Published in final edited form as:

J Cancer Surviv. 2018 August ; 12(4): 469–478. doi:10.1007/s11764-018-0686-8.

Workplace experiences and turnover intention among adult survivors of childhood cancer

Deborah B. Crom, PhD^{1,**}, Kirsten K. Ness, PT, PhD², Larry R. Martinez, PhD³, Michelle R. Hebl, PhD⁴, Leslie L. Robison, PhD², Melissa M. Hudson, MD¹, and Tara Brinkman, PhD²

¹Department of Oncology, St. Jude Children's Research Hospital, 262 Danny Thomas Place, MS 735, Memphis TN 38105

²Department of Epidemiology & Cancer Control, St. Jude Children's Research Hospital, 262 Danny Thomas Place, MS 735, Memphis, TN 38105

³Department of Psychology, 317 Cramer Hall, Portland State University 1721 SW Broadway, Portland, OR 97207

⁴Department of Psychology, Rice University, 429A Sewall Hall, 6100 Main Street, MS 25, Houston, TX 77005

Abstract

Purpose—Adult survivors of childhood cancer experience difficulty maintaining employment. The purpose of this study was to investigate workplace experiences and turnover intention (plan to leave a job) and to examine factors associated with turnover intention among survivors.

Methods—Adult survivors of childhood cancer with a history of employment ($n = 289$) completed measures of workplace experiences ($n = 50$, 18–29 years; $n = 183$, 30–44 years; $n = 56$; >45 years of age at follow-up). Turnover intention was assessed using 3 items from the Job Satisfaction Scale. Responses were dichotomized as reflecting high vs. low turnover intention. Path analysis was used to estimate the influence of demographic characteristics, treatment exposures (cranial radiation therapy [CRT]), and workplace experiences on turnover intention.

Results—Thirty percent of survivors reported high turnover intention. Exposure to CRT ($P = 0.003$), older attained age ($P < 0.001$), experiencing formal workplace discrimination ($P = 0.008$), and having lower continuance ($P < 0.001$) or affective commitment ($P < 0.001$) were associated with high turnover intention among survivors. Informal discrimination, mediated through job satisfaction, also influenced survivors' reported intent to leave their jobs.

Conclusions—A sizeable proportion of adult survivors of childhood cancer experience turnover intention, which is related to their cancer treatment, but more temporally proximal, workplace

**Corresponding Author: debbie.crom@stjude.org, Telephone: 901-595-5847, Fax: 901-595-5845.

Compliance with Ethical Standards:

Ethical approval: "All procedures performed in this study were in accordance with the ethical standards of the institution and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards."

Conflict of Interest: The authors declare that they have no conflicts of interest.

Informed consent: "Informed consent was obtained from all individual participants included in the study."

discrimination. Additional research is needed to understand the consequences of turnover intention among survivors.

Implications for Cancer Survivors—Survivors should be aware of legislative policies related to workplace discrimination (e.g. American with Disabilities Act) and related implications for job turnover.

Introduction

Progress in treating childhood cancer has resulted in more than 80% of newly diagnosed patients surviving 5 or more years beyond their diagnosis. The National Cancer Institute estimates that approximately 1 in 750 adults aged between 20 and 44 years who are alive today in the United States is a childhood cancer survivor (1). Unfortunately, the therapy required for effective treatment of childhood cancer predisposes long-term survivors to chronic health conditions, functional impairments, reduced quality of life, and psychosocial complications. Based on comprehensive clinical assessments of childhood cancer survivors, 98% develop one or more chronic health conditions, with 68% having a disabling condition (2). Survivors experience increased rates of frailty, with reduced muscle strength and poor exercise tolerance (3). In addition to often having visible physical impairments (4), survivors also experience increased rates of neurocognitive impairment and psychological distress, including anxiety, depression, social withdrawal, attention problems, and headstrong behavior (5, 6). Research suggests that such deficits may persist for decades after the original cancer diagnosis and increase over time (7, 8). These cumulative deficits challenge survivors who are struggling to achieve adult goals, such as obtaining and maintaining employment (9, 10). Cancer survivors derive many benefits from employment, including social connections, self-esteem, and a sense of normalcy. Employed survivors report higher global self-worth when compared to their unemployed counterparts (11). Working also provides financial stability in the form of wages and, often, health insurance benefits (12).

Obtaining and maintaining employment has become a central issue in survivorship care. Research suggests that childhood cancer and its treatment may affect adversely eventual employment, occupational choice, and work performance. Frobisher and colleagues, reporting for the British Childhood Cancer Study, noted increased rates of unemployment and underemployment among survivors (13). Similarly, an analysis from the Childhood Cancer Survivor Study revealed that adult survivors are employed in lower-skilled jobs when compared to their sibling controls. The risk of unemployment or underemployment appeared to affect survivors of cancer in all diagnostic groups, with survivors of central nervous system tumors being disproportionately affected (14). However, Prasad et al. contended that poor employment outcomes were not limited to a particular diagnosis but that pervasive neurocognitive and emotional deficits disrupted vocational attainment (5). Other established predictors of unemployment among survivors include young age at diagnosis, diagnosis of central nervous system or bone cancer, receipt of cranial radiation therapy (CRT), reduced physical strength, poor physical health status, and lower educational achievement or career readiness (15, 16).

