	RCT with 3-month follow-up	US adults with chronic pain and prescription opioid misuse Mean age 48 (14) Male 32%	(I): Mindfulness Oriented Recovery Enhancement (MORE) (C): Attention placebo (i.e., Support group)	8 weekly sessions <i>(Group based)</i>	-Pain severity (BPI) -Functional interference (BPI)	n/a	N=57	N=58

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
At post-treatment, significant differences were reported between the groups in favour of the mindfulness oriented recovery enhancement (MORE) intervention for pain severity (d= 0.50) and functional interference (d = 0.78). These treatment effects were maintained at 3-month follow-up.								
Kristjánsdóttir et al. (2013)	RCT with 5-month follow-up	Norwegian adults with fibromyalgia related chronic pain Mean age :(I) 44.59 (11.13), (C) 43.80 (11.20) Male 0%	(I): ACT based smart phone intervention with diaries and therapist feedback (C): Attention placebo (i.e., Informational Website with self-help pain management material)	4 weeks <i>smartphone delivered intervention</i> (Individual, group based and self-managed)	n/a	-Pain intensity (VAS) - Emotional functioning (SF-8) -Physical functioning (SF-8) -Emotional distress (GHQ)	N=70	N=70
At post-treatment, significant group differences were reported between the groups in favour of the ACT intervention for emotional functioning (d = 0.63). However, this effect was not sustained at 5-month follow-up. There were no significant group differences reported on pain intensity, physical functioning or emotional distress at post-treatment or 5-month follow-up.								
McCracken et al. (2013)	RCT with 3-month follow-up	UK adults experiencing chronic pain Mean age 58 (12.8) Male 31%	(I): Acceptance and commitment therapy (ACT) plus TAU (C): Treatment as usual (TAU)	Four 4hr sessions over 2 weeks (Group based)	-Disability (RMDQ) -Depression (PHQ) -Physical functioning (SF-36) -Pain intensity (0-10 rating)	-Emotional functioning (SF-36) -Subjective improvement (PGIC)	N=37	N=36
At post-treatment, significant differences were found between the groups in favour of ACT for depression (effect size=0.46) and overall improvement. At 3-month follow-up those in ACT demonstrated lower disability (d=0.58), less depression (d=0.59) and significantly higher pain acceptance (d=0.64) in comparison to those in TAU.								
Trompetter et al. (2014)	RCT with 6-month follow-up	Dutch adults experiencing chronic	(I1): Internet-based clinician guided self-help	Nine online modules over 9-12	-Pain interference (MPI)	-Depression and anxiety (HADS)	(I1) N=82 (I2) N=79	N=77

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

Authors & year	Design	Sample	Intervention (I) and Comparison (C)	Intervention delivery method, frequency, duration, (delivered to)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Participants randomised	
							I	C
		<p>pain</p> <p>Mean age (I): 52.9 (13.3), (I): 52.3 (11.8), (C) 53.2 (12)</p> <p>Male (I) 23%, (I) 24%, (C) 25%</p>	<p>intervention based on ACT</p> <p>(I2): Internet-based expressive writing</p> <p>(C): Waitlist</p>	<p>weeks duration</p> <p>(Individual and self-guided)</p>		<p>-Pain intensity (NRS)</p> <p>-Pain disability (PDI)</p> <p>-Positive mental health (MHC-SF)</p>		
<p>At post-treatment significant differences were reported between the groups in favour of ACT based internet self-help intervention compared to internet-based expressive writing therapy for pain interference (d= 0.33) and pain intensity (d=0.23). These effects were sustained at 6 month follow-up. No significant improvement was present for ACT compared to waitlist condition. However there were no differences between the groups at post-treatment when ACT was compared to the internet-based expressive writing or waitlist condition for depression, anxiety, pain disability or positive mental health outcomes.</p>								
Wicksell et al. (2013)	RCT	<p>Swedish adults with fibromyalgia related chronic pain</p> <p>Mean age 45.1 (6.6)</p> <p>Male 0%</p>	<p>(I): Acceptance and Commitment Therapy (ACT)</p> <p>(C): Waitlist</p>	<p>12 weekly 1.5hr sessions</p> <p>(Group based)</p>	-Pain related disability (PDI)	<p>-Quality of life (mental and physical functioning)(SF-36)</p> <p>-Depression (BDI)</p> <p>-Anxiety (STAI)</p> <p>-Pain intensity</p>	N=23	N=17
<p>Significant differences with moderate to large effect sizes were reported for those in the Acceptance and Commitment Therapy (ACT) condition compared to waitlist for pain related disability (d=0.75), mental functioning (d=0.84), depression (d=0.44), state anxiety (d=0.51) and trait anxiety (d=0.73). There were no significant differences in physical functioning or pain intensity between the groups.</p>								
BEHAVIOURAL THERAPIES								
Tobbackx et al. (2013)	RCT	<p>Belgian adults with whiplash associated chronic pain</p>	<p>(I): Muscle relaxation</p> <p>(C): Acupuncture</p>	<p>One 20 minutes session</p>	Pain sensitivity	<p>-Neck disability (NDI)</p> <p>-Neck pain (VAS)</p>	N=39	N=39

