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Psychosocial Interventions and Therapeutic Support as a Standard of Care in Pediatric Oncology

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Research indicates that a subset of youths with childhood cancer and their parents will experience significant psychological distress throughout the course of their illness. Importantly, the existing literature indicates that psychosocial support is beneficial in decreasing symptoms of distress in these families. The aim of the current review is to determine the extent of the evidence to support a standard of psychosocial care for children and their families throughout the cancer trajectory; thus, we examined the research related to psychosocial outcomes in youth with cancer and their parents. Pediatr Blood Cancer 2015;62:S585–S618.

Key words: cancer; intervention; pediatric; psychosocial; standard of care; support

INTRODUCTION

Position statements from professional organizations, guidelines, and journal articles emphasize that pediatric cancer patients and their families need access to psychosocial support and in tervention throughout the illness trajectory, including at the time of diagnosis and through survivorship. The type of support and interventions provided may vary depending on resource and staff availability, but should be provided by an individual with training and expertise in child development, emotional adjustment to illness, psychological and psychiatric syndromes, family systems, and/or concrete resources the family may need. Refer to Patenaude et al.[1] in this edition for further information about training for professionals.

Although pediatric cancer survival rates have increased in the past four decades, these treatments place patients and families at increased risk for coping difficulties throughout the treatment course, survivorship, and at end of life. Although many childhood cancer patients and their families cope effectively during the illness course,[2,3] it is quite clear that a significant subset of patients and their parents will indeed experience significant clinical levels of psychological distress at the time of diagnosis, during the course of treatment, and after treatment ends.[2,4] Numerous studies have highlighted the importance of providing access to resources at the time of diagnosis as the majority of patients and parents directly benefit from support from a psychosocial provider.[5–7] As such, access to and provision of psychosocial services is clearly necessary throughout the cancer experience from the time of diagnosis throughout survivorship.

METHODS

This review was performed as part of the collaborative *Standards for Psychosocial Care of Children with Cancer and Their Families* effort. Articles were reviewed using GRADE methodology. For a full description of the methods used to develop each standard, refer to Wiener et al.[8] in this special edition. Computerized literature searches of OVID, PSYCINFO, and PUBMED were performed. Searches were limited to articles published in the English language from March 1, 1995 to March 1, 2015. Search terms included combined neoplasm terms with child and follow-up-related terms and MeSH headings. See Supplemental Table SI for a full list of search terms used. Search results were supplemented with hand searching of the bibliographies of systematic reviews and selected seminal articles, and contributions from personal files.

Psychosocial Standard of Care

All youth with cancer and their family members should have access to psychosocial support and interventions throughout the cancer trajectory and access to psychiatry as needed.

Consultation With Other Experts/Groups

The study team comprised three pediatric clinical psychologists and a child and adolescent psychiatrist who jointly reviewed all articles. As part of the development of standards process, expert opinion of this work was sent to various individuals for their review and commentary; these individuals included pediatric oncologists, pediatric psychologists, and child psychiatrists. Minor changes, such as reviewing additional psychosocial literature and making the scope of the standard broader, were made following feedback from reviewers.

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Abbreviations: ALL, acute lymphoblastic leukemia; CBT, cognitive behavioral therapy; CNS, central nervous system; GRADE, grading of recommendations assessment, development, and evaluation; PSST, problem solving skills training; PTSD, post-traumatic stress disorder; PTSS, post-traumatic stress symptoms; RCT, randomized controlled trial

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RESULTS

The search strategy identified 173 peer-reviewed papers, including 19 randomized controlled trials, 109 quantitative studies, 8 qualitative studies, 36 systematic reviews of the literature, and one consensus report evaluating various aspects of psychosocial interventions. See Supplemental Table SII for a description of articles reviewed. This review resulted in three key findings: (i) youth diagnosed with cancer are at risk for negative adjustment difficulties; (ii) parents are at risk for negative adjustment outcomes; and (iii) support and intervention provides clear benefit in helping youth and parents adjust. These findings are discussed in more detail below.

Child Adjustment Outcomes

For well over four decades, researchers have examined the psychosocial functioning of children with cancer and their families.[9,10] Numerous studies document that children diagnosed with cancer experience various forms of distress associated with the cancer experience.[11] Cancer and its associated treatment can have a serious social and emotional impact on the child and the parent.[12] Much data indicate that child functioning is closely associated and often dependent on parent and family functioning.[13] The physical symptoms of cancer and associated treatment can have serious social and emotional consequences for the child and parent.[14] Further, children treated for acute lymphoblastic leukemia (ALL) or lymphoma report poorer emotional functioning, cognitive skills, autonomy, and family interaction than do children treated for non-CNS solid tumors.[15] For children whose disease or treatment directly involves the CNS, the risk of developing social isolation and peer difficulties appears much greater than children whose disease or treatment does not, and these children are less likely to be endorsed as friends by their peers.[16]

Specifically, children with cancer are at relative risk of experiencing anxiety, inhibited and withdrawn behavior, behavior problems, intense stress, depression, post-traumatic stress disorder (PTSD), academic difficulties, peer relationship difficulties, and worries about the future in relation to career and relationships.[17–20] Importantly, childhood cancer survivors have been identified as being particularly at risk for anxiety and somatic concerns. For more information about survivorship, refer to Lown et al.[16] in this special edition.[21] It should be noted, however, that some studies have not identified children to be at higher risk of experiencing post-traumatic stress (PTSS).[22]

Parent Adjustment Outcomes

Caregivers of children with cancer are also at risk for a variety of poor adjustment outcomes. Approximately 40% of caregivers of children with cancer meet criteria for acute distress disorder, a possible precursor to PTSD, within the first 2 weeks following their child's diagnosis; these symptoms appear to continue through the course of their child's illness.[11,23] Subclinical levels of symptoms of PTSS have also been documented in both mothers and fathers of childhood cancer survivors, and mothers of children newly diagnosed with cancer report significantly higher levels of PTSS than parents of long-term cancer survivors.[24] Other research has found that parents can experience moderate to severe post-traumatic stress at time of diagnosis in comparison to caregivers of long-term survivors.[25] Thus, parents of children with cancer appear to be at risk for experiencing distress both during the early diagnosis phase and after their child's cancer treatment ends. For more information related to psychosocial support for parents, refer to Kearney et al.[26] in this special edition.

General psychological distress in parents of children with pediatric cancer has also been documented. Rates of global psychological distress (e.g., a combination of depressive and anxious symptoms) have been estimated to be as high as 51%.[27] Numerous studies indicate that parents experience high levels of general distress during the initial weeks of treatment,[28] and that this distress remains stable or moderately decreases through the course of treatment.[29] Other studies would similarly indicate that both fathers and mothers have self-reported levels of psychological distress above normative means[30] with large sample studies demonstrating that mothers in particular evidence moderate levels of distress (Table I).[6,7,31]

In sum, both children and parents are at risk for poor adjustment outcomes throughout the illness course. The many other psychosocial challenges involved in pediatric cancer clearly warrant intervention to facilitate positive psychosocial adjustment.[32,33]

Psychosocial Interventions

Due to challenges associated with a diagnosis of childhood cancer and subsequent treatment, the development and implementation of effective psychosocial support resources is of the utmost importance. Such psychosocial support can be tailored to pediatric patients and their families as they face the challenges of cancer treatment.[34] Although little research has been conducted to assess practice patterns, traditional individual therapy appears to be broadly utilized in pediatric cancer centers. Individual therapy may take many forms, but most often, it appears to involve crisis intervention approaches or supportive therapy, especially in the time period following the initial diagnosis.[35] Traditional marital therapy and medical family therapy may be utilized as well.[36,37]

Efforts have been made to establish the efficacy of specific psychosocial interventions within pediatric cancer populations. Traditional cognitive behavioral therapy (CBT) approaches have witnessed empirical examination in pediatric cancer populations. CBT can include a variety of strategies, including the encouragement of emotional expression, identification of distorted automatic thoughts, use of problem-focused coping skills, discussion of psychosocial impact on the family, and training in assertiveness and communication skills, among others.[38–40] CBT has been utilized in working with both children with cancer as well as their parents. For example, Marsac et al.[41] provide them with strategies to deal with cancer-related stressors, such as medical procedures and hospital visits. Similarly, Wiener et al.[42] developed an innovative board game called "ShopTalk" that can be used in individual or group therapy sessions to assist in starting conversations about difficult emotional issues related to the child or adolescent's medical illness and the impact this illness has in various situations (e.g., school, home, peer relations).

PSST has been shown to be feasible and efficacious in reducing parental distress[6,7,43] compared to standard care as well as to non-directive supportive therapy in two large RCTs. This training involves teaching a very broad, general strategy that is designed to address a given problem situation. The client is taught to effectively utilize all available strategies that will address or solve the problem, evaluate the specific pros and cons of each possible solution to the

TABLE I. Psychosocial Interventions and Therapeutic Support as a Standard of Care: Summary of Evidence Table

Standard	Evidence summary	Methodology	Quality of evidence	Strength of recommendation
All youth with cancer and their family members should have access to psychosocial support and interventions throughout the cancer trajectory and access to psychiatry as needed	• Empirical evidence exists for providing access to psychosocial resources, as the majority of pediatric cancer patients and their families experience increased distress and benefit from such support • Research indicates that a subset of children and families will experience clinically significant adjustment issues. Additionally, psychosocial interventions can produce clinically meaningful decreases in distress Evidence gaps: • Prospective research and more randomized clinical trials could add to existing evidence base	• Consensus • Systematic review articles • Randomized controlled trials • Replication of findings	High quality of evidence given with consistent findings from numerous well-designed studies • Cross-sectional studies	Strong recommendation, given the impact of disease and treatment factors on the patient and family

problem, select a solution and take action, evaluate the effectiveness of that action, and determine whether another option or course of action is needed in order to effectively solve the problem.[44]

Mullins et al.[45] developed an interdisciplinary CBT-based intervention that targeted helping mothers learn to cope with the uncertainty of the cancer experience. This intervention was shown to be feasible, acceptable, and tended to improve adjustment in mothers. Cognitive behavioral approaches have also been integrated with other therapeutic approaches, such as family therapy, and have demonstrated feasibility and efficacy. The best example of such an intervention is the Surviving Cancer Competently Intervention Program developed by Kazak et al.[46,47] It should be noted that while the above interventions are highlighted, there is still the need for further research and development of evidenced-based interventions for children diagnosed with cancer and their parents.

