

Identification of Evidence for Key Positive Psychological Constructs in Pediatric and Adolescent/Young Adult Patients with Cancer: A Scoping Review

Cole Wayant, BS,¹ Jack Manquen, DO,¹ Hannah Wendelbo, DO,¹ Natalie Kerr, DO,¹
Matt Crow, BS,¹ Jon Goodell, MA,² Andrea C. Tricco, PhD,^{3,4} Jennifer W. Mack, MD, MPH,⁵
Chan Hellman, PhD,⁶ and Matt Vassar, PhD¹

Introduction: Children and adolescents/young adults (AYAs) with cancer are a vulnerable population susceptible to numerous late effects, such as fatigue and depression, which may diminish their long-term psychological, physical, spiritual, and emotional health. A well-rounded understanding of how positive psychological constructs affect the quality of care and treatment outcomes is therefore warranted.

Methods: We conducted a scoping review of 15 positive psychological constructs in children and AYAs with cancer. The primary research questions were (1) what is known about positive psychological constructs in children and AYAs with cancer; (2) what value is ascribed to these constructs by patients?

Results: Two hundred seventy-six articles were included after database search and screening. These studies were mostly observational or qualitative and conducted in North America. Constructs were often poorly defined, and measurement tools used to gather data were wide ranging. Numerous factors were correlated with increased or decreased expression of certain constructs, but overall themes were difficult to identify. Similarly, patients often spoke of what increased or decreased expression of a construct, with less emphasis on what they implicitly value.

Discussion: This scoping review found ample evidence for what increases or decreases expression of positive psychological constructs, but this evidence was observational and often conflicting. In the future, we recommend the development of a core set of psychological outcomes, with definitions and corresponding measurement tools. We further recommend an emphasis on randomized trials to more rigorously study how expression of constructs can be improved and what effect this has on the quality of life.

Keywords: adolescent, young adult, oncology, psychology, psychosocial, well-being

Introduction

CHILDREN AND ADOLESCENTS/YOUNG ADULTS (AYAs) with cancer are a vulnerable population, susceptible to numerous late effects, such as fatigue and depression, which may diminish their long-term psychological,^{1,2} physical,¹ spiritual,³ and emotional⁴ health. Fostering positive psychological constructs—such as hope or optimism—during treatment and maintenance has been shown to correlate with

improved rates of survival⁵ and quality of life⁶ in adult patients with cancer. To strengthen psychological care for children and AYAs with cancer, health care providers of pediatric and AYA cancer care must be equipped with robust evidence demonstrating the potential for psychological constructs to improve patient outcomes. However, a necessary first step before dedicating clinical resources to cultivating positive psychological constructs is to determine which constructs improve patient outcomes.

Departments of ¹Psychiatry and Behavioral Sciences and ²Library Services, Oklahoma State University Center for Health Sciences, Tulsa, Oklahoma, USA.

³Li Ka Shing Knowledge Institute, St. Michael's Hospital, Unity Health Toronto, Toronto, Canada.

⁴Epidemiology Division, Dalla Lana School of Public Health, University of Toronto, Toronto, Canada.

⁵Division of Population Sciences, Department of Pediatric Oncology, Dana Farber Cancer Institute/Boston Children's Hospital, Boston, Massachusetts, USA.

⁶School of Social Work, University of Oklahoma, Norman, Oklahoma, USA.

A significant portion of prior research has focused on negative psychological constructs, such as anxiety and depression, as predictors of poor health outcomes in cancer patients.^{7,8} The clinical importance of these studies is an onus on health care providers, such as doctors or nurses, to prevent, identify, and treat any negative psychological construct that arises in patients during cancer treatment. However, the mitigation or absence of negative psychological constructs does not equate to augmented positive psychological constructs, which are able to improve health outcomes in healthy and diseased populations. Moreover, positive psychological constructs may yet improve outcomes despite co-occurring negative constructs.⁹

A significant amount of research has been conducted with children and AYAs to investigate how psychological constructs function throughout cancer diagnosis, treatment, and follow-up (Evan and Zeltzer 2006).¹⁰ Much of this research is conflicting. For example, some studies have concluded that childhood cancer survivors are psychologically troubled (Hobbie et al. 2000; Meeske et al. 2001),^{11,12} whereas others conclude the opposite.¹³ Some of this research seems to have reached conclusive answers, such as how age may affect the ability of an AYA patient to cope (Jamison et al. 1986; Varni et al. 1994; Claflin and Barbarin 1991).^{14–16} However, given the breadth of the pediatric and AYA population and how family, developmental, and social factors may exert unique influences on individual patients, there is reason to believe that much is still unknown or unsolved. This becomes even more pressing when one considers the breadth of measurement instruments that have been developed, which may contribute to what seem to be conflicting results. Altogether, it is imperative that pediatric and AYA cancer research related to positive psychological constructs be collated in a systematic manner to identify key next steps to create efficient, patient-focused research objectives that can maximally improve psycho-oncological outcomes. A scoping review is an ideal method of accomplishing this task.

Scoping reviews systematically identify strengths and gaps in what is known about a topic. For example, a recent scoping review investigated practices or programs that promote AYA patient-centered communication.¹⁷ The authors of this scoping review found that only eight published articles were relevant to their review question and thus concluded that a significant gap exists in the literature regarding patient/provider communication in AYA oncology. The strength of a scoping review is to simultaneously answer a novel question (e.g., what is known on a topic) and generate new hypotheses that may be prioritized in future research. The chief aim of this scoping review is to map the existing literature regarding positive psychological constructs as they relate to health outcomes in children and AYAs with cancer. Beyond our immediate aim, the goal of this scoping review is to form the basis for a future psychometric systematic review and reliability generalization meta-analysis that will aim to identify the highest quality measurement instruments for positive constructs shown to improve health outcomes for children and AYAs with cancer.

Methods

This scoping review is reported and conducted in accordance with the PRISMA Extension for Scoping Reviews (PRISMA-ScR) and the 2020 Joanna Briggs Institute (JBI) manual for scoping reviews.^{18,19} This review was registered through the Open Science Framework (OSF).²⁰ Upon com-

pletion of this review, all data, metadata, and supplemental information will be publicly available through the OSF. This review was posted as a preprint to OSF Preprints.

Literature search

The search strategy was created and optimized by C.W., M.V., and J.G. to identify all relevant literature regarding previously selected positive psychological constructs in children and AYAs with cancer (age 2–39). The positive constructs are shown in Table 1 and a search strategy was constructed for each, individually. The search strategies were adapted to the chosen databases in accordance with the JBI manual: PubMed (which includes Medline) and CINAHL, including all conference proceedings and dissertations. Two preprint servers—MedRxiv and PsyArXiv—were searched to identify additional studies that have not been published. J.G., a medical librarian, executed the final search.

Research question

Based on the objective of this scoping review, the following research question was formulated: What is known from the published literature about positive psychological constructs and improvements in quality of life or survival among children and AYAs with cancer? The objective of this scoping review is to summarize and map the existing evidence about (1) which constructs, if any, children and AYAs consider important; (2) whether children/AYAs see value in cultivating positive psychological constructs during cancer treatment; and (3) whether cultivation of positive psychological factors is associated with improved quality of life or survival. In this study, we highlight key next steps that may include, but are not limited to: (1) recommendations for future research into specific psychological constructs; (2) recommendations to begin cultivating specific psychological constructs.

Inclusion criteria

Broad inclusion criteria for this scoping review were conceptualized according to population, concept, and context. For this review, evidence reporting on prespecified positive psychological constructs in pediatric and AYA with previous or current cancer of any type were included. No date or language limitations were enforced. Included studies related to child/AYA beliefs about selected positive psychological constructs or data related to how the selected constructs correlate with improved quality of life or survival in children or AYAs. Interventional, observational, and qualitative study designs were eligible for inclusion, along with reviews of any kind.

Included evidence came from studies of children and AYAs currently being treated for cancer or survivors of childhood or AYA cancer. Studies that focus on parent or sibling perspectives were included if they focused on the child or AYA with cancer and his or her experiences, but were analyzed separately. No restrictions based on type of cancer were included in this analysis. If a study included patients outside the age range prespecified for this study (age 2–39), it was included only if it was confirmed that at least 50% of the included patients fell within the required age range.

