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Psychological support for patients with cancer: evidence review and suggestions for future directions

Nicholas J. Hulbert-Williams*, Chester Research Unit for the Psychology of Health, Department of Psychology, University of Chester, UK

Lisa Beatty, Flinders Centre for Innovation in Cancer, Flinders University, Australia

Haryana M. Dhillon, Centre for Medical Psychology & Evidence-based Decision making, School of Psychology, University of Sydney, Australia

* Corresponding Author:

Chester Research Unit for the Psychology of Health
Department of Psychology
University of Chester
Parkgate Road
Chester
CH1 4BJ
United Kingdom

T: +44 (0)1244 511950
E: n.hulbertwilliams@chester.ac.uk

ABSTRACT

Purpose of the review. Psychological distress and mental health comorbidity are common in cancer. Various therapeutic frameworks have been used for interventions to improve psychological wellbeing and quality of life in cancer patients with mixed results. This paper reviews contributions to that literature published since January 2017.

Recent findings. The majority of new psychological intervention research in cancer has used Cognitive Behavioural Therapy or Mindfulness-Based Interventions. Cognitive behavioural Therapy has been considered a gold-standard intervention and recent evidence justifies continuation of this. Recent reviews call into question the validity of evidence for Mindfulness-Based Interventions. A smaller number of trials using Acceptance and Commitment Therapy, Meta-Cognitive Therapy, Dignity Therapy and Coaching have emerged, and whilst findings are promising, additional fully-powered trials are required. Weaker evidence exists for counselling, support-based, and Narrative Therapy interventions.

Summary. Efficacious, timely and acceptable psychological interventions are a necessary component of comprehensive cancer care. There is some way to go before the evidence conclusively points towards which interventions work for which cancer groups and for which specific outcomes. Methodological limitations must be addressed in future trials; at the forefront remains the need for fully-powered, head-to-head comparison trials.

Keywords**:** Cancer, Psychological Distress, Psychological Intervention, Cognitive Behavioural Therapy, Third-Wave Therapies

INTRODUCTION

Regardless of diagnosis or prognosis, the challenges that cancer brings present risk to psychological wellbeing, and the need for psychological support is well-established. Population estimates of clinical psychopathology vary between clinical and sociodemographic groups making it almost impossible to provide definitive summary incidence. For example, depression prevalence ranges from 4-49% in published work [1]. Anxiety is also common [2], alongside adjustment [3] and post-traumatic stress [4] disorders, and cancer groups are at higher relative risk of suicide compared to general populations [5*]. Furthermore, new diagnostic categories are emerging including clinically-relevant fear of cancer recurrence (FCR) [6], though how this disambiguates from clinical anxiety remains unclear. Non-clinical emotional distress is observed in up to 75% of cancer patients [7,8**]. Consequently, routine distress screening [9] and holistic needs assessment [10] are recommended. Comprehensive care — including evaluation, referral and follow-up — is essential for distress management [11].

An array of therapeutic modalities has explored how best to support cancer patients' psychological needs, including individualised, group-based, and online, self-administered interventions. Early suggestions of survival benefits failed to replicate and had largely been discredited, but a recently published pooled analysis (n=163,363) concluded that 'psychological distress might have some predictive capacity for selected cancer presentations…' (p.1) [12**]. Survival aside, evidence syntheses suggest psychological interventions have clear and beneficial effects for anxiety, depression and quality of life (QoL) [13,14], in the short-term at least.

In this paper we review recent additions to this literature (2017 onwards). We structure this around three groupings of psychological interventions, as informed by broader psychological literature:

1. Cognitive Behavioural Therapy (CBT). Perhaps the most well-known intervention framework, CBT is the current gold-standard treatment. Content varies based on symptoms targeted, but typically includes: psychoeducation; cognitive strategies to challenge unhelpful beliefs (cognitive restructuring, core belief work); and, behavioural strategies to challenge avoidance behaviours (behavioural activation, exposure) [15].

2. Third-wave interventions. Often considered an evolution of traditional CBT [16], many therapists use these integratively. Underpinned by contextual behavioural science and behaviour analysis more broadly, they focus less on cognitive strategies, giving more therapeutic attention to reducing problematic functional consequences of cognitions on behaviour. Hulbert-Williams et al [17] outlined third-wave interventions as a promising avenue for psychological support in cancer.

3. Other intervention frameworks. Many other frameworks could be used, with some more frequently applied to cancer than others. Support groups and supportive expressive group (psycho)therapies [18] are widely used, whilst others, such as Narrative Therapy [19] and Dignity Therapy [20] are more restricted to palliative cancer settings. Existential and meaning-focussed interventions are not reviewed given a recently published review [21*].

This paper is not intended to provide a fully systematic review of the available literature as space does not permit that. Instead, our review offers an overview of the most pertinent literature on this topic. Relevant literature was identified using the Google Scholar database. Although sometimes criticized, empirical research has demonstrated the efficacy of Google Scholar for comprehensive reviews [22]. We searched literature from January 2017 – April 2018 using the following search terms: "cancer" with "cognitive behavioural therapy", "mindfulness", "acceptance and commitment therapy", "meta-cognitive", "support", "support group", "supportive expressive", "counselling", "dignity therapy", "narrative therapy", "coaching", "solution focused therapy", "compassion focused therapy", and "schema therapy".

COGNITIVE BEHAVIOURAL THERAPY

34 CBT articles have been published, including: eight systematic/meta-analytic reviews [23,24,25*,26,27*,28-30]; two protocol papers [31,32]; two qualitative studies [33,34]; five single-arm pilot/feasibility/secondary analysis studies [35,36,37*,38,39]; and 17 randomised controlled trial (RCT) papers [40,41**,42-44,45*,46-49,50*,51*,52-55] (see table 1). Many newer studies focus on adaptations for different delivery modalities to increase reach and accessibility, including both online and print-based self-help, and blended approaches where face-to-face therapy is supplemented with telephone or online components. While these programs show promise, a systematic review of 14 self-guided interventions concluded that evidence was lacking, predominantly due to small samples and insufficient power [27*]. Of note, the evidence for those screened with high distress was stronger.

[INSERT TABLE 1 HERE]

Face-to-face CBT remains prevalent, but recent trials have explored non-psychologist delivery. Turner et al's [50*] RCT was noteworthy: their brief intervention was delivered predominantly by nurses, and though not superior compared to usual care control (UCC), participants with disease progression had fewer unmet needs over time. Methodological feasibility was demonstrated, but more intensive, or specialist-delivered, interventions may be warranted. Further research on non-psychologist delivered treatment for distress is recommended elsewhere too [25*].

CBT is adaptable across clinical presentations and recently published trials include tailoring for: FCR [45*,51*]; clinically-elevated distress [40]; insomnia [36,39,40,44,48]; sexual dysfunction [43,55]; depression and/or anxiety [33,40,41**,47,50*]; fatigue [49]; symptom clusters [35,46]; hot flushes [34]; and broader non-specific psychosocial coping [53-55]. Most demonstrate positive outcomes, but effect sizes vary considerably, with some comparison trials under-powered to detect between group differences. Interventions for FCR—particularly Lichtenthal et al's [45*] AIM-FBCR and van der Wal's [51*] SWORD trials—were innovative in trialing blended delivery. Four papers focussed on internet-facilitated delivery in AYA populations [32,33,37*,38]: these trials are smaller and more preliminary in scope, though promising findings are emerging.

CBT trials focus almost exclusively on non-advanced cancer. One notable exception piloted a five-session positive-affect program for women with metastatic breast cancer (MBC), comparing online versus face-to-face delivery against attention control [41**]. The program was feasible and acceptable with both online and face-to-face versions reducing depression and negative affect at one-month follow-up, with depression falling below minimal clinically meaningful difference

(MCMD) thresholds significantly more than controls. Targeting positive affect may have improved engagement, something often problematic in metastatic intervention research [56*].

Xiao et al [28] summarised 13 trials, concluding significant efficacy with large effect sizes for individually-delivered CBT for depression following breast cancer surgery. Ye et al [29] meta-analysed 10 studies, and Matthews et al [26] systematically reviewed 32 studies: both concluded clear evidence for CBT in treating anxiety and depression and improving QoL. Contrastingly, Zhang et al [30] concluded no evidence of efficacy for stress or QoL, but their included studies were heterogeneous, possibly limiting effects. Both Bradford et al [23] and Coughtrey et al [24] report modest evidence for psychological improvement in Adult and Young Adolescent (AYA) populations, however quality issues are problematic. All reviews agree further adequately-powered studies are required.

Whilst this evidence is promising, much of it derives from trials under 'ideal' conditions. Few pragmatic trials have been conducted, and it remains unclear how well CBT works in 'real world' settings — for example, in patients with complex physical or psychological comorbidities.

THIRD-WAVE PSYCHOLOGICAL INTERVENTIONS

Mindfulness-based interventions (MBIs)

These interventions have been increasingly investigated and recommended in cancer settings. Since 2017, two systematic reviews [57**,58*], two protocol papers [59,60], two cross-sectional studies [61*,62], one feasibility study [63*], four single-arm trials [64-67], and nine RCTs [68-76] have been published (see table 2). Overall, there is little consistency in results, intervention content, or outcomes used. Of the nine RCTs, six recruited only women with breast cancer [69,71*,72,73,75*,76], and the continued publication of underpowered studies is concerning, emphasised by consistent use of waitlist or UCC. One RCT compared MBI against an active control [75*].