Children with cancer may also have pre-existing psychiatric diagnoses, and are vulnerable to developing a range of psychiatric disorders related to psychological challenges of cancer treatment, as well as the physiological effects of the illness and cancer-directed therapies.[17,48,49] Psychiatric assessment and pharmacologic treatment should be available when other approaches are not sufficient, and medications should be used in conjunction with other psychotherapeutic modalities. Effective psychopharmacologic treatments are available for depression, anxiety, and delirium, and can be used safely in children receiving oncology treatment, although randomized controlled studies are lacking in this population. SSRIs are effective and well-tolerated first line treatments for depression in the general pediatric population, especially in combination with CBT.[50–52] Small studies demonstrate tolerability and efficacy in children with cancer.[48,51–55] There is widespread prescribing of anti-depressants by mental health professionals and pediatric oncologists, sometimes without mental health follow-up,[49,56–58] highlighting the need for access to specialized psychiatric consultation. Refer to Weaver et al.[59] in this special edition for information about palliative care standards.

DISCUSSION

Although accessible psychosocial resources for children and their families are a widely held expectation in pediatric oncology, models of assessment and delivery of services vary widely across centers, as does the availability of psychosocial staff.[35] Additionally, barriers may be present that hinder centers from providing comprehensive psychosocial care. For example, pediatric cancer centers vary in size and location, and as such have varying amounts of resources and funding. Some centers may not treat a sufficient number of patients to justify the financial cost of supporting a comprehensive multidisciplinary psychosocial team (e.g., a social worker, pediatric psychologist, and psychiatrist).

Centers can provide training for members of their staff on how to effectively support patients and families. Examples include ongoing trainings on family centered care, empathic listening, communication, child development, problem solving, and health literacy, among others.[60–62] Centers can build strong referral bases within the community through community support agencies, psychologists, psychiatrists, religious support, and can direct patients and families to these trained professionals. Centers can appoint or hire a staff member to oversee psychosocial support for families who would monitor supportive care given to patients and families and facilitate referrals. Centers can provide formal consultation services with local professionals to assist patients and families during clinic or hospital visits.

Additionally, staff at treatment centers may have limited access to training in supporting the specific needs of pediatric cancer patients and families. Those centers should ensure access to appropriate multimedia resources for both parents and children throughout the course of illness, including, but not limited to, disease education, procedure preparation videos, games, books, and handouts. Books and videos that normalize the cancer experience and feelings associated with different stages of illness could also be available. Centers should make a commitment to having at least one staff member with education or training in supportive care (social work, psychology, or counseling) to assist patients and families.

Based on the available high quality of evidence in the literature, it is a strong recommendation that pediatric oncology centers should provide psychosocial support for patients and families throughout the illness course. Child life specialists, social workers, psychologists, psychiatrists, clinical educators, patient/nurse navigators, and spiritual leaders may all serve in this role.[63] Services from social work and psychology, tailored to the specific needs of each family, are especially valuable at initial evaluation and are critical to the family's active participation in the treatment of their child. Identifying and addressing risk factors early is essential.[64]

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SUPPLEMENTARY INFORMATION

SUPPLEMENTAL TABLE I. Psychosocial Interventions and Therapeutic Support As a Standard of Care: Search Terms

Literature searches of OVID, PSYCINFO and PUBMED

1. ("Neoplasms"[Majr] OR cancer OR oncology)
2. (parent* OR caregiver* OR mother* OR father* OR maternal OR paternal)
3. ("Child"[Mesh] OR children OR youths OR teens OR adolescents OR teenagers OR pediatric OR pediatrics)
4. ("Family"[Mesh] OR family OR relatives)
5. ("Psychotherapy"[Majr] OR "Psychology"[Majr] OR "psychology"[Subheading] OR "Psychiatry"[Majr] OR "Psychiatric Nursing"[Majr] OR "psychosocial support" OR "psychosocial interventions")
6. ("Quality of Health Care"[Majr] OR "standard of care" OR "standards of care" OR "Continuity of Patient Care"[Majr] OR "Continuity of Patient Care" OR "cancer trajectory") OR "Psychopharmacolog*" OR "Psychotropic" OR "Depression" OR "Anxiety" OR "Antidepressant"
7. Filters: From 3/01/1995–3/01/2015
8. Filter: English
9. Filter: Child: birth-18 years

SUPPLEMENTAL TABLE II. Psychosocial Support Standard Evidence Table

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Alderfer, Cnaan, Annunziato, Kazak (2005) [1]	Empirical study; Self-report questionnaires; structured psychiatric interview	Couples parenting adolescent childhood cancer survivors (n = 98 parents)	● The majority of families had at least one parent with moderate to severe PTSS.	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned, low consent rates	6
Alderfer, Mougianis, Barakat, Beele, DiTaranto, Hwang, Reilly, Kazak (2009) [2]	Empirical study; Self-report questionnaires	Mothers (n = 9897) and fathers (n = 9839) of children with cancer	● At four months post-diagnosis, higher distress and family problems and greater use of psychosocial services were seen in parents who were found to be at higher psychosocial risk at diagnosis.	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned	6
Alderfer, Long, Lown, Marsland, Ostrowski, Hock, Ewing (2010) [3]	Literature review	Studies (n = 9865) examining psychosocial adjustment in siblings of children with cancer	● Elevated mean rates of psychiatric disorders are not seen in siblings ● A significant subset will experience emotional problems and school difficulties ● Distress is greater closer to time of diagnosis	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Allen, Newman, Souhami (1997) [4]	Longitudinal design; Self-report questionnaires	Adolescents (n = 42) with cancer, mothers (n = 34), fathers (n = 27)	● Overall, adolescents with cancer did not report greater depressive or anxious symptoms than the general population ● A subset of patients and controls had elevated anxiety and depression scores ● Girls were significantly more anxious and depressed than boys ● Mothers were the most anxious family members and were significantly more anxious than fathers ● Parental scores were higher than expected norms	Low sample size, no selective reporting, appropriate analysis, study completed as planned	6
Apter, Farbstein, Yaniv (2003) [5]	Literature review	Review of psychological and social factors related to pediatric cancer	● Review of the progress made in understanding the psychological and social factors in the pediatric cancer literature.	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Askins, Moore (2008) [6]	Literature review	N/A	● A review of literature pertaining to psychosocial support for pediatric cancer patients	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5

(*Continued*)

SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Askins, Sahler, Sherman, Fairclough, Butler, Katz, Dolgin, Varni, Noll, Phipps (2009) [7]	Empirical study, RCT; Self-report questionnaires	Mothers (n = 197)	● Study examined the efficacy of a handheld PDA for delivering supplemental Problem-Solving Skills Training (PSST) information compared to typical PSST ● Both groups indicated significant positive change over time. There were no between group differences. Mothers reported generally positive views related to using the PDA	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned, low consent rate	2
Barakat, Kazak, Meadows, Casey, Meeske, Stuber (1997) [8]	Empirical study; Self-report questionnaires	Survivors of childhood cancer (n = 309)	● Parents of childhood cancer survivors experienced significantly more symptoms of posttraumatic stress than parents of healthy children	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned, moderate consent rate	6
Barakat, Alderfer, Kazak (2006) [9]	Empirical study; Self-report questionnaires	Adolescent survivors (n = 150), mothers (n = 156), fathers (n = 107)	● PTG was reported by the majority of families and associated with greater perceived treatment severity and life threat. ● PTG and PTSS were positively associated for adolescents. ● Diagnosis after 5 years of age was associated with more perceived benefit and greater posttraumatic stress for adolescents	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned,	6
Barrera, Fleming, Khan (2004) [10]	Empirical study; Self-report questionnaires	Sibling referred for behavioral problems (n = 47), Non-referred siblings (n = 25)	● Social support was associated with decreased symptoms of psychological distress and behavior problems in siblings ● Group and gender differences existed for behavioral problems and internalizing symptoms	Small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Barrera, Hancock, Rokeach, Cataudella, Atenafu, Johnston, Punnett, Nathan, Bartels, Silva, Cassidy, Jansen, Shama, Greenberg (2014) [11]	Empirical study; Self-report questionnaires	Parents (n = 67)	● Psychometric properties of the revised Psychosocial Screening Tool (PATrev) are examined	Small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Best, Streisand, Catania, Kazak (2001) [12]	Empirical study; Longitudinal study design	Parents (n = 113)	● Later PTSS was significantly predicted by anxiety during treatment for mothers. Parental avoidance was associated with anxiety, self-efficacy, posttraumatic growth and length of time since treatment ended	Sufficient sample size, appropriate analysis, study completed as planned	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Boman, Lindahl, Björk, (2003) [13]	Empirical; cross-sectional; Self-report questionnaires	Parents (n = 264)	● Overall, levels of disease-related distress in parents decreased over time, though particular areas of distress, uncertainty, loneliness, and disease-related fear, remained high	Adequate sample size, no selective reporting, appropriate analysis, study completed as planned	6
Boman, Viksten, Kogner, Samuelsson, (2004) [14]	Empirical study; Self-report questionnaires	Parents of patients with cancer, diabetes, and control patients (n = 675)	● Parents of patients reported higher rates of distress compared to control parents across many areas of distress	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Boman, Kjallander, Eksborg, Becker (2013) [15]	Empirical study; Self-report questionnaires	Mothers (n = 97), Fathers (n = 72), Children (n = 103)	● Mothers demonstrated more severe symptoms of posttraumatic stress across all symptom dimensions	Adequate sample size, no selective reporting, appropriate analysis, study completed as planned	6
Bonner, Hardy, Willard, Hutchinson (2007) [16]	Empirical study; Self-report questionnaires	Fathers (n = 23) of pediatric oncology patients and mothers (n = 23) matched on demographic variables	● Fathers did not significantly differ on measures of distress or illness-related parenting stress compared to mothers, but a subset of parents evidenced elevated distress	Very small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Brier, Schwartz, Kazak (2014) [17]	Literature Review; Systematic Review	Intervention studies (n = 24)	● Review and summary of the efficacy of psychosocial, health behavior, and neurocognitive interventions for survivors of pediatric cancer ● Interventions utilizing various methods achieved moderate to strong efficacy. Areas in which more interventions are needed are also discussed	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this manner	1
Brinkman, Palmer, Chen, Zhang, Evankovich, Swain, Bonner, Janzen, Knight, Armstrong, Boyle, Gajjar (2012) [18]	Empirical study; Self-report questionnaires	Parents (n = 22) of children off treatment for embryonal tumors	● Parents reported higher social problems and depressive symptoms in patients compared to average risk patients ● Intelligence, age at diagnosis, and parent education level was associated with social functioning in patients	Very small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Brown Bylund (2008) [19]	Literature Review	N/A	● Describes the Memorial Sloan-Kettering Cancer Center Comskil Model for Communication Skills Training	Descriptive study based on theoretical models of communication, Strong literature reviewed in paper	6
Bruce (2006) [20]	Systematic Literature Review	Studies on PTSD and PTSS in childhood cancer (n = 24)	● Prevalence rates of PTSD/PTSS in children with cancer vary in the literature ● Predictors of PTSD/PTSS in this population varies in the literature	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this manner	1

