

## REVIEW

# Therapist-led interventions for the treatment of traumatic stress symptoms in cancer survivors: A systematic literature review

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**Abstract**

**Objective:** We reviewed the evidence regarding the effectiveness of therapist-led interventions for reducing symptoms of traumatic stress in cancer survivors.

**Methods:** This systematic review was completed in accordance with the guidelines illustrated by Popay and colleagues and the following online databases, PsychInfo, Medline, CINAHL, were searched for peer-reviewed literature. Further studies were searched through Google Scholar and manually scanning the reference lists of all included studies. The PRISMA guidelines were followed to report results.

**Results:** Sixteen studies were identified, their quality varied and the interventions broadly fell into two categories: CBT-based and non-CBT interventions. Effect sizes were small to moderate in 12 studies and large in four. Drop-out rates were mostly low.

**Conclusion:** This review has demonstrated that the research in this field is still scarce and due to the data mostly suggesting a small to moderate effect, firm conclusions cannot be drawn on the effectiveness of the included interventions.

**KEYWORDS**

adults, cancer survivors, post-traumatic stress disorder, psycho-oncology, psychotherapy, systematic literature review

## 1 | BACKGROUND

Cancer is the leading cause of death worldwide; smoking, alcohol consumption, unhealthy diets, and lack of physical activities are some of the most common risk factors for cancer.<sup>1</sup> The incidence of cancer worldwide is predicted to increase by 61.7% in the next 20 years reaching a total of 27.5 million new cancer cases per year<sup>2</sup>; at the same time, cancer mortality has been substantially reduced through early detection, diagnosis, and treatment<sup>1</sup> which has consequently increased cancer survival rates (e.g., cancer survival has doubled in

the last 40 years in the United Kingdom).<sup>2</sup> In order to provide comprehensive and effective cancer care the cancer patients' journey should not be considered over once they reach end of cancer treatment.<sup>3</sup>

Abbey and colleagues<sup>4</sup> have showed that cancer survivors are likely to develop mental health problems such as anxiety, depression, and posttraumatic stress disorder (PTSD), and experience lifestyle changes that may impact on their overall quality of life and relationships.<sup>3</sup> In the Diagnostic and Statistical Manual of Mental Disorder fourth edition (DSM-IV),<sup>5</sup> the diagnostic criteria for PTSD

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were adjusted to include diagnoses and life-threatening illness such as cancer; this change was made after multiple studies had demonstrated the presence of traumatic stress-like symptoms in cancer patients.<sup>6</sup> However, this adjustment was then revoked in the fifth edition of the DSM<sup>7</sup>; a life-threatening condition was not considered traumatic anymore unless experienced by the person as sudden and catastrophic.

Unlike other traumatic experiences (e.g., having survived an earthquake) that might lead to individuals developing traumatic stress symptoms, cancer acts as an ongoing and chronic stress for the individual<sup>8</sup> and fear of recurrence is experienced by many cancer survivors.<sup>9,10,11</sup> The Field Trials for the Fourth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-4)<sup>5</sup> found that 22% of cancer survivors suffer from some level of lifetime cancer-related traumatic stress symptoms.<sup>5,6</sup> The most common traumatic stress symptom experienced by cancer survivors include distressing recollections of cancer-related experiences such as receiving a diagnosis and having to undergo invasive procedures (e.g., chemotherapy, radiation, hormonal therapy, etc.).<sup>8,12</sup> In order to avoid triggering distressing recollections which can lead to unpleasant feelings and trauma-related thoughts and images, cancer survivors avoid specific places and situations (e.g., hospitals, doctor appointments, follow-up scans, etc.).<sup>12</sup>

Cancer-related traumatic stress symptoms can negatively impact on the ongoing care of cancer patients by reducing attendance at follow-up appointments, and adherence to a healthy lifestyle which may in turn increase healthcare costs and the use of healthcare services in the long run.<sup>13</sup> Although research has demonstrated that cancer survivors want psychosocial support for the emotional and social distress they experience as a result of their cancer journey<sup>6</sup> and are more likely to express their unmet psychological needs in the post-treatment phase compared to other stages in their cancer journey,<sup>14</sup> many cancer survivors are not referred to psycho-oncology services and therefore are not treated.<sup>15</sup> This is not only caused by an overall lack of psycho-oncologists in national health services, but also by other factors such as poor detection, having to wait long times, and geographical or physical barriers which prevent patients attending appointments.<sup>16</sup>

A recent systematic literature review by Dimitrov and colleagues<sup>17</sup> aimed to evaluate the effectiveness of interventions for cancer-related post-traumatic stress; however, the authors excluded papers where participants had not been clearly screened for PTSD or used validated PTSD measures that had subscales that assessed for other symptoms such as depression and overall psychological distress. This inevitably limited the focus of their review (only eight studies were found that matched the review's inclusion criteria). Individuals who do not meet the criterion for PTSD, often display clinically meaningful symptoms which have an impact on their everyday functioning.<sup>18,19,12</sup> Indeed Mundy and Baum<sup>20</sup> stated that PTSD might not be the right diagnosis to represent the emotional and social distress which cancer patients experience; although the PTSD diagnosis may capture many of the traumatic stress symptoms experienced by cancer patients, it may not incorporate

the multidimensionality of lasting responses that are typical of the cancer experience.<sup>21,22</sup> Furthermore, Dimitrov and colleagues' work<sup>17</sup> is limited to literature published up to April 2018, and therefore, our review provides with an overview of the most recent literature in the field.

The aim of this review was to systematically review the evidence on the effectiveness of therapist-led psychotherapeutic intervention for reducing symptoms of traumatic stress (e.g., intrusions, hyperarousal, and avoidance) in cancer survivors.

## 2 | METHODS

### 2.1 | Search strategy

This systematic review was conducted in accordance with PRISMA guidelines<sup>23</sup> and the following online databases, PsychInfo, Medline, CINAHL, were searched for peer-reviewed literature on these dates respectively 25<sup>th</sup> of June 2021, 27<sup>th</sup> of June 2021, and 29<sup>th</sup> of June 2021. Further studies were searched through Google Scholar (<https://scholar.google.com/>) and manually scanning the reference lists of all included studies.