[INSERT TABLE 2 HERE]

Several papers reported moderation/mediation analyses suggesting psychological mechanisms for MBIs, as well as identifying groups who may derive greater benefits. Schellekens et al's [75*] secondary analysis indicated social support increases may moderate improvements in mood disturbance and stress. Johannsen et al's [71] RCT in women reporting persistent pain after breast cancer treatment identified attachment avoidance as a statistically significant moderator of maximised potential benefit.

Haller et al's [57**] meta-analysis of 10 MBIs demonstrated post-intervention improvements in QoL, fatigue, sleep, stress, anxiety, and depression, but only depression and anxiety improvements were significant at six-month, and only anxiety at twelve-month follow-up. Studies comparing Mindfulness-Based Stress Reduction (MBSR) with other active interventions demonstrated significant differences for anxiety and depression, but average effects were typically below MCMD.

Shaw et al's [58*] systematic review of 30 RCTs found none adhered to standard MBSR protocols, with modifications poorly reported and contact time limited. Choice of outcomes

were also poorly justified. The authors suggest the terms MBSR, Mindfulness-Based Cognitive Therapy (MBCT), and MBI are used as short-hand descriptions even though interventions are not comparable in terms of definition, dose, or outcome. More content modification justification and exploration of potential mechanisms is needed before embarking on larger definitive effectiveness trials.

Acceptance and Commitment Therapy (ACT)

Few ACT trials have been published in cancer settings since the first RCT in 2012 [88]. Small-scale investigations report promising effects, but are methodologically limited [89,90] or feasibility studies only [91]. Recent additions include: one single-subject design [77*]; one single-arm intervention [78*] (described as CBT, we include here because of the focus on experiential avoidance as therapeutic process); and, three RCTs [79**,80*,81**] (see table 2). One trial [92] is excluded (despite impressive findings) due to concerns about data analytic and reporting quality.

Cederberg et al's [77*] single-subject design demonstrated improvement in treatment-related pain intensity and discomfort in five child/adolescent cancer patients. Aguirre-Camacho et al [78*] reported improvements across multiple outcomes, but only change in anxiety met MCMD criteria, with experiential avoidance mediating outcome improvement. One RCT compared group-delivered ACT, Behavioural Activation (BA), and wait-list control [79**]. Given conceptual similarity, it is unsurprising neither ACT or BA was superior, however both significantly reduced anxiety and depression more than control. A pilot RCT comparing telephone-based ACT and education/support control in MBC [80*], demonstrated significantly larger decreases in symptom interference (related to fatigue and sleep impairment) but neither this, nor reduced depression, significantly differed from control. Urech et al's [81**] STREAM trial (wait-list RCT of therapist-guided web-based ACT, including elements of MBSR and CBT) resulted in significant, small-to-medium effect sizes for distress and QoL, but non-significant improvement in anxiety and depression.

One final, non-randomised wait-list control study is noteworthy [82**]. This study reported large between-group effects on FCR intensity and interference despite not reducing distress significantly. We agree with the authors that this is an ACT-consistent finding: third-wave approaches aim not to eliminate distress, but reduce its behavioural impact. Reduced FCR interference in the presence of continued distress achieves that aim.

This small interventional evidence-base complements literature correlating ACT therapeutic processes and cancer outcomes [93,94] which has recently expanded to include: poorer symptom experiences [83]; problematic anxiety, depression and anticipatory grief [85]; and, moderation effects between unmet needs and distress [85*].

Meta-Cognitive Therapy (MCT)

Two MCT interventions have been published [86**,87*]. Fisher et al's [87*] case-series study delivered MCT to four patients with emotional distress, reporting clinically significant reductions in anxiety, depression and FCR, maintained to six-month follow-up. Butow et al's [86**] Conquer Fear trial was especially innovative: including elements of ACT this trial reported significant improvements in both FCR and distress up to six-month follow-up.

OTHER INTERVENTION APPROACHES

This section synthesises the evidence for a range of less-researched interventions (see table 3).

Support Groups, Supportive Expressive Therapy and Counselling

A Cochrane Review of six online support group interventions in women with breast cancer concluded low quality and mixed results provide insufficient evidence supporting their use in this context [95**]. Two single-arm designs [96,97] and three RCTs [98,99,100] reporting psychoeducation, online support groups, supportive-expressive group therapy, or combinations thereof concur.

[INSERT TABLE 3 HERE]

Two single-arm studies [101,102] and two RCTs [103*,104*] explored supportive, psychological or interpersonal counselling either in isolation or part of complex interventions. Four additional cross-sectional studies investigated relationships between use of psychosocial support services and psychological outcomes [105,106], treatment decision-making [107], and online community engagement [108]. This body of work is variable making it difficult to detect consistent patterns in outcomes. Many studies lack theoretical underpinning for intervention content, and small samples, inclusion of non-clinical samples, multiple endpoints, and inappropriate analyses potentially dilute effects.

Three studies report qualitative and/or feasibility designs [109-111] and initial efficacy indicators suggest several interventions worthy of additional investigation.

Dignity and Narrative Therapies

Dignity Therapy is used primarily in advanced cancer. Martínez et al's [112**] systematic review of 28 studies concluded overall benefit, however, only one RCT (of five) demonstrated significant decreases in anxiety and depression over time. The remaining RCTs were inconclusive, but other benefits included improved end-of-life experiences. One protocol paper for a culturally-adapted intervention [113] was published. Two qualitative studies [114,115] emphasise the importance of life review and creation of 'legacy document' components of Dignity Therapy. Dose et al's [116*] pilot trial demonstrated feasibility and acceptability for delivery in outpatient clinics, and Julião et al's [117**] RCT demonstrated statistically significant reductions in demoralisation and desire for death against UCC. Although Vuksanovic et al's [118*] RCT demonstrated positive effects on generativity, meaning and acceptance, no significant changes in distress or QoL were reported in either the intervention or life review/waitlist control groups.

Two Narrative Therapy interventions have been published. Lloyd-Williams et al's [119*] pilot RCT (compared with UCC) in patients with advanced cancer demonstrated greater reduction in depression and longer median survival, though differences were not significant. Similarly, Wise et al's [120**] RCT for Stage III/IV cancer patients also failed to identify significant effects on anxiety or depression.

Coaching-based approaches

Coaching differs from therapy in that interventions are briefer, problem-focussed, and targeted at improving wellbeing in non-clinical populations. Coaching is being used with increased frequency to support health behaviour change [123] and improve healthcare communication [124]. One recent RCT trained cancer survivors as peer-facilitators of coaching [121**]; results indicated significantly reduced anxiety compared to UCC, but non-significant effects on depression and QoL. Lay coaches were also used in McCusker et al's [122*] trial for depression. Eight weekly, telephone-delivered sessions were received, and although depression significantly decreased, there was no control group comparator. A programme of work based on the FORECAST web-based coaching framework is underway [125]. The high prevalence of non-clinical cancer-related distress may indicate coaching as an appropriate and effective modality, especially as moving away from 'therapy' might reduce stigma associated with psychological help seeking [126]. We encourage research exploring theory-driven coaching interventions, such as Cognitive Behavioural and Contextual Behavioural Coaching [127,128].

CONCLUSIONS

There is continued dominance of CBT. Within these studies, non-psychologist and alternative modality delivery is emerging, especially in AYA populations, and is important to overcoming psychosocial oncology workforce and access issues. Recent research highlights concerns regarding MBIs. ACT and MCT show promising effects, but additional appropriately-powered trials are needed. Dignity Therapy continues to show reasonably strong evidence in advanced cancer, though the literature is small. Counselling, supportive expressive approaches, and Narrative Therapy demonstrate weakest evidence to date. The emergence of coaching-based interventions is encouraging, but transition towards evidence-based coaching frameworks its recommended. We were unable to identify recent trials using Solution Focussed Therapy [129], Compassion Focussed Therapy [130] or Schema Therapy [131] despite growing evidence bases outside cancer.

There are common methodological limitations which future trials should address:

1. An excess of small-scale, feasibility and single-arm designs continues. Fully powered trials, including active controls, and head-to-head comparisons are needed. A lack of pragmatic and implementation trials limits knowledge of how successfully these might be integrated into routine clinical care.

2. Most research tests one-size-fits-all interventions. Unsurprisingly, therefore, significant effects are typically reported in only participants high in baseline distress. Testing of stepped-care models, and interventions tailored to specific population needs (e.g. low literacy) is currently neglected.

3. Trials in advanced, non-breast cancer, and non-adult samples are emerging though expansion of this evidence-base is needed. Though trials are emerging from non-anglophone countries, these are often poorer quality in design and reporting, highlighting broader capacity and training needs.

4. Few studies assess moderators/mediators of intervention outcomes, a major omission particularly as second- and third-wave interventions become less distinct. The emphasis in

clinical psychology away from package- and towards process-based interventions [132**] must occur in psychosocial oncology too.