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Calaminus, Kiebert (1999) [21]	Descriptive Study	Chairpersons of all national studies in pediatric oncology in the United Kingdom, France, Germany, Italy and Spain (n = 24)	● Most investigators reported that the survivors were in good health and functioning normally ● Of problems that were reported, they were fatigue, social functioning, self-esteem and post-traumatic stress.	Survey of researchers, Good inclusion of representative papers and data on HRQOL,	5
Casillas, Kahn, Doose, Landier, Bhatia, Hernandez, Zeltzer (2010) [22]	Empirical study; Qualitative study; Focus group study	Adolescent and young adult survivors of cancer (n = 27) and their parents (n = 21)	● Family involvement in survivorship care and symptom communication were major facilitative factors in engaging in survivorship care	Research question clearly stated, approach justified and study context clearly described, role of researcher clearly described, sampling strategy appropriate, method clearly described, data analysis clearly described	6
Clarke, McCarthy, Downie, Ashley, Anderson (2009) [23]	Systematic Literature Review	Studies (n = 30)	● Reviews and summarizes the literature on gender differences in parents of children with cancer	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this manner	1
Clawson, Jurbergs, Lindwall, Phipps (2013) [24]	Empirical study; Quantitative Study	Children with cancer (n = 199), healthy children (n = 108), their parents	● Parent and child Posttraumatic stress was significantly correlated. Parents of children with cancer were found to be accurate reporters of their child's symptoms of psychological distress, despite parental psychological distress	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Colletti, Wolfe-Christensen, Carpentier, Page, McNall-Knapp, Meyer, Chaney, Mullins (2008) [25]	Empirical study; Quantitative Study	Parents of children (n = 62)	● Higher levels of perceived child vulnerability was related to poorer emotional adjustment in children ● Higher levels of parenting stress was associated with poor behavioral and social adjustment in children	Relatively small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Coyne, Amory, Kiernan, Gibson (2014) [26]	Empirical study; Qualitative research	Children (n = 20) children and their parents (n = 22) and healthcare professionals (n = 40)	● Seriousness of the disease influence parents' and children's role in decision-making	Research question clearly stated, approach justified and study context clearly described, role of researcher clearly described, sampling strategy appropriate, method clearly described, data analysis clearly described	6
Da Silva, Jacob, Nascimento (2010) [27]	Literature Review	Studies on the impact of childhood cancer on parents' relationships (n = 14)	● Themes that emerged were: changes in relationship during child's disease, difficulty in communication, gender difference in stress and coping, and role changes	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this manner	5

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
DeJong, Fombonne (2006) [28]	Systematic literature review, mixed study methodology	12 studies = 577 subjects	● No significant increase in mean prevalence of depression in CA pts, but there may be vulnerable subset	Right types of papers included; Important, relevant studies included; Appropriately assessed for quality of studies; Reasonable to combine results in this way; Important outcomes considered	5
DeJong, Fombonne (2007) [29]	Case report	4	● Citalopram is well-tolerated, has wide margin of safety, and has low risk of med interactions. Each case had significant improvement in depression scores	Research question clearly stated; Study context clearly described; Sampling strategy appropriate for research question; Method of data collection clearly described	6
Dockerty, Williams, McGee, Skegg (2000) [30]	Empirical study, Cross-sectional	All children diagnosed with cancer at ages 0–14 years in New Zealand during a defined period	● Mothers and fathers of children with cancer had lower GHQ-12 and mood rating scores than control parents ● Cancer group parents who reported poor social support and no paid employment and also those who were bereaved had poorer emotional health scores	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Dragone, Bush, Jones, Bearison, Kamani (2002) [31]	Randomized Controlled Trial; Self-report questionnaires; Clinical interview	Children with Leukemia (n = 31)	● Children preferred an intervention utilizing a CD-ROM to an intervention utilizing a book ● No significant differences existed between groups on knowledge of leukemia ● Health professionals seemed satisfied with the use of a CD-ROM intervention	Very small sample size, selective sampling, appropriate analysis, study completed as planned	2
Duffey-Lind, O'Holleran, Healey, Vettese, Diller, Park (2006) [32]	Empirical study; Qualitative Study; Pilot study which assessed adolescent and parent concerns about transitional care.	Adolescent survivors (n = 4), Parents (n = 7), pediatricians (n = 3)	● Participants indicated a lack of psychosocial support	Research question clearly stated, approach justified and study context clearly described, role of researcher clearly described, sampling strategy appropriate, method clearly described, data analysis clearly described	6
Dunn, Rodriguez, Barnwell, Grossenbacher, Vannatta, Gerhardt, Compas (2012) [33]	Literature Review	Mothers (n = 191) and fathers (n = 95) completed measures of PTSS, depression and anxiety	● Parents of children with cancer who reported significant PTSS also reported significantly correlated elevated depressive and anxious symptoms ● Fathers of children and youth treated for relapse reported higher rates of elevated PTSS than fathers of children and youth treated for first-time diagnosis ● Symptoms of distress were negatively correlated with education levels for fathers	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Dyson, Thompson, Palmer, Thomas, Schofield (2010) [34]	Empirical study; cross-sectional; self-report questionnaires	Adolescents and young adults (n = 53) with newly diagnosed cancer	● Prevalence of distress was lower than that found previously in AYAs with cancer ● Pre-treatment patients predicted increased depression and state anxiety, while having treatment post-surgery predicted reduced anxiety	Relatively small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Eccleston, Palermo, Fisher, Law (2012) [35]	Meta-analysis, Cochrane review	Randomized controlled trials (n = 35)	● Psychological therapies that involved parents significantly improved child symptoms ● Cognitive-Behavioral and Problem Solving Therapy significantly improved child symptoms, parent behavior, and parent mental health post-treatment	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	1
Enskär, von Essen (2007) [36]	Empirical study	AYAs (n = 15) undergoing cancer treatment and AYAs (n = 39) off cancer treatment	● AYAs receiving treatment reported physical and mental health problem over and beyond those who were off treatment	Relatively small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Fallowfield, Jenkins, Farewell, Solis-Trapala (2003) [37]	Randomized Controlled Trial; Qualitative Study	Oncologists (n = 160) from cancer centers (n = 31)	● At follow-up assessment (12–15 months post intervention) clinicians were utilizing key communication skills in clinical practice	Adequate sample size, Waitlist control, Appropriate analysis, Study completed and long-term follow-up conducted	1
Fedele, Mullins, Wolfe-Christensen, Carpentier, (2011) [38]	Longitudinal Study; preliminary results; Self-report questionnaires	Mothers of children with cancer (n = 22)	● Mothers of children with cancer evidence improved parenting capacity over time ● Time 1 parenting capacity variables are significantly related to later child adjustment	Relatively small sample size, no selective reporting, appropriate analysis, study completed as planned	6
Fedele, Hullmann, Chaffin, Kenner, Fisher, Kirk, Eddington, Phipps, McNall-Knapp, Mullins (2013) [39]	Randomized Controlled Trial	Mothers of children with cancer (n = 52)	● Maternal distress was related to child internalizing symptoms ● Child internalizing symptoms were reduced post-intervention. This relationship was mediated by maternal distress	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned, high consent rate	2
Freeman, O'Dell, Meola, (2004) [40]	Empirical study; Self-report questionnaire designed by authors	Mothers (n = 45) and fathers (n = 45) of children with a childhood brain tumor	● Stressors changed across phases of illness. ● Married respondents appeared at increased risk for stress	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned, use of measure with no known reliability or validity	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Fuemmeler, Elkin, Mullins (2002) [41]	Literature Review	Studies (n = 31) assessing psychological variables in pediatric brain tumor survivors	● Survivors seem to be at risk for negative social competence as well as poorer long-term quality of life ● The literature varies on outcomes for this population	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
DeKeyser Ganz, Raz, Gothelf, Yaniv, Buchval (2010) [42]	Empirical study, Cross-sectional	Adult survivors (n = 70)	● Ten % of participants experienced mild, 40% experienced moderate, and 50% moderate to severe symptoms of posttraumatic stress. Sixteen % did not experience any symptoms. ● There was a significant negative relationship between scores and current age of respondent.	Moderate sample size, no selective reporting, appropriate analysis, study completed as planned	6
Gerhardt, Yopp, Leininger, Valerius, Correll, Vannatta, Noll (2007) [43]	Empirical study; Longitudinal Study	Cancer survivors (n = 56) and comparison peers (n = 60)	● Levels of PTSS were similar between adolescent childhood cancer survivors and their healthy counterparts. ● Late effects were related to higher levels of PTSS.	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned	6
Gianinazzi, Rueegg, Wengenroth, Bergstraesser, Rischewski, Ammann, Kuehni, Michel (2013) [44]	Empirical study; Self-report questionnaires	Survivors (n = 407) and siblings (n = 102)	● The majority of survivors reported psychological distress below the clinical threshold ● Of those who indicated significant distress, the severity of distress exceeded that of distressed siblings and psychotherapy patients	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Goldbeck (2001) [45]	Empirical study; Longitudinal Study; Self-report questionnaires	Parents (n = 108) of families with a child newly diagnosed with cancer (n = 25) or with a child newly diagnosed with juvenile diabetes or epilepsy (n = 29)	● Compared to the control group, parents reported higher levels of rumination = defense and information seeking, and less social support seeking strategies. ● Mothers reported better coping mechanisms than fathers ● Quality of life was similar for both mothers and fathers ● Child's quality of life was related to parental dissimilarity in information seeking behaviors	Small sample of parents of youth with cancer, no selective reporting, appropriate analysis, study completed as planned	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Gothelf, Rubinstein, Shemesh, Miller, Farbstein, Klein, Weizman, Apter, Yaniv (2005) [46]	Open Trial	15	● Fluvoxamine was well tolerated. Depression significantly decreased in 8 weeks	Small sample size; Data collection appropriate to study method; Appropriate analysis; Reporting comprehensive, clearly described; issues with follow-up or missing data described	3
Hamner, Latzman, Latzman, Elkin, Majumdar (2015) [47]	Empirical study; Self-report measures	Pediatric patients (n = 43)	● Parental chronic stress was related to lower levels of physical, emotional, and social functioning in children	Moderate sample size, No control group, Appropriate analysis, Standardized measures,	3
Hildenbrand, Alderfer, Deatrick, Marsac (2014) [48]	Empirical study; Mixed Methods Study	Parents (n = 17) of children with cancer	● Families used a host of approach and avoidance techniques to cope with diagnosis and treatment	Research question clearly stated, approach justified and study context clearly described, role of researcher clearly described, sampling strategy appropriate, method clearly described, data analysis clearly described	6
Hinds (2010) [49]	Literature Review	N/A	● Review of the literature defining, evaluating, and discussing quality of life in children and adolescents with cancer	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Hocking, Kazak, Schneider, Barkman, Barakat, Deatrick (2014) [50]	Empirical study; Qualitative research	Parents (n = 25) of parents with cancer	● Results of parental perceptions of their child's diagnosis support a posttraumatic stress framework ● Parents prefer intervention within t months after diagnosis ● Half of parents preferred intervention within 2 months post-diagnosis	Research question clearly stated, approach justified and study context clearly described, role of researcher clearly described, sampling strategy appropriate, method clearly described, data analysis clearly described	6
Hoekstra-Weebers, Heuvel, Jaspers, Kamps, Klip (1998) [51]	Randomized Controlled Trial; Self-report measures	Parents (n = 82) of children with cancer	● Psychological distress decreased for parents in both groups ● No differences existed between parents assigned to an intervention group utilizing CBT techniques and a control group	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned	2
Hoekstra-Weebers, Jaspers, Kamps, Klip (2001) [52]	Prospective Longitudinal Study	Parents (n = 28) of children with cancer	● Support services were significantly associated with later distress for fathers, but not mothers ● Dissatisfaction with support and negative interactions were risk factors for distress in fathers ● Mothers who received more support were better adjusted	Research question clearly stated, approach justified and study context clearly described, high consent rates, large sample size, no selective reporting, appropriate analysis, study completed as planned	6