Turnover intention

Turnover intention is the probability that an individual will leave a job within a certain period of time. Intention has been acknowledged as the best predictor of actual turnover. This is a complex phenomenon, integrating personal demographic characteristics (age, gender, tenure, experience, education, job stress, job satisfaction), employment variables (quality of work-life balance, supervisory style, workplace justice, peer relationships), and societal factors (availability of alternative sources of income, potential for other employment) (17, 18). The consequences of increased turnover include the direct organizational costs, such as the expense of identifying, recruiting, and training new employees, and the indirect costs of operational disruption and the demoralization and/or reduced productivity of those employees who remain (19).

For adult survivors of childhood cancer living in particularly strenuous life circumstances as a result of increased frailty and health impairments, turnover intention, the probability that an individual will leave a job within a certain period of time, eventually may result in a loss of income and insurance benefits, thereby lessening the ability of the survivors to be independent. Turnover intention, leading to turnover, also may represent a loss of self-esteem, work-related social contacts, and a sense of contributing to society. The purpose of the present study was to investigate the workplace experiences and attitudes of adult survivors of childhood cancer and examine variables that influence their turnover intention.

Methods

Participants

Participants were enrolled in the St. Jude Lifetime Cohort Study (SJLIFE), the details and methods of which have been reported previously (22, 23). Eligible participants included survivors who were at least 18 years of age and at least 10 years post-diagnosis. Detailed information about participants' cancer history and treatment was abstracted from medical records. In addition, SJLIFE participants self-reported health outcomes by completing a series of health surveys and underwent medical screening evaluations based on their specific cancer treatment, as recommended by the Children's Oncology Group Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent, and Young Adult Cancers (www.survivorshipguidelines.org). Data for this analysis was derived from a Work Experiences Survey distributed to SJLIFE participants who reported ever having had a full- or part-time job. Informed consent was obtained from all participants included in the study. All studies involving human participants were approved by the Institutional Review Board of St. Jude Children's Research Hospital.

Demographic and treatment-related variables

Study participants reported demographic variables including sex, race, and attained age; treatment-related variables including primary childhood cancer diagnosis, age at diagnosis, time since diagnosis, and cranial radiation therapy doses; and whether they had disclosed their history of childhood cancer to employers and/or co-workers.

Study measures

Unless otherwise noted, participants responded to items on 5- to 7-point Likert scales on which 1 = strongly disagree and 5 or 7 = strongly agree, depending on the scale.

Job satisfaction was defined as “an emotional reaction to one’s job, resulting from the comparison of actual outcomes with those that are desired” (24). It was assessed using Spector’s Job Descriptive Index (20 items) (25). In this index, 9 facets evaluate pay, promotion, supervision, fringe benefits, performance-based awards, operating procedures, coworkers, nature of work, and communication. An example item is “I like the things I do at work.”

Affective commitment and continuance commitment were measured using the 3-component Model of Job Commitment developed by Meyer and Allen (26). This scale measures “emotional ties an employee develops with an organization through positive work experiences” (affective commitment, 8 items) and the “desire to stay with an organization based on the perceived personal, economic, or social costs of leaving the job” (continuance commitment, 8 items). This model defines commitment as a force that binds an individual to a course of action, and it has been used to predict tardiness, absenteeism, job performance, and employment stability or turnover. Typical items include “I would be very happy to spend the rest of my career with this organization” and “Too much in my life would be disrupted if I decided I wanted to leave my organization right now.”

Job stress was measured using 4 items from the Occupational Stress Scale (27). This scale characterizes stress in negative terms, focusing on its potential dysfunctional effect on job performance. Stress is defined as “an unpleasant emotional experience associated with fear, dread, anxiety, irritation, annoyance, anger, sadness, grief, and depression.” These affective experiences result in deficits in performance, including reduced tolerance for frustration, clerical inaccuracy, interpersonal insensitivity, and decreased altruism. “I feel a great deal of stress because of my job” is one item in this evaluation.

Person-organization fit was determined using 3 items from the scale developed by Cable and Judge (28). This scale is based on the premise that individuals and organizations are most effective when their values, needs, and interests are aligned. This alignment is manifested by employee commitment, satisfaction/retention, organizational performance, and individual health. One item used was “My personal values match or fit the organization and the other employees in the organization.”

Performance was measured using 1 item from the World Health Organization Health and Work Performance Questionnaire that was developed to evaluate the indirect workplace costs of illness (29). It examines worker productivity losses from the point of view of the *worker* in terms of absenteeism due to illness and “presenteeism” (inadequate work performance from employees who are sick but present at work), along with the negative influence on productivity of untreated health problems. This single global item, assessed on a 10-point scale on which 0 is the worst possible work performance and 10 is the top work performance, asks workers for *their* perspective: “how would you rate your overall performance during the past 4 weeks?”

Formal discrimination was assessed using 2 items developed for this study. The items asked were “I feel I have experienced job discrimination in my company” and “My boss/supervisor treats me unfairly because I am a cancer survivor.”

Interpersonal discrimination was measured using an informal scale developed by Griffith and Hebl (30). This scale, originally developed to study formal and interpersonal discrimination against homosexual job applicants, evaluates the perspectives of people in stigmatized roles in actual employment settings (11 items). An example item is “My coworkers are hostile toward me.”

Turnover intention was measured using 3 items from the Job Satisfaction Scale developed by Cammann, Fichman, Jenkins, and Klesh (31). This scale is rooted in the premise that action follows intention. Items directly assess intention regarding leaving a current job with items such as “I will probably look for a new job in the next year” using a 7-point Likert scale. Higher scores reflected greater turnover intention and responses >5 on any one of the 3 items was defined as high turnover intention.