5. Trial outcomes should be chosen from a theoretical basis and it is rarely appropriate to include only distress reduction. Inclusion of health economic/utilisation data may provide powerful data for commissioners of clinical services. Authors should be more honest in reporting intervention outcomes: trials often assess multiple outcomes, many resulting in null-findings. An over-simplified and perhaps too positive message is often being disseminated.

KEYPOINTS

- There is a clear need for psychological support for cancer patients, and having efficacious, timely and accessible interventions is key to effective distress management.
- A number of new intervention studies have been published, the majority using Cognitive Behavioural Therapy, although growth is occurring in Acceptance and Commitment Therapy, Meta-Cognitive Therapy and Dignity Therapy.
- Cognitive Behavioural Therapy remains the gold-standard and most empirically supported intervention framework, although this may partly be by default: other interventions approaches do not yet have equivalence in terms of research funding and trial numbers.
- The recent evidence base for Narrative Therapy, Supportive Expressive Therapies, Counselling, and Mindfulness Based Interventions raises concerns.
- Future research needs to improve on methodological limitations if a conclusive and persuasive evidence base is to develop for implementation of psychological interventions in cancer care.

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CONFLICTS OF INTEREST: None

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[53] Willems RA, Lechner L, Verboon P, et al. Working mechanisms of a web-based self-management intervention for cancer survivors: a randomised controlled trial. Psychol Health 2017; 32:605-25.

[54] Willems RA, Mesters I, Lechner L, et al. Long-term effectiveness and moderators of a web-based tailored intervention for cancer survivors on social and emotional functioning, depression, and fatigue: randomized controlled trial. J Cancer Surviv 2017; 11:691-703.

[55] Wootten AC, Meyer D, Abbott JAM, et al. An online psychological intervention can improve the sexual satisfaction of men following treatment for localized prostate cancer: outcomes of a randomised controlled trial evaluating my road ahead. Psychooncology 2017; 26:975-81.

* [56] Beatty L, Kemp E, Butow P, et al. A systematic review of psychotherapeutic interventions for women with metastatic breast cancer: Context matters. Psychooncology 2018; 27:34-42.

This systematic review summarises the importance of looking at the context that interventions are delivered in, along with efficacy outcomes, and the need to balance efficacy against accessibility and engagement.

** [57] Haller H, Winkler MM, Klose P, et al. Mindfulness-based interventions for women with breast cancer: an updated systematic review and meta-analysis. Acta Oncol 2017; 56(12):1665-1676.

This systematic review of ten studies including 1,709 participants. Although the intervention effects did not result in clinically meaningful differences in outcomes and given the poor quality of the studies makes inclusion of mindfulness interventions in clinical practice questionable.

* [58] Shaw JM, Sekelja N, Frasca D, et al.Being mindful of mindfulness interventions in cancer: A systematic review of intervention reporting and study methodology. Psychooncology 2018; 1-10.

This systematic review classifies mindfulness interventions into MBSR, MBCT, MBI groupings and identified poor documentation of modifications to the standard protocols. The quality of studies was poor indicating a low evidence-base supporting application into practice, particularly without direct comparisons of mindfulness interventions with CBT.

[59] Carson JW, Carson KM, Olsen MK, et al. Mindful Yoga for women with metastatic breast cancer: design of a randomized controlled trial. BMC Altern Med 2017; 17(1):153.

[60] Ho RTH, Wan AHY, Chan JSM, et al. Study protocol on comparative effectiveness of mindfulness meditation and qigong on psychophysiological outcomes for patients with colorectal cancer: a randomized controlled trial. BMC Altern Med 2017; 17(1):390.

*[61] Garland EL, Thielking P, Thomas EA, et al. Linking dispositional mindfulness and positive psychological processes in cancer survivorship: a multivariate path analytic test of the mindfulness-to-meaning theory. Psychooncology 2017; 26(5):686-692.

This study explores components of a model of emotion regulation to assess the potential to use specific psychological characteristics to identify individuals more likely to respond to mindfulness interventions.

[62] Liu S, Qiu G, Louie W. Use of Mindfulness Sitting Meditation in Chinese American Women in Treatment of Cancer. Integ Cancer Ther 2017; 16(1):110-117.

*[63] Pollard A, Burchell JL, Castle D et al. Individualised mindfulness-based stress reduction for head and neck cancer patients undergoing radiotherapy of curative intent: a descriptive pilot study. Eur J Cancer Care 2017; 26(2).

This phase I study piloted a modified MBSR intervention in head and neck cancer patients during radiation therapy. Modifications to the MBSR program were made to adjust for specific concerns and symptoms commonly occurring in this population.

[64] Campo RA, Bluth K, Santacroce SJ, et al. A mindful self-compassion videoconference intervention for nationally recruited posttreatment young adult cancer survivors: feasibility, acceptability, and psychosocial outcomes. Support Care Cancer 2017; 25(6):1759-1768.

[65] Lee CE, Kim S, Kim S, et al. Effects of a Mindfulness-Based Stress Reduction Program on the Physical and Psychological Status and Quality of Life in Patients With Metastatic Breast Cancer. Holist Nurs Pract 2017; 31(4):260-269.

[66] Rohanszky M, Berenyi K, Fridrik D, Pusztafalvi H. [Effectiveness of mindfulness-based cancer recovery (MBCR) program among Hungarian cancer patients]. Orv Hetil 2017; 158(33):1293-1301.

[67] Van der Gucht K, Takano K, Labarque V, et al. A Mindfulness-Based Intervention for Adolescents and Young Adults After Cancer Treatment: Effects on Quality of Life, Emotional Distress, and Cognitive Vulnerability. J Adolesc Young Adult Oncol 2017; 6(2):307-317.

[68] Black DS, Peng C, Sleight AG, et al. Mindfulness practice reduces cortisol blunting during chemotherapy: A randomized controlled study of colorectal cancer patients. Cancer 2017; 123(16):3088-3096.

[69] Boyle CC, Stanton AL, Ganz PA, et al. Improvements in emotion regulation following mindfulness meditation: Effects on depressive symptoms and perceived stress in younger breast cancer survivors. J Consult Clin Psychol 2017; 85(4):397-402.

[70] Chambers SK, Occhipinti S, Foley E, et al. Mindfulness-Based Cognitive Therapy in Advanced Prostate Cancer: A Randomized Controlled Trial. J Clin Oncol 2017; 35(3):291-297.

* [71] Johannsen M, O'Toole MS, O'Connor M, et al. Clinical and psychological moderators of the effect of mindfulness-based cognitive therapy on persistent pain in women treated for primary breast cancer - explorative analyses from a randomized controlled trial. Acta Oncol 2017; 56(2):321-328.

This secondary, exploratory analysis of the moderators of MBCT on pain explores identifiable characteristics that could be used to identify women more likely to respond to MBCT.

[72] Kenne Sarenmalm E, Martensson LB, Andersson BA, et al. Mindfulness and its efficacy for psychological and biological responses in women with breast cancer. Cancer Med 2017; 6(5):1108-1122.

[73] Reich RR, Lengacher CA, Alinat CB, et al. Mindfulness-Based Stress Reduction in Post-treatment Breast Cancer Patients: Immediate and Sustained Effects Across Multiple Symptom Clusters. J Pain Symptom Manage 2017; 53(1):85-95.

[74] Reynolds LM, Bissett IP, Porter D, Consedine NS. A Brief Mindfulness Intervention Is Associated with Negative Outcomes in a Randomised Controlled Trial Among Chemotherapy Patients. Mindfulness 2017;8(5):1291-1303.

* [75] Schellekens MPJ, Tamagawa R, Labelle LE, et al. Mindfulness-Based Cancer Recovery (MBCR) versus Supportive Expressive Group Therapy (SET) for distressed breast cancer survivors: evaluating mindfulness and social support as mediators. J Behav Med 2017; 40(3):414-422.

This RCT is the only trial reported since 2017 comparing MBCR with another active intervention.

[76] Zhang JY, Zhou YQ, Feng ZW, et al. Randomized controlled trial of mindfulness-based stress reduction (MBSR) on posttraumatic growth of Chinese breast cancer survivors. Psychol Health Med 2017; 22(1):94-109.

* [77] Cederberg JT, Dahl J, von Essen L, Ljungman G. an acceptance-based intervention for children and adolescents with cancer experiencing acute pain–a single-subject study. J Pain Res 2017;10:2195.

This study uses a rarely employed methodology in psychosocial oncology research: the single-subject research design. Tentative findings worthy of future investigation are reported in the application of ACT to cancer-related pain.

* [78] Aguirre-Camacho A, Pelletier G, González-Márquez A, et al. The relevance of experiential avoidance in breast cancer distress: insights from a psychological group intervention. Psychooncology, 2017;26(4):469-475.

Although this is a single-arm study, it provides novel data on the potential explanatory mechanism of experiential avoidance during an ACT intervention for anxiety, depression and quality of life.

** [79] González-Fernández S, Fernández-Rodríguez C, Paz-Caballero MD, Pérez-Álvarez M. Treating anxiety and depression of cancer survivors: Behavioral activation versus acceptance and commitment therapy. Psicothema 2018;30(1):14-20.

This RCT compared group-delivered ACT with both an active comparator (behavioural activation) and wait-list control. Therapeutic process variables were measured as an indicator of potential intervention mechanism.