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SUPPLEMENTAL TABLE II. *(Continued)*

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Hoven, Anclair, Samuelsson, Kogner, Boman (2008) [53]	Empirical study	Parents of children with "complicated childhood cancers" ($n = 144$) and parents of children with lymphoblastic leukemia ($n = 177$)	● Cranial irradiation was significantly associated with heightened parental distress	Research question clearly stated, large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Iobst, Alderfer, Sahler, Askins, Fairclough, Katz, Butler, Dolgin, Noll (2009) [54]	Empirical study; Self-report measures	Mothers ($n = 464$) of children newly diagnosed (2–16 weeks) with cancer	● No between group differences existed for posttraumatic stress or problem solving between married and single mothers	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Jacobsen, Wagner (2011) [55]	Review	N/A	● Reviews current standards for psychosocial care, existing consensus- and evidenced-based recommendations for clinical practice	Systematic review of existing evidence, Standards of care and clinical guidelines reviewed, Thorough analysis of current practice	1
Jurbergs, Russell, Long, Phipps (2008) [56]	Empirical study; Self-report questionnaires	Parents of children with cancer ($n = 199$) or healthy children ($n = 108$)	● Adaptive style was a significant predictor of child-reported health-related quality of life and differences between parent/child-reported health-related quality of life within families	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Jurbergs, Long, Ticona, Phipps (2009) [57]	Empirical study; Self-report questionnaires	Parents of children with cancer ($n = 199$)	● Parents of children with cancer were not at increased risk for PTSS compared to parents of healthy children ● Parents of children with cancer who experienced a relapse were at increased risk for developing PTSD	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Karnik, Joshi, Paterno, Shaw (2007) [58]	Case report and treatment recommendation	2	● delirium can be effectively treated with risperidone and haldol	N/A	7
Kazak, Barakat, Meeske, Christakis, Meadows, Casey, Penati, Stuber (1997) [59]	Empirical study; Self-report measures	Childhood leukemia survivors ($n = 130$) and comparison participants ($n = 155$) and their parents	● Parents of survivors reported greater PTSS than parents of comparison peers ● No group differences existed for family functioning or social support	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Kazak, Stuber, Barakat, Meeske, Guthrie, Meadows (1998) [60]	Empirical study; Self-report questionnaires	Families of survivors of childhood cancer ($n = 331$)	● For both mothers and fathers, anxiety was the strongest predictor of PTSS ● Perceived life threat, perceived treatment intensity, and social support also contributed to posttraumatic stress	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Kazak, Simms, Barakat, Hobbie, Foley, Golomb, Best (1999) [61]	Empirical study; Self-report questionnaires	Families ($n = 19$) of adolescent survivors of childhood cancer	● All family members indicated that they perceived the intervention to be helpful ● PTSS and anxiety symptoms decreased over time for family members	Small sample size, no selective reporting, appropriate analysis for intervention development, study completed as planned	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Kazak, Alderfer, Streisand, Simms, Rourke, Barakat, Gallagher, Cnaan (2004) [62]	Empirical study	Mothers (n = 119) and fathers (n = 52) of children currently in treatment	● A subset of parents met diagnostic criteria for PTSD ● There were no differences between mothers and fathers. Parents reported greater symptoms than survivors	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Kazak, Alderfer, Rourke, Simms, Streisand, Grossman (2004) [63]	Randomized Wait-list Controlled Trial	Adolescent cancer survivors and their mothers, fathers, and siblings (n = 150)	● Intrusive thoughts were significantly reduced for fathers in the treatment group ● Arousal was significantly reduced for survivors in the treatment group	Sufficient sample size, no selective reporting, appropriate analysis, study completed as planned, low consent rates	2
Kazak, Simms, Alderfer, Rourke, Crump, McClure, Jones, Rodriguez, Boeving, Hwang, Reilly (2005) [64]	Randomized Controlled Trial; Self-report measures; Pilot study	Caregivers (n = 38) of children newly diagnosed with cancer	● Parents who were assigned to the three-session intervention had reduced symptoms of anxiety and PTSS	Small sample size, no selective reporting, appropriate analysis, study completed as planned, low consent rates	2
Kazak, Barakat, Ditaranto, Biros, Hwang, Beele, Kersun, Alderfer, Mougianis, Hocking (2011) [65]	Empirical study; Self-report questionnaires	Parents (n = 99) of children newly diagnosed with cancer	● 72% of families fell in the universal risk range ● 24% fell in the targeted range ● 4% fell in the clinical range	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Keegan, Lichtensztajn, Kato, Kent, Wu, West, Hamilton, Zebrack, Bellizzi, Smith, the AYA HOPE Study Collaborative Group (2012) [66]	Empirical study; Self-report questionnaires	AYAs (n = 523)	● Over half of the AYAs reported unmet information needs. ● Physical health and emotional problems were associated with reporting unmet needs	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Kersun, Elia (2007) [67]	Literature Review	13 studies = 765 subjects	● Most studies show no differences in rates of depression between children on cancer treatment and controls. However, when present, depression can complicate cancer treatment and adherence.	Right types of papers included; Important, relevant studies included; Appropriately assessed for quality of studies; Reasonable to combine results in this way; Important outcomes considered	5
Kersun and Kazak (2006) [68]	Physician survey	40 physicians	● 50% of physician subjects prescribe SSRI for perception of sadness, depression = anxiety	sufficient sample size; data collection appropriate to study method; appropriate analysis; reporting comprehensive, clearly described	4
Koocher, O'Malley (1981) [69]	Empirical study; Self-report questionnaires; Clinical interviews	Former pediatric cancer patients (n = 115)	● A significant number of survivors experienced negative psychological outcomes ● Survivors with poorer adjustment evidenced less effective socialization and self-help skills and lower intellectual functioning	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Kupst, Schulman (1988) [70]	Empirical study; Self-report questionnaires; Clinical interviews	Families of children with acute leukemia (n = 23)	● Coping significantly correlated with level of family support, quality of the parents' marital relationship, good coping of other family members, lack of other concurrent stresses and open communication within the family ● Coping did not significantly correlate with medical status and duration of the illness	Small sample size, Appropriate analysis, Long-term follow-up, Standardized measures, Multiple informant data collected	3
Kwak, Zebrack, Meeske, Embry, Aguilar, Block, Hayes-Lattin, Li, Butler, Cole (2013) [71]	Empirical study; Longitudinal Study	AYAs with cancer (n = 151)	● A large proportion of participants reported clinically significant PTSS, with no differences between 6 and 12 months ● Greater PTSS were predictive of a number of negative side effects	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Landolt, Vollrath, Ribi, Gnehm, Sennhauser (2003) [72]	Empirical study; Quantitative Study	287 children and their mothers (n = 239) and fathers (n = 221)	● A subset of parents met diagnostic criteria for PTSD ● Cancer diagnosis was associated with higher rates posttraumatic stress in parents ● Accidental injury was associated with higher rates of posttraumatic stress in children.	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Landolt, Ystrom, Sennhauser, Gnehm, Vollrath (2012) [73]	Empirical study; Longitudinal study	Children with cancer (n = 287) and their parents	● PTSS in parents were associated with later PTSS in children. ● Mothers reported more symptoms than fathers	Large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Last, Grootenhuis (1998) [74]	Literature review; Clinical Case Illustration	N/A	● A model for psychosocial support is proposed	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Lau, Lu, Balsamo, Devidas, Winick, Hunger, Carroll, Stork, Maloney, Kadan-Lottick (2014) [75]	Empirical study, Prospective cohort study	Children with ALL (n = 159) enrolled and treated on Children's Oncology Group protocol	● Parents experienced significantly greater risk of losing their employment than peers nationally ● Overall, families reported experiencing a high incidence of major life changes in the first year of their child's treatment	Large sample size, Adequate methods, Appropriate analysis, Study completed as planned, Results presented clearly	4
Law, Fisher, Fales, Noel, Eccleston (2014) [76]	Empirical study; Literature Review; Systematic Review; Meta-Analysis	Randomized controlled trials (n = 37)	● Parent/family based psychological interventions improve parent outcomes, particularly Problem Solving Therapy	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	1