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14. Turk D, Turk T, Rudy. Toward an empirically derived taxonomy of chronic pain patients: Integration of psychological assessment data. *Journal of Consulting and Clinical Psychology*. 1988;56(2):233-238.
15. Gauntlett-Gilbert J, Wilson S. Veterans and chronic pain. *British Journal of Pain*. 2013;7:79-84.
16. Beck A. Thinking and Depression. *Archives of General Psychiatry*. 1964;10(6):561.
17. Linton S, Shaw W. Impact of psychological factors in the experience of pain. *Phys Ther*. 2011;91(5):700-711.
18. Hassett A, Hassett R, Gevartz. Nonpharmacologic Treatment for Fibromyalgia: Patient Education, Cognitive-Behavioral Therapy, Relaxation Techniques, and Complementary and Alternative Medicine. *Rheumatic Diseases Clinics of North America*. 2009;35(2):393-407.
19. Arch J, Arch C, Ayers A, et al. Randomized clinical trial of adapted mindfulness-based stress reduction versus group cognitive behavioral therapy for heterogeneous anxiety disorders. *Behaviour Research and Therapy*. 2013;51(4):185-196.
20. Chiesa A, Serretti. Mindfulness-Based Interventions for Chronic Pain: A Systematic Review of the Evidence. *Journal of Alternative and Complementary Medicine*. 2011;17(1):83-93.
21. Kabat Zinn J. *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain and Illness*. Delta Trade Paperbacks; 1990.
22. SIGN. *Management of chronic pain*. Edinburgh, UK:Scottish Intercollegiate Guidelines Network; 2013.
23. Henschke N, Ostelo RWJG, van Tulder MW, et al. Behavioural treatment for chronic low-back pain. *Cochrane Database of Systematic Reviews*. 2010.
24. Martin BI, Deyo RA, Mirza SK, et al. Expenditures and health status among adults with back and neck problems. *JAMA*. 2008;299(6):656-664.
25. Turk D, Turk R, Dworkin R, et al. Core outcome domains for chronic pain clinical trials: IMMPACT recommendations. *Pain*. 2003;106(3):337-345.
26. Eccleston C, Morley S, Williams AdC. Psychological approaches to chronic pain management: evidence and challenges. *British Journal of Anaesthesia*. 2013;111(1):59-63.
27. Dworkin RH, Turk DC, Peirce-Sandner S, Baron R, Bellamy N, Burke LB ea. Research design considerations for confirmatory chronic pain clinical trials: IMMPACT recommendations. *Pain*. 2010;149(2):177-193.
28. Aggarwal VR, K. L, H. J, A. J, J. G. Psychosocial interventions for the management of chronic orofacial pain. *Cochrane Database of Systematic Reviews*. 2011(11).