* [80] Mosher CE, Secinti E, Li R, et al. Acceptance and commitment therapy for symptom interference in metastatic breast cancer patients: a pilot randomized trial. Support Care Cancer 2018:1-12.

This is a successful feasibility study, using a pilot randomised controlled trial design, comparing telephone-delivered ACT with educational/support control.

** [81] Urech C, Grossert A, Alder J, S et al. Web-Based Stress Management for Newly Diagnosed Patients With Cancer (STREAM): A Randomized, Wait-List Controlled Intervention Study. J Clin Oncol 2018;36(8):780-788.

This is a high quality, fully powered, RCT of psychologist-led, internet-facilitated, ACT versus wait-list control, which recruited across four countries in Europe. Intention to treat analyses were used.

** [82] Montesinos F, Luciano C. Acceptance of relapse fears in breast cancer patients: Effects of an ACT-based abridged intervention. Psicooncologia 2016;13(1):7.

Although this is a small study, it is novel in that is tests a brief, one session ACT intervention for fear of cancer recurrence.

[83] Mosher CE, Tometich DB, Hirsh A, et al. Symptom experiences in metastatic breast cancer patients: relationships to activity engagement, value-based living, and psychological inflexibility. Psychooncology 2017;26(11):1944-1951.

[84] Davis EL, Deane FP, Lyons GC, Barclay GD. Is Higher Acceptance Associated With Less Anticipatory Grief Among Patients in Palliative Care? J Pain Symptom Manage 2017;54(1):120-125.

* [85] Swash B, Bramwell R, Hulbert-Williams NJ. Unmet psychosocial supportive care needs and psychological distress in haematological cancer survivors: the moderating role of psychological flexibility. J Contextual Behav Sci 2017;6(2):187-194.

This cross-sectional survey analysed the moderating effects of psychological flexibility on the relationship between unmet psychosocial supportive care needs and anxiety, depression and quality of life in long-term haematological cancer survivors.

** [86] Butow PN, Turner J, Gilchrist J, et al. Randomized Trial of ConquerFear: A Novel, Theoretically Based Psychosocial Intervention for Fear of Cancer Recurrence. J Clin Oncol 2017;35:4066-77.

This was a high quality, powered, RCT comparing Meta-Cognitive Therapy (with elements of ACT) against relaxation control. Notable for significant of findings in the context of the use of an active control group.

* [87] Fisher PL, Byrne A, Salmon P. Metacognitive Therapy for Emotional Distress in Adult Cancer Survivors: A Case Series. Cognit Ther Res 2017;41(6):891-901.

This study used a multiple-baseline, single-subject research design analysing effects of the individually-delivered MCT on anxiety, depression and FCR.

[88] Rost AD, Wilson K, Buchanan E, et al. Improving psychological adjustment among late-stage ovarian cancer patients: examining the role of avoidance in treatment. Cogn Behav Pract 2012;19(4):508-517.

[89] Ghasemi F, Dehghan F, Farnia V, et al. Effectiveness of Acceptance and Commitment Therapy on Life Expectancy of Female Cancer Patients at Tehran's Dehshpour Institute in 2015. Asian Pac J Cancer Prev 2016;17(8):4115-4118.

[90] Mohabbat-Bahar S, Maleki-Rizi F, Akbari ME, Moradi-Joo M. Effectiveness of group training based on acceptance and commitment therapy on anxiety and depression of women with breast cancer. Iran J Cancer Prev, 2015;8(2):71.

[91] Arch JJ & Mitchell JL. An Acceptance and Commitment Therapy (ACT) group intervention for cancer survivors experiencing anxiety at re-entry. Psychooncology 2016;25(5):610-615.

[92] Mahdavi A, Aghaei M, Aminnasab V, et al. The Effectiveness of Acceptance-Commitment Therapy (ACT) on Perceived Stress, Symptoms of Depression, and Marital Satisfaction in Women With Breast Cancer. Archives of Breast Cancer 2017;4(1):16-23.

[93] Gillanders DT, Sinclair AK, MacLean M, Jardine K. Illness cognitions, cognitive fusion, avoidance and self-compassion as predictors of distress and quality of life in a heterogeneous sample of adults, after cancer. J Contextual Behav Sci2015;4(4):300-311.

[94] Hulbert-Williams, NJ, Storey L. Psychological flexibility correlates with patient-reported outcomes independent of clinical or sociodemographic characteristics. Support Care Cancer 2016;24(6):2513-2521.

** [95] McCaughan E, Parahoo K, Hueter I, et al. Online support groups for women with breast cancer. Cochrane Database Syst Rev 2017; 3: CD011652.

> Well executed Cochrane review of online support groups for women with breast cancer. Main findings highlight low quality of research in the field to date and heterogeneous results making it difficult to determine the clinical efficacy of these interventions.

[96] Banks T, Pearce S, French H, et al. Counselling for people affected by cancer: The impact outside a healthcare setting. Counselling & Psychotherapy Research 2017; 17(3): 227-233 .

[97] Bober SL, Recklitis CJ, Michaud AL, Wright AA Improvement in sexual function after ovarian cancer: Effects of sexual therapy and rehabilitation after treatment for ovarian cancer. Cancer 2018; 124(1): 176-182.

[98] Carlson LE, Rouleau CR, Speca M, et al. Brief supportive-expressive group therapy for partners of men with early stage prostate cancer: lessons learned from a negative randomized controlled trial. Support Care Cancer 2017; 25(4): 1035-1041.

[99] Kim E, Scheufele DA, Han JY, Shah D Opinion Leaders in Online Cancer Support Groups: An Investigation of Their Antecedents and Consequences. Health Commun 2017; 32(2): 142-151.

[100] Stephen J, Rojubally A, Linden W, et al. Online support groups for young women with breast cancer: a proof-of-concept study. Support Care Cancer 2017; 25(7): 2285-2296.

[101] Dorros SM, Segrin C, Badger TA Cancer survivors' and partners' key concerns and quality of life. Psychol Health 2017; 32(11): 1407-1427.

[102] Mareschal J, Weber K, Rigoli P, et al. The ADAPP trial: a two-year longitudinal multidisciplinary intervention study for prostate cancer frail patients on androgen deprivation associated to curative radiotherapy. Acta Oncol 2017; 56(4): 569-574.

* [103] Manne SL, Virtue SM, Ozga M, et al. A comparison of two psychological interventions for newly-diagnosed gynecological cancer patients. Gynecol Oncol 2017; 144(2): 354-362.

This three-arm randomised controlled trial investigated two separate interventions for women diagnosed with gynaecological cancer: i) coping and communication; ii) supportive counselling; iii) usual care. Results suggest supportive counselling did not differ from usual care. CCI participants greater improvement in depression and cancer-related distress at 6 months only.

* [104] Scarpa M, Pinto E, Saraceni E, et al. Randomized clinical trial of psychological support and sleep adjuvant measures for postoperative sleep disturbance in patients undergoing oesophagectomy. Br J Surg 2017; 104(10): 1307-1314.

A factorial designed randomised trial of psychological support and a sleep intervention in people with oesophageal cancer. First RCT of such interventions in this population.

[105] Faller H, Weis J, Koch U, et al. Utilization of professional psychological care in a large German sample of cancer patients. Psychooncology 2017; 26(4): 537-543.

[106] Matsui T, Tanimukai H. The use of psychosocial support services among Japanese breast cancer survivors. Jpn J Clin Oncol 2017; 47(8): 743-748.

[107] Huber J, Maatz P, Muck T, *et al.* The effect of an online support group on patients' treatment decisions for localized prostate cancer: An online survey. Urol 2017; 35(2): 37.e19-37.e28.

[108] Wang X, Zhao K, Street N. Analyzing and Predicting User Participations in Online Health Communities: A Social Support Perspective. J Med Internet Res 2017; 19(4): e130.

[109] Beatty L, Binnion C, Kemp E, Koczwara B. A qualitative exploration of barriers and facilitators to adherence to an online self-help intervention for cancer-related distress. Support Care Cancer 2017; 25(8): 2539-2548.

[110] Hammer NM, Egestad LK, Nielsen SG, et al. Feasibility and acceptability of active book clubs in cancer survivors - an explorative investigation. Acta Oncol 2017; 56(3): 471-478.

[111] Melton L, Brewer B, Kolva E, et al. Increasing access to care for young adults with cancer: Results of a quality-improvement project using a novel telemedicine approach to supportive group psychotherapy. Palliat Support Care 2017; 15(2): 176-180.

** [112] Martínez M, Arantzamendi M, Belar A, et al. 'Dignity therapy', a promising intervention in palliative care: A comprehensive systematic literature review. Palliat Med 2017;31(6):492-509.

This systematic review include 28 studies on the use of Dignity Therapy in the palliative setting. In addition to statistical improvements in psychological distress the review assessed satisfaction, suitability, feasibility and adaptability outcomes.

[113] Ho AHY, Car J, Ho MHR,et al. A novel Family Dignity Intervention (FDI) for enhancing and informing holistic palliative care in Asia: study protocol for a randomized controlled trial. Trials 2017;18(1):587.

[114] Dose AM, Rhudy LM. Perspectives of newly diagnosed advanced cancer patients receiving dignity therapy during cancer treatment. Support Care Cancer 2018;26(1): 187-195.