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Lee, Santacrose (2006) [77]	Cross-sectional design; correlational descriptive design	Young adult cancer survivors (n = 45)	● Those diagnosed with clinically significant PTSD had a higher rate of living alone than those in the non-PTSD group	Small sample size, no selective reporting, low consent rates, study completed as planned	6
Ljungman, McGrath, Cooper, Widger, Ceccolini, Fernandez, Frager, Wilkins (2003) [78]	Empirical study; Cross-sectional; Structured telephone interview	Parents of children with cancer (n = 56) and adolescents (n = 13)	● Utilizing a 0–10 scale parents mean rating for importance information needs and how well their needs are being met, respectively, are listed below: ● importance of information needs, 9.42 and 8.05 ● peer social support, 7.84 and 5.30 ● self-management therapy, 9.21 and 7.13	Small sample size, selective reporting, appropriate analysis, study completed as planned	6
Lund, Winther, Cederkvist, Andersen, Dalton, Appel, Rechnitzer, Schmiegelow, Johansen (2015) [79]	Population-based cohort study	population-based cohort of 5,452 Danish children treated for cancer	● Childhood cancer survivors are at increased risk of having antidepressants prescribed (HR, 1.4; 95% confidence interval (CI), 1.3–1.5). The excess absolute risk of antidepressant use was 2.5 per 1,000 person-years.	sufficient sample size; data collection appropriate to study method; appropriate analysis; reporting comprehensive, clearly described; issues with follow-up or missing data clearly described	4
Madden, Mowry, Gao, Cullen, Foreman (2010) [80]	Mixed method design; Repeated measures randomized design; Qualitative study; Self-report measures	Children with cancer (n = 16) and their parents in a randomized trial and children with cancer (n = 32) and their parents	● Parents of children in the creative arts therapy randomized to the intervention group reported improvements in child's hurt and child's nausea post intervention ● Parents of children in the nonrandomized intervention trial reported improved mood, being happier, more excited and less nervous post intervention	Small sample size, no selective reporting, appropriate analysis, study completed as planned, low consent rates	2
Marine, Miller 1998	Empirical study; Correlational design	Adolescents with cancer (n = 50)	● Conflict with mothers and physical impairment was related to psychological distress in teens	Medium sample size, no selective reporting, appropriate analysis, study completed as planned, somewhat low consent rates	6
Manne, Du Hamel, Gallelli, Sorgen, Redd (1998) [82]	Empirical study; Correlational design	Mothers of survivors of childhood cancer (n = 65)	● A subset of mothers indicated experiencing clinically significant PTSS. ● Of those diagnosed with PTSD, 25% had a comorbid diagnosis of an anxiety and depressive disorder	Medium sample size, no selective reporting, appropriate analysis, study completed as planned, somewhat low consent rates	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Marsac, Hildenbrand, Clawson, Jackson, Kohser, Barakat, Kassam-Adams, Aplenc, Vinsel, Alderfer (2012) [83]	Multi-phase pilot study; Feasibility and acceptability study	Children (phase 1 n = 15; phase 2 n = 15) undergoing cancer treatment and their parents	● All parents indicated that they were able to understand the book used in the Cellie Cancer Coping Kit during phase one of the study and that is was relevant to their experiences ● In phase 2 of the study 86% of children and 100% of parents reported that they would recommend the kit to others ● 64% of children and 93% of parents reported they the learned new information from the kit	Small sample size, no selective reporting, appropriate analysis, study completed as planned, good consent rates	3
Maurice-Stam, Oort, Last, Brons, Caron, Grootenhuis, (2008) [84]	Empirical study; Longitudinal study	Cancer survivors (n = 53)	● Two months after the end of successful treatment, patients reported significantly worse motor functioning and sleeping than the norm ● After one year patients still reported significantly worse anxiety and motor functioning than the norm ● Worse outcomes were associated with Longer duration of treatment, bad prognosis and greater parental psychological distress	Medium sample size, no selective reporting, appropriate analysis, study completed as planned, good consent rates	6
Maurice-Stam, Oort, Last, Brons, Caron, Grootenhuis, (2009) [85]	Empirical study; self-report questionnaires	Cancer survivors (n = 76)	● Lower levels of anxiety and higher levels of optimism were associated with the male gender ● Better health-related quality of life was associated with physician reliance	Medium sample size, no selective reporting, appropriate analysis, no control group, study completed as planned, good consent rates	6
McCarthy, Clarke, Vance, Ashley, Heath, Anderson (2009) [86]	Empirical study; Self-report questionnaires	mothers (n = 135) and fathers (n = 85) of children (n = 143) with cancer	● One-third of families indicated elevated psychosocial risk on the Psychosocial Assessment Tool (PAT2.0). ● Mothers' scores correlated with fathers' scores ● Psychosocial risk was similar across time point one and two	Large sample size, no selective reporting, appropriate analysis, study completed as planned, good consent rates	6
McCarthy, Ashley, Lee, Anderson (2012) [87]	Longitudinal Study	Parents (n = 220)	● A majority of both mothers and fathers met criteria for acute stress disorder at diagnosis ● 6–8 months after diagnosis, 21% of mothers and 16% of fathers met criteria for PTSD	Large sample size, no selective reporting, appropriate analysis, study completed as planned, good consent rates	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Meeske, Patel, Palmer, Nelson, Parow (2007) [88]	Empirical study	Cancer survivors (n = 86)	● Poorer physical functioning was associated with fatigue and more severe late effect ● Poorer psychosocial functioning was associated with ethnic minority status, and a brain tumor diagnosis	Medium sample size, no selective reporting, appropriate analysis, study completed as planned, good consent rates	6
Meyler, Guerin, Kiernan, Breatnach (2010) [89]	Literature review	Studies (n = 21)	● Positive outcomes were evidenced by the majority of interventions examined ● The most effective interventions were family-based behavioral interventions	Quality studies included, Relevant studies included	5
Michel, Greenfield, Absolom, Ross, Davies, Eiser, Late Effects Group Sheffield (2009) [90]	Empirical study; Self-report questionnaires	N/A	● Childhood cancer survivors are in favor of sustaining long-term follow-up care within the existing consultant-led model ● Survivors rejected other types of care, e.g. nurse-led, GP-led or telephone follow-up	Adequate sample, pre-post cohort, standardized measures	3
Michel, Rebholz, von der Weid, Bergstraesser, Kuehni (2010) [91]	Empirical study; Self-report questionnaires	Adult survivors of childhood cancer (n = 1,076) in Switzerland	● Compared to norm population = survivors had lower scores in global severity index, somatization = obsessive-compulsive tendencies, and anxiety ● More survivors had higher levels of distress for global severity index, interpersonal sensitivity, depression = aggression = and psychotic tendencies than the expected norm percentage	Adequate sample, standardized measures, population based registry	5
Mitchell, Clarke, Sloper (2006) [92]	Empirical study	Families (n = 303)	● Parents reported being mostly satisfied with psychosocial support services for their children with cancer ● Parents indicated a need for age appropriate facilities for the child and emotional support in varied areas	Adequate sample, survey result, representative sample	5
Muglia-Wechsler, Bragado-Álvarez, Hernández-Lloreda (2014) [93]	Literature review	Articles (n = 14)	● Most psychological interventions showed some efficacy ● Only a limited number of interventions were considered effective	Good number of articles included, appropriate search and review, good quality of articles	5
Mullins, Fedele, Chaffin, Hullmann, Kenner, Eddington, Phipps, McNall-Knapp (2012) [94]	RCT; Self-report questionnaires	Mothers (n = 52) of children newly diagnosed with cancer	● Mothers participating in the interdisciplinary intervention group tended to improve or remain stable across adjustment outcome ● A portion of the control group showed increasingly worse outcome ● Satisfaction ratings for the intervention group ● The intervention study seemed feasible to implement	Research question clearly stated, approach justified and study context clearly described, sufficient sample size, no selective reporting, appropriate analysis, study completed as planned, high consent rates	2