The search terms used were (Cancer n4 survivors) AND (Trauma\* OR PTSD OR Post Traumatic Stress Disorder) AND (Psychotherap\* OR Group Therapy OR Psychodynamic\* OR Cognitive Behavioural Therapy (CBT) OR Cognitive Behavio\* OR Acceptance and commitment therapy (ACT) OR Mindfulness OR Eye Movement desensitization reprocessing OR Cognitive Processing therap\* OR Compassion Focused Therapy OR Cognitive Analytic Therapy OR Schema Therapy). The 'n' search term represents the number of words that could appear between keywords/phrases, in our case four; this was used in an attempt to include all cancer types and terminology. These search terms were employed in free-text searches, but where possible, controlled vocabulary indices were also used. Controlled vocabulary indices included neoplasms and survivors, psychological trauma, post-traumatic stress disorder, and psychotherapy. All searches were conducted by the first author (DD).

### 2.2 | Study selection

All citations were managed using the referencing software Mendeley; after all duplicates were removed, the remaining citations' titles and abstracts were screened using the inclusion criteria in Table 1 (see Supplemental Appendices). Inclusion criteria were organised based on the PICO reporting structure (e.g., Population, Intervention, Comparator, Outcome). When eligibility was established, the papers were accessed and their full-text read.

Due to the scarcity of studies in this area, attempts were made to keep the inclusion criteria as wide as possible (e.g., no restriction on study designs, date of publication, or cancer types). The search and study selection process is illustrated in Figure 1 (see Supplemental Appendices).

TABLE 1 Inclusion criteria

Inclusion criterion	Rationale
Cancer survivors not in active treatment	To allow enough time for traumatic stress to develop and avoid confounding treatment-induced distress
Adults (18 years and above), diagnosed with cancer in adulthood	This review focused on cancer survivors who were diagnosed with cancer in adulthood Being diagnosed with cancer in childhood might represent a different experience compared to receiving a diagnosis in adulthood
All cancer types	Having access to papers which included all types of cancer widened the search And allows to be more inclusive as all cancer experiences have the potential to be traumatic
Measure of traumatic stress with documented psychometric properties	The focus of this review was to identify research that aimed to reduce symptoms of traumatic stress in cancer survivors To ensure the reliability and validity of the findings
Comorbidity with other mental health disorders	Traumatic stress is often associated with other mental health disorders (e.g., depression and anxiety) and therefore studies were participants presented with comorbidities were included to facilitate ecological validity.
<b>Patients with or without comorbidities were included</b>	
Any psychotherapeutic therapist-led interventions	Having access to papers which included any therapist-led psychotherapeutic interventions widened the search Interventions which are therapist-led or guided are likely to be categorically different from self-help programmes
Any study designs	Having access to papers which included all study designs widened the search Because the literature in this area highlights an overall heterogeneity of designs, choosing one specific study design would have limited our search
Studies published in English	The authors speak English
Studies published in peer-reviewed journal	It's a quality standard and they are more likely to be of higher methodological quality

### 2.3 | Data extraction

The study characteristics that were extracted from eligible studies included: author(s), year, country, total number of participants and their mean age, cancer types, study design, measures of traumatic stress (including times of administration), intervention delivered (including duration and who delivered it), control group (where present), results (including where possible effect sizes). Please refer to Table 2 in Supplemental Appendices for all extracted data.

### 2.4 | Quality appraisal

Due to the heterogeneity of study designs included in this review, the Mixed Method Appraisal Tool (MMAT)<sup>24</sup> was chosen to appraise the quality of the studies selected. The MMAT was developed to help researchers to appraise the methodological quality of empirical studies. Within a single tool, the MMAT provides methodological criteria to appraise five study designs and therefore it is more time efficient compared to other tools. The MMAT can appraise qualitative studies, Randomised Controlled Trials (RCTs), non-randomised trials, quantitative descriptive research, and finally mixed-method study designs; it includes 25 criteria and 2 screening questions. The

MMAT is easy to use and access online, comprehensive, quick, and short.<sup>25</sup> Three main steps are followed when using the MMAT. First, there are two optional screening questions which will determine whether the study is empirical or not, then the researcher has to choose the appropriate category for the study they want to appraise so that the MMAT can acknowledge the study's methodological characteristics, and finally, the researcher rates the criteria of the chosen category (e.g., 'Yes', the criterion is met; 'No', the criterion is not met; 'Can't tell', there is not enough information to judge whether the criterion is met or not). Hong and colleagues<sup>21</sup> recommended to provide a thorough presentation of the rating for each criterion when scoring. No study was excluded on the basis of the quality appraisal due to the paucity of studies in this field.

### 2.5 | Data synthesis

Because eligible studies were diverse in terms of their clinical and methodological characteristics (e.g., variability in study design, intervention components, timing of outcome measures), a meta-analysis could not be performed to synthesize the findings. Therefore, a narrative synthesis approach was used to describe and compared eligible studies' characteristics and findings. The narrative