[115] Vuksanovic D, Green H, Morrissey S, Smith S. Dignity Therapy and Life Review for Palliative Care Patients: A Qualitative Study. J Pain Symptom Manage 2017;54(4):530-537.

* [116] Dose AM, Hubbard JM, Mansfield AS, et al. Feasibility and Acceptability of a Dignity Therapy/Life Plan Intervention for Patients With Advanced Cancer. Oncol Nurs Forum 2017;44:194-202.

A small, single arm feasibility and acceptability trial of Dignity Therapy in patients with advanced pancreatic or non-small cell lung cancer.

** [117] Julião M, Oliveira F, Nunes B, et al. Effect of dignity therapy on end-of-life psychological distress in terminally ill Portuguese patients: A randomized controlled trial. Palliat Support Care 2017;15(6):628-637.

This paper reports a well-powered non-blinded RCT comparing group-delivered Dignity Therapy against usual care control.

* [118] Vuksanovic D, Green H, Dyck M & Morrissey S. Dignity Therapy and Life Review for Palliative Care Patients: A Randomized Controlled Trial. J Pain Symptom Manage 2017; 23(2):162-170.

This RCT paper reports a trial comparing group-delivered Dignity Therapy against Life Review Groups (an active control group) and waitlist control. Fidelity and protocol adherence were monitored.

* [119] Lloyd-Williams M, Shiels C, Ellis J, et al. Pilot randomised controlled trial of focused narrative intervention for moderate to severe depression in palliative care patients: DISCERN trial. Palliat Med 2018;32(1):206-215.

This is a small but well designed pilot RCT comparing a Narrative Therapy based intervention against usual care control.

** [120] Wise M, Marchand LR, Roberts LJ, Chih MY. Suffering in Advanced Cancer: A Randomized Control Trial of a Narrative Intervention. J Palliat Med 2018;21(2):200-207.

This was a substantial RCT comparing a Narrative-based intervention with active control. The study is noteworthy for trialing telephone-based delivery plus online resources including social networking functions.

** [121] Yun YH, Kim YA, Lee MK, et al. A randomized controlled trial of physical activity, dietary habit, and distress management with the Leadership and Coaching for Health (LEACH) program for disease-free cancer survivors. BMC cancer 2017;17(1):298.

The is a large-scale RCT of peer-delivered coaching for both lifestyle improvement and psychological wellbeing. It is especially notable for the large sample size and innovative delivery method.

* [122] McCusker J, Yaffe M, Faria R, et al. Phase II trial of a depression self-care intervention for adult cancer survivors. Eur J Cancer Care 2018;27(1):e12763.

This paper reports a well-designed and reported acceptability and feasibility study for a new coaching based intervention for cancer survivors with moderate levels of depression.

[123] Ritvo P, Obadia M, Santa Mina D, et al. Smartphone-Enabled Health Coaching Intervention (iMOVE) to Promote Long-Term Maintenance of Physical Activity in Breast Cancer Survivors: Protocol for a Feasibility Pilot Randomized Controlled Trial. JMIR Res Protoc 2017;6(8):e165.

[124] Rodenbach RA, Brandes K, Fiscella K, et al. Promoting end-of-life discussions in advanced cancer: effects of patient coaching and question prompt lists. J Clin Oncol 2017;35(8):842.

[125] Kyriazakos S, Valentini V, Cesario A, Zachariae R. FORECAST: a cloud-based personalized intelligent virtual coaching platform for the well-being of cancer patients. Clin Transl Radiat Oncol 2018;8:50-59.

[126] Clement S, Schauman O, Graham T, et al. What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. Psychol Med 2015;45(1):11-27.

[127] Palmer S, Szymanksa K. Cognitive Behavioural Coaching: An integrative approach. In S Palmer & A Whybrow, Handbook of Coaching Psychology: A Guide for Practitioners. Hove UK: Routledge 2008.

[128] Hulbert-Williams L, Hochard K, Hulbert-Williams NJ, et al. Contextual behavioural coaching: A scientifically coherent model for supporting behaviour change. International Journal of Coaching Psychology 2016;11(2):142-154.

[129] De Shazer S, Dolan Y, Korman H, Trepper T. More than Miracles: The state of the Art of Solution-Focused Brief Therapy. Haworth Press 2014.

[130] Gilbert P. Compassion Focussed Therapy: Distinctive Features. Hove UK: Routledge Ltd. 2010.

[131] Young JE, Klosko JS, Weishaar ME. Schema Therapy: A Practitioner's Guide. Guilford Press 2006.

** [132] Hayes SC, Hofmann SG. The third wave of cognitive behavioral therapy and the rise of process-based care. World Psychiatry 2017;16(3):245-246.

This commentary article provides an easy to access overview to the shift in psychological intervention research away from package-based therapy and towards process based therapy. This is a profoundly important conceptual shift in intervention research and will undoubtedly affect how future research trials should be conducted.

Table 1. Summary information for CBT research published since January 2017

Paper Ref #	Authors & Date	Country	Population	Sample Size	Study Design	Type of control group	Summary Outcome
23	Bradford & Chan (2017)	Australia	AYA (ages 13-39)	17 studies	Systematic review	n/a	Total of 2314 participants in 17 studies included. Participants in 15/17 studies were childhood cancer survivors; only 2 studies young adulthood. 10 RCTs, 7 single-arm. Studies of variable quality. Modest positive health outcomes.
24	Coughtrey, Millington, Bennett, *et al.* (2017)	UK	Paediatric (age < 18)	12 studies	Systematic review	n/a	Interventions included CBT (4 studies); CBT+physical exercise (1 study); family therapy (1 study); family therapy + CBT (1 study); therapeutic music video (2 studies); coping (1 study); wish-fulfillment (1 study). Nine studies reported statistically significant improvements on psychological outcomes; six had positive impact on physical symptoms.
25*	Li, Kennedy, Byrne, *et al.* (2017)	Canada	Cancer Patients with Depression	21 studies	Meta-analytic review	n/a	Compared collaborative care interventions (combined pharmacotherapy and psychological therapy) to pharmacotherapy vs psychotherapy for depression in cancer. Collaborative care significantly more effective, and sustained, than usual care. Pharmacotherapy and psychotherapy independently effective in short, but not long, term.
26	Matthews, Grunfeld & Turner (2017)	UK	Breast Cancer patients	32 studies	Meta-analytic Review	n/a	CBT most effective form of psychosocial intervention for anxiety, depression, QOL. Generalizability of findings limited, due to small samples and short follow-up period.

27*	Ugalde, Haynes, Boltong, *et al.* (2017)	Australia	Heterogeneous Cancer	14 studies	Systematic review	n/a	Examined impact of self-guided interventions; only one adequately powered study, which demonstrated a positive effect. Almost all interventions required some facilitation. Distressed patients may benefit more. Currently, evidence is lacking, further research needed.
28	Xiao, Song, Chen, *et al.* (2017)	China	Breast Cancer with Depression	13 studies	Meta-analytic review	n/a	Significant efficacy with large effect sizes for individually delivered CBT in improving depression after breast cancer surgery. Further well-designed / powered RCTs needed.
29	Ye, Du, Zhou, *et al.* (2018)	China	Breast Cancer survivors and patients	10 studies	Meta-analytic review	n/a	Moderate-to-strong pooled effects of CBT on QOL, depression, stress, anxiety, hyperarousal.
30	Zhang, Huang, Feng, *et al.* (2017)	China	Breast Cancer survivors	6 studies	Meta-analytic review	n/a	Examined impact of CBT on QOL and stress; no impact found for breast cancer survivors. But: only 6 studies included and all underpowereded; CBT often delivered in combination with other treatments (exercise, hypnosis etc).
31	Murphy, Newby, Butow, *et al.* (2017)	Australia	Heterogeneous Cancer Survivors	n/a	RCT - Protocol	Usual care	RCT Protocol of an internet-delivered transdiagnostic supervised program (iCanAdapt-Early) for diagnosed depression and/or anxiety in early stage cancer survivors.
32	Ander, Wikman, Ljotsson, *et al.* (2017)	Sweden	AYA (ages 15-25)	Aim N=30	Single arm feasibility – protocol	n/a	Protocol of an uncontrolled feasibility trial, pre-post, 3-month follow-up design. Participants will receive YoungCan – therapist guided, internet-administered self-help CBT.