Statistical analysis

Descriptive statistics were calculated to characterize and compare participants and nonparticipants (Table 1). Differences were evaluated with *t*-tests or nonparametric equivalents as appropriate. To determine which demographic and treatment variables to include in a path model with disclosure- and workplace-specific constructs, variables were compared between participants with high and low turnover intention by using logistic regression. Path analysis was then performed to determine the potential associations among age, exposure to cranial irradiation, disclosure of cancer survivor status, formal and interpersonal discrimination, affective and continuance commitment, job stress, job performance, person-organizational fit, job satisfaction, and job turnover intention. Analyses were conducted in SAS version 9.4 using PROC CALIS, employing a maximum likelihood method to obtain parameter estimates. Goodness of fit statistics (standardized root mean residual [SRMR], the comparative fit index [CFI], and the root mean square error of approximation [RMSEA] with 90% confidence intervals [RMSEA90]) were used to assess the model fit in iterative steps. The chi-square statistic enables comparisons between a baseline and 3 revised models. The SRMR, CFI, RMSEA, and RMSEA90 enabled further refinement of the model fit. CFI values of 0.94 or higher indicate a good fit, SRMR and RMSEA values of less than 0.09 indicate an acceptable fit, and SRMR and RMSEA values of less than 0.055 indicate a good fit. After fitting an initial model, Wald tests were performed to see whether eliminating specific paths would improve the model fit, and Lagrange multipliers were used to determine whether adding particular paths would improve the model fit.

Results

Our eligible population consisted of 498 survivors in the St. Jude Life Cohort with previous work experience, of whom 289 (57%) participated in this study by completing the Work Experience Survey. Nonparticipants included those who had recently died, those who agreed to participate but did not return a survey, and those who returned a survey that was too

incomplete for inclusion in the analysis (i.e., it was missing more than 50% of the required data).

Demographics and cancer-related variables

The demographic and clinical characteristics of participants ($n = 289$) and nonparticipants ($n = 209$) are summarized in Table 1. In this cohort, study participants did not differ from nonparticipants with respect to sex, race, attained age, time since diagnosis, or treatment with CRT. Most respondents were female (56%), white (90%), and survivors of leukemia or lymphoma (76%). Approximately half (43%) had received CRT as part of their treatment.

Thirty percent of survivors reported a high turnover intention. Turnover intention did not differ by sex, age at diagnosis, or CRT exposure. However, a larger portion of nonwhite participants reported high turnover intention as compared to white participants (48% vs 28%, $P = 0.03$), and the proportion reporting high turnover varied significantly by current attained age (20–25 years: 58%; 25–30 years: 50%; 30–35 years: 33%; 35–40 years: 24%; 40–45 years: 23%; >45 years: 25%; $P = 0.01$). Turnover intention did not vary by type of occupation (e.g., professional, service, construction), but it did vary by income level (< \$20,000/year: 44%; \$20,000–\$39,999/year: 31%; \$40,000–\$59,999/year: 20%; >\$60,000/year: 26%; $P = 0.05$).

Descriptive data (mean and standard deviation) and correlations among each of the variables included in our final path analysis are shown in Supplemental Table 1. The standardized path coefficients, along with the standard errors, t -statistics, and P -values, are shown in Supplemental Table 2. Path-analysis goodness of fit indices are summarized in Table 3. The final model, with a CFI of 0.94, an SRMR of 0.06, an RMSEA of 0.06, and an RMSEA 90% CI of 0.04–0.08, is shown in Figure 1. Job satisfaction ($\beta = -0.25$, $P < 0.001$), affective commitment ($\beta = -0.28$, $P < 0.001$), continuance commitment ($\beta = -0.18$, $P < 0.001$), previous exposure to CRT ($\beta = -0.14$, $P < 0.001$), and attained age ($\beta = -0.16$, $P < 0.001$) each had inverse direct associations with turnover intention. Only formal discrimination had a positive direct effect on turnover intention ($\beta = 0.13$, $P = 0.008$). Formal discrimination also influenced job satisfaction and interpersonal discrimination. Informal discrimination mediated through job satisfaction ($P = 0.001$) had an indirect effect on turnover intention.

Discussion

To our knowledge, this is the first study to examine turnover intention among adult survivors of childhood cancer and to investigate factors associated with survivors' intentions to leave their jobs. In our sample, sex, age at diagnosis, time since diagnosis, and primary cancer diagnosis were not significantly related to turnover intention, despite their identification in prior research as important predictors of employment status (13, 32). However, we identified several factors that *were* significantly associated with turnover intention among survivors. Four constructs in our model were especially salient in predicting turnover intention: exposure to CRT in childhood, experiencing formal or informal discrimination, attained age, and affective or continuance commitment.

One of our findings was counterintuitive in that as cranial radiation dose exposure increased (thereby placing survivors at risk for greater cognitive and functional impairment), turnover intention decreased. This may indicate that survivors who receive higher doses of cranial irradiation, and who are probably more cognitively compromised as a consequence, remain in their jobs because they have fewer employment options. Also, these survivors often lack social insight and may be unaware of formal and informal discrimination—a factor that also predicts turnover intention in our sample. Conflicting results have been reported regarding work sustainability among survivors who received CRT (33, 34). However, most research has documented poor employment outcomes due to reduced cognition and deficits in attention, working memory, and processing speed (21, 35). In a report from the Childhood Cancer Survivor Study on occupational outcomes, Kirchhoff and colleagues noted that survivors who had received CRT were disproportionately working in service or blue-collar positions, as opposed to professional jobs [16]. Fewer options for alternative employment are available to workers in these lower-skilled positions.