Screening

All screening of retrieved papers from the bibliographic database search was done in duplicate and blinding was

TABLE 1. NUMBER OF STUDIES PER CONSTRUCT WITH CONSTRUCT DEFINITIONS

<i>Construct</i>	<i>Definition</i>	<i>Number of articles</i>	<i>Article characteristics</i>
Well-being	The positive components of psychological health that characterize individuals who feel good about life and function well ¹⁷⁸	96	Quantitative: 42 Qualitative: 34 Mixed Methods: 20 Proxy: 11
Personal growth	Positive psychological change that occurs following experience with adversity ¹⁷⁹	65	Quantitative: 36 Qualitative: 11 Mixed Methods: 18 Proxy: 5
Hope	The perceived capability to derive pathways to desired goals, and motivate oneself through agency thinking to use those pathways ¹⁸⁰	60	Quantitative: 25 Qualitative: 15 Mixed Methods: 20 Proxy: 5
Meaning in life	The cognizance of order, coherence, and purpose in one's existence, the pursuit and attainment of worthwhile goals, and an accompanying sense of fulfillment ¹⁸¹	41	Quantitative: 24 Qualitative: 5 Mixed Methods: 12 Proxy: 3
Self-esteem	No <i>a priori</i> definition established, was included as incidental finding according to protocol	40	Quantitative: 24 Qualitative: 6 Mixed Methods: 10 Proxy: 5
Vitality	One's conscious experience of possessing energy and aliveness ¹⁸²	38	Quantitative: 18 Qualitative: 8 Mixed Methods: 12 Proxy: 7
Optimism	The belief that one's outcomes will be positive rather than negative ¹⁸³	36	Quantitative: 20 Qualitative: 4 Mixed Methods: 12 Proxy: 2
Resilience	No <i>a priori</i> definition established, was included as incidental finding according to protocol	29	Quantitative: 14 Qualitative: 4 Mixed Methods: 11 Proxy: 0
Gratitude	Generalized tendency to recognize and respond with grateful emotion to the roles of other people's benevolence in the positive experiences and outcomes that one obtains ¹⁸⁴	25	Quantitative: 14 Qualitative: 4 Mixed Methods: 7 Proxy: 1
Life satisfaction	A global assessment of a person's quality of life according to their chosen criteria ¹⁸⁵	23	Quantitative: 16 Qualitative: 1 Mixed Methods: 6 Proxy: 2
Self-acceptance	An individual's satisfaction or happiness with themselves ¹⁸⁶	15	Quantitative: 4 Qualitative: 9 Mixed Methods: 2 Proxy: 1
Happiness	A positive emotional state that is most general and not restricted to any specific circumstances or events ¹⁸⁷	14	Quantitative: 8 Qualitative: 1 Mixed Methods: 5 Proxy: 1
Tranquility	A natural settling of thoughts and emotions, in which there is stability of attention, sensory clarity, and equanimity of affect and behavior ¹⁸⁸	9	Quantitative: 6 Qualitative: 2 Mixed Methods: 1 Proxy: 1
Perseverance	The ability to pursue one's goals to completion, even in the face of obstacles ¹⁸⁹	6	Quantitative: 2 Qualitative: 2 Mixed Methods: 2 Proxy: 0
Contentment	The perception that the present situation is enough and entire ¹⁹⁰	4	Quantitative: 1 Qualitative: 1 Mixed Methods: 2 Proxy: 1

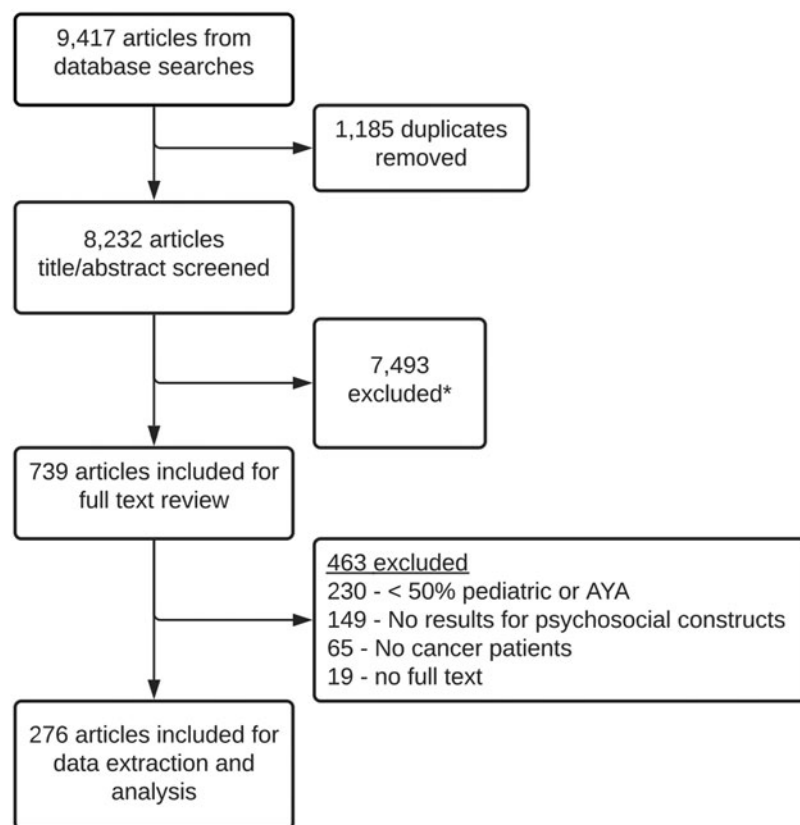


FIG. 1. Flow diagram of included and excluded studies. *Reasons for inclusion include <50% pediatric or AYA, no results for psychological constructs, no cancer patients. AYA, adolescent and young adult.

maintained between screeners. Before screening, a pilot test of 50 randomly selected articles was completed. Greater than the prespecified 90% concordance between screeners was achieved after one pilot test. We used Rayyan²¹ to screen all references by title and abstract. The full text of studies was then examined to finalize the list of included studies using the same methods to ensure blinding.

Data charting

Following the identification of included articles, we proceeded to data charting. Data charting, like article screening, was conducted in a dual, blinded fashion using an extraction form optimized for use in Google Forms. A pilot test was conducted to optimize the extraction form, similar to the methods described in the Screening section. Prespecified information to be gathered on positive psychological constructs included qualitative data, quantitative data, or both, depending on the design of the included studies. The purpose of this phase of the scoping review was to chart the strengths and gaps in our knowledge of positive psychological factors on health outcomes in children and AYAs.

Synthesis

Fifteen positive psychological constructs were selected based on previously published literature related to cancer, diabetes, and cardiovascular outcomes.^{6,22,23} Data were cataloged according to the 15 chosen constructs. New constructs, beyond those initially searched that were identified, were included as novel constructs and analyzed separately. Included studies and their constructs were judged against the definitions for included

constructs seen in Table 1. If an included study did not define a construct, we did our best to judge whether included data were relevant. For example, if a patient expressed appreciation for their ability to complete small, day-to-day tasks, we would categorize this as “gratitude,” even if the study did not offer any definition of gratitude.

Due to the nature of this scoping review, there were no statistical analyses planned. Included data were reported using simple thematic categorization. Proposed themes included favorable, unfavorable, or indifferent patient views or quantitative data regarding specific positive constructs in the context of cancer treatment. All data were charted and recommendations for future research are made with as much specificity as possible, based on age at diagnosis, race, gender, type of cancer, and other socioeconomic factors identified. For age at diagnosis, we attempted to categorize data according to three distinct groups of pediatric/AYA cancer patients/survivors: those <15 years of age, between 15-21 years of age, and >21 years of age.

Results

Characteristics of included studies

Overall, 9417 articles were returned from our database searches. After removing duplicates (n -1185), 8232 articles were screened for inclusion. After applying inclusion and exclusion criteria, 739 articles were eligible for full-text review. After a full-text review, 276 were included as our final sample. A flow diagram of all inclusions and exclusions is shown in Figure 1. No data for the constructs of cheerfulness and enthusiasm were found in our final sample; however, two



FIG. 2. Word cloud of constructs and their frequency in included articles.

new constructs were identified: resilience and self-esteem (Fig. 2). Eighteen potentially relevant studies were identified from preprint servers, but zero met inclusion criteria.

Included studies had a median sample size of 60 (IQR 17–171.75) and included patients from 38 countries, most often the United States ($n=114$, 41.3%), Canada ($n=27$, 9.8%), and Sweden ($n=15$, 5.4%) (Table 2). These included studies were mostly observational ($n=91$, 32.9%), interviews ($n=74$, 26.8%), mixed-methods studies ($n=47$, 17.0%), or narrative reviews ($n=25$, 9.1%). Few randomized-controlled trials ($n=11$, 4.0%) and systematic reviews ($n=15$, 5.4%) were included. Categorizing studies by age group was challenging due to individual study reporting. The majority of included studies included patients whose ages spanned more than one prespecified group ($n=158$, 57.2%). Overall, 57 (20.7%) studies were restricted to patients less than 15 years of age, 16 (5.8%) to 15–21-year olds, and 21 (7.6%) to 22–39-year olds. Few studies evaluated a single cancer ($n=44$, 15.9%). Overall, studies most often included patients with leukemia ($n=198$, 71.7%), lymphomas ($n=64.5%$), and central nervous system tumors ($n=120$, 43.5%). A significant number of studies did not, in part or in whole, specify which tumors they include ($n=107$, 38.8%). Few studies included proxy reports ($n=28$, 10.1%). All included constructs were measured by at least 2 different measurement tools, with growth, well-being, optimism, resilience, and self-esteem each being measured by more than 10.

