

# Health and supportive care needs of young adult cancer patients and survivors

Brad J. Zebrack · Jennifer Mills · Tammy S. Weitzman

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## Abstract

**PURPOSE** A sizable body of literature exists for young adult survivors of *childhood* cancer but relatively little is known about the health and supportive care needs of older adolescent and young adult cancer survivors. This project assessed priority health and supportive care needs for young adult patients and off-treatment survivors.

**METHODS** 1,088 cancer patients and off-treatment survivors (age 18–39, diagnosed between the ages of 15–35) rank ordered a series of health and supportive care needs. Item rank scores were calculated to prioritize lists of needs for patients receiving treatment and off-treatment survivors, respectively. Differences in rankings based on respondent age, age at diagnosis, years since diagnosis, gender and treatment status (currently receiving treatment or off-treatment) were examined.

**RESULTS** Availability of state-of-the-art treatment specific to this age-group and having adequate health insurance were the most highly-ranked health care needs. Support

from family and friends were the most highly ranked supportive care needs, although younger respondents attributed greater importance to support from family and friends. Older respondents attributed greater importance to availability of age-appropriate information, psychological counseling, and being responsible for one's own health care and decision-making. Younger respondents reported significantly higher needs for fertility information and services and for scheduling treatments to fit their lifestyles.

**CONCLUSION** Needs of adolescents and young adults with cancer vary along a continuum of care, from diagnosis and treatment through survivorship. Findings emphasize the value of age-appropriate resources and peer support. The study offers direction for delivering services to what previously has been an underserved population.

**Keywords** Young adult · Cancer · Survivor · Health care · Supportive care · Needs assessment

Statistics from the National Cancer Institute/Surveillance, Epidemiology, and End Results (SEER) dataset indicate that, from the 1970s to the mid-late 1990s, the incidence of cancer among adolescents and young adults age 15–29 has risen faster, on an annual basis, than that of cancer diagnosed in younger children and older adults.[6] In terms of 5-year relative survival for the years 1975–1997, pediatric patients and older patients above 55 years of age experienced average annual percent increases in survival of 1.5–2.5%; however, average annual increases for older adolescent and young adult patients were below average.[7] Thus, improvements in cancer outcomes observed for children and older adults are not experienced as such by adolescent and young adult patients.

In the US, approximately 5% of 15–25 years olds with cancer are entered into clinical trials, in remarkable contrast

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B. J. Zebrack (✉)  
School of Social Work, University of Southern California,  
669 W. 34th St.,  
Los Angeles, CA 90089-0411, USA  
e-mail: zebrack@usc.edu

J. Mills  
Lymphoma Research Foundation,  
111 Broadway, 19th Floor,  
New York, NY 10006, USA  
e-mail: jmills@lymphoma.org

T. S. Weitzman  
LCSW Clinical Social Worker, Bone Marrow Transplant Program,  
Dana Farber Brigham and Women's Cancer Center,  
44 Binney St.,  
Boston, MA 02115, USA  
e-mail: tammy\_weitzman@dfci.harvard.edu

to 60–65% of younger patients.[5] Lack of participation in and/or availability of clinical trials for this age group may be a contributing factor to the lackluster improvements in mortality and survival, particularly given evidence that risks, risk factors and responses to treatment may be different for this age group when compared to pediatric and older adult populations.[7] Young adults in their 20s also are least likely to possess health insurance,[28, 33] which may contribute to delays in seeking health care and obtaining timely diagnoses or treatment. Finally, the developmental challenges faced by young people in general (e.g., completing high school or college, initiating careers or gainful employment, development of intimate relationships) may influence adherence to treatment, or be influenced by major disruptions in work, school, and relationships with spouses/partners, family members and peers.

Adolescence and young adulthood represent periods of great psychosocial growth and transition. While a sizable body of literature exists for young adult survivors of *childhood* cancer, relatively few empirical studies and reports examine cancer's impact on unique aspects of young adulthood such as sexuality and fertility concerns, [3, 20, 22, 35, 39, 46] treatment outcomes and physical symptoms,[15, 23, 24, 29] psychosocial adjustment, coping and quality of life issues,[2, 4, 8–12, 14, 16, 17, 19, 21, 24, 25, 27, 32, 37, 38, 44, 50] health care,[1, 47, 48] family impact,[19, 30] and peer support interventions.[13, 36, 49] Some studies compare patients and survivors diagnosed with Hodgkin's disease to testicular cancer survivors,[8, 26] and others compare younger to older adult patients or survivors.[18, 30, 41, 45]