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

29. Hoffman B, Hoffman R, Papas D, Chatkoff R, Kerns. Meta-analysis of psychological interventions for chronic low back pain. *Health Psychology*. 2007;26(1):1-9.
30. Glombiewski J, Hartwich-Tersek J, Wilfred R. Two Psychological Interventions Are Effective in Severely Disabled, Chronic Back Pain Patients: A Randomised Controlled Trial. *International Journal of Behavioral Medicine*. 2010;17(2):97-107.
31. McBeth J, McBeth G, Prescott G, et al. Cognitive Behavior Therapy, Exercise, or Both for Treating Chronic Widespread Pain. *Archives of Internal Medicine*. 2012;172(1):48.
32. Buhrman GM, Andersson M, Buhrman E, Nilsson Ihrfeldt M, Jannert L, Ström. Guided internet-based cognitive behavioural treatment for chronic back pain reduces pain catastrophizing: A randomized controlled trial. *Journal of Rehabilitation Medicine*. 2011;43(6):500-505.
33. Pigeon WR, Moynihan J, Matteson-Rusby S, et al. Comparative effectiveness of CBT interventions for co-morbid chronic pain & insomnia: a pilot study. *Behav Res Ther*. 2012;50(11):685-689.
34. Zonneveld LNL, van Rood YR, Timman R, Kooiman CG, Van't Spijker A, Busschbach JJV. Effective group training for patients with unexplained physical symptoms: a randomized controlled trial with a non-randomized one-year follow-up. *PLoS ONE*. 2012;7(8):e42629.
35. Dear BF, Titov N, Perry KN, et al. The Pain Course: a randomised controlled trial of a clinician-guided Internet-delivered cognitive behaviour therapy program for managing chronic pain and emotional well-being. *Pain*. 2013;154(6):942-950.
36. Dunne RL, Kenardy J, Sterling M. A randomized controlled trial of cognitive-behavioral therapy for the treatment of PTSD in the context of chronic whiplash. *The Clinical Journal of Pain*. 2012;28(9):755-765.
37. Castro MMC, Daltro C, Kraychete DC, Lopes J. The cognitive behavioral therapy causes an improvement in quality of life in patients with chronic musculoskeletal pain. *Arquivos de Neuro-Psiquiatria*. 2012;70(11):864-868.
38. Ferrando M, Galdon MJ, Dura E, Andreu Y, Jimenez Y, Poveda R. Enhancing the efficacy of treatment for temporomandibular patients with muscular diagnosis through cognitive-behavioral intervention, including hypnosis: a randomized study. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2012;113(1):81-89.
39. Kip KE, Rosenzweig L, Hernandez DF, et al. Accelerated Resolution Therapy for treatment of pain secondary to symptoms of combat-related posttraumatic stress disorder. *Eur J Psychotraumatol*. 2014;5.

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

40. Tang NKY, Goodchild CE, Salkovskis PM. Hybrid cognitive-behaviour therapy for individuals with insomnia and chronic pain: a pilot randomised controlled trial. *Behav Res Ther.* 2012;50(12):814-821.
41. Otis JD, Sanderson K, Hardway C, Pincus M, Tun C, Soumekh S. A randomized controlled pilot study of a cognitive-behavioral therapy approach for painful diabetic peripheral neuropathy. *Journal of Pain.* 2013;14(5):475-482.
42. Siemonsma PC, Stuive I, Roorda LD, et al. Cognitive treatment of illness perceptions in patients with chronic low back pain: a randomized controlled trial. *Phys Ther.* 2013;93(4):435-448.
43. Castel A, Cascon R, Padrol A, Sala J, Rull M. Multicomponent cognitive-behavioral group therapy with hypnosis for the treatment of fibromyalgia: Long-Term outcome. *Journal of Pain.* 2012;13(3):255-265.
44. Nicholas MK, Asghari A, Blyth FM, et al. Self-management intervention for chronic pain in older adults: a randomised controlled trial. *Pain.* 2013;154(6):824-835.
45. Nicholas MK, Asghari A, Sharpe L, et al. Cognitive exposure versus avoidance in patients with chronic pain: Adherence matters. *European Journal of Pain.* 2014;18(3):424-437.
46. Sleptsova M, Woessmer B, Grossman P, Langewitz W. Culturally sensitive group therapy for Turkish patients suffering from chronic pain: a randomised controlled intervention trial. *Swiss Med Wkly.* 2013;143:w13875.
47. Andersson G, Johansson C, Nordlander A, Asmundson GJG. Chronic pain in older adults: a controlled pilot trial of a brief cognitive-behavioural group treatment. *Behav.* 2012;40(2):239-244.
48. Jensen KB, Kosek E, Wicksell R, et al. Cognitive Behavioral Therapy increases pain-evoked activation of the prefrontal cortex in patients with fibromyalgia. *Pain.* 2012;153(7):1495-1503.
49. Buhrman M, Fredriksson A, Edström G, et al. Guided internet-delivered cognitive behavioural therapy for chronic pain patients who have residual symptoms after rehabilitation treatment: Randomized controlled trial. *European Journal of Pain.* 2013;17(5):753-765.
50. Carmody TP, Duncan CL, Huggins J, et al. Telephone-delivered cognitive-behavioral therapy for pain management among older military veterans: a randomized trial. *Psychol Serv.* 2013;10(3):265-275.
51. Scascighini L, Toma V, Dober Spielmann S, Sprott H. Multidisciplinary treatment for chronic pain: a systematic review of interventions and outcomes. *Rheumatology.* 2008;47(5):670-678.