33	Ander, Woodford, Cernvall, *et al.* (2017)	Sweden	AYA (ages 17-25)	N=10	Single arm	n/a	Individual CBT (up to 15 sessions); clinical outcomes assessed pre, post, and 3-months later. Qualitative interviews also conducted. Uptake rate = 5% (10/201); Retention=90% (9/10). Significant feasibility concerns.
34	Grunfeld, Hunter & Yousaf (2017)	UK	Prostate Cancer patients and survivors	N=20	Qualitative / Single arm feasibility study (substudy of larger RCT)	n/a	Participants from treatment arm completed semi-structured interviews. Framework analysis – intervention was well received, three superordinate themes emerged relating to improved symptom management; skill acquisition; and broader program-benefits.
35	Alberts, Hadijistavropoulous, Heather, *et al.* (2017)	Canada	Cancer survivors screened for distress	N=18	Single arm feasibility trial	n/a	Trialed internet-delivered CBT for recent survivors. Intervention led to reduced depression anxiety, and QOL scores. Feasibility demonstrated.
36	Dozeman, Verdonck-de Leeuw, Irma, *et al.* (2017)	Netherlands	Breast cancer survivors with insomnia	N=171	Single arm feasibility trial	n/a	Trialed guided internet-CBT for insomnia with breast cancer patients. Program received high value ratings (7.5/10); 59% completed intervention fully; feasibility, acceptability and effectiveness (improving insomnia severity, fatigue and daytime functioning) demonstrated, especially younger or those with greater symptom severity at baseline.
37*	McGill, Sansom-Daly, Wakefield, *et al.* (2017)	Australia	AYA	N=39	Substudy of RCT	n/a	Intervention participants from online "Recapture Life" program rated therapeutic alliance and group cohension – both were highly rated, demonstrating feasibility and acceptability of this modality.

38	Zhou, Vrooman, Manley, *et al*. (2017)	USA	AYA with Insomnia	N=12	Single-arm pilot	n/a	Adapted 10-session CBT-insomnia to improve accessibility by delivering blended therapy – in-person (6-sessions) and videoconference (4 sessions). Intervention immediately improved sleep variables, sustained at 2-months. Feasibility demonstrated.
39	Zhou, Partridge & Recklitis (2017)	USA	Cancer survivors with insomnia	N=38	Single arm feasibility trial	n/a	Trialed group CBT-Insomnia (3-session); Significant pre-post improvements in sleep efficiency, quality and insomnia symptoms. Treatment Attrition = 24%.
40	Chambers, Ritterband, Thorndike, *et al*. (2018)	Australia	Cancer patients screened for distress	N=163 (T: 79; C: 84)	RCT	Attention control (static patient education website)	RCT of web-based CBT "CancerCope" for distressed cancer patients. Intention to treat analysis: No impact on primary or secondary outcomes. Per-protocol analyses: CancerCope significantly greater reductions in distress, cancer-specific distress and unmet needs at 8-week follow-up compared to control. Younger patients more likely to complete intervention.
41**	Cheung, Cohn, Dunn, *et al*. (2017)	USA	Metastatic breast cancer patients	N=39 (T1:13; T2: 13; T3: 13)	RCT	Attention-control	Randomized pilot of a positive-affect skill intervention (LILAC), comparing face-to-face vs online delivery vs attention-control. Feasibility, acceptability and retention all demonstrated. Within group analyses: LILAC (regardless of delivery) reduced depression and negative affect at 1-month follow-up. Control participants did not change.
42	Desautels, Savard, Ivers, *et al*. (2018)	Canada	Breast Cancer patients with depression	N=62 (T1:25; T2:26; C:11)	RCT	Waitlist control	Compared 8-week cognitive therapy (T1) vs bright light therapy (T2) vs waitlist control for depressed breast cancer patients. T1 superior to T2 at post-tx on depression scores; both T1 and T2 significantly better treatment gains (sustained) cf WLC.

43	Hummel, Van Lankveld, Jacques, *et al.* (2017)	Netherlands	Breast Cancer survivors with DSM-IV diagnosis of sexual dysfunction	N=169 (T:84; C: 85)	RCT	Waitlist control	Compared internet-delivered CBT vs waitlist control for sexual functioning. 62% completed CBT. CBT significantly greater improvement on range of sexual functioning outcomes, body image, menopausal symptoms. CBT=C for orgasmic functioning sexual satisfaction, relationship intimacy, marital functioning, psych distress and QOL.
44	Irwin, Olmstead, Carrillo, *et al.* (2017)	USA	Cancer survivors with Insomnia	N=90 (T1:45; T2: 45)	RCT – noninferiority	Active treatment (CBT)	Compared Tai Chi Chih (TCC) to CBT. TCC noninferior to CBT. Insomnia treatment response TCC = 46.7% vs CBT = 43.7% @ 15-month follow-up;
45*	Lichtenthal, Corner, Roberts, *et al.* (2017)	USA	Breast cancer survivors with fear of recurrence	N=110 (T1:38 T2: 36 C: 36)	RCT	Attention control	Examined feasibility, acceptability, preliminary efficacy of 2-versions of home-delivered cognitive bias modification intervention vs control. Interventions significantly improved health worries and interpretation biases. No reductions in fear of recurrence. Only 26% uptake rate; but high retention (83%) and satisfaction (90%) ratings.
46	Mendoza, Capafons, Gralow, *et al.* (2017)	USA	Heterogeneous curative cancer patients / survivors	N=44 (T:22; C: 22)	RCT - crossover	Education control (participants received both conditions in counterbalanced order)	Trial of Valencia model of hypnosis + CBT for pain, fatigue & sleep management Treatment significantly greater improvements than control on all outcomes (pain, fatigue, sleep, depression, pain interference, pain catastrophizing, cancer-distress), sustained at 3-months.

47	Merckaert, Lewis, Delvallez, *et al.* (2017)	Belgium	Breast cancer patients	N=159 (T1:82; T2: 77)	RCT	Active treatment	Compared a single-component (support) vs multi-component (CBT+hypnosis) group intervention for anxiety regulation. 20% uptake rate. Multi-component significantly greater reductions in anxiety, heart rate, FCR-distress; improvements in anxiety regulation, coping strategies than single-component.
48	Peoples, Garland, Perlis, *et al.* (2017)	USA	Cancer survivors with Insomnia	N=95 (T1:24; T2: 23; T3: 24; C: 25)	RCT	Placebo	Compared CBT-insomnia + placebo (T1); CBT-I + armodafinil (T2); Armodafinil (T3); placebo (C) CBT significantly improved QOL post-intervention with benefits sustained at 3-m; armodafinil had no effect on QOL.
49	Sandler, Goldstein, Horsfield, *et al.* (2017)	Australia	Cancer survivors with fatigue	N=46 (T: 23 C: 23)	RCT	Education control	CBT significantly and clinically greater improvements in fatigue and functional status. Low response rate. Magnitude of benefit couldn't be determined due to small sample size.
50*	Turner, Kelly, Clarke, *et al.* (2017)	Australia	Depressed Cancer patients	N=469 (T: 247 C: 222)	RCT – cluster	Stepped-wedge control (usual care)	Trial of brief 4-session CBT delivered via front-line oncology health professionals. Intervention non-superior to control in anxiety and depression scores. Intervention participants with disease progression had significantly reduced unmet needs compared to control.
51*	van der Wal, Thewes, Gielissen, *et al.* (2017)	Netherlands	Breast, prostate, colorectal cancer survivors with high fear of cancer recurrence	N=88 (T: 45; C: 43)	RCT	Usual care	Trial of blended (face-to-face and online) CBT; Blended CBT had statistically and clinically significantly lower fear of cancer recurrence than C with moderate to large effects. Treatment-attrition rate 33%.

52	Willems, Bolman, Mesters, *et al.* (2017)	Netherlands	Recent cancer survivor12	N=462 (T:231; C: 231)	RCT	Waitlist control	Trial of a web-based 'Cancer Aftercare Guide'. Attrition rate=11.5%. At 6-months: Intervention significantly greater improvements in depression, fatigue, emotional and social functioning vs control. Small effects but clinically relevant.
53	Willems, Mesters, Lechner, *et al.* (2017)	Netherlands	Recent cancer survivors	N=462 (T:231; C: 231)	RCT	Waitlist control	Trial of a web-based 'Cancer Aftercare Guide'. At 12-months: Intervention no longer significantly different from control in depression, fatigue, emotional or social functioning. Moderator analysis: at 6-months male gender, younger age, chemotherapy were moderators. At 12-months education level moderated.
54	Willems, Lechner, Verboon, *et al.* (2017)	Netherlands	Recent cancer survivors	N=462 (T:231; C: 231)	RCT	Waitlist control	Secondary analysis of Cancer Aftercare Guide trial, to test hypothesized mediators. Intervention effects in decreasing depression and fatigue were mediated by personal control; problem solving skills did not mediate effects.
55	Wootten, Meyer, Abbott, *et al.* (2017)	Australia	Localised prostate cancer	N=142 (T1:47 T2:48 T3:47)	RCT	Active treatment (Online forum)	Trial of online CBT intervention (T1), CBT+forum (T2) vs forum only (T3). Only T3 led to significant improvements in total sexual satisfaction, with large effect size. Structural equation modelling showed increased sexual function, masculine self-esteem and sexual confidence were mediators in the T3 condition.