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Mullins, Tackett, Suorsa (2015) [95]	Literature Review;	N/A	● Discusses and reviews three pediatric psychology models of resilience ● Discusses results from an interdisciplinary intervention for parents of children with cancer	Quality studies included, Relevant studies included	5
Myers, Balsamo, Lu, Devidas, Hunger, Carroll, Winick, Maloney, Kadan-Lottick (2014) [96]	Prospective study; Self-report questionnaires	Children (n = 159) with standard-risk ALL and their parents	● Mean anxiety, depression = aggression and hyperactivity scores did not differ from population norms ● More children's scores fell in the at-risk/clinical range at time point 1, 2, and 3 for depression than expected based on population norms ● More children scored in the at-risk/clinical range at time point 1 for anxiety ● Anxiety and depression was predicted by family functioning ● Ethnicity, marital status, and social support were associated with depression ● Initial emotional distress predicted anxiety and depression over time	Research question clearly stated, approach justified and study context clearly described, high consent rates, large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Nagarajan, Kamruzzaman, Ness, Marchese, Sklar, Mertens, Yasui Y, Robison, Marina (2010) [97]	Empirical study; Self-report questionnaires	N/A	● A large portion of osteosarcoma survivors experienced some sort of chronic medical condition ● Over half experienced at least two ● Survivors of osteosarcoma did not differ in their reported general health status when compared to survivors of other cancers	Inclusive data, medical chart extraction = thorough representation	6
Niemelä, Väisänen, Marshall, Hakko, Räsänen (2010) [98]	Empirical study; Qualitative data	Experienced clinicians (n = 7)	● Clinicians indicated 4 primary categories: inter-team collaboration = focus on the children = death, and perceived impact of interventions	Qualitative data rated by experienced clinicians,	6
Norberg, Boman (2008) [99]	Empirical study	Mothers (n = 266) Fathers (n = 208)	● Heightened anxiety and depression was most prominent in parents up to 2.5 years after diagnosis ● Parents of recently diagnosed children had more cancer-related intrusive thoughts than those of long-term survivors	Adequate sample size, comparison group to population norms	3

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Ozono, Saeki, Mantani, Ogata, Okamura, Yamawaki (2007) [100]	Empirical study; Self-report questionnaires	Adolescent cancer survivors (n = 88) Mothers (n = 87) Fathers (n = 72)	● Severe PTSS were reported by 10.9% of survivors ● Severe PTSS were reported by 20.7% of mothers ● Severe PTSS were reported by 22.2% of fathers. ● PTSS were significantly correlated between mothers and survivors ● Higher trait anxiety was significantly related to symptoms for survivors, mothers, and fathers	Adequate sample, correct analysis, thorough research questions	6
Ozono, Saeki, Mantani, Ogata, Okamura, Yamawaki, Nakagawa, Ueda, Inada, Yamawaki (2010) [101]	Empirical study; Self-report questionnaires	Adolescent cancer survivors (n = 88) Mothers (n = 87) Fathers (n = 72)	● Conflictive-type family members reported the highest levels of posttraumatic stress, depression = and anxiety	Adequate sample, correct analysis, thorough research questions	6
Pai, Greenley, Lewandowski, Drotar, Youngstrom, Peterson (2007) [102]	Meta-analysis	Studies (n = 29) assessing psychological distress and family functioning in parents of children with cancer	● Mothers indicated greater distress than fathers up to 1 year post-diagnosis ● Parents of children with newly diagnosed cancer indicated a greater degree of distress than comparison samples ● Mothers of children with cancer reported greater family conflict than mothers of healthy children	Appropriate types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	1
Pai, Patino-Fernandez, McSherry, Beele, Alderfer, Reilly, Hwang, Kazak (2008) [103]	Empirical study; Self-report questionnaires	Female Caregivers (n = 132) Male Caregivers (n = 72) Newly Diagnosed Children (n = 141)	● Significant correlations existed between the Psychosocial Assessment Tool 2.0 subscales and measures of corresponding constructs ● For mothers and fathers, total scores were correlated with acute stress and child behavior symptoms	Validity of psychosocial screening tool, adequate sample, accurate analysis	6
Pao, Ballard, Rosenstein, Wiener, Wayne (2006) [104]	Retrospective chart review	347 patients on treatment for cancer	14% of pts were prescribed psychotropic meds: anticonvulsants (37%), antidepressants (35%). 45% had >1 med prescribed	Sufficient sample size; appropriate analysis; reporting comprehensive, clearly described	6
Patenaude, Kupst (2001) [105]	Review	N/A	● Reviews recent developments in childhood psycho-oncology ● Discusses challenges in the field	Variety of literature reviewed, Quality studies included, Recommendations for direction of future research	5

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Patenaude, Last (2005) [106]	Review	N/A	● Interventions to lesson procedural distress exist ● Late effects contribute to deficits in social functioning ● Survivors of pediatric adjust well overall ● Subsets of more vulnerable patients experience greater distress	Introduction to special edition journal, Brief overview of psycho-oncology, Some review of literature and consensus data	7
Patiño-Fernández, Pai, Alderfer, Hwang, Reilly, Kazak (2008) [107]	Empirical study; Self-report questionnaires	Mothers (n = 129) and fathers (n = 72) of children (n = 138) newly diagnosed with cancer	● 51% of mothers met the criteria set by the DSM-IV for ASD ● 40% of fathers met the criteria set by the DSM-IV for ASD ● General anxiety predicted symptoms of acute stress after controlling for demographic variables	Research question clearly stated, approach justified and study context clearly described, good consent rates, large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Pelcovitz, Libov, Mandel, Kaplan, Weinblatt, Septimus (1998) [108]	Empirical study; Structured interviews; Self-report questionnaires	Adolescents with cancer (n = 23) Physically abused adolescents (n = 27) Healthy and non-abused adolescents (n = 23)	● Adolescents with cancer viewed their parents as significantly more caring and protective than comparison or abused adolescents ● Cancer subjects who met criteria for lifetime PTSD saw their families as significantly more chaotic than those who did not	Good comparison groups, small sample size, concise investigative question	6
Peters, Connolly (2012) [109]	Literature review	21 studies = 2201 healthy subjects	● In general (non-medically ill) population = empiric evidence supports the use of CBT strategies, as a first-line agent for mild-mod anxiety disorders. Empirically based data support the use of combination therapy (CBT + antidepressants) in youth with more severe anxiety d/o	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	1
Phipps, Hudson, Rai (2005) [110]	Empirical study; Self-report questionnaires	Pediatric cancer patients (n = 162) and their parents	● Recently diagnosed patients and their parents obtained higher posttraumatic stress scores than survivors and parents of more than 5 years past diagnosis ● There was a correlation between parent and child scores ● No differences were observed between parent and patient report	Appropriate sampling, multiple informants	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Phipps, Long, rai (2006) [111]	Empirical study; Self-report questionnaires	Pediatric cancer patients and parents (n = 162)	● Low anxious and repressor children reported lower levels of posttraumatic stress than did high anxious children ● Low anxious and repressor parents self-reported lower levels of posttraumatic stress than high anxious individuals in themselves and their children	Good sample size, Valid and standardized measures, appropriate analysis	6
Phipps, Barrera, Vannatta, Xiong, Doyle, Alderfer (2010) [112]	RCT; Self-report questionnaires	Pediatric cancer patients (n = 178)	● Randomized to either: a child-targeted intervention involving massage and humor therapy, interventions plus a parent intervention involving massage and relaxation/imagery, or standard care control group ● No significant differences were found between treatment arms ● No significant between-group differences were noted on any of the medical variables as secondary outcomes.	Representative sample, good sample size, Correct analyses	2
Phipps, Buckholdt, Fernandez, Wiener, Kupst, Madan-Swain, Mullins, Robert, Sahler, Vincent, Noll (2012) [113]	Physician Survey	151	● 71% of oncologists reported prescribing SSRIs for their patients. Oncologists report difficulties differentiating symptoms of depression from cancer treatment. Mental health practitioners are consulted occasionally but not routinely, and oncologists reported a need for increased mental health resources.	Sufficient sample size; data collection appropriate to study method; appropriate analysis; reporting comprehensive, clearly described;	6
Phipps, Klosky, Long, Hudson, Huang, Zhang, Noll (2014) [114]	Structured interview; Self-report measures	Children with cancer (n = 255) and demographically matched peers (n = 101)	● 52.6% of children with cancer identified their disease as a traumatic event and this percentage declined to 23.8% 5 years post diagnosis ● For children and parents rates of PTSD did not differ from controls	Large sample, Matched control group, Standardized measures, Appropriate statistical analysis, Significant contribution, Results presented in reasonable manner	3
Pöder, Ljungman, von Essen (2008) [115]	Longitudinal study; Self-report measures via telephone interview	Mothers (n = 107) and fathers (n = 107) of children newly diagnosed with cancer and on cancer treatment	● More mothers than fathers scored as possibly meeting criteria for ASD and PTSD at time 1, time 2, and time 3 ● 50% of the parent who seemed to meet criteria for ASD at time one also seemed to meet criteria for PTSD at time 3	Research question clearly stated, approach justified and study context clearly described, high consent rates, large sample size, no selective reporting, appropriate analysis, study completed as planned	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Portteus, Ahmad, Tobey, Leavey (2006) [116]	Retrospective chart review	216 children and adolescents with cancer	• 10.2% received antidepressant medication within 1 year of diagnosis. Children 12 years or older, children with ALL, and children receiving radiotherapy or opiate analgesics were more likely to receive antidepressant medication	sufficient sample size; data collection appropriate to study method; appropriate analysis; reporting comprehensive, clearly described	6
Ranmal, Prictor, Scott (2008) [117]	Meta-analysis	Studies (n = 10) of interventions to enhance communication about cancer in children and adolescents	• The majority of interventions reported significant results • Studies of planned play, story telling, and self-care coping reported no significant results	Appropriate types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Recklitis, Lockwood, Rothwell, Diller (2006) [118]	Empirical study; Self-report questionnaires	Adult survivors of childhood cancer (n = 226)	• Suicidal symptoms were reported by a significant minority of adult survivors of childhood cancer • Symptoms were related to cancer treatments and post-treatment mental and physical health	Adequate sample size, standardized measures, appropriate analysis	4
Recklitis, Diller, Li, Najita, Robison, Zeltzer (2010) [119]	Empirical study; Self-report questionnaires	Adult survivors (n = 9,126) of childhood cancer and Siblings (n = 2,968)	• Suicidality was associated with primary CNS cancer diagnosis, depression = and poor health outcomes • It was unrelated to age, age at diagnosis, sex, cancer therapy, recurrence, time since diagnosis, or second malignancy	Appropriate research question = Large sample, survey data	4
Ribi, Vollrath, Sennhauser, Gnehm, Landolt (2007) [120]	Empirical study; Longitudinal study	Fathers of children diagnosed with epilepsy or type 1 diabetes mellitus (n = 69) Fathers of children with unintentional injury (n = 70)	• Rates of PTSS were higher in fathers of children with a chronic illness than fathers of children with an unintentional injury • Rates of posttraumatic stress decreased over time for both groups	Unique sample, contribution to the literature	5
Robinson, Gerhardt, Vannatta, Noll (2007) [121]	Empirical study; self-report questionnaires	Families of children with cancer (n = 95) and comparison peers (n = 98).	• Significant relationships were found between parent and child distress • Family environment, child age and gender, a cancer diagnosis, and treatment severity moderated the impact of father distress on child distress • Family environment partially mediated father and child distress.	Adequate sample, control group, research question appropriate, results presented in reasonable manner	3
Robinson, Gerhardt, Vannatta, Noll (2009) [122]	Empirical study; Longitudinal study	Childhood cancer survivors (n = 55) Healthy peers and their parents (n = 60)	• Reported parental distress was associated with reported survivor distress • This relationship was moderated by survivor gender, severity of initial treatment and late effects.	Good sample, control group, research question appropriate, correct analysis	3