In our cohort, both formal and informal discrimination influenced turnover intention. Although some reports have emphasized positive survivor adaptation and integration into workplaces (36, 37), others have focused on experiences reflecting discriminatory practices, including being denied employment, being passed over for promotions, having reduced job responsibilities, and being the target of negative comments or attitudes from coworkers or supervisors (12). Cancer survivors have reported experiencing more negative workplace outcomes when compared to their healthy counterparts (38), but the role of perceived discrimination in these experiences has not been specifically examined. The present study delineated between overt formal forms of discrimination and more subtle interpersonal forms of discrimination, incorporating important job-relevant attitudes to help examine the link between discrimination and intention to quit. Cancer survivors encounter formal discrimination because they are often perceived by supervisors to be less productive and poor candidates for promotion or advancement (39). Indeed, Dowling et al. documented that, compared to healthy controls, survivors of childhood cancer were more likely to be unable to work or to be limited in their work duties because of health problems. Additionally, survivors had significantly more days lost from work (40.2 days vs 15.1 days; $P < 0.001$) (40). Survivors themselves report depression and impaired task efficiency as important contributors to workplace problems leading to discrimination (5).

The Americans with Disabilities Act (ADA) of 1990 was designed to protect individuals with physical illness, including cancer survivors, from being excluded from the workplace if they can perform a job with reasonable accommodations. Despite this legal protection, workplace discrimination may contribute to cancer survivors' turnover intentions. Cancer survivors are more likely to file claims of discrimination under the ADA than are those with other disabilities, and these claims are more likely to be found to be legitimate (41, 42). Survivors who reported workplace discrimination were likely to have left the workforce 2 years earlier than those who did not report discrimination (43). Notably, a recent meta-analysis concluded that even a small, seemingly inconsequential amount of subtle discrimination can have a dramatic effect on workplace performance and outcomes such as turnover (44).

In our cohort, turnover intention decreased as attained age increased and as continuance or affective commitment increased. In 1993, Hays examined the influence of age on employment in 2 groups of survivors: those older than 30 years and those aged 20 to 29 years. He found that in those survivors older than 30 years, economic achievement and insurability were similar to those of the control group, whereas survivors aged 20 to 29 years had a wider variance from control subjects in employment and workplace relationships. Older employees had fewer disputes with workplace supervisors regarding work assignments and were less likely to request special provisions in the workplace because of health factors (45).

Age also may influence turnover intentions from a developmental perspective. Although not traditionally regarded as a vocational developmental theory, Erikson's stages of psychosocial crisis help in understanding the developmental nature of turnover intention. Young adults are developing their identity/sense of self, part of which includes career development that might be influenced by goal seeking or experimentation, resulting in high turnover intention. In contrast, older adults strive for personal mastery and responsibility, which includes being productive at work and focusing on societal concerns beyond themselves; thus, they experience lower turnover intention (46). The influence of affective commitment and continuance commitment on turnover intention also evolves over the lifespan. Such an evolution is related to maturity and shifting motivational factors. Younger individuals are often happy simply to be employed and are open to new experiences—including job change. In contrast, older employees more frequently identify with their organization and feel they are accomplished at their job. They also have increased mean levels of conscientiousness and agreeableness (47). This contributes to their affective commitment or their emotional attachment to, identification with, and involvement in an employing organization. Another possible explanation for increased affective commitment is that experiencing cancer as a child may be a traumatic event that allows survivors to develop a more positive, resilient outlook on life (including their jobs) than do those individuals who have not had to endure such hardships. Compared to people who have never had cancer, survivors are more likely to report that their current circumstances are better than those they have experienced in the past and that they are, therefore, more attached to the organizations for which they work (48). Employees with strong affective commitment stay with an organization because they want to. In fact, affective commitment has been noted to have the strongest relation to turnover intention (49).

In our study, continuance commitment, the perception of costs associated with leaving employment, was related inversely to turnover intention. In their research evaluating employment in cancer survivors, Feuerstein and colleagues note that in evaluating the pros and cons of employment, survivors are faced with a complex decision. Specifically, middle-aged survivors have often reached their peak in terms of position and earnings and are faced with financial burdens, including a mortgage or care of their extended family, and/or they depend on employer-provided health insurance to meet medical bills. They may struggle with balancing work-life demands, personal interests, and health needs (20). In light of emerging evidence that survivors of childhood cancer have increased levels of frailty, limiting their activities of daily living (3), impaired survivors may feel that they have only limited employment options. Turnover intention depends on age and health factors, but it

also depends on whether it occurs in the context of a good economy and a job market that includes possibilities for alternative employment. Older survivors, as well as other workers, may face discrimination in part because technological advances render their skills outdated or obsolete (50). Continuance commitment is at times assumed to be undesirable, being negatively related to job performance or citizenship behavior. Workers who stay in their job based on continuance commitment might lack the motivation to work hard, and they might be absent from work more often (51).