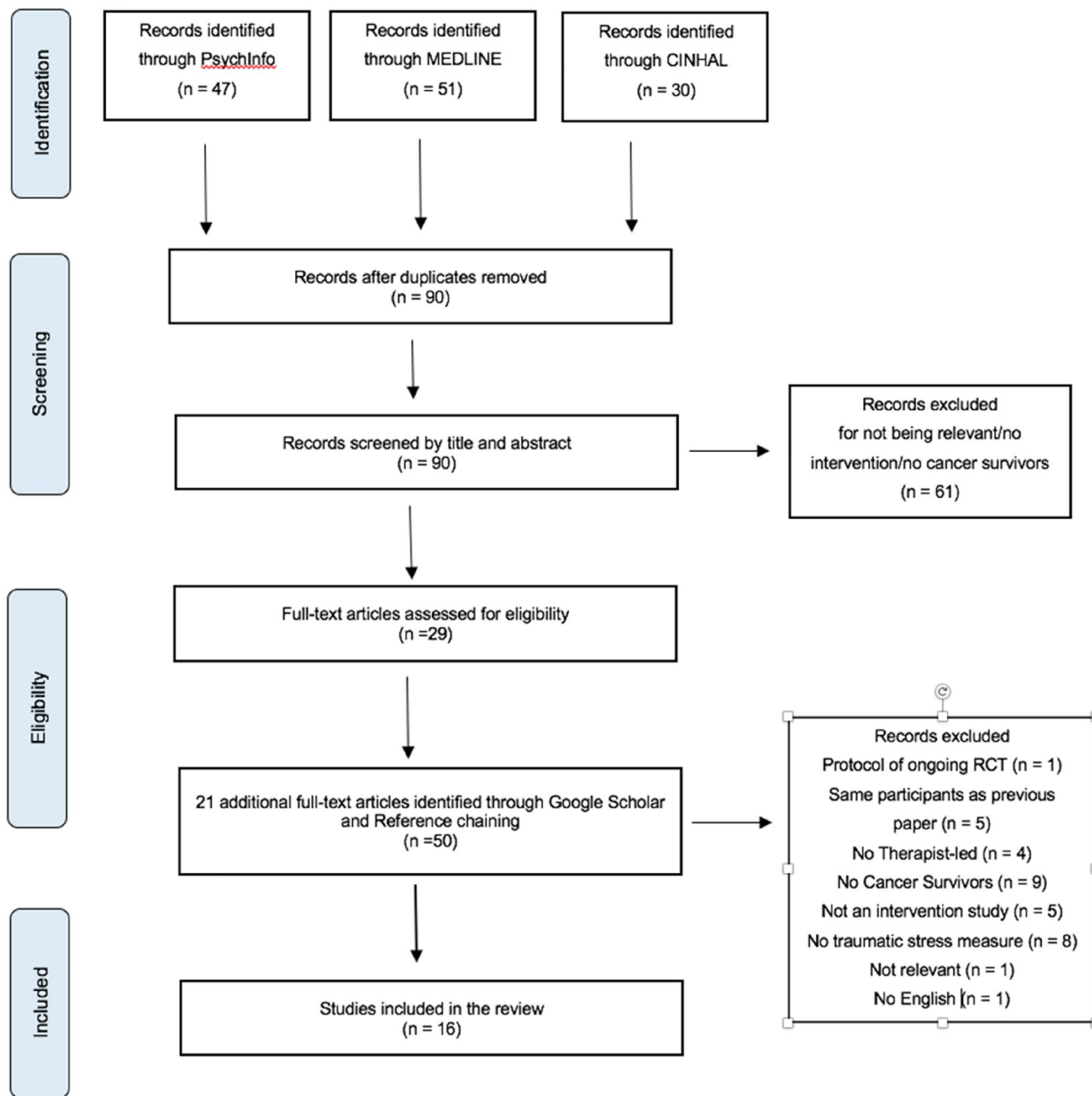


FIGURE 1 PRISMA flowchart of study selection process

synthesis was constructed following the Popay and colleagues' guidelines.<sup>26</sup> Where feasible, effect sizes were calculated (where not reported) and reported to explore the magnitude of each intervention on participants.<sup>27</sup>

### 3 | RESULTS

#### 3.1 | Study characteristics

The electronic search of databases produced 128 papers; from this, 29 were included after title and abstract search, further 21 papers

were identified through Google Scholar and reference chaining, after full-text review was completed 16 papers entered the review (Figure 1). The characteristics of the 16 studies included are illustrated in Table 2 (Appendix A). The studies were published between 2007 and 2021 and most of them were conducted in the USA,<sup>12,28-35</sup> whilst the remaining studies were conducted in Spain,<sup>36-38</sup> UK,<sup>39</sup> Hong Kong,<sup>40</sup> Sweden,<sup>41</sup> and Australia.<sup>42</sup> All articles were written in English and published in peer-reviewed journal. RCTs were the most common study design<sup>28,29,33-35,37,38,41,42</sup> followed by pilot studies and case series<sup>12,30-32,40</sup> an open trial,<sup>39</sup> and non-randomized trial.<sup>36</sup> The sample size of the studies varied greatly ranging from five to 347 and all studies were conducted on middle-aged populations and

TABLE 2 Study characteristics

Author	Study location	Participants	Study characteristics	Measure of traumatic stress	Intervention	Control	Results
1. Monti et al., 2007 <sup>12</sup>	USA	7 cancer survivors  Cancer type: breast, cervical, hodgkins  Mean age: 56.8  All women	Case series	IES  Pre and post intervention	Neuro-emotional technique (NET)  Number of sessions depends on time required for participants to report that the event no longer feels bothersome.  Delivered by a psychiatrist	N/A	<ul style="list-style-type: none"> <li>NET was effective in reducing symptoms of stress triggered by distressing cancer-related recollections (<math>d = 1.27</math>)</li> </ul>
2. Branstrom et al., 2010 <sup>41</sup>	Sweden	71 cancer survivors  Cancer type: varied  Mean age: 51.8  70 women  1 man	Randomised controlled trial	IES-R  Pre and post intervention	Mindfulness based stress reduction (MBSR) ( $n = 32$ )  8 2-h weekly group sessions  Delivered by clinical psychologists	Waiting list (WL) ( $n = 39$ )	<ul style="list-style-type: none"> <li>Participants randomised to the intervention condition showed greater decrease in symptoms of posttraumatic stress (IES-subcales effect sizes ranged between 0.29 and 0.59)</li> </ul>
3. Duhamel et al., 2010 <sup>28</sup>	USA	81 survivors of hematopoietic stem-cell transplantation  Cancer type: hematologic and lymphoid cancers and non-malignant  Diseases  T-CBT:  Mean age: 52.19  19 women	Randomised clinical trial	PCL-C  Baseline  Follow ups:  6/9/12 months after intervention	Telephone -CBT  T-CBT ( $n = 47$ )  10-Session manualized intervention delivered during a period of 10-16 weeks  Delivered by post-doctoral psychology research fellows	Assessment only ( $n = 34$ )	<ul style="list-style-type: none"> <li>T-CBT participants experienced less PTSD symptoms and were less likely to meet criteria for a PTSD diagnosis at follow-up.</li> <li>T-CBT was effective for intrusive thoughts and avoidance, but not for numbness and hyperarousal.</li> <li>No effect sizes reported</li> </ul>

(Continues)

TABLE 2 (Continued)

Author	Study location	Participants	Study characteristics	Measure of traumatic stress	Intervention	Control	Results
4. Marcus et al., 2010 <sup>29</sup>	USA	28 men Assessment only: Mean age: 49.38 22 women 12 men 304 breast cancer survivors	Randomized controlled trial	IES - only intrusion subscale Baseline 3/6/12/18 months post-enrolment	Telephone counselling programme (n = 114) 16 45-min sessions Delivered by master-level psychosocial oncology counsellors	Resource booklet only	<ul style="list-style-type: none"> <li>The telephone counselling programme led to reduction in symptoms of traumatic stress compared to the control condition</li> <li>No effect sizes reported</li> </ul>
5. Rico, 2012 <sup>40</sup>	Hong Kong	5 cancer survivors  Cancer type: colon, breast  Mean age: 54.8  4 women 1 man	Case series	IES  Pre and post intervention	CBT  9-10 individual sessions of approximately 90 min Delivered by clinical oncologist	N/A	<ul style="list-style-type: none"> <li>Two out of five participants showed a small reduction in symptoms of traumatic stress</li> <li>There was no significant difference between pre and post-tests in the two IES subscales</li> <li>No effect sizes reported</li> </ul>
6. Charlson et al., 2014 <sup>30</sup>	USA	46 breast cancer survivors  42 completed follow-up	Pilot study	IES  Pre and post intervention	Contemplative self-healing group intervention  20-week group meditation-based stress reduction programme	N/A	<ul style="list-style-type: none"> <li>The contemplative self-healing group intervention reduced symptoms of post-traumatic stress, especially avoidance</li> <li>No effect sizes reported but calculated: <math>d = 0.37</math> which demonstrated the</li> </ul>