Psychological constructs

Well-being was studied by 96 (34.7%) included articles. There was conflicting evidence about whether patient well-being was better,^{24,25} worse,^{26–28} or no different from healthy controls.^{29–31} Most often, well-being was correlated with increased social support.^{32–35} Physical activity^{36,37} and art making^{38,39} also correlated with increased well-being. Health care workers played an important role in patient well-being through good communication,³¹ comprehensive care,⁴⁰ and encouraging appropriate expectations of treatment.⁴¹

TABLE 2. SUMMARY OF STUDY AND INCLUDED PATIENT CHARACTERISTICS

Included cancers (most common)	
Leukemia	
Unspecified type	113 (40.94%)
Acute lymphoblastic	58 (21.01%)
Acute myeloid	20 (7.25%)
Lymphoma	
Unspecified type	86 (31.16%)
Hodgkin’s	49 (17.75%)
non-Hodgkin’s	40 (14.49%)
Sarcoma	
Soft tissue	58 (21.01%)
Bone	45 (16.30%)
Ewing	24 (8.70%)
Central nervous system	120 (43.48%)
Other (not specified)	107 (38.77%)
Germ cell	69 (25.0%)
Patient age groups*	
< 15 years old	57 (20.65)
15–21 years old	16 (5.80%)
22–39 years old	42 (15.22%)
Ages span more than 1 group	158 (57.25%)
Proxy reports only, ages not specified	3 (1.09%)
Study designs	
Observational	91 (32.9%)
Interview	74 (26.81%)
Mixed-Methods	47 (17.0%)
Review	25 (9.06%)
Systematic review	15 (5.43%)
Randomized controlled trial	11 (3.99%)
Nonrandomized trials	6 (2.17%)
Case study	2 (0.72%)
Post-hoc analysis of trial	2 (0.72%)
Predictive model	1 (0.36%)
Psychometric validation study	1 (0.36%)
Conference presentation	1 (0.36%)
Location of patients**	
USA	114
Canada	27
Sweden	15
Australia	12
Netherlands	12
Italy	10
United Kingdom	10

*Grouped according to these criteria due to variations between studies. **Counts greater than 10, some studies included patients from more than 1 country.

Negative body image,^{33,42,43} anxiety, depression,^{44,45} and fatigue^{46,47} decreased patient well-being. Moreover, treatment side effects, especially pain,⁴⁸ correlated with lower well-being. Last, ample evidence, from primary and proxy reports, indicated that as time passed from diagnosis, well-being decreased.^{49–51}

Personal growth was described by 65 (23.6%) articles in our sample. The most significant factor contributing to personal growth was the cancer experience itself (37/65, 56.9%). Some specific areas of growth mentioned were improved self-reflection,⁵² clearer life purpose,⁵³ a positive new identity,^{54,55} overall maturation,⁵⁶ and increased empathy.⁵⁷ Faith in God and spiritual struggles played a significant role in patient personal growth,^{58,59} mostly by allowing patients to

adapt to or comprehend their disease. Social support systems helped promote growth in patients with cancer.^{60,61} Last, inner resources of patients, including self-esteem,⁶² optimism,⁶³ and self-affirmation,⁶⁴ were shown to improve growth in patients with cancer.

Survivors of cancer described how body image changes and perceived changes to their social reputation among peers⁶⁵ were factors which decreased personal growth. Depression⁶⁶ and stress⁶⁷ also played a role.

Hope in cancer patients was reported by 60 (21.7%) articles. One study identified three main objects of hope for patients with cancer⁶⁸: breakthrough treatments, cures,^{69,70} and future children or family.⁷¹⁻⁷⁴ Hope was shown to predict resilience,^{75,76} mitigate future distress,⁷⁷ and aid recovery.⁷⁸ Hope was important for patients to derive meaning and cope with their illness.⁷⁹⁻⁸¹

Increased hope was correlated with positive rumination,⁸² humor, belief in God,⁸³ self esteem,⁸⁰ optimism,⁸⁴ and peer/family support.^{85,86} Other factors were related to health care providers, with nurses being especially important.^{87,88} As it relates to physicians, studies highlighted the importance of honest, complete communication with patients about prognosis.^{83,89,90}

Factors which correlated with decreased hope included anxiety, depression,⁸² infertility,⁹¹ and dissatisfaction with oncologist communication. One father described how his son's oncologist "undid some of our work on hope" by disclosing his son's prognosis, against his son's wishes.⁹²

Meaning in life for patients with cancer was discussed by 41 (14.9%) articles. Cancer facilitated meaning discovery through refined career goals,^{52,93} self reflection,⁷³ new religious perspectives,⁹⁴ and giving patients a purpose.⁹⁵ One study suggested that patients may find meaning in cancer by: attempting to define the disease, viewing cancer as a "divine test", or as a catalyst for positive self-reconstruction.⁹⁶ Intrinsic factors, such as self-esteem,⁴⁴ religious faith,⁹⁷ spiritual well-being,⁹⁸ and positive coping strategies,⁹⁹ correlated with meaning discovery. Interventions that may improve meaning discovery include increasing social support,⁹⁸ legacy making through story or art,¹⁰⁰ increased benevolence toward others,⁶⁴ and certain meaning-centered programs.¹⁰¹ Finally, there is evidence that fulfilling employment, meeting education goals,¹⁰² and accomplishing tasks¹⁰³ may improve meaning discovery in patients with cancer.

Factors that interfered with meaning discovery included anxiety, depression,¹⁰⁴ negative emotions,¹⁰⁵ and a sense that there is little time left to live.¹⁰⁶

Self-esteem was described by 40 (14.5%) articles to be increased by peer engagement, hope, academic success, and physical activity.^{34,80,84} Patients commonly attributed their self-esteem to having and surviving cancer,¹⁰⁷⁻¹⁰⁹ as well as relationships with health care providers.¹¹⁰ Factors that decreased self-esteem included poor body image,^{29,73,111} sexual dysfunction,¹¹² physical impairment,¹¹³ and fatigue.²⁹

Included articles did not agree with respect to whether patients with cancer have higher self-esteem than healthy controls. Some found higher,^{25,113} lower,^{108,114} or equal^{28,115} self-esteem in patients.

Vitality among patients with cancer was reported in 38 (13.8%) of included studies, most often as a component of overall quality of life or well-being. Few factors were reported that increased vitality, including marriage,¹¹⁶ yoga,¹¹⁷

and stronger overall mental or physical health.^{118,119} There were conflicting results for whether time since diagnosis improves vitality.¹²⁰⁻¹²³

Decreased vitality was seen in patients with lower income, a longer disease course, a longer hospital stay, and sexual dysfunction.^{124,125} More conflicting evidence about vitality was found for patients relative to healthy controls; five studies observed no difference,¹²⁵⁻¹²⁹ three observed lower vitality,¹³⁰⁻¹³² and three observed higher vitality.¹³³⁻¹³⁵ Demographic characteristics followed a similar trend. For example, one study found older patients have more vitality than younger,¹²¹ whereas three studies showed the opposite.^{125,131,136}

Optimism was a focus of 36 (13.0%) included articles. Multiple studies reported that optimism was increased during the cancer experience^{94,137-139} and that optimism improved a patient's ability to cope with cancer.^{71,102,140} Family and peer support were important for increasing optimism.¹⁴¹ Other factors such as religious faith,⁵⁹ hope,¹⁴² posttraumatic growth,⁶⁶ and strong mental health^{143,144} were correlated with higher levels of optimism.

Factors that decreased optimism were less often reported. Proxy reports indicate that pessimism¹⁴⁵ and a diagnosis of brain cancer⁵⁶ correlated with lower levels of optimism in patients with cancer.

Resilience was frequently discussed (29/276, 10.5%), despite not being included in our original search. The cancer experience itself induced resilience,^{34,108,146} similar to engaging in positive coping strategies,^{42,66,75} such as setting and maintaining future goals.⁷⁸ When patients felt any form of connection or belonging, resilience was reported to increase.^{66,147} Religious faith may be one form of connection or belonging.⁵⁹ Similar to other constructs, anxiety, distress, pessimism, and a feeling of not knowing what to expect decreased resiliency.^{66,78}

Gratitude was evaluated by 25 (9.1%) included articles. No factors were found that decreased gratitude. The three predominant factors that increased gratitude were: having and surviving cancer,^{55,57,148} peer support,^{103,149} and a strong relationship with their health care provider.^{110,150} Cancer was described as helping patients appreciate the small things in life.⁵⁷ Family selflessness was important for cancer patients, with one cancer patient describing how newfound fatherly affection made them the most grateful.¹⁰³ Moreover, when health care providers made time for patients and treated them as individuals, gratitude increased.^{110,150} Other factors that were associated with increased gratitude were religious faith,¹⁵¹ the possibility of having a future family,⁷¹ and understanding the finiteness of life.⁹¹ Interestingly, patients said that their gratitude as a child improved health care follow-up in adulthood through increased personal responsibility.¹⁵²

Satisfaction with life or circumstance was described by 23 (8.3%) articles. Patients described how finding ways to grow as a person,¹⁵³ focus on just the present,⁶⁴ engage with friends and family,^{154,155} and maintain a positive affect or outlook¹⁵⁶ were factors that increased life satisfaction. Improved social skills and perceptions of their health correlated with improved life satisfaction.¹⁵³ However, factors that eroded life satisfaction ranged from depression to anxiety to somatic late effects of cancer to longer treatment duration.¹⁵⁷ Sexual dysfunction and disfigurement from treatment contributed to lower life satisfaction.^{124,158}

Self-acceptance was discussed by 15 (5.4%) included articles. None focused on mechanisms or factors that decrease patient self-acceptance. In a similar fashion to other constructs, the cancer experience was most often shown to increase self-acceptance through increased optimism, heightened existential awareness, and more positive self-beliefs.^{34,94}

Anticipatory guidance about possible physical changes during cancer treatment increased female patient self-acceptance,³³ as did peer engagement¹⁵⁹ and a focus on social-emotional well-being.⁴⁴ When cancer patients were reminded or shown that they are capable of accomplishing tasks like peers without cancer, their self-acceptance increased.^{54,103} Mind-body exercises, like yoga and tai-chi, improved self-acceptance, and, according to patients, this occurred by demonstrating their body's physical capabilities were intact.^{33,117}

Happiness was studied by 14 (5.1%) included articles. The factors most commonly attributed to increased happiness was the cancer experience and the suffering it caused,⁹⁴ the relief of completing treatment,¹⁶⁰ and gratitude for suffering less than expected.¹⁴¹ In many cases, it was implied that patient happiness was relative to others, and may not represent increased happiness from baseline before cancer. A randomized trial showed that guided imagination and drawing-storytelling increased patient happiness.¹⁶¹ A qualitative study indicated that displaying patient artwork made the hospital feel less "clinical".³⁹ If patients were disfigured¹⁵⁸ or subjected to a more intense treatment regimen,¹⁶² their happiness was reported to decline.

