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‘Having cancer was awful but also something good came out’: Post-traumatic growth among adult survivors of pediatric and adolescent cancer

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Abstract

Purpose: The cancer experience may cultivate positive psychological changes that can help reduce distress during adult survivors of childhood and adolescent cancer life course. The aim of this study is to examine the positive impact of cancer in adult survivors utilizing posttraumatic growth as a guiding framework.

Method: Participants were identified and recruited through the Utah Cancer Registry. Eligible cases were diagnosed with cancer age ≤20 years from 1973 to 2009, born in Utah, and were age ≥18 at study. Semi-structured phone interviews (N = 53) were analyzed using deductive analysis.

Results: The primary five themes that emerged were similar to Tedeschi and Calhoun’s (1996) themes for measuring positive effects, and were used to frame our results. The primary themes along with uniquely identified sub-themes are the following: personal strength (psychological confidence, emotional maturity), improved relationship with others (family intimacy, empathy for others), new possibilities (having passion work with cancer), appreciation for life (reprioritization), and spiritual development (strengthened spiritual beliefs, participating in religious rituals and activities).

Conclusions: For survivors, cancer was life altering and for many the experience continues. Understanding survivors’ complex cancer experience can help improve psychosocial oncology care.

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Conflict of interest
None.

1. Introduction

Cancer during childhood or adolescence is a life altering event that can result in posttraumatic stress disorder symptoms later in life (Rourke et al., 2007), but at the same time, can also be interpreted as positive by some survivors. These positive effects have been associated with the cancer experience in several studies with childhood cancer survivor populations (Bellizzi et al., 2010; Garland et al., 2007; Jim and Jacobsen, 2008; Koutrouli et al., 2012; Yi et al., 2015; Zebrack et al., 2012). Findings from these studies emphasize how growth in survivors can occur in different areas such as spirituality and appreciation for life by, intentionally or unintentionally, imparting meaning through the cancer experience (Lee, 2008). With nearly 85% of adolescent survivors of childhood cancer reporting at least one positive outcome from their cancer experience (Barakat et al., 2006), further investigations can inform interventions that promote growth and resilience.

Researchers have made efforts to understand the multiple domains of positive growth (Park et al., 1996) and have postulated that through the cancer journey, survivors can grow in the following areas: spirituality (Connerty and Knott, 2013; Denney et al., 2011; Mehrabi et al., 2015), interrelationships (Chambers et al., 2012; Connerty and Knott, 2013; Sabiston et al., 2007; Tomich and Helgeson, 2002), resilience (Chambers et al., 2012; Mehrabi et al., 2015; Rinaldis et al., 2010), personal cognition and mentality (e.g., priorities and worldview) (Connerty and Knott, 2013; Helgeson, 2011; Mehrabi et al., 2015; Rinaldis et al., 2010; Sabiston et al., 2007) and social activity (e.g. paying back society) (Duran, 2013).

In this study we use the term posttraumatic growth (PTG) (Tedeschi et al., 1998) as it best expresses the meaning of our study phenomena. PTG describes a cognitive process for how, from a traumatic event, an individual can experience a feeling of emotional and mental growth that is beyond their previous level of adaptation, psychological functioning, and awareness. Positive growth has also been referred to as ‘adversarial growth’ (Linley and Joseph, 2004), ‘perceived benefits’ (Calhoun and Tedeschi, 1991), ‘positive psychological changes’ (Yalom and Lieberman, 1991), ‘stress-related growth’ (Park et al., 1996), or ‘thriving’ (O’Leary et al., 1998). However, terms like “stress-related growth” or “thriving” do not articulate psychological distress and may inadequately acknowledge the severity of disruption that occurs from the cancer experience (Ben-Zur et al., 2015; Tedeschi and Calhoun, 2004).