TABLE 2 (Continued)

Author	Study location	Participants	Study characteristics	Measure of traumatic stress	Intervention	Control	Results
7. Arch & Mitchell, 2016 <sup>31</sup>	USA	Mean age: 63 All women 42 cancer survivors	Pilot study	IES-R	Delivered by psychologists  Acceptance and commitment therapy (ACT) group intervention 7 weekly 2 h sessions	N/A	<p>intervention had a small to medium effect</p> <ul style="list-style-type: none"> <li>Trauma symptoms related to cancer diminished at both post (<math>d = 0.58</math>) and FU (<math>d = 0.84</math>).</li> <li>However, the magnitude of improvement was small for avoidance at both post and FU (<math>d = 0.17</math>; <math>d = 0.32</math>)</li> </ul>
		Cancer type: breast, gastrointestinal, gynaecologic, leukaemia/lymphoma, other		Three baseline points: 3.5/2/0.5 weeks prior to intervention	Delivered by a clinical psychologist and an experienced social worker, both trained in ACT		
		Mean age: 53.52 39 women 3 men		Mid-intervention Post intervention (1 week after) Follow-up (3 months after)			
8. Butow et al., 2017 <sup>42</sup>	Australia	222 cancer survivors Cancer type: breast, colorectal, melanoma ConquerFear: Mean age: 53.31 115 women 6 men TIE: Mean age: 52.27 96 women 5 men	Randomized controlled trial	IES	Conquer fear ( $n = 121$ ) 5 60–90 min sessions Delivered by therapists	Taking-it-easy (TIE) ( $n = 101$ ) 5 60–90 min sessions Delivered by therapist	<ul style="list-style-type: none"> <li>Conquer fear led to greater reductions in symptoms of traumatic stress compared to the taking-it-easy intervention</li> <li>Effect sizes: Conquer fear: <math>d = 0.57</math> TIE: <math>d = 0.23</math></li> </ul>

(Continues)

TABLE 2 (Continued)

Author	Study location	Participants	Study characteristics	Measure of traumatic stress	Intervention	Control	Results
9. Ochoa et al., 2017 <sup>36</sup>	Spain	126 cancer survivors	Non randomised-trial	PCL-C	Positive psychotherapy for cancer survivors (PCC) (n = 73) 12 weekly group sessions 90–120 min long	Waiting list (WL) (n = 53)	<ul style="list-style-type: none"> <li>The PCC group intervention promoted an increase in PTG among participants which then led to a reduction in symptoms of post-traumatic stress and emotional distress among participants</li> <li>Effect size: <math>d = 10.03</math></li> </ul>
		Cancer type: mostly breast, and some uterine, hodgkins lymphoma, colon, ovary, rectum	No random allocation	Pre-intervention	Delivered by clinical psychologists		
		PCC		Post-intervention			
		Mean age: 48.93	3 and 12 months FU				
		All women	(FUs only for the intervention condition)				
		WL					
		Mean age: 48.49					
		All women					
10. Offidani et al., 2017 <sup>32</sup>	USA	31 breast cancer survivors	Pilot study	IES	Contemplative self-healing meditation intervention	N/A	<ul style="list-style-type: none"> <li>The intervention was more effective in reducing symptoms of traumatic stress in women who were distressed at baseline compared to those who were not</li> <li>Effect sizes (not reported but calculated) ranged between <math>d = 0</math> and <math>0.25</math> in the No stress group and between <math>d = 0</math> and <math>0.48</math> in the stress group</li> </ul>
		Mean age: 60		Pre and post intervention	4-week group programme 90-min session		
		All women					
11. Owen et al., 2017 <sup>33</sup>	USA	347 cancer survivors	Pilot randomised controlled trial	IES-R	Health-space intervention (n = 176)	Waiting list (WL) (n = 171)	<ul style="list-style-type: none"> <li>Health-space was not associated with significant improvements in cancer-related distress</li> <li>Both the treatment and control condition showed improvement over time (SNI: <math>d = 0.25</math>; WL: <math>d = 0.29</math>)</li> </ul>
		Cancer type: breast, prostate, colorectal, female reproductive, hematologic, others		Pre and post intervention			
		Health-space			12-week multicomponent distress management group intervention (guided)		



TABLE 2 (Continued)

Author	Study location	Participants	Study characteristics	Measure of traumatic stress	Intervention	Control	Results
		Mean age: 52.9 136 women 40 men WL Mean age: 53.3 138 women 33 men			Delivered by doctoral-level clinical psychology students		
12. Fisher et al., 2019 <sup>39</sup>	UK	27 cancer survivors Cancer type: breast, haematological, ovarian, sarcoma, colorectal, ocular, lung Mean age: 51.15 23 women 4 men	Open trial	IES-R Pre and post treatment 3-month follow up 6-month follow up	Metacognitive therapy 6 individual face to face sessions Delivered by therapists	N/A	<ul style="list-style-type: none"> <li>Metacognitive therapy led to significant reductions in post-traumatic symptoms and treatment gains were sustained through the 6-month follow-up (post: <math>d = 1.21</math>, 3-month: <math>d = 1.14</math>, 6-month: <math>d = 1.18</math>)</li> </ul>
13. Johns et al., 2020 <sup>34</sup>	USA	91 breast cancer survivors ACT Mean age: 59.84 All women Survivorship education	3-arm pilot randomised controlled trial	IES-R Baseline Post intervention 1 month after the intervention 6 months after the intervention	ACT (group-based) ( $n = 33$ ) 6 weekly 2-h sessions Delivered by a doctoral-level provider trained in mindfulness and ACT	Survivorship education (group-based) ( $n = 32$ ) 6 weekly 2-h sessions Delivered by master level oncology social workers <u>Enhanced usual care</u>	<ul style="list-style-type: none"> <li>Both the SE and EUC groups demonstrated weak reductions in fear of recurrence distress and posttraumatic stress disorder symptoms compared with individuals who engaged in the ACT group</li> <li>Effect sizes: ACT versus SE: <math>d = 0.33</math> ACT versus EUC: <math>d = 0.42</math></li> </ul>