Tranquility was mentioned by 9 (3.3%) articles included in this study. Similar to other constructs, the cancer experiences increased tranquility, although through patients experiencing a nearness to death and suffering.⁹⁶ Interventions that were found to improve tranquility ranged from advanced care planning¹⁶³ to high-quality communication from health care providers¹⁶⁴ to prayer and religious engagement.¹⁶⁵ On the contrary, fatigue, depression, and anxiety all eroded tranquility among cancer patients.^{46,164} There was also evidence from one observational study that cancer survivors were less tranquil over time than healthy controls.¹⁶⁶

Perseverance was discussed in 6 (2.2%) included articles. Factors found to increase perseverance of pediatric and AYA cancer patients were: the cancer experience,^{34,167} hope for a future cure,¹⁶⁸ and relationships with oncology nurses.⁸⁷ The cancer experience was described as giving patients an "unknown strength" by patients,¹⁶⁷ whereas hope for a cure allowed patients to persevere despite treatment side effects. Finally, perseverance was described as an active choice in the face of disease progression.¹⁴¹

Contentment was discussed in 4 (1.4%) articles in our final sample. Overall, four unique factors, each supported by a single study, were found to increase contentment in pediatric and AYA cancer patients: home cancer treatments, increased self-esteem, gratitude for having fewer negative cancer experiences, and surviving cancer.^{64,107,169} Moreover, receiving a diagnosis of cancer was found to decrease contentment in a positive manner, by driving patients to see fulfillment and meaning in their life.¹⁷⁰

Discussion

This scoping review of key positive psychological constructs in pediatric and AYA patients with cancer found a significant amount of observational research and mixed

TABLE 3. PROPOSED NONPHARMACOLOGICAL INTERVENTIONS THAT MAY BE TESTED IN FUTURE CLINICAL TRIALS

<i>Intervention</i>	<i>Construct(s) to which it may apply</i>
Home chemotherapy	Well-being, contentment
Physical activity	Well-being, satisfaction, self-esteem, vitality, self-acceptance
Art-making	Well-being, happiness, meaning
Social or clinical support mechanisms	Well-being, growth, hope, meaning, optimism, gratitude
Advanced care planning	Tranquility
Communication with patients	Well-being, hope, tranquility

methods research, with less focus on patient interviews, and little focus on interventions. The result is that our study shows what may correlate with increased or decreased expression of included positive constructs, but is hindered in its ability to identify key mechanisms to improve the psychological care of pediatric and AYA patients with cancer. We did not find any studies correlating improved psychological care with survival benefits. Nonetheless, our study is able to provide key recommendations for future research in pediatric and AYA patients with cancer, which include the identification of a core set of positive psychological constructs, use of standardized measurement tools, and the testing of interventions with randomized trials (Table 3).

To begin, we identified the included constructs by reviewing the pediatric cancer, diabetes, and cardiovascular literature.^{6,22,23} We were unable to identify a core set of psychological constructs that play the largest role in oncology care for pediatric and AYA patients. Moreover, we were hindered in our ability to determine if the studies we included used compatible definitions for constructs. Many included studies did not define the construct they were studying, making it difficult for us to assess their results. An example has to do with the construct "vitality". It was often unclear if authors were assessing patients for vitality in the sense of physical capacity to perform activities, or in the sense of mental energy and aliveness. Only the latter is a psychological construct. A core set of psychological constructs would help resolve this issue by standardizing the name and definition of psychological outcomes.¹⁷¹ Core outcome sets have been used across the medical literature and represent the minimum set of outcomes that should be reported in a scientific discipline.^{172,173} These outcomes are chosen by patients, caregivers, physicians, and other stakeholders using robust, Delphi methodology.¹⁷⁴ For children and AYAs with cancer, this core outcome set may vary if the patient is at the end of life or palliative treatment setting. In the present case, perhaps highly related constructs, like contentment and tranquility can be combined and standardized so that the literature on these constructs is more unified and powerful.

Next, as a continuation of identifying a core set of psychological constructs, we recommend that measurement tools be studied with more scrutiny, since the tools used in our study were wide ranging and applied to diverse ranges of patients. For

all constructs, at least two measurement instruments were used by included studies, with five constructs being measured by more than 10 unique instruments or versions of instruments. The goal of this study was not to test the robustness of measurement tools; however, we suspect that one measurement tool may not be relevant to both pediatric and AYA populations. As it stands, the pediatric and AYA population is one of the most diverse in all clinical oncology^{175,176}; thus, more precision is required when planning studies, choosing measurement tools, and gathering data.

Last, our study showed that multiple factors correlated with increased expression of included positive psychological constructs, but there is evidence that this data may not be robust. For example, patients with cancer had higher, lower, or no different expressions of certain constructs when compared with healthy controls. Nonetheless, there is a framework for interventions being tested to improve expression of positive constructs. The PRISM intervention¹⁷⁷—a skill-based, early palliative care intervention targeting stress management, goal setting, cognitive reframing, and meaning making—was tested in a randomized trial and shown to improve expression of resilience in the primary analysis, as well as hope, optimism, well-being, and personal growth in a post-hoc analysis. Moreover, a recent review of psychological interventions showed that the vast majority of those studied found favorable results.¹⁴⁶ Therefore, while our call for increased attention to randomized testing of psychological interventions in the pediatric and AYA patient population is not new, our study shows yet again that more decisive research is needed to improve the psychological care of patients with cancer.

This study is limited by factors previously discussed: lack of definition of included constructs and conflicting data, which occasionally hindered reaching consensus. Nonetheless, our scoping review searched the medical and psychological literature broadly, and was able to make key recommendations to improve the psycho-oncology literature going forward as it pertains to pediatric and AYA patients.

In conclusion, this study of 15 positive psychological constructs in pediatric and AYA oncology found that much of the literature is observational or qualitative, with less reliance on randomized trials. Moreover, the included studies used a diverse set of measurement tools, and it is unclear whether these tools are appropriate for all participants. In the future, we recommend the study of psychosocial constructs in the context of clinical trials (with disease severity in mind) and the development of a core set of psychological outcomes and measurement instruments.

Author Contributions

C.W., A.C.T., and M.V. planned and conceptualized the project. C.W., M.V., and J.G. optimized and conducted all database searches. C.W., J.M., H.W., N.K., and M.C. screened all references and extracted all data. All authors participated in writing the article. All authors approved the article in its final form.

Author Disclosure Statement

The authors have no conflicts of interest.

Funding Information

Research reported in this publication was supported by the National Cancer Institute of the National Institutes of Health

under Award Number F30CA243651. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. ACT is funded by a Tier 2 Canada Research Chair in Knowledge Synthesis.