Recommendations

Our results underscore the importance of clinicians' awareness of the factors influencing job turnover in survivors of cancer. Advocacy, in terms of survivor employment, must be based on recognizing potential barriers and should focus on realistic options in addressing challenges. The interdisciplinary staff of survivorship clinics are positioned uniquely to obtain more than merely socially acceptable responses from survivors regarding their workplace experiences. We have previously shown that such a positive listening environment is essential for survivors to relate complete and honest information about their life experiences, motivations, and expectations (52). Clinicians also may raise awareness of discrimination in the workplace. Specifically, they can inform survivors about their rights as employees (under the ADA), so that injustices can be identified and addressed. Survivors can also be urged to foster clear and open relations with their supervisors in order to dispel negative stereotypes. From the time of their diagnosis, survivors need customized, team-based, long-term support in envisioning career options and managing employment opportunities to maximize their retention in the workforce. Including career and vocational services as integral aspects of survivorship evaluations and implementing measures to enhance career satisfaction, including how to identify and respond to discrimination, are essential.

Limitations and future research

Our results should be interpreted in the context of several limitations. Our data was cross-sectional which limited our ability to assess temporal or causal associations. Our sample was limited to survivors with a history of employment with 57% of eligible survivors participating, and our results, therefore may be vulnerable to selection bias. For example, most study participants were survivors of leukemia and lymphoma; survivors of central nervous system tumors, a subgroup who experience greater workplace challenges, were under-represented. Our data relied exclusively on survivor self-report, and self-reported data are prone to recall bias and socially acceptable responses. Despite this, patient-reported outcomes offer a unique perspective, because experiences of job-related attitudes, discrimination, and intentions to quit all inherently reside within the survivors themselves; therefore, participants' self-reported attitudes constitute their work-life realities. However, it would be informative to gather data from other sources such as coworkers and supervisors.

This study represents a promising starting point for better understanding the employment turnover intention of survivors. Future studies are needed to assess more accurately the impact of childhood cancer on adult work experiences. Large longitudinal studies in diverse populations with appropriate comparison groups could provide additional insights.

Identifying subgroups of survivors at risk for adverse employment outcomes may facilitate the development of interventions to enhance their retention in the workplace. Finally, the effectiveness of novel informational and support interventions, such as using social media to educate survivors and connect them with their peers, should be examined.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

We thank Keith A. Laycock, PhD, ELS, for scientific editing

Funding: This research was supported by Cancer Center Support (CORE) grant CA21765 from the National Cancer Institute (NCI), U01CA195547-01, and by American Lebanese Syrian Associated Charities (ALSAC).

References

- 1SEER Cancer Statistics Review (CSR) 1975–2013 [Internet] National Cancer Institute; 2016 based on November 2015 SEER data submission, posted to the SEER website, April 2016]. Available from: http://seer.cancer.gov/csr/1975_2013/ [cited May 1, 2017]
- 2Hudson MM, Ness KK, Gurney JG, Mulrooney DA, Chemaitilly W, Krull KR, et al. Clinical ascertainment of health outcomes among adults treated for childhood cancer. *Jama*. 2013; 309(22): 2371–81. [PubMed: 23757085]
- 3Ness KK, Armstrong GT, Kundu M, Wilson CL, Tchkonja T, Kirkland JL. Frailty in childhood cancer survivors. *Cancer*. 2015; 121(10):1540–7. [PubMed: 25529481]
- 4Vuotto SC, Ojha RP, Li C, Kimberg C, Klosky JL, Krull KR, et al. The role of body image dissatisfaction in the association between treatment-related scarring or disfigurement and psychological distress in adult survivors of childhood cancer. *Psycho-oncology*. 2017
- 5Prasad PK, Hardy KK, Zhang N, Edelstein K, Srivastava D, Zeltzer L, et al. Psychosocial and Neurocognitive Outcomes in Adult Survivors of Adolescent and Early Young Adult Cancer: A Report From the Childhood Cancer Survivor Study. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2015; 33(23):2545–52. [PubMed: 26150441]
- 6Brinkman TM, Li C, Vannatta K, Marchak JG, Lai JS, Prasad PK, et al. Behavioral, Social, and Emotional Symptom Comorbidities and Profiles in Adolescent Survivors of Childhood Cancer: A Report From the Childhood Cancer Survivor Study. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2016; 34(28):3417–25. [PubMed: 27432919]
- 7D'Agostino NM, Edelstein K, Zhang N, Recklitis CJ, Brinkman TM, Srivastava D, et al. Comorbid symptoms of emotional distress in adult survivors of childhood cancer. *Cancer*. 2016; 122(20): 3215–24. [PubMed: 27391586]
- 8Bitsko MJ, Cohen D, Dillon R, Harvey J, Krull K, Klosky JL. Psychosocial Late Effects in Pediatric Cancer Survivors: A Report From the Children's Oncology Group. *Pediatric blood & cancer*. 2016; 63(2):337–43. [PubMed: 26488337]
- 9Kirchhoff AC, Leisenring W, Krull KR, Ness KK, Friedman DL, Armstrong GT, et al. Unemployment among adult survivors of childhood cancer: a report from the childhood cancer survivor study. *Medical care*. 2010; 48(11):1015–25. [PubMed: 20940653]
- 10Liu L, O'Donnell P, Sullivan R, Katalinic A, Moser L, de Boer A, et al. Cancer in Europe: Death sentence or life sentence? *European journal of cancer*. 2016; 65:150–5. [PubMed: 27498140]
- 11Seitzman RL, Glover DA, Meadows AT, Mills JL, Nicholson HS, Robison LL, et al. Self-concept in adult survivors of childhood acute lymphoblastic leukemia: a cooperative Children's Cancer Group and National Institutes of Health study. *Pediatric blood & cancer*. 2004; 42(3):230–40. [PubMed: 14752860]