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

52. Ravenek MJ. A systematic review of multidisciplinary outcomes in the management of chronic low back pain. *Work*. 2010;35(3):349.
53. van Geen J-W, Edelaar MJA, Janssen M, van Eijk JTM. The long-term effect of multidisciplinary back training: a systematic review. *Spine*. 2007;32(2):249-255.
54. Tse MM, Vong SK, Tang SK. Motivational interviewing and exercise programme for community-dwelling older persons with chronic pain: A randomised controlled study. *Journal of Clinical Nursing*. 2013;22(13):1843-1856.
55. Fersum KV, O'Sullivan P, Skouen JS, Smith A, Kvåle A. Efficacy of classification-based cognitive functional therapy in patients with non-specific chronic low back pain: A randomized controlled trial. *European Journal of Pain*. 2013;17(6):916-928.
56. Abbasi M, Dehghani M, Keefe FJ, Jafari H, Behtash H, Shams J. Spouse-assisted training in pain coping skills and the outcome of multidisciplinary pain management for chronic low back pain treatment: a 1-year randomized controlled trial. *European Journal of Pain*. 2012;16(7):1033-1043.
57. Angeles RN, Cuenter D, McCarthy L, et al. Group interprofessional chronic pain management in the primary care setting: A pilot study of feasibility and effectiveness in a family health team in ontario. *Pain Research and Management*. 2013;18(5):237-242.
58. Makino I, Arai YCP, Aono S, et al. The effects of exercise therapy for the improvement of jaw movement and psychological intervention to reduce parafunctional activities on chronic pain in the craniocervical region. *Pain Practice*. 2014;14(5):413-418.
59. Garland EL, Manusov EG, Froeliger B, Kelly A, Williams JM, Howard MO. Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: Results from an early-stage randomized controlled trial. *Journal of Consulting and Clinical Psychology*. 2014;82(3):448-459.
60. Brown CA, Jones AKP. Psychobiological correlates of improved mental health in patients with musculoskeletal pain after a mindfulness-based pain management program. *Clin J Pain*. 2013;29(3):233-244.
61. Veehof M-J, Oskam KMG, Schreurs E, Bohlmeijer. Acceptance-based interventions for the treatment of chronic pain: A systematic review and meta-analysis. *Pain*. 2011;152(3):533-542.
62. Schmidt S, Schmidt P, Grossman B, et al. Treating fibromyalgia with mindfulness-based stress reduction: Results from a 3-armed randomized controlled trial. *Pain*. 2011;152(2):361-369.

What are effective psychological or multi-modal interventions for adults experiencing chronic pain?

63. Wong S, Chan F, Wong R, et al. Comparing the effectiveness of mindfulness-based stress reduction and multidisciplinary intervention programs for chronic pain: a randomized comparative trial. *The Clinical Journal of Pain*. 2011;27(8):724-734.
64. Wetherell J, Wetherell N, Afari T, et al. A randomized, controlled trial of acceptance and commitment therapy and cognitive-behavioral therapy for chronic pain. *Pain*. 2011;152(9):2098-2107.
65. Wicksell RK, Kemani M, Jensen K, et al. Acceptance and commitment therapy for fibromyalgia: A randomized controlled trial. *European Journal of Pain*. 2013;17(4):599-611.
66. McCracken LM, Sato A, Taylor GJ. A trial of a brief group-based form of acceptance and commitment therapy (ACT) for chronic pain in general practice: Pilot outcome and process results. *The Journal of Pain*. 2013;14(11):1398-1406.
67. Buhrman M, Skoglund A, Husell J, et al. Guided internet-delivered acceptance and commitment therapy for chronic pain patients: A randomized controlled trial. *Behav Res Ther*. 2013;51(6):307-315.
68. Kristjánsdóttir ÓB, Fors EA, Eide E, et al. A smartphone-based intervention with diaries and therapist-feedback to reduce catastrophizing and increase functioning in women with chronic widespread pain: Randomized controlled trial. *Journal of Medical Internet Research*. 2013;15(1):125-146.
69. Trompetter HR, Bohlmeijer ET, Veehof MM, Schreurs KMG. Internet-based guided self-help intervention for chronic pain based on acceptance and commitment therapy: A randomized controlled trial. *Journal of Behavioral Medicine*. 2014.
70. van Middelkoop M, van Middelkoop S, Rubinstein T, et al. A systematic review on the effectiveness of physical and rehabilitation interventions for chronic non-specific low back pain. *European Spine Journal*. 2011;20(1):19-39.
71. Tobbax Y, Meeus M, Wauters L, et al. Does acupuncture activate endogenous analgesia in chronic whiplash-associated disorders? A randomized crossover trial. *European Journal of Pain*. 2013;17(2):279-289.
72. NHRMC. How to review the evidence: systematic identification and review of the scientific literature. Canberra: Biotext; 1999.