(Continues)

TABLE 2 (Continued)

Author	Study location	Participants	Study characteristics	Measure of traumatic stress	Intervention	Control	Results
		Mean age: 57.53 All women		IES-R		(n = 26) Participants received standard care from their healthcare providers and a booklet entitled: 'Facing Forward: Life After Cancer Treatment'	
		Enhanced usual care				Delivered by a doctoral level oncology nurse	
		Mean age: 58.68 All women					
14. Lleras de Frutos et al., 2020 <sup>37</sup>	Spain	269 cancer survivors	Randomized controlled trial	PCL-C	Face to face group positive psychotherapy	Online group positive psychotherapy	<ul style="list-style-type: none"> <li>Treatment effect was clinically significant in both modalities showing that positive psychotherapy can reduce symptoms of traumatic stress in cancer survivors</li> <li>No effect sizes reported</li> </ul>
		Cancer type: breast		Baseline	(n = 145)	(n = 124)	
		F2F		Immediately after treatment	12 weekly group sessions	11 weekly online group sessions and 1 session conducted face to face	
		Mean age: 52.17		3 months after treatment	Delivered by clinical psychologists		
		All women					
		Online					
		Mean age: 47.34					
		All women					
15. Ochoa-Arnedo et al., 2020 <sup>38</sup>	Spain	140 cancer survivors	Randomised controlled trial	PCL-C	Cognitive behavioural stress management (CBSM) (n = 67)	Positive psychotherapy for cancer survivors (PCC)	<ul style="list-style-type: none"> <li>PCC was more effective in reducing stress and distress in cancer survivors (d = 0.67)</li> </ul>

TABLE 2 (Continued)

Author	Study location	Participants	Study characteristics	Measure of traumatic stress	Intervention	Control	Results	
16. Arch et al., 2021 <sup>35</sup>	USA	Cancer type: mostly breast, but also colorectal, gynaecological, others	Randomised clinical trial	Pre and post intervention	12 weekly 90 min group sessions	(n = 73)	compared to CSBM: (d = 0.28)	
					Delivered by clinical psychologists	12 weekly 90 min group sessions		Delivered by clinical psychologists
		Cognitive Behavioural Stress Management (CBSM)	3 and 12 months FU	Mean age: 49.68	All women	PPC	Mean age: 50.81	All women
		Cancer type: breast, blood, gastrointestinal, gynaecologic, lung, head and neck, prostate or testicular, other	Baseline (before randomization)	7 weekly 2 h sessions	Emailing an extensive	Effect sizes:	ACT: d = 0.30	EUC: d = 0.28
		ACT	Follow ups:	1/2/5/8 months after randomization (the 2 months assessment occurred at 1-week post-intervention)	Mean age: 56.19	57 women	10 men	EUC

mostly on women. The interventions largely fell into two categories: CBT-based<sup>28-32,34,35,39,40,42</sup> and non-CBT based<sup>12,33,36-38,41</sup> interventions. The total duration of interventions ranged between 3 weeks through to the longest lasting 20 weeks. In the RCTs, four studies had active comparators,<sup>34,37,38,42</sup> three had a Waiting list (WL)<sup>33,36,41</sup> one had Assessment only,<sup>28</sup> and two had Enhanced Usual Care.<sup>34,35</sup> Eleven studies<sup>12,28-30,32,33,36-40</sup> targeted reduction of traumatic stress symptoms as their primary aim/outcome, whilst the remaining studies<sup>31,34,35,41,42</sup> targeted it as secondary aim/outcome.

### 3.2 | Quality appraisal

The included studies demonstrated variable quality; Table 3 (see Supplemental Appendices) provides with an overview of the quality appraisal conducted on the studies included in this review. Within the RCTs, there was frequent failure to describe randomisation procedures and allocation concealment. Six out of the nine RCTs included described and appropriately performed the randomisation process,<sup>33-35,37,41,42</sup> five had comparable sample characteristics and pre-intervention scores<sup>28,33,35,38,41</sup> six provided complete outcome data,<sup>28,33-35,38,41</sup> only three provided information on assessor blinding<sup>34,35,38</sup> and only one of the nine RCTs reported information regarding participants' adherence to the assigned intervention.<sup>37</sup> None of the RCTs explicitly reported any of their pitfalls in their study limitations section.

In all case series and pilot studies, the criteria for recruitment were clear and the sample strategy was relevant to address the research question. Although all studies included cancer survivors, some studies only focused on one type of cancer which may not necessarily be representative of the target population (cancer survivors). Four studies had breast cancer survivors<sup>29,30,32,34</sup> and one had survivors of hematopoietic stem-cell transplantation.<sup>28</sup> The PTSD Checklist Civilian (PCL-C)<sup>43,28,36,37,38</sup>, the Impact of Event Scale (IES)<sup>44</sup>,<sup>12,29,30,32,40,42</sup> and the Impact of Event Scale-Revised (IES-R)<sup>45</sup>,<sup>31,33,34,35,39,41</sup> were used to assess traumatic stress in participants and their psychometric properties are widely accessible in the literature.<sup>46,47,48</sup> Finally, effect sizes were reported in six out of the 16 papers included,<sup>12,31,34,35,36,39</sup> six papers provided enough information to allow for effect sizes to be calculated,<sup>30,32,33,38,41,42</sup> whilst four did not provide enough information.<sup>28,29,38,40</sup>

### 3.3 | Effectiveness of cognitive behavioural interventions for traumatic stress in cancer survivors

The majority of studies (62.5%) used CBT<sup>49</sup> features as part of their intervention plan, including socialisation to the CBT model of formulation, and strategies such as thought monitoring, thought challenges, and behavioural experiments. Of these, two studies<sup>28,40</sup> explicitly identified their therapeutic intervention as CBT, whilst the others delivered adapted versions of CBT. Among the adaptations of CBT, four studies have used third wave cognitive behavioural

therapies interventions such as ACT<sup>31,34,35</sup> and Metacognitive Therapy,<sup>39</sup> whilst four have used CBT in the context of counselling<sup>29</sup> or have combined cognitive behavioural techniques with other strategies such as relaxation and mindfulness practices.<sup>30,32,42</sup>