References

- Stein KD, Syrjala KL, Andrykowski MA. Physical and psychological long-term and late effects of cancer. *Cancer*. 2008;112(S11):2577–92.
- Banegas MP, Guy GP Jr, de Moor JS, et al. For Working-age cancer survivors, medical debt and bankruptcy create financial hardships. *Health Aff*. 2016;35(1):54–61.
- Puchalski CM. Spirituality in the cancer trajectory. *Ann Oncol*. 2012;23(Suppl 3):49–55.
- Stanton AL. What happens now? Psychosocial care for cancer survivors after medical treatment completion. *J Clin Oncol*. 2012;30(11):1215–20.
- Hoodin F, Uberti JP, Lynch TJ, et al. Do negative or positive emotions differentially impact mortality after adult stem cell transplant? *Bone Marrow Transplant*. 2006;38(4):255–64.
- Amonoo HL, Barclay ME, El-Jawahri A, et al. Positive psychological constructs and health outcomes in hematopoietic stem cell transplantation patients: a systematic review. *Biol Blood Marrow Transplant*. 2009;25(1):e5–e16.
- El-Jawahri A, Traeger L, Greer JA, et al. Effect of inpatient palliative care during hematopoietic stem-cell transplant on psychological distress 6 months after transplant: results of a randomized clinical trial. *J Clin Oncol*. 2017; 35(32):3714–21.
- Costanzo ES, Juckett MB, Coe CL. Biobehavioral influences on recovery following hematopoietic stem cell transplantation. *Brain Behav Immun*. 2013;30(Suppl): S68–74.
- Chida Y, Steptoe A. Positive psychological well-being and mortality: a quantitative review of prospective observational studies. *Psychosom Med*. 2008;70(7):741–56.
- Evan EE, Zeltzer LK. Psychosocial dimensions of cancer in adolescents and young adults. *Cancer*. 2006;107(7 Suppl):1663–71.
- Hobbie WL, Stuber M, Meeske K, et al. Symptoms of posttraumatic stress in young adult survivors of childhood cancer. *J Clin Oncol*. 2000;18(24):4060–6.
- Meeske KA, Ruccione K, Globe DR, Stuber ML. Post-traumatic stress, quality of life, and psychological distress in young adult survivors of childhood cancer. *Oncol Nurs Forum*. 2001;28(3):481–9.
- Gray RE, Doan BD, Shermer P, et al. Psychologic adaptation of survivors of childhood cancer. *Cancer*. 1992; 70(11):2713–21.
- Jamison RN, Lewis S, Burish TG. Cooperation with treatment in adolescent cancer patients. *J Adolesc Health Care*. 1986;7(3):162–7.
- Varni JW, Katz ER, Colegrove R, Dolgin M. Perceived stress and adjustment of long-term survivors of childhood cancer. *J Psychosoc Oncol*. 1994;12(3):1–16.
- Claffin CJ, Barbarin OA. Does “telling” less protect more? Relationships among age, information disclosure, and what children with cancer see and feel. *J Pediatr Psychol*. 1991;16(2):169–91.
- Gorman JR, Standridge D, Lyons KS, et al. Patient-centered communication between adolescent and young adult cancer survivors and their healthcare providers: Identify-

- ing research gaps with a scoping review. *Patient Educ Couns*. 2018;101(2):185–94.
18. Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*. 2018;169(7):467–473.
 19. Peters MDJ, Godfrey C, McInerney P, et al. Chapter 11: Scoping Reviews (2020 version). In: Aromataris E, Munn Z, eds. *JBI Manual for Evidence Synthesis*. Joanna Briggs Institute; 2020.
 20. Wayant C, Manquen J, Wendelbo H, et al. Identification of key positive psychosocial constructs in pediatric and adolescent/young adult patients with cancer: a scoping review protocol [Internet]. Open Science Framework. 2020. Accessed October 5, 2020 from: <https://osf.io/dzb82/>
 21. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. *Syst Rev*. 2016;5(1):210.
 22. Huffman JC, DuBois CM, Millstein RA, et al. Positive psychological interventions for patients with type 2 diabetes: Rationale, theoretical model, and intervention development. *J Diabetes Res*. 2015;2015:428349.
 23. Huffman JC, Mastromauro CA, Boehm JK, et al. Development of a positive psychology intervention for patients with acute cardiovascular disease. *Heart Int*. 2011;6(2):e14.
 24. Tremolada M, Bonichini S, Taverna L, et al. Health-related quality of life in AYA cancer survivors who underwent HSCT compared with healthy peers. *Eur J Cancer Care*. 2018;27(6):e12878.
 25. Sautier LP, Sarkar S, Petersen M, et al. Psychological symptom burden in children and adolescents after leukemia or lymphoma diseases. *Prax Kinderpsychol Kinderpsychiatr*. 2015;64(4):273–89.
 26. Warner EL, Nam GE, Zhang Y, et al. Health behaviors, quality of life, and psychosocial health among survivors of adolescent and young adult cancers. *J Cancer Surviv*. 2016;10(2):280–90.
 27. Waters EB, Wake MA, Hesketh KD, et al. Health-related quality of life of children with acute lymphoblastic leukaemia: comparisons and correlations between parent and clinician reports. *Int J Cancer*. 2003;103(4):514–8.
 28. van Riel CAHP, Meijer-van den Bergh EEM, Kemps HLM, et al. Self-perception and quality of life in adolescents during treatment for a primary malignant bone tumour. *Eur J Oncol Nurs*. 2014;18(3):267–72.
 29. Dobinson KA, Hoyt MA, Seidler ZE, et al. A grounded theory investigation into the psychosexual unmet needs of adolescent and young adult cancer survivors. *J Adolesc Young Adult Oncol*. 2016;5(2):135–45.
 30. Kızmaçoğlu D, Sari S, Evim Sezgin M, et al. Assessment of health-related quality of life in pediatric acute lymphoblastic leukemia survivors: Perceptions of children, siblings, and parents. *Turk J Haematol*. 2019;36(2):112–6.
 31. Skaczkowski G, White V, Thompson K, et al. Do Australian adolescents' and young adults' experiences of cancer care influence their quality of life. *Psycho-Oncology*. 2018;27:990–7.
 32. Roberts CS, Piper L, Denny J, Cuddeback G. A support group intervention to facilitate young adults' adjustment to cancer. *Health Soc Work*. 1997;22(2):133–41.
 33. Burg AJ. Body Image and the female adolescent oncology patient. *J Pediatr Oncol Nurs*. 2016;33(1):18–24.
 34. Choquette A, Rennick JE, Lee V. Back to school after cancer treatment: making sense of the adolescent experience. *Cancer Nurs*. 2016;39(5):393–401.
 35. Trevino KM, Fasciano K, Block S, Prigerson HG. Correlates of social support in young adults with advanced cancer. *Support Care Cancer*. 2013;21(2):421–9.
 36. Epstein I. Adventure therapy: a mental health promotion strategy in pediatric oncology. *J Pediatr Oncol Nurs*. 2004;21(2):103–10.
 37. Keats MR, Courneya KS, Danielsen S, Whitsett SF. Leisure-time physical activity and psychosocial well-being in adolescents after cancer diagnosis. *J Pediatr Oncol Nurs*. 1999;16(4):180–8.
 38. Derman YE, Deatrck JA. Promotion of well-being during treatment for childhood cancer: A literature review of art interventions as a coping strategy. *Cancer Nurs*. 2016;39(6):E1–16.
 39. Green AR, Young RA. The lived experience of visual creative expression for young adult cancer survivors. *Psycho-Oncology*. 2018;27:990–7.
 40. Kirch R, Reaman G, Feudtner C, et al. Advancing a comprehensive cancer care agenda for children and their families: Institute of Medicine Workshop highlights and next steps. *CA A Cancer J Clin*. 2016;66:398–407.
 41. Hinds PS. Quality of life in children and adolescents with cancer. *Semin Oncol Nurs*. 1990;6(4):285–91.
 42. Jacobs LA, Pucci DA. Adult survivors of childhood cancer: the medical and psychosocial late effects of cancer treatment and the impact on sexual and reproductive health. *J Sex Med*. 2013;10 Suppl 1:120–6.
 43. Kuhlthau K, Luff D, Delahaye J, et al. Health-related quality of life of adolescent and young adult survivors of central nervous system tumors: Identifying domains from a survivor perspective. *J Pediatr Oncol Nurs*. 2015;32(6):385–93.
 44. Ryan SJ, Hoyt MA. Adult self-image and well-being after testicular cancer: The role of agency and meaning. *Psychol Health*. 2018;33(8):1049–61.
 45. Darabos K, Hoyt MA. Cancer-related worry and physical well-being in the context of perceived stress in young adults with testicular cancer. *J Adolesc Young Adult Oncol*. 2017;6(2):363–6.
 46. Gibson F, Mulhall AB, Richardson A, et al. A phenomenologic study of fatigue in adolescents receiving treatment for cancer. *Oncol Nurs Forum*. 2005;32(3):651–60.
 47. Wu M, Hsu L, Zhang B, et al. The experiences of cancer-related fatigue among Chinese children with leukaemia: a phenomenological study. *Int J Nurs Stud*. 2010;47(1):49–59.
 48. Li HCW, Chung OKJ, Chiu SY. The impact of cancer on children's physical, emotional, and psychosocial well-being. *Cancer Nurs*. 2010;33(1):47–54.
 49. van Dijk J, Huisman J, Moll AC, et al. Health-related quality of life of child and adolescent retinoblastoma survivors in the Netherlands. *Health Qual Life Outcomes*. 2007;5:65.
 50. Hendricks-Ferguson V. Hope and spiritual well-being in adolescents with cancer. *West J Nurs Res*. 2008;30(3):385–401; discussion 402–7.
 51. McDougall J, Tsonis M. Quality of life in survivors of childhood cancer: a systematic review of the literature (2001–2008). *Support Care Cancer*. 2009;17(10):1231.
 52. Jones BL, Parker-Raley J, Barczyk A. Adolescent cancer survivors: identity paradox and the need to belong. *Qualit Health Res*. 2011;21:1033–40.