Table 2. Summary information for third-wave research published since January 2017

Paper Ref #	Authors & Date	Country	Population	Sample Size	Study Design	Type of control group	Summary Outcome
MINDFULNESS-BASED INTERVENTIONS							
57**	Haller, Winkler, Klose, *et al.*(2017)	Germany	Breast cancer	10 studies	Systematic review	n/a	Total sample of 1709 participants in 10 studies reported over 14 articles included. Intervention effects did not result in clinically meaningful differences in outcomes. Post intervention improvements in: Qol, fatigue, sleep, stress, anxiety, depression. 6 month follow-up: Reduced anxiety and depression. 12-month follow-up: reduced anxiety Risk of bias was unclear for most items, other than attrition & other which were low. When compared to other active interventions, significant mindfulness effects noted only post-intervention and only for anxiety & depression.
58*	Shaw, Sekelja, Frasca, *et al.*(2018)	Australia	Mixed cancer	30 studies	Systematic review	n/a	No studies adhered to formal MBSR program. Modifications were poorly justified, contact time lower than standard protocols, target outcomes poorly justified. 12 did not identify primary aim. Few recruited clinical samples, and most that did failed to report clinical cut-offs. Overall methodology of studies is poor and results unclear.
59	Carson, Carson, Olsen, *et al.* (2017)	Canada	Metastatic breast cancer	N=65 (T: 40; C: 20)	RCT	Attention control (social support)	Protocol paper reporting design. Assessing feasibility and symptoms (pain fatigue, sleep quality, psychological distress, mindfulness and functional capacity).

60	Ho, Wan, Chan, *et al.*(2017)	Hong Kong	Early breast cancer	n/a	RCT - protcol	Waitlist control	Protocol paper reporting design. Assessing cancer-related symptoms and symptom distress.
61*	Garland, Thielking, Thomas, *et al.* (2017)	USA	Mixed cancer	N=97	Cross-sectional survey	n/a	Dispositional mindfulness and positive reappraisal may be pathway by which mindfulness improves outcomes.
62	Liu, Qiu, Louie (2017)	USA	Breast cancer	N=89	Cross-sectional survey	n/a	24% used Mindfulness Sitting Medication (MSM) intervention. Those who did had better English, income, education. Perception of effectiveness MSM was variable. Better English predicted MSM use.
63*	Pollard, Burchell, Castle *et al.* (2017)	Australia	Head and neck cancer	N=19	Single arm feasibility trial	n/a	Demonstrated feasibility and acceptability. No change in mindfulness scores. Tension anxiety reduced but depression did not.
64	Campo, Bluth, Santacroce, *et al.* (2017)	USA	AYA	N=34	Single arm feasibility trial	n/a	Intervention was feasible. All psychosocial outcomes, except for resilience, demonstrated significant changes with medium to large effect sizes
65	Lee, Kim, Kim, *et al.* (2017)	Korea	Metastatic breast cancer	N=18	Single arm	n/a	No significant change in pain, depression, distress.
66	Rohanszky, Berenyi, Fridrik, Pusztafalvi (2017)	Hungary	Mixed cancer	N=173	Cohort study	Non-cancer control	Psychological outcomes improved after intervention, improvements in two aspects QOL sustained at 6 months.
67	Van der Gucht, Takano, Labarque, *et al.* (2017)	Belgium	AYA	N=16	Single arm	n/a	Reduction in emotional distress and improved QoL at 3 months, reduction in negative attitudes toward self, and improved mindfulness skills.

68	Black, Peng, Sleight, *et al.* (2017)	USA	Colorectal cancer receiving chemotherapy	N=57	RCT	Attention control (cancer education) or resting exposure	Mindfulness group showed increase in cortisol levels at 20 mins during chemotherapy infusion. Cortisol levels did not correlate with behavioural outcomes measured.
69	Boyle, Stanton, Ganz, *et al.* (2017)	USA	Early breast cancer	N=71	RCT	Waitlist control	Self-kindness, rumination, increased mindfulness mediated reduction in depressive symptoms.
70	Chambers, Occhipinti, Foley, *et al.* (2017)	Australia	Prostate cancer	N=189 (T: 94; C: 95)	RCT	Enhanced usual care	Did not reduce psychological distress, cancer-specific distress, and PSA anxiety.
71*	Johannsen, O'Toole, O'Connor, *et al.* (2017)	Denmark	Early breast cancer	N=129 (T: 67; C: 62)	RCT	Waitlist control	Attachment avoidance was a significant moderator and may help identify those who would benefit most from MBCT.
72*	Kenne Sarenmalm, Martensson, Andersson, *et al.* (2017)	Sweden	Early breast cancer	N=166 (T: 62; AC: 52; C: 52)	RCT	Active control (self-instructing MBSR or non-MBSR)	Mindfulness reduced depressive symptoms, symptom burden, and improved mental health. Mindfulness did not change anxiety.
73	Reich, Lengacher, Alinat, *et al.* (2017)	USA	Early breast cancer	N=322 (T: 167; C: 155)	RCT	Usual care	Identified symptom cluster: Pain, Psychological, Fatigue, Cognitive. At 6 weeks mindfulness reduced symptoms but not sustained at 12 weeks.
74	Reynolds, Bissett, Porter, Consedine (2017).	New Zealand	Early stage cancer + having chemotherapy	N=68 (T: 32; C: 36)	RCT	Active control (relaxation training)	Mindfulness intervention was associated with increased symptom distress and social avoidance and reduced quality of life.

75*	Schellekens, Tamagawa, Labelle, *et al.* (2017)	Canada	Early breast cancer	N=139 (T: 69; C: 70)	RCT	Supportive Expressive Therapy	Mood disturbance & Stress symptoms were reduced in MBCR group, QOL was not. Social support increased T1-2 in MBCR group compared to SET - social support is important.
76	Zhang, Zhou, Feng, *et al.* (2017)	China	Breast cancer	N=60	RCT	Waitlist control	MBSR promoted PTG and decreased perceived stress and anxiety.
ACCEPTANCE AND COMMITMENT THERAPY							
77*	Cederbeg, Dahl, von Essen, *et al.* (2017)	Sweden	Paediatric (4-18 years of age)	N=5	Single-subject research design	n/a	All five participants reported decreased discomfort of pain and improved pain-related coping. Three out of five reported lower pain intensity.
78*	Aguirre-Camacho, Pelletier, González-Márquez, *et al.* (2017)	Spain	Breast cancer survivors	N=54	Single-arm	n/a	Changes in anxiety and depression across the intervention were predicted by changes in experiential avoidance. The pathway from experiential avoidance to quality of life was indirect, operating via the depression pathway. Path analyses showed good fit indices.
79**	González-Fernández, Fernández-Rodríguez, Paz-Caballero (2017)	Spain	Disease free cancer survivors, screened for high distress	N=66 (T1:17; AC: 22; C:27)	RCT	Active control (Behavioural Activation) and wait-list control.	Both treatment groups were superior to control in reducing anxiety, depression: similar patterns of change in experiential avoidance indicates a potential mediator of intervention affect in both groups.
80*	Mosher, Secinti, Li, *et al.* (2018)	USA	Metastic breast cancer	N=47 (T:23; C:24)	Pilot RCT	Education / Support Group	Feasibility was demonstrated for a future trial. Although between group differences were not significant, greater reductions in sleep-related symptom interference and impairment were reported in the treatment group.

81**	Urech, Grossert, Alder, *et al.* (2018)	Switzerland, Germany, Austria, UK	Newly diagnosed cancer patients (within 12 weeks of treatment start)	N=129 (T:65; C:64)	RCT	Wait-list control	Quality of life and distress improved in the intervention group significantly more than controls (small-medium effect sizes). Between-group comparison in anxiety and depression were not significant. Quality of life improvement was observed in the control group after delayed access to the intervention.
82**	Montesinos & Luciano (2016)	Spain	Breast cancer survivors	N=12 (T: 8; C:4)	Non-randomised, open trial	Wait-list control	Statistically significant reductions in interference related to, and intensity of, fear of recurrence. Large effect sizes maintained to three month follow up. Distress, anxious preoccupation and hypochondria decreased but not significantly between groups.
83	Mosher, Tometich, Hirsh, *et al.* (2017)	USA	Metastatic breast cancer	N=80	Observational / survey study	n/a	Cluster analysis methods were used to determine three groups of symptom experience (low, low-moderate, moderate-high). Between-group differences were found in psychological inflexibility and value obstruction, but not value progress.
84	Davis, Deane, Lyons, Barclay (2017)	Australia	Palliative patients	N=73	Observational / survey study	n/a	Strong correlations between acceptance and anxiety, depression and anticipatory grief. Regression models determined that acceptance predicted 13% variance above anxiety and depression for anticipatory grief.
85*	Swash, Bramwell, Hulbert-Williams (2017)	UK	Haematological cancer survivors, <18 months post-diagnosis	N=91	Observational / survey study	n/a	Psychological flexibility correlated with unmet psychosocial supportive care needs, anxiety, depression and quality of life. Regression models testing moderating effects of psychological flexibility between needs and anxiety, depression and quality of life were significant in 4/15 cases.

META-COGNITIVE THERAPY

86**	Butow, Turner, Gilchrist, *et al.* (2017)	Australia	Breast, colorectal, melanoma cancer survivors screened for clinical fear of cancer recurrence	N=222 (T:121 C: 101)	RCT	Relaxation control (active control)	RCT of 'Conquer Fear', a therapist-administered therapy for reducing fear of cancer recurrence (FCR). Treatment superior to control for clinically and statistically reducing FCR total score and severity subscales, general anxiety, cancer-specific distress, mental QOL and meta-cognitions. Benefits sustained at 3- and 6-month follow-up for FCR total score.
87*	Fisher, Byrne, Salmon (2017)	UK	Cancer survivors attending an adult clinical psychology cancer service	N=4	Single-subject research design	n/a	Clinically-significant reductions in anxiety, depression and fear of cancer recurrence were observed in all cases. Effects were maintained at six-month follow-up in 3/4 participants.