Most studies showed a magnitude of improvement between small to Moderate,<sup>30-32,34,35,42</sup> demonstrating the impact of these interventions on reducing symptoms of traumatic stress in cancer survivors. Three studies<sup>28,31,40</sup> provided information on the way in which the intervention did not act uniformly on symptoms of traumatic stress (hyperarousal, avoidance, intrusions). DuHamel and colleagues<sup>28</sup> found that participants who engaged in Telephone - CBT (T-CBT) experienced fewer PTSD symptoms and were less likely to meet diagnostic criteria for PTSD at the final follow-up compared to the control condition (assessment only). Although participants showed an overall improvement in PTSD symptoms, T-CBT reduced intrusive thoughts and avoidance, but not numbing and hyperarousal; the authors acknowledged that feelings of numbness and emotional detachment were not directly targeted in therapy and relaxation techniques and challenging maladaptive beliefs might have not been effective in reducing hyperarousal symptoms. Rico<sup>40</sup> examined whether CBT could reduce symptoms of anxiety, traumatic stress and depression in breast cancer survivors. Of the five participants who engaged in the intervention, one showed a reduction in intrusive symptoms but not in avoidance, two showed a reduction in symptoms of avoidance but not in intrusions, and the others deteriorated across all symptoms. Arch and Mitchell<sup>31</sup> examined the effectiveness of an ACT group intervention<sup>50,51</sup> in reducing symptoms of anxiety and trauma in cancer survivors; the authors found that cancer-related trauma symptoms diminished at both post-intervention and follow-up; however, reduction of traumatic stress symptoms was mostly found in relation to hyperarousal and intrusiveness symptoms, but not in avoidance symptoms. Among the studies that utilised cognitive behavioural interventions, only one was found to have a large effect. Fisher and colleagues<sup>39</sup> examined whether six one-hour weekly individual Metacognitive Therapy<sup>52</sup> sessions would reduce symptoms of anxiety, depression, posttraumatic stress, and fear of recurrence in cancer survivors. Metacognitive Therapy<sup>52</sup> claims that cancer survivors' tendency to ruminate and worry, to focus on threat signals (e.g., pain), and to rely on unhelpful coping mechanisms (e.g., searching the Internet to match their symptoms to an illness) are all reinforced by positive metacognitive beliefs about the helpfulness of these behaviours (e.g., 'worry will help me to be more prepared'). Metacognitive Therapy led to significant reduction in post-traumatic stress symptoms and treatment gains were maintained at follow-up 6 months later. Distinct from the other CBT-based studies included, Fisher and colleagues<sup>39</sup> included exposure strategies within their intervention plan. It could be argued that exposure strategies might have led to the large effect size found in their study. Although the findings were promising, the smaller sample size ( $n = 27$ ) represents a limitation in terms of generalisability. Exposure strategies were also adopted by DuHamel and colleagues,<sup>28</sup> however, although they reported that the intervention was effective, we cannot quantify this as they did not include or **provide** enough information to calculate effect sizes.

TABLE 3 Critical appraisal of the included studies based on the Mixed Method Appraisal Tool (MMAT) tool

Study	Quantitative randomised controlled MMAT item				
	Is randomization appropriately performed?	Are the groups comparable at baseline?	Are there complete outcome data?	Are outcome assessors blinded to the intervention provided?	Did the participants adhere to the assigned intervention?
Branstrom et al., 2010	Yes	Yes	Yes	Can't tell	Can't tell
DuHamel et al., 2010	No	Yes	Yes	Can't tell	Can't tell
Marcus et al., 2010	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell
Butow et al., 2017	Yes	No	No	No	Can't tell
Owen et al., 2017	Yes	Yes	Yes	No	Can't tell
Johns et al., 2020	Yes	Can't tell	Yes	Yes	Can't tell
Lleras de Frutos et al., 2020	No	No	No	No	Yes
Ochoa et al., 2020	Yes	Yes	Yes	Yes	Can't tell
Arch et al., 2021	Yes	Yes	Yes	Yes	Can't tell
Study	Quantitative non-randomised MMAT item				
	Are the participants representative of the target population?	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	Are there complete outcome data?	Are the confounders accounted for in the design and analysis?	During the study period, is the intervention administered (or exposure occurred) as intended?
Ochoa et al., 2017	Yes	Yes	No	Can't tell	Can't tell
Study	Quantitative descriptive MMAT item				
	Is the sampling strategy relevant to address the research question?	Is the sample representative of the target population?	Are the measurements appropriate?	Is the risk of nonresponse bias low?	Is the statistical analysis appropriate to answer the research question?
Monti et al., 2007	Yes	No	Can't tell	Can't tell	Can't tell
Rico, 2012	Yes	No	Can't tell	Can't tell	Can't tell
Arch & Mitchell, 2016	Yes	Yes	Yes	Can't tell	Yes
Offidani et al., 2017	Yes	No	Yes	Can't tell	Yes
Fisher et al., 2019	Yes	Yes	Yes	Can't tell	Yes

(Continues)

TABLE 3 (Continued)

Study	Mixed method MMAT item	Are the different components of the study effectively integrated to answer the research question?	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?
Charlson et al., 2014	No	No	No	No	Can't tell

### 3.4 | Effectiveness of non-cognitive behavioural interventions for traumatic stress in cancer survivors

The remaining studies adopted other forms of intervention, such as Positive Psychotherapy (PCC),<sup>36–38</sup> Neuro Emotional Technique,<sup>12</sup> Health-Space<sup>33</sup> (live weekly facilitated online chat where cancer-related topics were discussed and coping skills introduced), and Mindfulness-Based Stress Reduction.<sup>41</sup> Effect sizes were found for all studies but one.<sup>37</sup> Large effect sizes were found in study<sup>12,36,38</sup> the remaining interventions had a small to moderate effect size.<sup>33,41</sup> Among the studies which showed a large effect size, Monti and colleagues<sup>12</sup> examined the effectiveness of a Neuro Emotional Technique (NET)<sup>53</sup> intervention in reducing symptoms of traumatic stress in cancer survivors who experienced distressing cancer-related recollections (e.g., intrusions). The intervention aimed to help the client to identify the cognitions, emotions, and behaviours associated with the distressing recollections and involved a muscle-resistance feedback test to help the client to understand the difference between the physiological responses activated by the recalled images against the response obtained when the individual engaged in positive cognitive statements (e.g., I can be safe). NET was effective in reducing symptoms of stress triggered by distressing cancer-related recollections in three or less 1-h sessions. Although NET had a large effect size, due to the small sample size, findings cannot be generalised.