Multiple instruments have been developed to identify the domains of PTG, (Frazier et al., 2001; Joseph et al., 1993; McMillen and Fisher, 1998; Park et al., 1996; Phipps et al., 2007). The most well-known instrument for measuring positive effects is the Posttraumatic Growth Inventory (PTGI). PTGI is a 21-item questionnaire originally developed by Tedeschi and Calhoun (1996) that includes five domains: personal strength, new possibilities, relating to others, appreciation for life, and spiritual change (Calhoun and Tedeschi, 2006; Tedeschi and Calhoun, 2004). The constructs in this instrument have been confirmed as relatively robust, with good construct validity (Yi et al., 2015).

The PTG construct has been sufficiently examined in quantitative studies with the development of related instruments (Zoellner and Maercker, 2006); the five domains are well known and supported by existing literature. Due to the nature of quantitative methodology, however, there have been limits to developing a deeper understanding of each domain, including how cancer survivors express their experience related to each of the five PTG domains and how the process of growth and factors mediate the positive changes of childhood and adolescent cancer survivor populations. A qualitative approach may help to enrich the comprehension of the PTG concept by filling the unmet part of the existing quantitative research. Therefore, this study sought to qualitatively examine the positive impacts of cancer in this population, using posttraumatic growth as a theoretical framework, in order to better understand how they derive meaning-making from their cancer experience.

2. Methods

This study was conducted as part of a larger study at the Huntsman Cancer Institute (HCI) examining health care, health insurance, employment, educational, and life course experiences of adult survivors of childhood and adolescent cancer. This study was approved by the Institutional Review Board at the University of Utah.

2.1. Participants and recruitment

Potential participants were identified by the statewide Utah Cancer Registry (UCR), part of the National Cancer Institute’s Surveillance, Epidemiology and End Results Program. Eligible cases were diagnosed with cancer age ≤20 years from January 1, 1973 to December 31, 2009. We limited participants to those born in Utah, currently age ≥18 and alive at the time of study contact, due to the eligibility criteria of the overall study. We included all diagnoses meeting International Childhood Cancer Classification criteria. Non-melanoma skin and cancers in-situ were excluded due to concerns in completeness of registry and the perception of these cancers by participants as rarely life threatening.

To recruit a diverse sample, residence location (rural versus urban community at diagnosis), gender, and age were considered in recruitment; accordingly, the UCR sent letters to a random sample of 150 of 2686 eligible participants on their registry. Of these, 70 could not be reached due to outdated contact information, and 3 were out of the country or deemed ineligible because they pilot tested the interview script. Of the remaining 77 eligible participants, 63 agreed to participate, yielding a response rate of 82%. In this study, 53 participants actually participated because our research team halted interviews under the judgement that data were theoretically saturated.

2.2. Data collection

Phone interviews (N = 53) were conducted between April 2012 to July 2012. Each interview lasted between 30 and 45 min. Informed consent was obtained prior to each interview. Study participants were asked sociodemographic questions regarding sex, age, race, educational attainment, and work status. Zip code was obtained from the cancer registry and was used to determine current residency location (rural vs. urban community) using Rural Urban Commuting Area Codes from the University of Washington Rural Health Research Center (n.d.). Religious affiliation was not explicitly asked and was determined by self-report.

We started the interview with a guiding question: What positive effects have cancer had on your life? Following this, probing questions were asked to elicit participants' growth experiences from having cancer. Before implementation to study participants, pilot interviews were conducted with 5 childhood cancer survivors receiving care at the HCI's Late Effects Clinic. Under the participants' agreement, interviews were recorded and later transcribed. Participants received a $20 gift card for their participation.

2.3. Data analysis

We analyzed the qualitative data to achieve the study aim: To examine the positive impact of cancer in adult survivors utilizing posttraumatic growth as a guiding framework. The research team was intimately aware of Tedeschi & Calhoun's research and analyzed the data within this framework. Two leading researchers independently coded the transcripts word by word, line by line, and segment by segment, and kept comparing the coded data through email until reaching consensus. The initial coding was continuously revised based on online discussions with all six members of the research team. The two leading researchers again independently categorized the codes into themes and then the larger research team met in-person until all agreed on these categorized themes.