In 2005–2006, the National Cancer Institute partnered with the Lance Armstrong Foundation to address the special research and cancer care needs of adolescents and young adults, and to solicit recommendations for a national agenda to improve cancer prevention, early detection, diagnosis, treatment (including survivorship care), and outcomes for these patients.[31] By including young adult cancer patients and survivors, as well as oncology researchers, clinicians, and biologists as expert sources of knowledge, the NCI's Adolescent and Young Adult Oncology Progress Review Group sought multiple and varied perspectives on priority health and supportive care needs for young adult patients and off-treatment survivors.

## Materials and methods

### Data collection procedures and participants

This report details results from an online needs assessment of young adult cancer patients and survivors. To qualify,

respondents had to be age 18–39 at time of study and diagnosed with cancer between the ages of 15–35. The survey was conducted March 15 through June 15, 2006. Organizations serving young adult cancer patients and survivors posted public announcements about the survey in their own newsletters, directing eligible subjects to the Lymphoma Research Foundation's website and link to the survey (See Table 1 for a list of organizations that posted newsletter and/or electronic announcements about the survey). Data were collected via SurveyMonkey, an online software program and interface that allows investigators to design their own surveys and collect responses electronically. Upon completion of the survey, all raw data were exported to the principal investigators' own secured server at the University of Southern California School of Social Work. Data were analyzed using SPSS 11.0. The project and procedures were approved and performed in accordance with policies set forth by the University Park Institutional Review Board at the University of Southern California.

### Measures of "Need"

Items assessed all survey participants' perceptions about the needs of those in treatment as well as those of off-treatment survivors. Two sets of questions asked respondents to rank order health care and supportive care needs of patients in treatment and off-treatment survivors, respectively. The items presented in this series of questions were derived through a pilot needs assessment of young adult cancer patients and survivors.[48] Mean rank scores were calcu-

**Table 1** Referring organizations

Source	Frequency (Percent)
Lymphoma Research Foundation	283 (26.0)
Young Survival Coalition	195 (17.9)
Planet Cancer	150 (13.8)
Ulman Family Fund for Young Adults	81 (7.5)
Fertile Hope	51 (4.7)
Testicular Cancer Resource Center/TC-Net	48 (4.4)
Other Cancer Organizations <sup>a</sup>	92 (8.5)
Word of Mouth <sup>b</sup>	111 (10.2)
Other Internet Resources <sup>c</sup>	64 (5.9)
Other	12 (1.1)

<sup>a</sup> Camp Māk-a-Dream, Cancer Survivors Unite, First Descents, Global Campaign for Cancer Survivorship, Hope Lab, Minnie Pearl Foundation, NY Lifelab, Realtime Cancer, Steps for Living, Vital Options, American Cancer Society, Cancer Care Resources (Portland, OR), Leukemia & Lymphoma Society (Portland, OR), Gilda's Club (Detroit Metro, NYC), Lance Armstrong Foundation, WorkingAgainstCancer  
<sup>b</sup> Friend, relative, another cancer survivor, hospital/clinic staff, email message

<sup>c</sup> Association of Cancer Online Resources listservs, cancer-related message boards and online support groups (e.g., Yahoo, WebMagic).

lated for each item by tabulating the number of times an item was ranked first, second, third, fourth, fifth or unranked and then awarding five points to an item for each time a respondent ranked it first, four points for each time a respondent ranked it second, and so on. The sum for each item was divided by the total number of respondents in the sample to derive the rank scores, which were then ordered numerically to determine the order of items. Utilizing the non-parametric Mann-Whitney Test for statistical significance and reporting significant differences where  $p < .05$ , bivariate analyses were applied to examine mean differences for each item's rank score by respondents' treatment status (currently receiving therapy/off-treatment) and gender. Spearman Rank Correlation Coefficients were calculated to examine associations between rank scores for each item and respondent age, age at diagnosis and years since diagnosis. Non-parametric testing approaches were used in all analyses because the rankings for some items were highly skewed and also because calculation of mean rank scores assumed ranks to be continuous, and not ordinal, variables in the creation of a continuous rank score for each item. All survey respondents ranked all items. Thus, survey respondents who indicated that they were receiving treatment at time of study ranked needs for both patients in treatment and off-treatment survivors, as did those respondents who reported being off-treatment at time of study.