Two studies delivered PCC,<sup>54</sup> one compared it to a WL control condition<sup>36</sup> and one compared to a + intervention.<sup>38,55</sup> Positive Psychotherapy helps cancer survivors to develop stress management and emotional regulation strategies and facilitates posttraumatic growth though focusing on positive resources such as positive emotions, strengths, and personal meaning; PCC facilitates narrative meaning making to alter beliefs and the integration of the cancer experience into the individual's values and future priorities. Positive Psychotherapy was effective in reducing symptoms of traumatic stress compared to both control conditions. Although PCC showed a large effect size and was effective in reducing symptoms of traumatic stress, the authors<sup>36,38</sup> acknowledged that since PCC is a multicomponent intervention, it was not possible to establish which element was the most effective to reduce symptoms of traumatic stress; moreover, as most participants were survivors of breast cancer, the generalisability of their findings to all cancer survivors is unclear. Positive Psychotherapy was also delivered by Lleras de Frutos and colleagues<sup>37</sup>; in their RCT where they examined the effects of an online PCC group intervention compared to a face to face PCC on distress and posttraumatic stress, and posttraumatic growth among cancer survivors. Both versions were found to be clinically significant and symptoms of traumatic stress improved in both conditions, treatment gains were also maintained over time. However, the authors did not include effect sizes and therefore definite conclusions on effectiveness cannot be made.

### 3.5 | Acceptability/drop-out rates of interventions for traumatic stress in cancer survivors

Drop-out rates ranged between 0% and 40%. Both case series<sup>12,40</sup> reported 100% attendance, Duhamel et al. (T-CBT)<sup>28</sup> and Charlson et al.<sup>30</sup> (Contemplative Self-Healing) reported rates above 90%, all ACT studies<sup>31,34,35</sup> reported 80% attendance rates, all PCC studies<sup>35,36,37</sup> reported attendance rates between 75% and 90%, lower rates were found in Offidani et al.<sup>32</sup> and Owen et al.<sup>33</sup> studies, with rates below 65% whilst the remaining studies,<sup>29,39,41,42</sup> reported rates ranging between 75% and 87%. It is worth noting that in Monti's study,<sup>12</sup> the maximum number of sessions delivered was three which might have had impact in terms of attendance rates.

Eight studies<sup>28,30,32,36,38,39,41,42</sup> clearly stated the reasons for participants drop-outs; the reasons for drop-out included: lack of interest/change their mind,<sup>32,36,38,39,41,42</sup> lack of time,<sup>30,36,38,39,41,42</sup> cancer recurrence<sup>28,39,42</sup> and other health issues.<sup>30,36,38</sup> Only one study<sup>30</sup> included qualitative data in relation to participant's experience of the intervention. The authors delivered Contemplative Self-Healing,<sup>56</sup> a 20-week meditation-based stress reduction group program which focused on teaching participants meditation skills (e.g., breathing, healing imagery), and cognitive, affective, and behavioural coping strategies to help participants unlearn unhealthy habits and have a healthier approach to life. Participants appreciated being in a group context and therefore being able to share their experiences with other people who have been through similar challenges and learning different meditation strategies which helped them to feel less anxious and worried about the possibility of dying.

## 4 | DISCUSSION

The aim of this review was to conduct a systematic narrative review of all available evidence for the treatment of traumatic stress symptoms in cancer survivors. All included studies explored the impact of therapist-led interventions on symptoms of traumatic stress; traumatic stress was either a primary or secondary outcome. Sixteen studies were identified that matched this review's inclusion criteria; the small number suggests that the literature on the treatment of traumatic stress symptoms in cancer survivors is still largely scarce, despite the recent statistics which have highlighted the increase in cancer survival rates.<sup>1</sup> All included studies were conducted in the last 15 years which demonstrates that the research in this field is still in its infancy. The overlap between the studies identified in our review and the ones identified by Dimitrov and colleagues<sup>17</sup> is limited, one or two studies were included in both reviews.<sup>28,29</sup> This is associated with the difference in inclusion and exclusion criteria; for example, our study only included studies which recruited cancer survivors not in active treatment whilst Dimitrov and colleagues<sup>17</sup> included cancer patients in all stages of treatment.

Although four studies<sup>12,36,39,38</sup> showed a large effect size, the data suggested a small to moderate effect across most interventions which demonstrated their limited impact in reducing symptoms of

traumatic stress in cancer survivors. In comparison the literature on the effectiveness of psychological interventions for reducing symptoms of depression and anxiety in the same population appears more promising. Williams and Dale's systematic review<sup>57</sup> indicated that CBT, psychotherapy and social support groups offered some potential benefits in reducing symptoms of depression. However, the authors appropriately acknowledged that firm conclusions on effectiveness could not be drawn due to several methodological limitations (e.g., small sample sizes, inadequately powered studies, uncontrolled confounding variables). Conversely, a meta-analysis by Osborn and Demoncada<sup>58</sup> found CBT for anxiety and depression to have a large magnitude of treatment effect in the cancer population. However, this was limited to a small number of studies and thus further research is needed.

Although CBT is recommended as a first-line intervention for the treatment of post-traumatic stress disorder symptoms,<sup>59</sup> no evidence was found in favour of the Cognitive Behavioural interventions included in this review, apart from Metacognitive Therapy,<sup>39,52</sup> which study had a small sample size and therefore firm conclusions about its effectiveness cannot be generalised. It is worth noticing that none of the studies that delivered CBT reported using evidence-based CBT based on the cognitive model initially developed by Beck and colleagues.<sup>49</sup> CBT aims to change the way in which a person thinks and act by using both cognitive and behavioural strategies. Of the 10 studies that delivered CBT, none utilised the model developed by Beck and colleagues<sup>49</sup>; Duhamel and colleagues<sup>28</sup> and Fisher and colleagues<sup>39</sup> were the only authors to deliver behavioural strategies (e.g., behavioural experiments and graded exposure) as part of their intervention plan whilst others focused only on cognitive strategies such as thought challenge. Different forms of CBT have been used worldwide for the treatment of a variety of psychiatric and medical conditions<sup>60</sup>; but in 1996, the National Health Service in the United Kingdom stated that clinicians should use the literature more effectively and therefore use psychological interventions which are evidence-based.<sup>61</sup>

Positive Psychotherapy was found to have a large effect size; through delivering PCC, the authors<sup>36,38</sup> aimed to facilitate cancer survivors' post traumatic growth (PTG)<sup>62</sup> by a process of narrative meaning-making and focus on positives. Post traumatic growth is the result of the individual recognising the negative and positive effects of the event, analysing its meaning, and accepting the possible changes that the event has brought on the self.<sup>63</sup> PTG represents a process of transformation which ends in a successful integration of the traumatic events within the individual's life narrative.<sup>64,65,66,67</sup> It could be argued that the focus on PTG might have led cancer survivors to experience a reduction in symptoms of traumatic stress; a recent meta-analysis<sup>68</sup> which included 51 studies found an overall modest, positive relationship between PTG and PTSD in the cancer population. However, being able to identify the positives of a traumatic experience can only be achieved if the individual is free from the anxiety of death<sup>67</sup> this might not always be possible as cancer survivors often experience fear of recurrence.<sup>9,10,11</sup> As mentioned in the results section, although results were overall promising, samples

from both Ochoa et al.'s studies<sup>36,38</sup> were mostly survivors of breast cancer and therefore it is not possible to draw a definite conclusion regarding the effectiveness of this intervention for all cancer survivors.