53. Morse EE, O'Rourke K. Spirituality of childhood cancer survivors. *J Soc Integr Oncol*. 2009;7(4):146–54.
54. Gillard A, Allsop J. Camp experiences in the lives of adolescents with serious illnesses. *Child Youth Serv Rev*. 2016;65:112–9.
55. Fauske L, Bondevik H, Ahlberg K, Bjørndal A. Identifying bone sarcoma survivors facing psychosocial challenges. A study of trajectories following treatment. *Eur J Cancer Care*. 2019;28(5):e13119.
56. Nicklin E, Velikova G, Hulme C, et al. Long-term issues and supportive care needs of adolescent and young adult childhood brain tumour survivors and their caregivers: A systematic review. *Psycho-Oncology*. 2019;28:477–87.
57. Hauken MA, Grue M, Dyregrov A. “It’s been a life-changing experience!” A qualitative study of young adult cancer survivors’ experiences of the coexistence of negative and positive outcomes after cancer treatment. *Scand J Psychol*. 2019;60:577–84.
58. Rabelais E, Jones NL, Ulrich CM, Deatrck JA. Meaning making and religious engagement among survivors of childhood brain tumors and their caregivers. *Oncol Nurs Forum*. 2019;46(2):170–84.
59. Niepage M, Georgievski G, Shama W, Lucchetta S. Exploring adolescents’ cancer journey through photovoice: a narrative synthesis. *J Adolesc Young Adult Oncol*. 2018;7:15–21.
60. Tremolada M, Bonichini S, Basso G, Pillon M. Adolescent and young adult cancer survivors narrate their stories: predictive model of their personal growth and their followup acceptance. *Eur J Oncol Nurs*. 2018;36:119–28.
61. Turner JK, Hutchinson A, Wilson C. Correlates of post-traumatic growth following childhood and adolescent cancer: A systematic review and meta-analysis. *Psychooncology*. 2018;27(4):1100–9.
62. Koutná V, Jelínek M, Blatný M, Kepák T. Predictors of posttraumatic stress and posttraumatic growth in childhood cancer survivors. *Cancers*. 2017;9(3):26.
63. Michel G, Taylor N, Absolom K, Eiser C. Benefit finding in survivors of childhood cancer and their parents: further empirical support for the benefit finding scale for children. *Child Care Health Dev*. 2010;36:123–9.
64. Yi J, Kim MA, Akter J. How do they grow out of their cancer experience? Korean adolescent and young adult cancer survivors’ stories. *Ethn Health*. 2019;1–17.
65. Zwiers A, Campbell C, Evans M, Kirkwood K. Constructing the meaning of survivor with former pediatric brain tumor patients. *J Pediatr Oncol Nurs*. 2015;32(3):143–52.
66. Arpawong TE, Oland A, Milam JE, Ruccione K, et al. Post-traumatic growth among an ethnically diverse sample of adolescent and young adult cancer survivors. *Psychooncology*. 2013;22(10):2235–44.
67. Barnett M, McDonnell G, DeRosa A, et al. Psychosocial outcomes and interventions among cancer survivors diagnosed during adolescence and young adulthood (AYA): a systematic review. *J Cancer Surviv*. 2016;10(5):814–31.
68. Gray MF, Ludman EJ, Beatty T, et al. Balancing Hope and Risk Among Adolescent and Young Adult Cancer Patients with Late-Stage Cancer: a Qualitative Interview Study. *J Adolesc Young Adult Oncol*. 2018;7:673–80.
69. Al-Azri MH, Al-Awisi H, Al-Rasbi S, Al-Moundhri M. Coping with a diagnosis of breast cancer among Omani women. *J Health Psychol*. 2014;19:836–46.
70. Crane S, Haase J, Hickman S. Well-Being of Child and Family Participants in Phase 1 Pediatric Oncology Clinical Trials. *Oncol Nurs Forum*. 2018;45:E67–97.
71. Benedict C, McLeggon J-A, Thom B, et al. “Creating a family after battling cancer is exhausting and maddening”: Exploring real-world experiences of young adult cancer survivors seeking financial assistance for family building after treatment. *Psychooncology*. 2018;27(12):2829–39.
72. Goertzel L, Goertzel T. Health locus of control, self-concept, and anxiety in pediatric cancer patients. *Psychol Rep*. 1991;68:531–40.
73. Kavas MV. How to increase the quality of a suffering experience: lessons derived from the diary narratives of a dying adolescent girl. *OMEGA*. 2018;76:256–95.
74. Parton C, Ussher JM, Perz J. Hope, burden or risk: a discourse analytic study of the construction and experience of fertility preservation in the context of cancer. *Psychol Health*. 2019;34:456–77.
75. Hong SS, Park HR. Predictors of Resilience in Adolescents with Leukemia. *J Korean Acad Nurs*. 2015;45:595.
76. Ginter AC. “The day you lose your hope is the day you start to die”: quality of life measured by young women with metastatic breast cancer. *J Psychosoc Oncol*. 2020;38:418–34.
77. Rosenberg AR, Bradford MC, Bona K, et al. Hope, distress, and later quality of life among adolescent and young adults with cancer. *J Psychosoc Oncol*. 2018;36:137–44.
78. Crawshaw MA, Sloper P. “Swimming against the tide”—the influence of fertility matters on the transition to adulthood or survivorship following adolescent cancer. *Eur J Cancer Care*. 2010;19(5):610–20.
79. Ishibashi A, Ueda R, Kawano Y, et al. How to improve resilience in adolescents with cancer in Japan. *J Pediatr Oncol Nurs*. 2010;27(2):73–93.
80. Abrams AN, Hazen EP, Penson RT. Psychosocial issues in adolescents with cancer. *Cancer Treat Rev*. 2007;33(7):622–30.
81. Petersen CL. Spiritual care of the child with cancer at the end of life: a concept analysis. *J Adv Nurs*. 2014;70(6):1243–53.
82. Yuen ANY, Ho SMY, Chan CKY. The mediating roles of cancer-related rumination in the relationship between dispositional hope and psychological outcomes among childhood cancer survivors. *Psycho-Oncology*. 2014;23:412–9.
83. Juvakka T, Kylmä J. Hope in adolescents with cancer. *Eur J Oncol Nurs*. 2009;13:193–9.
84. Omari OA, Al Omari O, Wynaden D, et al. Coping strategies of Jordanian adolescents with cancer. *J Pediatr Oncol Nurs*. 2017;34:35–43.
85. Hendricks-Ferguson VL. An analysis of the concept of hope in the adolescent with cancer. *J Pediatr Oncol Nurs*. 1997;14(2):73–80; discussion 81–2.
86. Pennant S, C Lee S, Holm S, et al. The role of social support in adolescent/young adults coping with cancer treatment. *Children*. 2019;7(1):2.
87. Enskär K, Darcy L, Björk M, et al. Experiences of young children with cancer and their parents with nurses’ caring practices during the cancer trajectory. *J Pediatr Oncol Nurs*. 2020;37(1):21–34.
88. Foster TL, Lafond DA, Reggio C, Hinds PS. Pediatric palliative care in childhood cancer nursing: from diagnosis to cure or end of life. *Semin Oncol Nurs*. 2010;26:205–21.