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SUPPLEMENTAL TABLE II. *(Continued)*

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Rosenberg, Baker, Syrjala, Wolfe (2012) [123]	Literature Review; Qualitative synthesis	Studies (n = 13) of bereaved parents of children with cancer	● Psychiatric comorbidities, prior loss, financial difficulties, duration and intensity of child's treatment, medical care perceptions, child's quality of life, preparedness for and location of child's death is associated with morbidity in parents.	Appropriate types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Rourke, Stuber, Hobbie, Kazak (1999) [124]	Literature review	N/A	● Review of the literature supporting a posttraumatic framework in pediatric cancer survivors	Representative articles included	5
Rourke, Hobbie, Schwartz, Kazak (2007) [125]	Empirical study; Psychiatric interviews; Self-report questionnaires	Survivors (n = 182) of pediatric cancer	● A subset of individuals met criteria for PTSD ● Most of the sample reported symptoms re-experiencing ● Those with PTSD indicated having more negative beliefs about their health and illness	Adequate sample, appropriate analysis, outcomes considered	4
Sahler, Varni, Fairclough, Butler, Noll, Dolgin, Phipps, Copeland, Katz, Mulhern, (2002) [126]	Empirical study; RCT	Mothers of children with newly diagnosed with cancer randomized to a treatment (n = 50) or a control group (n = 42)	● Mothers in the problem solving therapy group reported greater problem solving skills and decreased negative affectivity compared to mothers in the control group	Appropriate sample, measures, control group, correct analyses	2
Sahler, Fairclough, Phipps, Mulhern, Dolgin, Noll, Katz, Varni, Copeland, Butler (2005) [127]	RCT; Self-report questionnaires	English and Spanish speaking mothers (n = 430) of children newly diagnosed with cancer	● Significantly increased problem solving skills sand decreased negative affectivity was reported by mothers in the problem solving therapy intervention group compared to mothers in the control group ● Young, single, Spanish speaking mothers benefited most from the intervention	Large sample, randomized, control group, intervention well planned, appropriate analyses	2
Sahler, Dolgin, Phipps, Fairclough, Askins, Katz, Noll, Butler RW (2013) [128]	RCT; Self-report questionnaires	92 mothers of children newly diagnosed with cancer	● Both groups indicated similar improvements directly after treatment ended ● Mothers in the problem solving therapy group reported greater improvements in mood, anxiety, and problem solving 3-months post treatment	Appropriate sample, measures, control group, correct analyses	2
Salley, Gerhardt, Fairclough, Patenaude, Kupst, Barrera, Vannatta (2014) [129]	Empirical study; Self-report questionnaires; Peer-report questionnaires	Classmates of children treated for intracranial tumor	● Compared to peers, survivors overestimated their level of leadership-popularity and underestimated levels of sensitive-isolated behaviors and victimization by peers. ● Female survivors were more likely than their male counterparts to underestimate sensitive-isolated behaviors and victimization	Adequate sample, Matched control group, Reasonable analysis, Study completed as intended	3

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Savage, Riordan, Hughes (2009) [130]	Systematic review	Studies (n = 6) examining quality of life in children with acute lymphoblastic leukemia	● Parents' reports of quality of life differed from children's reports ● Findings varied across studies for physical, psychological, psychosocial, and cognitive domains and disease and treatment symptoms	Appropriate types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Sawyer, Antoniou, Toogood, Rice, Baghurst (1993) [131]	Empirical study	Unknown	● Mothers of children with cancer reported significantly more anxiety, insomnia, somatic symptoms, and social dysfunction than mothers in the community ● At the follow-up assessment the mothers of children with cancer reported significantly more symptoms of depression and somatic symptoms than mothers in the community	Reasonable research question, Comparison group, Findings presented in reasonable way	4
Schieveld, van der Valk, Smeets, Berghmans, Wassenberg, Leroy, Vos, van Os (2009) [132]	Clinical summary and treatment algorithm	N/A	● Recommends systematic and comprehensive evaluation and management of pediatric delirium in critically ill children.	N/A	7
Schirman, Kronenberg, Apter, Brent, Melhem, Pick, Carmel, Frisch, Weizman, Gothelf (2010) [133]	Open trial	78 healthy children	● Citalopram was moderately effective, well tolerated and safe. 43% of depressed and 51% of anxious subjects had a 50% or greater reduction in scores.	Sufficient sample size; data collection appropriate to study method; appropriate analysis; reporting comprehensive, clearly described; issues with follow-up or missing data clearly described	3
Schulte, Bartels, Barrera (2014) [134]	Pilot study for feasibility; RCT	Child and adolescent survivors (n = 23) of childhood CNS tumors	● Social skills improved from time 1 to time 2 for the intervention group ● Parent and teacher reported social problem increased over time for the control group only	Small sample, measures, inclusion of control group, correct analyses	2
Schwartz, Drotar (2006) [135]	Empirical study; Longitudinal study	Childhood cancer survivors (n = 57) and a comparison group (n = 83)	● Survivors were more likely to meet criteria for PTSD than the control group ● Survivors who met criteria for diagnosis were more likely to experience negative adjustment outcomes compared to survivors who did not meet criteria for diagnosis	Adequate sample and comparison group, appropriate research question	3
Scott, Chalmers (2001) [136]	Literature review	Studies (n = 6)	● All studies reported some level of improvement across the various outcomes measured	Right types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Scott, Harmsen, Prictor, Sowden, Watt (2003) [137]	Literature review	Studies (n = 9) that evaluated the effects of interventions aimed at enhancing communicating with children/adolescents about their cancer	● Interventions aimed at enhancing communication skills in children and adolescents with cancer seem to be beneficial for psychosocial well-being	Appropriate types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Seitz, Besier, Goldbeck (2009) [138]	Literature review	Studies of psychosocial interventions for adolescent cancer patients (n = 4)	● One of four studies reported significant improvements, while the remainder reported no significant changes in adolescent patients with cancer.	Contribution to literature in sparse area, focusing on adolescents only with cancer	5
Seitz, Besier, Debatin, Grabow, Dieluweit, Hinz, Kaatsch, Goldbeck (2010) [139]	Empirical study; Self-report questionnaires	Survivors (n = 820) of adolescent cancer and matched controls (n = 1,027)	● PTSS was three times more likely to be present in survivors versus controls ● Only female survivors reported depression and anxiety significantly more often than the controls.	Large sample, carefully selected comparison group, thoughtful research question = valid measures used	3
Seitz, Knaevelsrud, Duran, Waadt, Loos, Goldbeck (2014) [140]	Intervention study	Pediatric cancer survivors (n = 20)	● Post-intervention PTSS, anxiety, and fear of progression/relapse were significantly lower than pre-intervention ● Except for an improvement in depression = all effects were sustained 3 months after the end of treatment.	Small sample (pilot), Good quality research question, Appropriate analyses, Promising new intervention described	3
Servitzoglou, Papadatou, Tsiantis, Vasilatou-Kosmidis (2009) [141]	Empirical study; Self-report questionnaires	Greek AYA survivors of cancer (n = 103) and matched healthy controls (n = 135)	● Survivors' quality of life scores were similar to controls' scores ● Survivors reported greater perceived vulnerability to health problems ● Survivors reported perceiving themselves as mature and grounded compared to peers	Adequate sample, standardized measures, appropriate descriptive analysis	6
Sloper, 2000 [142]	Empirical study; Longitudinal study	Mothers (n = 68) and fathers (n = 58)	● A proportion of mothers and fathers indicated high levels of distress at 6 months and 18 months post-diagnosis ● Mothers and fathers differed on predictors of distress	Large sample, representative sample, descriptive and comparative measures of parental stress	6
Stam, Grootenhuis, Last (2001) [143]	Empirical study; Self-report questionnaires	Children (n = 126) with cancer and their mothers (n = 124) and fathers (n = 111)	● Across several subscales, health-related quality of life was significantly worse for parents and patients compared to the general population	Representative sample, multiple informants, appropriate analyses	6
Stam, Grootenhuis, Brons, Caron, Last (2006) [144]	Empirical study; Longitudinal study	Children and adolescent (n = 126) new survivors and their mothers (n = 124) and fathers (n = 111) and comparison peers (n = 507)	● Survivors reported a lower health-related quality of life than their peers ● Health status and coping were significant predictors of health-related quality of life outcomes.	Representative sample, multiple informants, appropriate analyses, other conclusions addressed	6