Table 3. Summary information for other intervention research published since January 2017

Paper Ref #	Authors & Date	Country	Population	Sample Size	Study Design	Type of control group	Summary Outcome
SUPPORT GROUPS, SUPPORTIVE EXPRESSIVE THERAPY AND COUNSELLING							
95**	McCaughan, Parahoo, Hueter, *et al.* (2017)	International	Breast cancer	6 studies	Systematic Review	n/a	Total sample of 492 participants included. Quality of trials was low. Mixed results for both anxiety & depression. Unclear whether participation in online support groups is beneficial.
96	Banks, Pearce, French, *et al.* (2017)	UK	Adult cancer patients or caregivers	N=158	Single arm	n/a	Psychological distress improved in both patients and caregivers Counselling outside healthcare setting is beneficial to both patients and caregivers.
97	Bober, Recklitis, Michaud, Wright (2018)	USA	Ovarian cancer	N=53	Cohort study	n/a	Sexual function improved over time; Psychological distress improved. Participants were satisfied with intervention.
98	Carlson, Rouleau, Speca, *et al.* (2017)	Canada	Partners of men with prostate cancer (but outcomes collected on patients too)	N=77 (T: 45; C: 32)	RCT	Usual care	No differences between SET and US groups at all at any time point. Partners in both groups reported improvement in mood, tension, anger, confusion, state anxiety and emotional support.
99	Kim, Scheufele, Han, Shah (2017)	USA	Breast cancer	N=221	RCT – secondary analysis	n/a	Opinion leadership positively related to cancer information competence and breast cancer knowledge. Those giving more advice employed more active coping strategies. No impact on HQOL. No difference on personality traits. Opinion leaders more likely to be optimistic.

100	Stephen, Rojubally, Linden, *et al.* (2017)	Canada	Young breast cancer aged <50 years	N=96	RCT	Active control (self-help psycho-education and workbook	Small reduction in illness intrusiveness and depressive symptoms for online support group. Control group demonstrated greater improvement in post-traumatic growth.
101	Dorros, Segrin Badger (2017)	USA	Early breast cancer, prostate cancer	N=86	Cohort study	n/a	Survivor concerns were cancer- and treatment-related issues. Partner concerns were the well-being of their spouse with cancer, and their role in helping cope with illness. Key concerns were relationship maintenance and communication issues.
102	Mareschal, Weber, Rigoli, *et al.* (2017)	Switzerland	Early prostate cancer	N=35	Single arm	n/a	Cognitive function did not decline significantly, anxious and depressive symptoms remained below clinically significant thresholds. Pattern of symptoms & side effects differed from that expected in patients on AD+RT
103*	Manne, Virtue, Ozga, *et al.* (2017)	USA	Gynaecological cancers	N=352	RCT	Usual care	CCI participants greater decline in depression and cancer-related distress at 6 months only. SC outcomes did not differ from UC
104*	Scarpa, Pinto, Saraceni, *et al.* (2017)	Italy	Oesophageal cancer	N=87	RCT	Usual care	Psychological counselling improved HQOL and sleep outcomes, reduced use of hypnotic medications. Did not change pain scores.
105	Faller, Weis, Koch, *et al.* (2017)	Germany	Mixed cancer	N=4020	Cross-sectional survey	n/a	28.9% accessed PT (13.4%) or PC (24.2%) for cancer related concerns. Less than half diagnosed with mental disorder reported uptake of therapy. Use was lowest in acute care hospitals (22.1%.) 32.1% reported current need and of those 54.4% had previously accessed care. Young, women, high education all reported higher use

106	Matsui, Tanimukai (2017)	Japan	Early breast cancer	N=171	Cross-sectional survey	n/a	51% had used a psychosocial support service. 40% were members of a survivorship organization and were more likely to use support services. Of the 515 reporting use of services, 46% had accessed more than 1.
107	Huber, Maatz, Muck T, *et al.* (2017)	Germany	Prostate cancer	N=668	Cross-sectional survey	n/a	200 men revised treatment decision after exposure to decision aid. They were more likely to opt for external beam RT or active surveillance than radical prostatectomy. Engaging longer with OSG, more active role in decision-making, being in conventional support group independently associated with revised decision.
108	Wang, Zhao, Street (2017)	USA	Breast cancer	n/a	Content analysis of Online Health community (OHC)	n/a	2.8 million posts by approx. 50,000 users, most were not very active. Users who provided more informational support, sought more emotional support or posted more about companionship had longer time spans of activities in the OHC; Those who sought or received more informational support often left the OHC earlier.
109	Beatty, Binnion, Kemp, Koczwara (2017)	Australia	Cancer - mixed	N=13	Qualitative	n/a	19 individual barriers identified: Most disease related followed by intervention factors, computer/tech, psychological, personal factors. 17 facilitators, intervention most prevalent, psychological, computer/tech, and personal factors
110	Hammer, Egestad, Nielsen, *et al.* (2017)	Denmark	Early cancer - mixed	N=17	Pilot	n/a	Participants motivated to engage in reading fiction again. The group was important, especially face to face. Did not like literary selection but found regular walking rewarding. Most were not clinically depressed or anxious, but had sleep disturbance and did light PA.

111	Melton, Brewer, Kolva, *et al.* (2017)	USA	Young Adults	N=8	Pilot	n/a	Excellent retention, adherence varied but generally high for each session. Telemedicine enabled participation in groups despite being hospitalised or unwell. Participants were comfortable using technology, none wanted to attend in person, all reported increased sense of connection.
DIGNITY AND NARRATIVE THERAPY							
112**	Martínez, Arantzamendi, Belar *et al.* (2017)	Spain	Palliative care	28 studies	Systematic Review	n/a	Five RCTs were included; only two showed significant effects on anxiety and depression. Nonrandomised studies also show statistical improvements, and interventions were typically rated positively and beneficial for end-of-life experience.
113	Ho, Car, Ho, *et al.* (2017)	Singapore	Palliative care	n/a	RCT - Protocol	Usual care	This paper presents a protocol for a novel culturally adapted, couples-based Dignity Therapy RCT currently underway in Singapore.
114	Dose & Rhudy (2018)	USA	Advanced cancer, undergoing chemotherapy	N=20	Qualitative	n/a	Presentation a thematic analysis of experiences of a group of patients undergoing Dignity Therapy. Emphasised the importance of talking about family and of imparting a message of hope.
115	Vuksanovic, Green, Morrissey, Smith (2017).	Australia	Advanced terminal disease	N=70 (T: 23; AC: 23; C:24)	Qualitative (substudy of larger RCT)	Life Review and Waitlist control	This qualitative analysis of legacy documents (from Dignity Therapy arm) and Life Review session transcripts were analysed using Framework analysis. Dignity therapy resulted in qualitatively difference session content, even controlling for therapist influences and session length.
116*	Dose, Hubbard, Mansfield, *et al.* (2017)	USA	Advanced pancreatic or non-small cell lung cancer	N=18	Single-arm feasibility trial	n/a	Feasibility and acceptability were demonstrated. Participants completing the intervention reported that their expectations were met or exceeded and that they would recommend it to others.

117**	Julião. Oliveira, Nunes, *et al.* (2017)	Portugal	Life-threatening illness with prognosis <6months	N=80 (T:41; C:39)	RCT	Usual care	Dignity Therapy resulted in significantly decreased demoralisation and desire for death. Significantly greater improvement on 19/25 items of the Patient Dignity Inventory.
118*	Vuksanovic D, Green H, Dyck M & Morrissey S (2017)	Australia	Advanced terminal disease	N=70 (T: 23; AC: 23; C:24)	RCT	Life Review and Waitlist control	Significant increases were reported in generatively and ego-integrity in the Dignity Therapy group only. Despite high levels of acceptability and intervention satisfaction, no significant changes in dignity-related distress, or QOL were reported in any trial arm.
119*	Lloyd-Williams, Shiels, Ellis, *et al.* (2018)	UK	Palliative care	N=57 (T: 33; C: 24)	Pilot RCT	Usual care	Feasibility was demonstrated: although a non-significant between-group difference, greater improvement in distress and longer median survival were observed in the intervention group.
120**	Wise, Marchand, Roberts, Chih (2018).	USA	Stage III or IV cancer patients	N=86	RCT	Active control	There were no significant effects at two month follow-up, but by 4-months, the intervention group reported a significantly greater increase in peace. There were no significant effects on meaning, depressed, anxious or angry mood.
COACHING-BASED APPROACHES							
121**	Yun, Kim, Lee, et al. (2017)	South Korea	Mixed cancer survivors	N=248 (T: 166; C: 82)	RCT	Usual care	Significantly greater improvement in the intervention group on anxiety (but not depression) and some aspects of quality of life between baseline and three month follow-up. Only the fatigue component of quality of life was significant in baseline to one year follow-up analysis.
122*	McCusker, Yaffe, Faria, *et al.* (2018)	Canada	Mixed cancer survivors	N=32	Single-arm	n/a	Good recruitment and retention rates were demonstrated and along with significant improvements in key outcomes, this demonstrates potential feasibility and acceptabilty for a larger trial.