We then purposefully compared the themes to Tedeschi & Calhoun's PTG domains. We examined if the themes that we came up with could expand more on this PTG concept. After discussions amongst the research members, we found that our themes were in line with the five PTG domains identified by Tedeschi and Calhoun. Furthermore, we expanded these themes through the development of sub-themes. Throughout the analysis process, we were aware of the fact that "the researcher is the instrument" (Patton, 2002). We recognized the inherent potential for researcher bias in the analysis given our prior knowledge with PTG and the positive growth literature. To address this issue, the researchers discussed the coding and analysis process frequently. The sub-themes identified were unique and not explicitly used by Tedeschi and Calhoun.

3. Results

3.1. Characteristics of the sample

Ages ranged from 18 to 56 years (M 40, SD 11) at the time of the interview. On average survivors were 13 years old at diagnosis (SD = 6.5) and were 26.1 years from treatment completion (SD = 9.6). A slight majority of survivors were female 54.7% (N = 29) (Table 1). Most participants 94.3% (N = 50) were white. Of the sample, 28.3% (N = 15) reported being college graduates, 52.8% (N = 28) had attended some college or technical school and 18.9% (N = 10) had a high school degree or less. More than half 50.9% (N = 27) lived in an urban area.

While 64.1% (N = 34) of the participants were full-time employed, 15.1% (N = 8) and 18.9% (N = 10) were part-time employed and unemployed, respectively. Only 1.9% (N = 1) participant reported being retired. Nearly half (47.2%, N = 25) self-reported their religion as The Church of Jesus Christ of Latter Day Saints (LDS) while almost another half was unidentifiable or did not identify with any religion (47.1%, N = 25). Of the remaining, 5.7% (N = 3) identified with another religion.

3.2. Theme 1: personal strength

3.2.1. Psychological confidence—

Some survivors gained self-confidence and internal strength while experiencing near death situations and overcoming cancer. One participant shared that with faith you can overcome anything or deal with anything. Another participant reinterpreted her “F.E.A.R.” of cancer from “forget everything and run” to “face everything and recover.” (Participant No. 39, female, age group 30–45, 17 years since diagnosis, ovarian).

Being strong and fighting to survive cancer prepared survivors for other life challenges. They accepted that although they could not control unexpected events (i.e. having or not having cancer, life, or death), they were better able to handle stressors or pain in their life. This increased mental resilience helped them enjoy their life after cancer as well.

> [Having cancer] helped me be a little more fearless. I think that pre-cancer I always seemed to be timid. And not really adventurous, and then after I think I kind of had this new lease on my life. And you know I just loved to travel, and do things that I probably wouldn’t have ever had the confidence to do before. (Participant No. 2, female, age group 18–29, 11 years since diagnosis, lymphoma)

3.2.2. Emotional maturity—

Some survivors described a shift in their personal development with increased emotional maturity. They described being more empathetic:

> It has made me just look at people differently and not judge them so much. I learned that the hard way when I ended up being bald and scrawny and not walking so good. I really learned to look at people for themselves and not for other things. But it also, I had a hard time with friends. I was the weird child in school having cancer. So that was hard too, going through middle school being the ‘weird kid’. But it just taught me to look at people for who they are and not what clothes they’re wearing or what hairstyle they have, but for who they are on the inside. (Participant No. 16, female, age group 30–45, 20 years since diagnosis, leukemia)

3.3. Theme 2: improved relationships with others

3.3.1. Family intimacy—

Many survivors described improvements in their personal relationships after their cancer diagnosis, such as becoming closer to parents, siblings, and partners. From diagnosis to treatment, survivors had to overcome physical, emotional, and psychological difficulties under the care of family members. While fighting cancer together, survivors realized how much their family members loved them. They also were able to get to know each other more.