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SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Stam, Grootenhuis, Caron, Last (2006) [145]	Empirical study	Children (n = 126) with cancer and their mothers (n = 124) and fathers (n = 111)	● All age groups of patients except for those 8–11 years experienced worse health-related quality of life than the norm related to their motor-functioning ● Pre-school patients were rated worse on sleeping, appetite, stomach, skin = problem behavior, anxiety, and liveliness, and patients aged 6–7 on motor functioning and autonomy. ● Parents reported more psychological distress than the norm.	Research question clearly stated, approach justified and study context clearly described, high consent rates, large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Stecker, Schlomer-Doll, Mucke, Rodi (2000) [146]	Empirical study; Nonclinical case study	Patients (n = 126)	● Case report of psych-oncologic model of care from Germany	Review of literature and case example	6
Stoppelbein, Greening, David (2006) [147]	Empirical study	Pediatric cancer survivors (n = 39) Children who lost a parent to death (n = 39)	● Bereaved children had significantly higher rates of posttraumatic stress than survivors ● This relationship was partially mediated perceived risk of future threat.	Small sample, Appropriate research question = Appropriate analysis	6
Streisand, Rodrigue, Houck, Graham-Pole, Berlant (2000) [148]	RCT; Prospective study; Self-report questionnaires	Mothers of children undergoing bone marrow transplantation assigned to an intervention (n = 11) or control (n = 11) group	● Mothers participating in the intervention group indicated using more stress management methods than mothers in the comparison group ● No other important significant differences on outcome measures	Small sample, measures, control group, correct analyses	2
Svavarsdottir, 2005 [149]	Empirical study; Self-report questionnaires	Icelandic parents (n = 26) and their children with cancer	● Mothers tended to struggle with the organizational aspect of maintaining plans for the family as well as taking care of any behavior problems ● Fathers tended to struggle with balancing their work life, father responsibilities, as well as giving emotional support to their wife	Descriptive study, self-report measures, small sample, longitudinal, correct analysis	6
Svavarsdottir, Sigurdardottir, Tryggvadottir (2014) [150]	Empirical study; Self-report questionnaires	Families (n = 10) of children with cancer (n = 10), asthma (n = 31), and diabetes (n = 15)	● Mothers reported significantly higher collaboration and problem-solving activities after intervention ● Fathers did not report significant differences	Adequate sample, pilot study, pre-post intervention = correct analysis	6
TADS Team (2007) [151]	Randomized Control Trail	Healthy adolescents (n = 327)	● In general (non- medically ill) population = significant response at 12 weeks: 73% for combination therapy, 62% for fluoxetine therapy, 48% for CBT. At 36 weeks: 86% for combination therapy, 81% for fluoxetine therapy, 81% for CBT	Sufficient sample size; blinding or data collection appropriate to study method; appropriate analysis; reporting comprehensive, clearly described; issues with follow-up or missing data clearly described	2

(*Continued*)

SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Täeb, Moro, Baubet, Revah-Lev, Flament (2003) [152]	Literature review	Studies (n = 20)	● Time elapsed since the diagnosis of cancer is typically not predictive of persistent symptoms of PTSD ● The presence of symptoms in survivors is not always related to those of their parents	Quality articles included, appropriate conclusions offered	5
Vannata, Zeller, Noll, Koontz (1998) [153]	Empirical study; Self-report questionnaires	Bone Marrow Transplant Survivors (n = 48) and comparison peers (n = 48)	● Survivors were described as being less physically attractive, athletically skilled, and socially isolated than their peers	Research question clearly stated, approach justified and study context clearly described, high consent rates, large sample size, no selective reporting, appropriate analysis, study completed as planned	6
Varni, Katz, Colegrove, Dolgin (1993) [154]	RCT; Self-report questionnaires; Multiple raters	Children (n = 64) newly diagnosed with cancer	● Compared to pre-treatment, children in the social skill training intervention group reported increased perceived classmate and teacher social support at the 9-month follow-up ● Parents of children receiving treatment reported decreased internalizing and externalizing behavior problems and increased school competence	Research question clearly stated, approach justified and study context clearly described, small but adequate sample size, no selective reporting, appropriate analysis, study completed as planned, acceptable consent rates	2
Warner, Ludwig, Sweeney, Spillane, Hogan, Ryan, Carroll (2011) [155]	Empirical study; Pilot study; Repeated measures design; Self-report studies	Parents (n = 5) of children with cancer	● A 4-session cognitive–behavioral intervention reduced symptoms of state anxiety, depression = feelings of burden = and distress in parents of children with cancer who reported elevated levels of distress prior to receiving treatment	Research question clearly stated, approach justified, very small sample size, no selective reporting, no control group	2
Waters, Wake, Hesketh, Ashley, Smibert (2002) [156]	Empirical study; Self-report measures	Parents of children (n = 31) with ALL	● Parents reported significantly lower functioning and well-being than population norms for all CHQ scales ● Cancer-specific quality of life was comparable to PCQL norms ● Clinician reports of the child's global physical and psychosocial health were moderately associated with each other and, with the parent reported physical, and psychosocial CHQ summary scores.	Small sample, appropriate measures, appropriate statistical analysis	4
Wiener, Battles, Mamalian, Zadeh (2011) [157]	Qualitative study; Pilot study	Professionals (n = 110) who work with youth with cancer	● A therapeutic game aimed at helping youth with cancer to communicate about their disease appears to be helpful in identifying coping skills and psychological adjustment, as well as issues related to self-esteem, depression = stress, prognosis, and family and peer relationships	Research question clearly stated, approach justified and study context clearly described, adequate sample size, no selective reporting, appropriate analysis, study completed as planned	6

(*Continued*)

SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Wiener, Viola, Koretski, Perper, Patenaude, (2015) [158]	Literature review	Articles about Psychosocial care (n = 27)	• No current articles were specific enough to serve as a standard of care for psychosocial resources for patients with cancer and their families	Appropriate types of papers included; Important, relevant studies included; Reasonable to combine results in this way; Important outcomes considered	5
Williams, Drew, Deluca, McCarthy (2013) [159]	Empirical study; Self-report questionnaires	Parents (n = 35) and adolescents (n = 14) off treatment for cancer	• Parents who indicated long-term uncertainty related to their child's illness reported more psychosocial difficulties	Research question clearly stated, approach justified and study context clearly described, adequate sample size, no selective reporting, appropriate analysis, study completed as planned	6
Woodgate, Degner (2004) [160]	Qualitative study	Children with cancer (n = 39) and their families	• Six transition periods were acknowledged • Families members' roles and responsibilities changed dependent of the transition period	Research question clearly stated, approach justified and study context clearly described, adequate sample size, no selective reporting, appropriate analysis, study completed as planned	6
Woodgate, 2006 [161]	Longitudinal study; Qualitative data; Observational Study	N/A	• Patients and their families provided qualitative information about the cancer experiences.	Narratives from survivors	5
Zebrack, Chesler (2001) [162]	Empirical study; Self-report questionnaires	Childhood cancer survivors (n = 303)	• Significant relationships were found between worries and objective factors, self-image, and outlook on life • Perceptions about one's cancer status, age at diagnosis, and gender wee better associated with self-image and life outlook	Large sample, standardized measures, appropriate analyses	4
Zebrack, Mills, Weitzman (2007) [163]	Empirical study	Cancer patients and off-treatment survivors (n = 1,088)	• Older respondents attributed greater importance on availability of age appropriate information • Younger respondents attributed greater importance to friend and family support	Large sample, underrepresented population = appropriate analysis	6
Zebrack (2009) [164]	Empirical study; Self-report questionnaires	N/A	• More than 60% of respondents indicated a need for age-appropriate cancer information about diet, exercise, nutrition = health services, infertility, mental health counseling, and camp or retreat programs for young adults • Over than 50% of respondents indicated unmet needs • Those who were younger at age of diagnosis, of poor physical health status, and less likely to be advanced in work, school, or a committed/marital relationship were more likely to report unmet needs	Large sample, underrepresented population = appropriate analysis	6

(*Continued*)

SUPPLEMENTAL TABLE II. (*Continued*)

Study	Design	Sample	Findings	Study Rigor	Level of Evidence*
Zebrack, Block, Hayes-Lattin, Embry, Aguilar, Meeske, Li, Butler, Cole (2014) [165]	Empirical study; Longitudinal study	Newly diagnosed AYAs (n = 215)	● AYAs between 20 and 29 years of age were significantly less likely to use psychosocial services than all other age groups ● This group reported the greatest need information. ● Participants treated in adult facilities reported greater levels of unmet needs than those in pediatric settings.	Large sample, underrepresented group, appropriate analysis	6
Zeltzer, Lu, Leisenring, Tsao, Recklitis, Armstrong, Mertens, Robison, Ness (2008) [166]	Empirical study; Self-report questionnaires	Adult cancer survivors (n = 7,147) Siblings (n = 388)	● Survivors reported greater symptoms of global distress than siblings ● Scores were below population norms	Large sample, survivors and siblings represented, appropriate analysis, participation rate	3
Zeltzer, Recklitis, Buchbinder, Zebrack, Casillas, Tsao, Lu, Krull (2009) [167]	Review; Self-report questionnaires	N/A	● Most survivors, except for brain tumor survivors, report both good present and expected future life satisfaction ● Psychological distress predicted poor health behaviors, such as smoking	Representative articles included, appropriate analysis	5
Zwaanswijk, Tates, van Dulmen, Hoogerbrugge, Kamps, Bensing (2007) [168]	Empirical study; Online focus group	N/A	● Participants gave opinions on how communication in pediatric oncology can improve ● Suggestions included: a more collaborative role in medical decisions, being truthful, and the requirement to have all the information all the time	Representative articles included, appropriate analysis	5

NOTE. PDA, Personal Digital Assistant; PTG, posttraumatic growth; PTSD, posttraumatic stress disorder; PTSS, posttraumatic stress symptoms; AYA, adolescents and young adults; CBT, cognitive behavioral therapy; UK, United Kingdom; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, 4th Edition; ASD, acute stress disorder; CNS, Childhood Central Nervous System; ALL, Acute Lymphoblastic Leukemia; N/A, not applicable to study; *1, systematic review or meta-analysis of controlled studies, or evidence-based clinical practice guidelines; 2, individual experimental studies (randomized clinical trial); 3, quasi-experimental studies (non-randomized); 4, non-experimental studies (case-control, cohort); 5, systematic reviews of descriptive or qualitative studies; 6, individual descriptive or qualitative study; 7, opinions of respected authorities and expert committees.

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