89. Ito Y, Okuyama T, Ito Y, et al. Good death for children with cancer: a qualitative study. *Jpn J Clin Oncol*. 2015; 45:349–55.
90. Mack JW, Fasciano KM, Block SD. Communication about prognosis with adolescent and young adult patients with cancer: information needs, prognostic awareness, and outcomes of disclosure. *J Clin Oncol*. 2018;36:1861–7.
91. Kim B, White K, Patterson P. Understanding the experiences of adolescents and young adults with cancer: A meta-synthesis. *Eur J Oncol Nurs*. 2016;24:39–53.
92. Thomas D. The importance of oncologists giving hope. *Pediatric Blood Cancer*. 2017;64:e26534.
93. Conte TM. From patient to provider: the lived experience of pediatric oncology survivors who work as pediatric oncology nurses. *J Pediatr Oncol Nurs*. 2018;35: 428–38.
94. Straehla JP, Barton KS, Yi-Frazier JP, et al. The Benefits and Burdens of Cancer: a Prospective Longitudinal Cohort Study of Adolescents and Young Adults. *J Palliat Med*. 2017;20(5):494–501.
95. Odo R, Potter C. Understanding the needs of young adult cancer survivors: a clinical perspective. *Oncology*. 2009 Oct;23(11 Suppl Nurse Ed):23–7, 33.
96. Farsi Z. The meaning of disease and spiritual responses to stressors in adults with acute leukemia undergoing hematopoietic stem cell transplantation. *J Nurs Res*. 2015; 23(4):290–7.
97. Fochtman D. Understanding the meaning of the lived experience of adolescents in treatment for cancer [Doctorate of Philosophy in Nursing]. Magnussen L, (ed). University of Hawai'i at Manoa; 2010.
98. Hong SS, Park HR. Predictors of meaning in life in adolescents with leukemia. *Child Health Nursing Research*. 2015;21(1):74–81.
99. Hoyt MA, Nelson CJ, Darabos K, et al. Mechanisms of navigating goals after testicular cancer: meaning and emotion regulation. *Psychooncology*. 2017;26(6): 747–54.
100. Devine KA, Viola AS, Coups EJ, Wu YP. Digital health interventions for adolescent and young adult cancer survivors. *JCO Clin Cancer Inform*. 2018;2: 1–15.
101. Kang K-A, Kim S-J. Development and preliminary testing of a meaning-centered program for young adults with advanced-stage cancer. *J Hospice Palliat Nurs*. 2015;17: 213–22.
102. Mishra SI, Brakey HR, Kano M, et al. Health related quality of life during cancer treatment: perspectives of young adult (23–39 years) cancer survivors and primary informal caregivers. *Eur J Oncol Nurs*. 2018;32:48–54.
103. An H, Lee S. Returning to social life: Development of social identity for adolescent and young adult survivors of leukemia in Korea. *J Pediatr Oncol Nurs*. 2019;36(1):35–43.
104. Moore K, Talwar V, Gomez-Garibello C, et al. Children's spirituality: exploring spirituality in the lives of cancer survivors and a healthy comparison group. *J Health Psychol*. 2020;25:888–99
105. Greup SR, Kaal SEJ, Jansen R, et al. Post-traumatic growth and resilience in adolescent and young adult cancer patients: an overview. *J Adolesc Young Adult Oncol*. 2018;7:1–14.
106. Knox MK, Hales S, Nissim R, et al. Lost and stranded: the experience of younger adults with advanced cancer. *Support Care Cancer*. 2017;25(2):399–407.
107. Jóhannsdóttir IM, Moum T, Hjermsstad MJ, et al. Emotional functioning and school contentment in adolescent survivors of acute myeloid leukemia, infratentorial astrocytoma, and wilms tumor. *J Adolesc Young Adult Oncol*. 2011;1(3):133–9.
108. Mertens AC, Brand S, Ness KK, et al. Health and well-being in adolescent survivors of early childhood cancer: a report from the Childhood Cancer Survivor Study. *Psychooncology*. 2014;23(3):266–75.
109. Duran B. Posttraumatic growth as experienced by childhood cancer survivors and their families: a narrative synthesis of qualitative and quantitative research. *J Pediatr Oncol Nurs*. 2013;30(4):179–97.
110. Phillips CR, Haase JE. A Connectedness Primer for Healthcare Providers: adolescents/young adult cancer survivors' perspectives on behaviors that foster connectedness during cancer treatment and the resulting positive outcomes. *J Adolesc Young Adult Oncol*. 2018;7:174–80.
111. Mauricio R. Comfort: Voices of adolescents with metastatic cancer. 2012. Accessed August 19, 2020 from: <https://twu-ir.tdl.org/handle/11274/421>
112. Kedde H, van de Wiel HBM, Weijmar Schultz WCM, Wijzen C. Subjective sexual well-being and sexual behavior in young women with breast cancer. *Support Care Cancer*. 2013;21(7):1993–2005.
113. Anholt UV, Fritz GK, Keener M. Self-Concept in Survivors of Childhood and Adolescent Cancer. *J Psychosoc Oncol*. 1993;11(1):1–16.
114. Cantrell MA, Lupinacci P. Investigating the determinants of health-related quality of life among childhood cancer survivors. *J Adv Nurs*. 2008;64(1):73–83.
115. Eilertsen M-EB, Jozefiak T, Rannestad T, et al. Quality of life in children and adolescents surviving cancer. *Eur J Oncol Nurs*. 2012;16:185–93.
116. Yonemoto T, Takahashi M, Maru M, et al. Marriage and fertility in long-term survivors of childhood, adolescent and young adult (AYA) high-grade sarcoma. *Int J Clin Oncol*. 2016;21:801–7.
117. Evans S, Seidman L, Sternlieb B, et al. Clinical case report: Yoga for fatigue in five young adult survivors of childhood cancer. *J Adolesc Young Adult Oncol*. 2017; 6(1):96–101.
118. Marchese VG, Ogle S, Womer RB, et al. An examination of outcome measures to assess functional mobility in childhood survivors of osteosarcoma. *Pediatr Blood Cancer*. 2004;42:41–5.
119. Ginsberg JP, Cnaan A, Zhao H, et al. Using health-related quality of life measures to predict cardiac function in survivors exposed to anthracyclines. *J Clin Oncol*. 2004; 22:3149–55.
120. Jörggård A, Mattsson E, von Essen L. Health-related quality of life, anxiety and depression among adolescents and young adults with cancer: a prospective longitudinal study. *Eur J Cancer*. 2007;43:1952–8.
121. Servitzoglou M, Papadatou D, Tsiantis I, Vasilatou-Kosmidis H. Quality of life of adolescent and young adult survivors of childhood cancer. *J Pediatr Nurs*. 2009;24: 415–22.
122. Ander M, Grönqvist H, Cernvall M, et al. Development of health-related quality of life and symptoms of anxiety and depression among persons diagnosed with cancer during adolescence: a 10-year follow-up study. *Psycho-Oncology*. 2016;25:582–9.

123. Ganz PA, Moinpour CM, Pauler DK, et al. Health Status and Quality of Life in Patients With Early-Stage Hodgkin's Disease Treated on Southwest Oncology Group Study 9133. *J Clin Oncol.* 2003;21:3512–9.
124. Zebrack BJ, Foley S, Wittmann D, Leonard M. Sexual functioning in young adult survivors of childhood cancer. *Psycho-Oncology.* 2010;19:814–22.
125. Firoozi M, Besharat MA, Farahani H, Ghaed Rahmat A. "Vitality" a missing link in adjustment to childhood cancer. *Iran J Cancer Prev.* 2011;4(3):109–13.
126. Pedreira CC, Stargatt R, Maroulis H, et al. Health Related Quality of Life and Psychological Outcome in Patients Treated for Craniopharyngioma in Childhood. *J Pediatr Endocrinol Metab.* 2006;19:15–24.
127. Rueegg CS, Gianinazzi ME, Rischewski J, et al. Health-related quality of life in survivors of childhood cancer: the role of chronic health problems. *J Cancer Surviv.* 2013;7(4):511–22.
128. Ford JS, Kawashima T, Whitton J, et al. Psychosexual functioning among adult female survivors of childhood cancer: a report from the childhood cancer survivor study. *J Clin Oncol.* 2014;32(28):3126–36.
129. Maunsell E, Pogany L, Barrera M, et al. Quality of life among long-term adolescent and adult survivors of childhood cancer. *J Clin Oncol.* 2006;24:2527–35.
130. Kristiansen I, Strinnholm M, Strömberg B, Frisk P. Clinical characteristics, long-term complications and health-related quality of life (HRQoL) in children and young adults treated for low-grade astrocytoma in the posterior fossa in childhood. *J Neuro-Oncol.* 2019;142:203–10.
131. Chan CWH, Choi KC, Chien WT, et al. Health-related quality-of-life and psychological distress of young adult survivors of childhood cancer in Hong Kong. *Psycho-Oncology.* 2014;23:229–36.
132. van Dijk EM, van Dulmen-den Broeder E, Kaspers GJL, et al. Psychosexual functioning of childhood cancer survivors. *Psycho-Oncology.* 2008;17:506–11.
133. Mört S, Salanterä S, Matomäki J, et al. Cancer related factors do not explain the quality of life scores for childhood cancer survivors analysed with two different generic HRQL instruments. *Cancer Epidemiol.* 2011;35:202–10.
134. Souza CMC de, de Souza CMC, Cristofani LM, et al. Comparative study of quality of life of adult survivors of childhood acute lymphocytic leukemia and Wilms' tumor. *Einstein (São Paulo).* 2015;13:492–9.
135. Harila MJ, Salo J, Lanning M, et al. High health-related quality of life among long-term survivors of childhood acute lymphoblastic leukemia. *Pediatr Blood Cancer.* 2010;55:331–6.
136. C, Vázquez C, Hervás G. Positive interventions in seriously-ill children: effects on well-being after granting a wish. *J Health Psychol.* 2016;21:1870–83.
137. Kim Y. Exploration of life experiences of positive growth in long-term childhood cancer survivors. *Eur J Oncol Nurs.* 2017;30:60–6.
138. Steinberg DM, Santiago RA, Tanenbaum ML, et al. "It Made Me the Person I Am Today.": survivors of Childhood, Adolescent, and Young Adult Cancer Reflect on Their Experiences. *J Adolesc Young Adult Oncol.* 2020;9(2):239–46.
139. Foster RH, Russell CC, Dillon R, et al. Relations among optimism, perceived health vulnerability, and academic, self-regulatory, and social self-efficacy in adolescent survivors of childhood cancer. *J Psychosoc Oncol.* 2014;32(2):207–23.
140. Howard Sharp KM, Rowe AE, Russell K, et al. Predictors of psychological functioning in children with cancer: disposition and cumulative life stressors. *Psychooncology.* 2015;24(7):779–86.
141. Bell CJ. Understanding Quality of Life in Adolescents Living with Advanced Cancer [Doctorate of Philosophy]. Indiana University-Purdue University Indianapolis; 2011. Accessed 19 August, 2020 from: <https://scholarworks.iupui.edu/handle/1805/2604>
142. Chien C-H, Chang Y-Y, Huang X-Y. The lived experiences of adolescents with cancer: a phenomenological Study. *Clin Nurs Res.* 2020;29:217–25.
143. Mannix MM, Feldman JM, Moody K. Optimism and health-related quality of life in adolescents with cancer. *Child Care Health Dev.* 2009;35:482–8.
144. Packman W, Weber S, Wallace J, Bugescu N. Psychological effects of hematopoietic SCT on pediatric patients, siblings and parents: a review. *Bone Marrow Transpl.* 2010;45:1134–46.
145. Williams NA, Davis G, Hancock M, Phipps S. Optimism and pessimism in children with cancer and healthy children: confirmatory factor analysis of the youth life orientation test and relations with health-related quality of life. *J Pediatr Psychol.* 2010;35:672–82.
146. Walker E, Martins A, Aldiss S, et al. Psychosocial interventions for adolescents and young adults diagnosed with cancer during adolescence: a critical review. *J Adolesc Young Adult Oncol.* 2016;5(4):310–21.
147. Soanes L, Gibson F. Protecting an adult identity: A grounded theory of supportive care for young adults recently diagnosed with cancer. *Int J Nurs Stud.* 2018;81:40–8.
148. Brassil KJ, Engebretson JC, Armstrong TS, et al. Exploring the cancer experiences of young adults in the context of stem cell transplantation. *Cancer Nurs.* 2015;38(4):260–9.
149. Jones BL, Volker DL, Vinajeras Y, et al. The meaning of surviving cancer for Latino adolescents and emerging young adults. *Cancer Nurs.* 2010;33(1):74–81.
150. Phillips-Salimi C. Young Adult Cancer Survivors' Experiences of Connectedness with Their Healthcare Providers. 2010. Accessed August 19 2020 from Available from: <https://scholarworks.iupui.edu/handle/1805/2067>
151. Haase JE, Robb SL, Burns DS, et al. Adolescent/young adult perspectives of a therapeutic music video intervention to improve resilience during hematopoietic stem cell transplant for cancer. *J Music Ther.* 2020;57(1):3–33.
152. Granek L, Nathan PC, Rosenberg-Yunger ZRS, et al. Psychological factors impacting transition from paediatric to adult care by childhood cancer survivors. *J Cancer Surviv.* 2012;6(3):260–9.
153. Weinstein AG, Henrich CC, Armstrong GT, et al. Roles of positive psychological outcomes in future health perception and mental health problems: A report from the Childhood Cancer Survivor Study. *Psychooncology.* 2018;27(12):2754–60.
154. Strauser DR, Wagner S, Wong AWK. Enhancing psychosocial outcomes for young adult childhood CNS cancer survivors. *Int J Rehabil Res.* 2012;35:311–6.
155. Raque-Bogdan TL, Hoffman MA, Ginter AC, et al. The work life and career development of young breast cancer survivors. *J Couns Psychol.* 2015;62:655–69.
156. Sulkers E, Fleer J, Brinksma A, et al. Dispositional optimism in adolescents with cancer: differential associations