> If I think back to going through the chemotherapy sessions and stuff in the hospital, I would have to say that I actually got to know my father probably better than I would [not] have through cancer. He was a great guy anyway; he just really shined through that. (Participant No. 53, male, age group 30–45, 24 years since diagnosis, testicular)

One consistency in responses were that relationships during the cancer experience did not remain static. One survivor shared how her romantic relationship with her partner was strengthened and they became a family.

> In my life it [cancer] was a positive effect on my relationship with my husband. At the time we were just flirty boyfriend and girlfriend. And then it [cancer] really strengthened us to be more close friends through an experience like that. And you know, like six years later we got married. So it [cancer] helped us that way. (Participant No. 2, female, age group 18–29, 11 years since diagnosis, lymphoma)

3.3.2. Empathy for others—

Many survivors expressed an increased capacity for compassion, sharing more empathy and sympathy particularly towards others with difficulties. They described feeling a connection to those who were having difficult trials in their lives. In particular, survivors felt common ground with those undergoing cancer treatments. Several participants volunteered at a cancer hospital after they finished therapy to encourage other patients to not give up.

> I'm able to talk to them and give them some kind of hope, because I am a survivor, thirty-plus years, I would say for somebody that's going through that [cancer]. I just talked with a lady the other day in [regional name], you could tell that she was taking chemotherapy because she had no hair and I went up and I talked to her, and I just told her to hang in there and to not give up. I have the ability to relate to someone else who's going through [cancer]. I'm thankful for that. (Participant No. 43, male, age group 46–56, 34 years since diagnosis, oral cavity)

3.4. Theme 3: new possibilities

3.4.1. Having passion to work with cancer—

Many survivors expressed how having cancer helped them develop a curiosity about the field of cancer, either as a profession, as volunteers, and by supporting others going through the experience. One survivor, who was now employed as an oncologist, explained, "It [cancer] got me interested in this field. It kind of fostered or cultivated my interest in oncology." (Participant No. 1, male, age group 30–45, 25 years since diagnosis, kidney). Similarly, another survivor contributed by being a study participant in cancer studies.

> I would say it was good from the standpoint of being more aware of how it impacts people. And how many people are affected by cancer, and trying to help in any way that I can to better the research of cancer. (Participant No. 8, male, age group 30–45, 30 years since diagnosis, soft tissue sarcoma)

One survivor described an public role in the area of cancer prevention.

> It [Having cancer] has caused me to be a compassionate, understanding person, which has caused me to be proactive in things like organizing sponsorships for non-profit cancer organizations. And you know, some of those larger type research things that anytime we can do something and donate it to a cancer charity or anything like that we often do. (Participant No. 5, female, age group 30–45, 35 years since diagnosis, thyroid)

3.5. Theme 4: appreciation of life

3.5.1. Reprioritization—To many survivors, cancer was an existential experience in which they felt close to death or watched someone else dying during the treatment. They described a cancer journey where they would have “a second chance” (Participant No. 48, male, age group 46–56, 11 years since diagnosis, central nervous system) to live, as well as to “understand [their] own mortality.” (Participant No. 19, male, age group 46–56, 33 years since diagnosis, melanoma). One survivor described.

> It [cancer] has also made me realize not to take life for granted. When you’re twenty and you think you’re going to live forever, and all of a sudden you think you may die. (Participant No. 34, female, age group 18–29, 15 years since diagnosis, leukemia)

The recognition of death made the survivors have a higher value for life. Like an expression of one participant, “Alright I get by another day of life. This is awesome!” (Participant No. 4, male, age group 30–45, 28 years since diagnosis, thyroid) Survivors considered life as “a gift.” (Participant No. 9, male, age group 30–45, 31 years since diagnosis, lymphoma) They were joyful about living and tried not to forget the gratitude for being alive, “It’s made me appreciate life so much more. It’s something you never forget, and it does become a part of you.” (Participant No. 25, female, age group 30–45, 29 years since diagnosis, ovarian).