- 12Moskowitz MC, Todd BL, Chen R, Feuerstein M. Function and friction at work: a multidimensional analysis of work outcomes in cancer survivors. *Journal of cancer survivorship : research and practice*. 2014; 8(2):173–82. [PubMed: 24464639]
- 13Frobisher C, Lancashire ER, Jenkinson H, Winter DL, Kelly J, Reulen RC, et al. Employment status and occupational level of adult survivors of childhood cancer in Great Britain: The British childhood cancer survivor study. *Int J Cancer*. 2017; 140(12):2678–92. [PubMed: 28316069]
- 14de Boer AG, Taskila T, Ojajarvi A, van Dijk FJ, Verbeek JH. Cancer survivors and unemployment: a meta-analysis and meta-regression. *Jama*. 2009; 301(7):753–62. [PubMed: 19224752]
- 15Strauser D, Wagner S, Wong AW, O'Sullivan D. Career readiness, developmental work personality and age of onset in young adult central nervous system survivors. *Disability and rehabilitation*. 2013; 35(7):543–50. [PubMed: 22891646]
- 16Kirchhoff AC, Krull KR, Ness KK, Park ER, Oeffinger KC, Hudson MM, et al. Occupational outcomes of adult childhood cancer survivors: A report from the childhood cancer survivor study. *Cancer*. 2011; 117(13):3033–44. [PubMed: 21246530]
- 17Kaur Bandhanpreet, Mohindru Pankaj D. Antecedents of Turnover Intentions: A Literature Review. *Global Journal of Management and Business Studies*. 2013; 3(10):1219–30.
- 18Holtom BC, Mitchell TR, Lee TW, Eberly MB. Turnover and Retention Research: A Glance at the Past, a Closer Review of the Present, And a Venture into the Future. *The Academy of Management Annals*. 2008; 2(1):231–74.
- 19Mobley WH, Griffeth RW, Hand HH, Meglino BM. Review and conceptual analysis of the employee turnover process. *Psychological Bulletin*. 1979; 86(3):493–522.
- 20Feuerstein M, Todd BL, Moskowitz MC, Bruns GL, Stoler MR, Nassif T, et al. Work in cancer survivors: a model for practice and research. *Journal of cancer survivorship : research and practice*. 2010; 4(4):415–37. [PubMed: 20945110]
- 21Brinkman TM, Krasin MJ, Liu W, Armstrong GT, Ojha RP, Sadighi ZS, et al. Long-Term Neurocognitive Functioning and Social Attainment in Adult Survivors of Pediatric CNS Tumors: Results From the St Jude Lifetime Cohort Study. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2016; 34(12):1358–67. [PubMed: 26834063]
- 22Hudson MM, Ness KK, Nolan VG, Armstrong GT, Green DM, Morris EB, et al. Prospective medical assessment of adults surviving childhood cancer: study design, cohort characteristics, and feasibility of the St. Jude Lifetime Cohort study. *Pediatric blood & cancer*. 2011; 56(5):825–36. [PubMed: 21370418]
- 23Hudson M, Ehrhardt M, Bhakta N, Baassiri M, Eissa H, Chemaitilly W, et al. Approach for classification and severity grading of long-term and late-onset health events among childhood cancer survivors in the St. Jude Lifetime Cohort. *Cancer Epidemiol Biomarkers Prev*. 2017; 26:666–74. [PubMed: 28035022]
- 24Locke EA. The Nature and Causes of Job Satisfaction. In: Dunnette MD, editor *Handbook of industrial and organizational psychology* Chicago: Rand McNally; 1976
- 25Spector PE. Measurement of Human Service Staff Satisfaction: Development of the Job Satisfaction Survey. *American Journal of Community Psychology*. 1985; 13(6):693–713. [PubMed: 4083275]
- 26Meyer JP, , Allen NJ. *Commitment in the workplace: Theory, research, and application* Thousand Oaks, CA: Sage Publications; 1997
- 27Motowidlo SJ, Packard JS, Manning MR. Occupational stress: its causes and consequences for job performance. *The Journal of applied psychology*. 1986; 71(4):618–29. [PubMed: 3804934]
- 28Cable DM, Judge TA. The role of person-organization fit in organizational selection decisions. 1985
- 29Kessler RC, Barber C, Beck A, Berglund P, Cleary PD, McKenas D, et al. The World Health Organization Health and Work Performance Questionnaire (HPQ). *Journal of occupational and environmental medicine / American College of Occupational and Environmental Medicine*. 2003; 45(2):156–74.
- 30Griffith KH, Hebl MR. The disclosure dilemma for gay men and lesbians: "coming out" at work. *The Journal of applied psychology*. 2002; 87(6):1191–9. [PubMed: 12558225]
- 31Cammann C, , Fichman M, , Jenkins D, , Klesh J. Assessing the attitudes and perceptions of organizational members. In: Seashore SE, Lawler EE, Mirvis PH, , Camman C, editors *Assess Organ Change Guide Methods Meas Pr* New York, NY: Wiley Interscience; 1983