## Results

A total of 1,088 completed the entire survey, including questions related to demographics and service needs. Survey respondents were approximately 31 years old and diagnosed at age 26.5 years, on average. Average time since diagnosis was 4.3 years. Approximately three-fourths of the sample was female. Eighty percent of the sample reported being off-treatment at time of study. See Tables 2 and 3 for a summary of respondents' demographic and medical/health status characteristics.

### Health and supportive care needs for patients in treatment

Based on each item's calculated rank score, Table 4 lists the rank order of all assessed health and supportive care needs for young adult patients receiving treatment. Seventy-two percent of all respondents (those currently in treatment and off-treatment survivors, combined) ranked state-of-the-art treatment for cancers diagnosed in young adults as their first or second most important health care need, and 57% of respondents ranked availability of health care providers who know about treating young adults with cancer as their first or second most important need. Respondents overwhelmingly identified support from family and friends as

**Table 2** Demographics ( $n=1,088$ )

	Frequency (%)
Gender	
Male	257 (23.8%)
Female	823 (76.2%)
Geographic location	
Northwest <sup>a</sup>	64 (5.9%)
Southwest <sup>b</sup>	232 (21.3%)
Midwest <sup>c</sup>	197 (18.1%)
Northeast <sup>d</sup>	312 (28.7%)
Southeast <sup>e</sup>	203 (18.7%)
Canada	44 (4.0%)
Other <sup>f</sup>	36 (3.3%)
Education	
Less than high school graduate	14 (1.3%)
High school grad or GED equivalent	58 (5.4%)
Some college, vocational or training	241 (22.2%)
Associate Degree	73 (6.7%)
College Graduate	390 (36.0%)
Post-graduate education	308 (28.4%)
Employment	
Full-time	594 (54.8%)
Part-time	120 (11.1%)
Full-time homemaker	63 (5.8%)
Full-time student	145 (13.4%)
On temporary medical leave or disability	75 (6.9%)
Unemployed	59 (5.4%)
Permanently unable to work	28 (2.6%)
Racial/ethnic background	
White/Caucasian	920 (88.5%)
Black/African American	31 (3.0%)
Asian	44 (4.2%)
Hispanic/Latin	41 (3.9%)
Native American	4 (0.4%)
Marital/relationship status	
Married or committed relationship	656 (60.5%)
Not currently married	429 (39.5%)
Average Household Income <sup>g</sup> (s.d.)	
Range: (\$15,648–\$159,538)	\$53,119 (\$18,990)
Mean age (s.d.)	30.8 (5.6) years
Range: 18–40	

<sup>a</sup> (Alaska, Colorado, Idaho, Montana, Oregon, Washington, Wyoming)

<sup>b</sup> (Arizona, California, Hawaii, Nevada, New Mexico, Oklahoma, Texas, Utah)

<sup>c</sup> (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin)

<sup>d</sup> (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia)

<sup>e</sup> (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Virginia, Washington DC)

<sup>f</sup> Includes Europe, Asia, Mexico, Australia, and South America

<sup>g</sup> Household income was determined via US Census zip code data. Thus, Individual Household Income is the average income for the zip code in which each respondent resides, and not the respondent's actual household income.

**Table 3** Medical characteristics ( $n=1,088$ )

	Frequency (%)
Type of cancer	
Breast cancer	250 (22.9)
Hodgkin's disease	305 (28.0)
Non-Hodgkin's lymphoma	158 (14.5)
Leukemia	59 (5.4)
Testicular cancer	80 (7.4)
Bone and other soft tissue sarcomas <sup>a</sup>	78 (7.2)
Adenosarcomas and other carcinomas <sup>b</sup>	66 (6.1)
Brain tumor	27 (2.5)
All other <sup>c</sup>	63 (5.8)
Status	
Currently receiving treatment	215 (19.9)
Off-treatment	867 (80.1)
General Health	
Excellent	231 (21.3)
Very Good	437 (40.3)
Good	306 (28.2)
Fair	95 (8.8)
Poor	16 (1.5)
Recurrence	
Yes	221 (20.4)
No	862 (79.6)
Cancer-related health problems	
Yes	451 (41.7)
No	443 (40.9)
Don't know/not sure	188 (17.4)
Extent to which problems interfere with daily activities ( $n=639$ )	
None	66 (10.3)
Little	230 (36.0)
Some	227 (35.5)
A lot	116 (18.2)
Other health problems	
Yes	575 (53.0)
No	510 (47.0)
Mean age at diagnosis (s.d.)	26.5 (5.8) years
Range: 15–35	
Time since diagnosis (s.d.)	4.3 (3.9) years
Range: 0–25	