Drop-out rates were overall low in all studies; this is perhaps not unexpected as previous research has showed that cancer patients want psychosocial support for their cancer-related emotional and social distress.<sup>6</sup> It is not possible to establish whether the low drop-out rates were related to participants' acceptability of the included interventions, or whether it demonstrates cancer survivors' clear need for psychological support. Harrison and colleagues<sup>14</sup> found that unmet needs were more likely to be found in cancer survivors compared to cancer patients in active treatment; they identified that 12%–85% of cancer patients reported unmet psychological needs. Cancer survivors have often reported feelings of loneliness; they might avoid talking to friends and family members to avoid having to talk about their cancer experience or to avoid being told to “stay positive” or “fight back” which is not always in line with how they feel, and they worry that by being scared or sad they will upset their loved ones and appear weak.<sup>6,15</sup> Therefore, having had the opportunity to talk freely about their cancer experience and their life beyond cancer might have had an impact on overall drop-out rates. It might have not been the intervention in itself to lead to low drop-out rates, but the opportunity to access social support and feel listened to and understood. Social support has been found to act as an effective coping strategy in managing emotional distress and has been associated with decreased depressive and anxiety symptoms<sup>69</sup> and overall improvements in well-being and quality of life in cancer survivors.<sup>70</sup>

Most studies' samples mainly included middle-aged women who had recovered from a breast cancer diagnosis; middle-aged women are over-represented in the current literature on cancer-related traumatic stress and therefore it is unclear how these findings can be generalised to the wider population of cancer survivors.<sup>8</sup> This is in line with the findings of Dimitrov and colleagues<sup>17</sup> whose review included studies where women were the predominant sample.

#### 4.1 | Review limitations

Studies were limited to English language only and this might have limited the data collection. This review has only included studies which were therapist-led with the purpose to keep the focus of the review clear; however, other types of intervention (e.g., self-help) could be effective in treating symptoms of traumatic stress in cancer survivors. Future research could evaluate the difference between therapist-led and self-help interventions in reducing symptoms of traumatic stress in cancer survivors. The current review included studies where the PCL-C,<sup>43</sup> IES,<sup>44</sup> and IES-R<sup>45</sup> were utilised. It is worth noting that whilst the PCL-C is one of the most commonly used self-report measures of PTSD and its items correspond to all of the Diagnostic and Statistical Manual of Mental Disorder fourth edition (DSM-IV) PTSD symptoms, the IES does not measure the hyperarousal symptoms. However, both measures have showed good

internal consistency (PCL-C  $\alpha$ : 0.94; IES  $\alpha$ : 0.86) and test-retest reliability (PCL-C  $r$ : between 0.68 and 0.92; IES  $r$ : between 0.79 and 0.87).<sup>46,47</sup>

The current review has also only included peer-reviewed papers to ensure a minimum standard for scientific quality at the cost of increasing publication bias: by accessing the grey literature, more studies with a positive results could have been identified.<sup>71</sup> Future systematic literature reviews could consider including the grey literature to widen the search of an already limited field. Finally, this review's protocol was not registered *a priori* and this is acknowledged by the authors as a shortcoming of this paper; however, a search of the Prospero database was conducted before initiating the process to ensure no other systematic literature reviews were conducted on the same topic area.

#### 4.2 | Clinical implications

In 2018 The National Institute For Health and Care Excellence<sup>59</sup> recommended Narrative Exposure Therapy (NET)<sup>72</sup>; CBT,<sup>49</sup> Prolonged Exposure<sup>73,74</sup> and Cognitive Processing Therapy<sup>75</sup> as first-line treatment options for the treatment of PTSD in adults. In the study by DuHamel and colleagues,<sup>28</sup> T-CBT was effective for intrusive thoughts and avoidance, but not for numbness and hyperarousal and in the study by Arch and Mitchell,<sup>31</sup> ACT was more effective in reducing symptoms of hyperarousal and intrusive thoughts, but not avoidance. The review tentatively suggests that by adopting evidence-based psychological interventions which are tailored to reduce symptoms of traumatic stress, the likelihood of cancer survivors to experience a reduction of symptoms in all areas (e.g., hyperarousal, intrusion, and avoidance) might increase. Future research in this field should test the effectiveness of more targeted evidence-based interventions for the treatment of traumatic stress in cancer survivors. Further research should also consider testing the acceptability of the interventions delivered for this population through gathering quantitative and qualitative data on participants' experience of the interventions received and their view on what has brought change (e.g., Elliot and colleagues' Change Interview)<sup>76</sup> and evaluating the impact of the therapeutic relationship on outcomes. Further research in this field might help to inform clinical practice within psycho-oncology services.

#### 5 | CONCLUSIONS

To conclude this review explored all available evidence for the treatment of traumatic stress symptoms in cancer survivors and has demonstrated that the research in this field is still scarce and in its infancy. Due to the data mostly suggesting a small to moderate effect, firm conclusions cannot be drawn on the effectiveness of the included interventions for cancer survivors. More research should be carried out to expand our understanding of cancer survivors' psychological needs and identify interventions which are suitable



and beneficial to reduce symptoms of traumatic stress for this population.

## ACKNOWLEDGEMENT

No funding was used.

## CONFLICT OF INTEREST

No conflict of interest to disclose.

## ETHICS APPROVAL

Not applicable. No ethics approval and consent were required.

## DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** D'Errico D, Schröder T, Gresswell M. Therapist-led interventions for the treatment of traumatic stress symptoms in cancer survivors: a systematic literature review. *Psychooncology*. 2022;31(7):1057-1075. <https://doi.org/10.1002/pon.5964>