- 32Zeltzer LK, Lu Q, Leisenring W, Tsao JC, Recklitis C, Armstrong G, et al. Psychosocial outcomes and health-related quality of life in adult childhood cancer survivors: a report from the childhood cancer survivor study. *Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*. 2008; 17(2):435–46.
- 33Crom DB, Lensing SY, Rai SN, Snider MA, Cash DK, Hudson MM. Marriage, employment, and health insurance in adult survivors of childhood cancer. *Journal of cancer survivorship : research and practice*. 2007; 1(3):237–45. [PubMed: 18648974]
- 34Pillon M, Tridello G, Boaro MP, Messina C, Putti MC, Varotto S, et al. Psychosocial life achievements in adults even if they received prophylactic cranial irradiation for acute lymphoblastic leukemia during childhood. *Leuk Lymphoma*. 2013; 54(2):315–20. [PubMed: 22793040]
- 35Krull KR, Brinkman TM, Li C, Armstrong GT, Ness KK, Srivastava DK, et al. Neurocognitive outcomes decades after treatment for childhood acute lymphoblastic leukemia: a report from the St Jude lifetime cohort study. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2013; 31(35):4407–15. [PubMed: 24190124]
- 36Willard VW, Klosky JL, Li C, Srivastava DK, Brinkman TM, Robison LL, et al. The impact of childhood cancer: Perceptions of adult survivors. *Cancer*. 2017; 123(9):1625–34. [PubMed: 28098955]
- 37Fernandez-Pineda I, Hudson MM, Pappo AS, Bishop MW, Klosky JL, Brinkman TM, et al. Long-term functional outcomes and quality of life in adult survivors of childhood extremity sarcomas: a report from the St. Jude Lifetime Cohort Study. *Journal of cancer survivorship : research and practice*. 2017; 11(1):1–12. [PubMed: 27262580]
- 38Langeveld NE, Stam H, Grootenhuys MA, Last BF. Quality of life in young adult survivors of childhood cancer. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2002; 10(8):579–600. [PubMed: 12436217]
- 39Guy GP Jr, Berkowitz Z, Ekwueme DU, Rim SH, Yabroff KR. Annual Economic Burden of Productivity Losses Among Adult Survivors of Childhood Cancers. *Pediatrics*. 2016; 138(Suppl 1):S15–S21. [PubMed: 27940973]
- 40Dowling E, Yabroff KR, Mariotto A, McNeel T, Zeruto C, Buckman D. Burden of illness in adult survivors of childhood cancers: findings from a population-based national sample. *Cancer*. 2010; 116(15):3712–21. [PubMed: 20564096]
- 41Feuerstein M, Luff GM, Harrington CB, Olsen CH. Pattern of workplace disputes in cancer survivors: a population study of ADA claims. *Journal of cancer survivorship : research and practice*. 2007; 1(3):185–92. [PubMed: 18648969]
- 42Olson R, Hung G, Bobinski MA, Goddard K. Prospective evaluation of legal difficulties and quality of life in adult survivors of childhood cancer. *Pediatric blood & cancer*. 2011; 56(3):439–43. [PubMed: 20830781]
- 43Paraponaris A, Teyssier LS, Ventelou B. Job tenure and self-reported workplace discrimination for cancer survivors 2 years after diagnosis: does employment legislation matter? *Health policy*. 2010; 98(2–3):144–55. [PubMed: 20619922]
- 44Jones KP, Peddie CI, Gilrane VL, King EB, Gray AL. Not so subtle: A meta-analytic investigation of the correlates of subtle and overt discrimination. *Journal of Management [Internet]*. 2013 September 1, 2015.
- 45Hays DM. Adult Survivors of Childhood Cancer: Employment and Insurance Issues in Different Age Groups. *Cancer*. 1993; 71:3306–9. [PubMed: 8490872]
- 46Munley PH. Erikson's theory of psychosocial development and career development. *Journal of Vocational Behavior*. 1977; 10(3):261–9.
- 47Kanfer RA, L P. Aging, Adult Development, and Work Motivation. *Academy of Management Review*. 2004; 29(3):440–58.
- 48Tillery R, Howard Sharp KM, Okado Y, Long A, Phipps S. Profiles of Resilience and Growth in Youth With Cancer and Healthy Comparisons. *Journal of pediatric psychology*. 2015

- 49Meyer JP, Stanley DJ, Herscovitch L, Topolnysky L. Affective, Continuance, and Normative Commitment to the Organization: A Meta-analysis of Antecedents, Correlates, and Consequences. *Journal of Vocational Behavior*. 2002; 61:20–52.
- 50Lachman ME. Development in Midlife. *Annu Rev Psychol*. 2004; 55:305–31. [PubMed: 14744218]
- 51Solinger ON, van Olffen W, Roe RA. Beyond the three-component model of organizational commitment. *The Journal of applied psychology*. 2008; 93(1):70–83. [PubMed: 18211136]
- 52Crom DB, Hinds PS, Gattuso JS, Tyc V, Hudson MM. Creating the basis for a breast health program for female survivors of Hodgkin disease using a participatory research approach. *Oncology nursing forum*. 2005; 32(6):1131–41. [PubMed: 16270109]