3.5.2. Avoiding bad behavior—The experience of cancer highlighted the importance of maintaining a healthy lifestyle. This led survivors to reflect on their lifestyle and engage in healthy behaviors. Most survivors acknowledged how being physically fit was a priority to them. One survivor observed friends damaging their health by putting drugs into their bodies, a contrast to the drugs he needed to put in his body just to stay alive.

> Well, as a child, 17 or 16, when I first found out that I had cancer, all of my friends were drinking, and partying and doing marijuana or whatever. Because I was so sick with chemotherapy and radiation, I didn’t want anything to do with it, so I would say that was good in my life. I didn’t get hooked on smoking and drinking or doing marijuana, or doing other things that I shouldn’t have. I would say it was bad, but in a way it was a blessing. (Participant No. 43, male, age group 46–56, 34 years since diagnosis, oral cavity)

This example captures the sentiment expressed by many survivors e that of being conscious and careful with health-related habits. Negative health habits (e.g. drugs, alcohol, smoking, fast food) were evaluated for the effect they were going to have on their long term health.

3.6. Theme 5: spiritual development

3.6.1. Strengthened spiritual beliefs—For some survivors, their cancer experience fostered a relationship with God and emphasized or reaffirmed a belief in miracles or an afterlife. A belief in an afterlife made them feel calm as one participant explained, “I knew that if I passed away that I would be with my family again. That was very comforting for my family to know.” (Participant No. 34, female, age group 18–29, 15 years since diagnosis, leukemia).

To some survivors, surviving was seen as evidence that God was caring for them. One survivor described herself as a “walking miracle” (Participant No. 38, female, age group 30–45, 37 years from diagnosis, lymphoma) witnessed by doctors and family members. Survivors described a belief that God was creative and that spiritual ways of being cured from cancer existed. Another participant similarly explained how the experience confirmed her faith in God.

> [Surviving cancer] confirmed to me that we are watched over, because there were many miracles that happened while I was sick, and I should have died at least three times. I don’t know. It was a good experience for that overall. I mean it was awful, but it was also good. (Participant No. 34, female, age group 18–29, 15 years since diagnosis, leukemia)

Participants who did not mention miracles or afterlife still mentioned that surviving cancer reinforced their conviction to their religion, strengthened beliefs or their spirituality.

> Before I had cancer I was kind of just floating in my religious beliefs. I don’t think I was really actively living my religious beliefs in my everyday life. I mean after I had cancer it was kind of a wake-up call that I needed to take it [religion] more seriously, and that it [religion] was real. (Participant No. 29, female, age group 18–29, 23 years since diagnosis, soft tissue sarcoma)

3.6.2. Participating in religious rituals and activities—Participants described how their experiences in religious or spiritual care during cancer fostered a closeness with God and an increased participation in religious and spiritual practices. These spiritual changes not only influenced their internal beliefs but also religiouslyand spiritually directed their behaviors. Some felt spiritual comfort and increased faith through religious activities, such as attending church services, missionary work, prayer, reading the bible and other religious books. Some survivors stated that by maintaining their religious duties and practices, they were able to increase their faith, ease the illness experience, and make cancer survival possible.

> When it came time for me to go on a mission, I was just kind of right in the middle, or just finishing up the radiation, and the bishop told me I promise if you’ll go on a mission that you won’t have any more occurrences of cancer, and I’ve gone on a mission, and I haven’t had any more occurrences of cancer. I believe that to be true. (Participant No. 43, male, age group 46–56, 34 years since diagnosis, oral cavity)

Although many survivors acknowledged the importance of religious rituals and activities in a religious community setting, some could not attend activities because of their follow-up treatment schedules, side-effects, or lack of energy. Instead of attending their respective places of worship and meetings, they attempted to keep following their own spiritual rituals at the hospital or at home. For instance, one participant described the church services at the hospital, “as maintaining my faith while I was in the cancer unit.” (Participant No. 47, female, age group 18–29, 6 years since diagnosis, lymphoma) Another survivor described finding comfort in reading certain biblical verses repeatedly. Likewise, prayer was beneficial to participants whenever they felt a sense of insecurity or fear, or wanted to distract themselves from their cancer experience.