- of optimism and pessimism with positive and negative aspects of well-being. *Br J Health Psychol.* 2013;18:474–89.
157. Seitz DCM, Hagmann D, Besier T, et al. Life satisfaction in adult survivors of cancer during adolescence: what contributes to the latter satisfaction with life?. *Qual Life Res.* 2011;20:225–36.
 158. Miller HH, Bauman LJ, Friedman DR, DeCosse JJ. Psychosocial adjustment of familial polyposis patients and participation in a chemoprevention trial. *Int J Psychiatry Med.* 1986;16(3):211–30.
 159. Smith K, Ostroff J, Tan C, Lesko L. Alterations in self-perceptions among adolescent cancer survivors. *Cancer Invest.* 1991;9(5):581–8.
 160. Wakefield CE, McLoone J, Goodenough B, et al. The psychosocial impact of completing childhood cancer treatment: a systematic review of the literature. *J Pediatr Psychol.* 2010;35(3):262–74.
 161. Piasai K, Phumdoung S, Wiroonpanich W, Chotsampancharoen T. A randomized control trial of guided-imagination and drawing-storytelling in children with cancer. *Pacific Rim International Journal of Nursing Research.* 2018;22(4):386–400.
 162. Bitsko MJ, Stern M, Dillon R, et al. Happiness and time perspective as potential mediators of quality of life and depression in adolescent cancer. *Pediatr Blood Cancer.* 2008;50(3):613–9.
 163. Taylor EJ, Petersen C, Oyedele O, Haase J. Spirituality and spiritual care of adolescents and young adults with cancer. *Semin Oncol Nurs.* 2015;31(3):227–41.
 164. Gittzus JA, Fasciano KM, Block SD, Mack JW. Peace of mind among adolescents and young adults with cancer. *Psychooncology.* 2020;29(3):572–8.
 165. de Moura Souza V, Frizzo HCF, de Paiva MHP, et al. Spirituality, religion and personal beliefs of adolescents with cancer. *Rev Bras Enferm.* 2015;68(5):509–14.
 166. Park CL, Cho D. Spiritual well-being and spiritual distress predict adjustment in adolescent and young adult cancer survivors. *Psycho-Oncology.* 2017;26:1293–300.
 167. Woodgate RL, West CH, Tailor K. Existential anxiety and growth: an exploration of computerized drawings and perspectives of children and adolescents with cancer. *Cancer Nurs.* 2014;37(2):146–59.
 168. Sposito AMP, Silva-Rodrigues FM, Sparapani V de C, et al. Coping strategies used by hospitalized children with cancer undergoing chemotherapy. *J Nurs Scholarsh.* 2015;47(2):143–51.
 169. Close P, Burkey E, Kazak A, et al. A prospective, controlled evaluation of home chemotherapy for children with cancer. *Pediatrics.* 1995;95(6):896–900.
 170. Hoyt MA, Gamarel KE, Saigal CS, Stanton AL. Goal navigation, approach-oriented coping, and adjustment in young men with testicular cancer. *Ann Behav Med.* 2016;50(4):572–81.
 171. Williamson PR, Altman DG, Blazeby JM, et al. Developing core outcome sets for clinical trials: issues to consider. *Trials.* 2012;13:132.
 172. Prinsen CAC, Vohra S, Rose MR, et al. How to select outcome measurement instruments for outcomes included in a “Core Outcome Set” - a practical guideline. *Trials.* 2016;17(1):449.
 173. Williamson PR, Altman DG, Bagley H, et al. The CO-MET Handbook: version 1.0. *Trials.* 2017;18(Suppl 3):280.
 174. Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *J Adv Nurs.* 2000;32(4):1008–15.
 175. Quinn GP, Gonçalves V, Sehovic I, et al. Quality of life in adolescent and young adult cancer patients: a systematic review of the literature. *Patient Relat Outcome Meas.* 2015;6:19–51.
 176. Subbiah V, Bupathi M, Kato S, et al. Clinical next-generation sequencing reveals aggressive cancer biology in adolescent and young adult patients. *Oncoscience.* 2015;2(7):646–58.
 177. Rosenberg AR, Bradford MC, McCauley E, et al. Promoting resilience in adolescents and young adults with cancer: Results from the PRISM randomized controlled trial. *Cancer.* 2018;124(19):3909–17.
 178. Keyes CLM, Annas J. Feeling good and functioning well: distinctive concepts in ancient philosophy and contemporary science. *J Posit Psychol.* 2009;4:197–201.
 179. Vishnevsky T, Quinlan MM, Kilmer RP, et al. “The Keepers of Stories”: personal growth and wisdom among oncology nurses. *J Holist Nurs.* 2015;33(4):326–44.
 180. Snyder CR. Hope theory: Rainbows in the mind. *Psychol Inq.* 2002;13(4):249–75.
 181. Reker GT, Wong PTP. Aging as an individual process: Toward a theory of personal meaning. In: Birren JE, (Ed). *Emergent theories of aging.* New York, NY, USA: Springer Publishing Co, xiv; 1988. pp. 214–46.
 182. Ryan RM, Frederick C. On energy, personality, and health: subjective vitality as a dynamic reflection of wellbeing. *J Personal.* 1997;65:529–65.
 183. Scheier MF, Carver CS. Optimism, coping, and health: assessment and implications of generalized outcome expectancies. *Health Psychol.* 1985;4(3):219–47.
 184. McCullough ME, Emmons RA, Tsang J-A. The grateful disposition: A conceptual and empirical topography. *J Pers Soc Psychol.* 82(1):112–27.
 185. Shin DC, Johnson DM. Avowed happiness as an overall assessment of the quality of life. *Soc Indic Res.* 1978;5(1):475–92.
 186. Shepard LA. Self-acceptance: The evaluative component of the self-concept construct. *Am Educ Res J.* 1979;16(2):139–60.
 187. Uchida Y, Norasakkunkit V, Kitayama S. Cultural Constructions of Happiness: theory and Empirical Evidence. *J Happiness Stud* 2013;5:269–80.
 188. Vago DR, Zeidan F. The brain on silent: mind wandering, mindful awareness, and states of mental tranquility. *Ann N Y Acad Sci.* 2016 ;1373(1):96–113.
 189. Duckworth AL, Peterson C, Matthews MD, Kelly DR. Grit: perseverance and passion for long-term goals. *J Pers Soc Psychol.* 2007;92(6):1087–101.
 190. Cordaro DT, Brackett M, Glass L, Anderson CL. Contentment: Perceived completeness across cultures and traditions. *Rev Gen Psychol.* 2016;20(3):221–35.

Address correspondence to:
Cole Wayant, BS

Department of Psychiatry and Behavioral Sciences
Oklahoma State University Center for Health Sciences
1111 W 17th Street
Tulsa, OK 74107
USA

E-mail: cole.wayant@okstate.edu