Figure 1.
Final Model

Table 1

Demographics and characteristics of participants and nonparticipants

	Participants (n=289)		Nonparticipants (n=209)		P-value
	N	%	N	%	
Sex					0.70
Male	128	(44.3)	90	(43.1)	
Female	161	(55.7)	119	(56.9)	
Race					0.61
White	260	(90.0)	191	(91.4)	
Nonwhite	29	(10.0)	18	(8.6)	
Age at diagnosis					0.27
0–4 years	95	(32.9)	77	(36.8)	
5–9 years	77	(26.6)	61	(29.3)	
10–14 years	63	(21.8)	31	(14.8)	
15–20 years	54	(18.7)	40	(19.1)	
Age at questionnaire					0.89
18–24 years	12	(4.2)	9	(4.3)	
25–29 years	38	(13.2)	33	(15.8)	
30–34 years	43	(14.9)	32	(15.3)	
35–39 years	70	(24.2)	54	(25.8)	
40–44 years	70	(24.2)	43	(20.6)	
45+ years	56	(19.3)	38	(18.2)	
Time since diagnosis					0.82
10–19 years	29	(10.0)	20	(9.6)	
20–29 years	120	(41.5)	92	(44.1)	
30+ years	140	(48.5)	97	(46.3)	
Cranial radiation					0.95
None	166	(57.5)	119	(56.9)	
1–23 Gy	42	(14.5)	29	(13.9)	
24 Gy	65	(22.5)	51	(24.4)	

	Participants (n=289)		Nonparticipants (n=209)		P-value
	N	%	N	%	
25+ Gy	16	(5.5)	10	(4.8)	0.23
Diagnosis					
Leukemia	149	(51.6)	121	(57.9)	
Lymphoma	70	(24.2)	42	(20.1)	
Bone or soft tissue sarcoma	33	(11.4)	30	(14.4)	
Neuroblastoma	14	(4.8)	8	(3.8)	
Wilms tumor	13	(4.5)	3	(1.4)	
Other	10	(3.5)	5	(2.4)	
Employment status					
Professional	160	(55.4)	---	---	
Service worker	72	(24.9)	---	---	
Production/construction/ outdoor work	57	(19.7)	---	---	
Personal income [*]					
<US\$20,000/year	55	(21.3)	---	---	
US\$20–39,000/year	94	(36.4)	---	---	
US\$40–59,999/year	51	(19.8)	---	---	
US\$60,000+/year	58	(22.5)	---	---	
Education attainment					
College graduate	136	(47.1)	---	---	
Not a college graduate	153	(52.9)	---	---	

^{*} 258 survivors answered the question on personal income.

Table 2

Characteristics: high turnover vs. low turnover

	Total n	Low turnover		High turnover		P-value
		n	%	n	%	
Sex						0.51
Male	128	92	45.5	36	41.4	
Female	161	110	54.5	51	58.6	
Race						0.03
White	260	187	92.6	73	83.9	
Nonwhite	29	15	7.4	14	16.1	
Age at diagnosis						0.99
0–4 years	95	67	33.2	28	32.2	
5–9 years	77	54	26.7	23	26.4	
10–14 years	63	43	21.3	20	23.0	
15–20 years	54	38	18.8	16	18.4	
Age at questionnaire						0.008
18–24 years	12	5	2.5	7	8.1	
25–29 years	38	19	9.4	19	21.8	
30–34 years	43	29	14.4	14	16.1	
35–39 years	70	53	26.2	17	19.5	
40–44 years	70	54	26.7	16	18.4	
45+ years	56	42	20.8	14	16.1	
Time since diagnosis						0.003
10–19 years	29	16	7.9	13	14.9	
20–29 years	120	75	37.1	45	51.7	
30+ years	140	111	55.0	29	33.3	
Cranial radiation						0.04
None	166	111	55.0	55	63.2	
1–23 Gy	42	29	14.3	13	14.9	
24 Gy	65	49	24.3	16	18.4	
25+ Gy	16	13	6.4	3	3.5	

	Low turnover		High turnover		P-value
	Total n	n	%	n	%
Employment status					0.89
Professional	160	112	55.4	48	55.2
Service worker	72	49	24.3	23	26.4
Production/construction/ outdoor work	57	41	20.3	16	18.4
*Personal income per year					0.46
<\$20,000	55	31	17.2	24	30.8
\$20–39,999	94	65	36.1	29	37.2
\$40–59,999	51	41	22.8	10	12.8
\$60,000	58	43	23.9	15	19.2
Educational attainment					0.99
College graduate	136	95	47.0	41	47.1
Not a college graduate	153	107	53.0	46	52.9
Diagnosis					0.87
Leukemia	149	109	54.0	40	46.0
Lymphoma	70	47	23.3	23	26.4
Bone or soft tissue sarcoma	33	21	10.4	12	13.8
Neuroblastoma	14	9	4.4	5	5.8
Wilms tumor	13	9	4.4	4	4.4
Other	10	7	3.5	3	3.5

* 258 answered, 31 responses missing

Table 3

Final path model goodness of fit indices

Model	χ^2	DF	Change χ^2	Change DF	CFI	SRMR	RMSEA	RMSEA 90% CI
Baseline	856.11	66						
Initial model	442.88	36	413.23	30	0.48	0.15	0.20	0.18–0.21
Revised model 2	94.56	37	348.32	1	0.93	0.07	0.07	0.06–0.09
Revised model 3	85.18	41	9.38	4	0.94	0.06	0.06	0.04–0.08

DF = degrees of freedom; CFI = comparative fit index; SRMR = standardized root mean residual; RMSEA = root mean square error approximation; RMSEA 90% CI = root mean square error approximation with 90% confidence interval.