4. Discussion

The aim of this study was to qualitatively examine the positive impact of cancer on adult survivors of childhood and adolescent cancer using posttraumatic growth to understand how they create meaning, and how growth can occur from debilitating physical and psychological changes (Duran, 2013; Salick and Auerbach, 2006). The findings provide insight that support interventions that improve quality of life (Tanyi et al., 2015).

In this study, we found that childhood and adolescent cancer survivors experienced many areas of growth that coincide within the PTG framework: personal strength, relating with others, appreciation of life, new possibilities, and spiritual change (Tedeschi and Calhoun, 1996). Our results indicate that through the process of confronting their cancer, survivors developed positive meaning-making and reinterpreted basic assumptions about themselves and their world (Horowitz, 1986; Lee, 2008).

Given its qualitative nature, our study does not identify the degree of PTG per theme, but it does reveal positive outcomes in cancer, and refines our understanding of how adult survivors of childhood and adolescent cancer survivors make meaning after the cancer experience. Survivors' personal strength (theme) described by increased emotional maturity (sub-theme) and psychological confidence (sub-theme) shifted how they perceived multiple areas of their lives. It pushed survivors to re-evaluate and improve their family and social relationships. For survivors this process was emotionally taxing but seemed to be sustained over time.

Through this personal strength, some survivors seemed persuaded and enthusiastic to help others struggling with cancer or other traumatic events (theme: relating to others, sub-theme: empathy for others). While Tedeschi and Calhoun's (1996) original PTG theme of relating to others was non-specific, these results demonstrate a particular empathy for others experiencing cancer or other traumatic events. Some took on roles as cancer prevention advocates and volunteers at hospitals, providing emotional support to cancer patients and caregivers.

When survivors described new possibilities (theme), they spoke about having passion to work with cancer (sub-theme). Again, while Tedeschi and Calhoun (1996) did identify new possibilities as a theme, it was not specific for cancer. Survivors appreciated life (theme) and described a shift in their priorities (sub-theme). All the same, this high level of engagement and awareness is a potential opportunity for hospitals to recruit and educate cancer survivors as mentors for current patients (e.g. mentor-mentee programs, support groups). Survivors in the role of mentors can support others in coping with the demands of the disease and treatment, adherence to therapy and setting expectations while helping them to focus on positive effects rather than negative aspects (Butow et al., 2010; Zebrack et al., 2015). Peer based programs and support groups have already been shown to be effective in supporting full psychosocial development for adolescent cancer survivors (Cassano et al., 2008; Meltzer and Rourke, 2005).

For our study, spiritual development (theme) was very prevalent, expressed through strengthened spiritual beliefs (sub-theme) and participation in religious rituals and activities (sub-theme). We speculate that the prominence placed on spirituality and religiosity may be due to the fact that almost half our sample self-reported belonging to The Church of Jesus Christ of Latter Day Saints. The other half did not report a religious affiliation. Therefore there is an uncertainty in being able to conclusively say how religion contributed to the cancer experience. It would be valuable to identify how religiosity shapes the cancer experience. There may be clinical value in providing appropriate programs and services that meet cancer patients' spiritual and religious needs. A previous study has demonstrated increased PTG levels for survivors with higher attendance of religious activities (Jeon et al., 2015). Our results also indicate that providing individualized religious and spiritual support may influence patients' PTG. Religious organizations may be more positioned to advise or help build the capacity of hospitals to serve survivors seeking these services during treatment, as well as during re-entry into the community after therapy completion. Religious or spiritual coping training that incorporates PTG as a framework could be developed for adults of childhood and adolescent cancer survivors, their caregivers, or service providers (e.g. social workers, chaplains).

While our study focused on the positive outcomes of cancer, health systems should evaluate how to provide additional support to survivors with a high risk for re-experiencing PTSD symptoms, such as those who feel their cancer is still life threatening (Rourke et al., 2007). Further research is needed to understand at what point in the cancer experience survivors view cancer as positive, and how types of cancer, severity of treatment, and developmental stage (e.g. childhood, adolescence, young adulthood) contribute to long term responses to trauma. While Tedeschi and Calhoun (2004) have proposed a model for understanding what processing trauma in growth entails, Kazak et al. (2006) have proposed a model for understanding how posttraumatic stress symptoms change over time for children with life threatening circumstances. They have conceptualized trauma in three phases: I, peritrauma; II, early, ongoing, and evolving responses; and III, longer-term. Each phase is an opportunity to provide clinical and psychosocial support. Likewise, a similar model could be conceptualized to understand how posttraumatic growth changes over time, in a longitudinal study. A better understanding of these processes can help in determining how PTG can be utilized to provide more psychosocial support to survivors.

Although our study provided rich detail about the PTG experience for cancer survivors, certain limitations exist. First, as this study depended on participants' subjective experiences, self-bias of participants may affect our results. Second, our sample was restricted to the state of Utah and lacked ethnic, religious, and cultural diversity. We were not able to meaningfully correlate demographic, diagnosis, or treatment variables with PTG. Although a previous study with childhood cancer survivors has noted no associations between PTG and income, survivor age, or the intensity of treatment (Barakat et al., 2006), the regional characteristics may have affected the results, especially the spiritual development aspect. Another limitation from this study is we did not evaluate when these positive changes started to occur. Future studies would benefit from a longitudinal approach to capture PTG changes over the life course, as it would help in determining how these changes could support improved follow-up care behaviors.

Lastly, this study may be meaningful in verifying the PTG concept qualitatively. Although PTG has confirmed validity and reliability in many studies, it was initially developed from researchers' perspectives and hypotheses, not the cancer survivors' perspective. In this study, we verified the concept and five domains of PTG from emerged themes based on participants' experiences and perspectives. We verified that the concept of PTG accords with experiences of childhood and adolescent cancer survivors. We believe that such results validate the PTG concept as valid and reliable with a childhood and adolescent cancer population.

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Table 1

Demographic and cancer-related characteristics (N = 53).

	N (%)
Female	29 (54.7)
Age at interview, years[a]	
18–29	14 (26.4)
30–45	19 (35.9)
46–56	20 (37.7)
Age at cancer diagnosis, years[b]	
0–4	10 (18.9)
5–9	6 (11.2)
10–14	4 (7.6)
15–20	33 (62.3)
White, Not Hispanic/Latino	50 (94.3)
Cancer diagnosis	
Lymphoma	13 (24.5)
Gonad/germ cell	10 (18.9)
Leukemia	9 (17.0)
Sarcoma	6 (11.3)
Thyroid	5 (9.4)
Other	10 (18.9)
Education	
High school or less	10 (18.9)
Some college or technical school	28 (52.8)
College graduate or more	15 (28.3)
Employment	
Full-time	34 (64.1)
Part-time	8 (15.1)
Unemployed	10 (18.9)
Retired	1 (1.9)
Religion	
The Church of Jesus Christ Latter Day Saints	25 (47.2)
No religious or unknown affiliation	25 (47.2)
Other affiliation	3 (5.7)
Urban County of Residence at Diagnosis[c]	27 (50.9)
Urban County of Residence at Interview[c,d]	33 (70.2)

[a] Mean age at interview was 39.7, SD = 11.2.

[b] Mean age at diagnosis was 13, SD = 6.5.

[c] Rural = living in a county with <75% of population in an urban area [population ≥2500].

[d] Missing for five survivors.