<sup>a</sup> Includes Ewing's sarcoma, osteogenic sarcoma, rhabdomyosarcoma

<sup>b</sup> bladder, cervical, colorectal, endometrial or uterine, kidney, liver, lung, nasal, ovarian, rhabdomyosarcoma, stomach, thyroid, tongue/oral, chondrosarcoma, other non-differentiated

<sup>c</sup> Includes melanoma, multiple myeloma, basal cell carcinoma, neuroblastoma, thyroid cancer and other non-differentiated or missing

the most important support needs. Seventy-five percent of respondents ranked support from family as first or second, and 45% ranked support from friends either first or second.

With regard to age, age at diagnosis and years since diagnosis, Spearman Rank Correlation Coefficients indicated significant differences in several rankings (Table 4). Older respondents in the sample and those diagnosed at older ages were more likely than younger respondents to attribute higher rankings to need for state-of-the-art treatments for young adults and need for access to multiple

medical opinions. Older respondents ranked the need to assume responsibility for one's own health care and decision-making significantly higher than did younger respondents. Younger respondents and those diagnosed at younger ages attributed higher rankings to needs for fertility services, scheduling treatments to fit their lifestyles, and support from family and friends. Younger respondents also were more likely to rank needs for minimizing side effects higher than were older respondents. The need for patients in treatment to have opportunities to meet other young adult cancer patients and survivors with similar diseases and ages was ranked significantly higher among respondents whose diagnoses were further out in time.

In several instances male and female respondents differed in their rankings. With regard to medical care for patients in treatment, Mann-Whitney values indicated that female respondents ranked the need for minimizing side effects significantly higher than did males ( $p=0.01$ ), whereas male respondents ranked the need for access to multiple medical opinions significantly higher ( $p=0.002$ ). As for supportive care needs of patients in treatment, females ranked the needs for age-appropriate information about cancer ( $p=0.03$ ), opportunities to meet other people with cancer ( $p<0.001$ ), and the need for psychological counseling during treatment ( $p=0.005$ ) significantly higher than did males. Males ranked the need for support from friends ( $p=0.03$ ) and the need to assume responsibility for one's own health care ( $p=0.008$ ) significantly higher than did females.

Respondents currently receiving treatment ( $n=215$ ) differed from respondents who were off-treatment survivors ( $n=867$ ) in their rankings of several patient needs. Off-treatment survivors ranked the need for psychological counseling while in treatment significantly higher than did respondents currently receiving treatment ( $p=0.014$ ). In contrast, respondents currently receiving treatment ranked the need for age-appropriate cancer information higher than did respondents who were off-treatment survivors ( $p=0.019$ ).

#### Health and supportive care needs for off-treatment survivors

Based on each item's calculated rank score, Table 5 lists the rank order of health and supportive care needs for off-treatment survivors. Fifty-nine percent of all survey respondents ranked having adequate health insurance as their first or second choice for most important need, and 50% ranked availability of health care providers who know about long-term follow-up care for survivors as one of their two most highly ranked health care needs. The entire sample again ranked support from family and friends as the two highest priority supportive care needs for off-treatment survivors, followed by opportunities to meet other survivors and encouragement to pursue social activities.

**Table 4** Health and supportive care needs for *patients in treatment* ( $n=1,083$ ), and variation in mean rank scores by current age, age at diagnosis, years since diagnosis

Rank order (%) <sup>1</sup>	Current age	Age at diagnosis	Years since diagnosis
<b>Health care needs</b>			
1. State-of-the-art treatment for cancers diagnosed in young adults in their 20s and 30s.	0.13***	0.10**	0.04
2. Availability of health providers who know about treating young adults with cancer.	-0.02	0.02	0.02
3. Minimizing side effects and symptoms of cancer treatment (such as nausea, pain).	-0.08*	-0.06	0.01
4. Fertility services, including pre-treatment information about infertility risks and options for having children.	-0.08*	-0.07*	0.04
5. Access to multiple medical opinions.	0.11***	0.09**	0.07*
6. Scheduling treatments so they fit into young adults' lifestyles (around school, work, day care for young children, etc.).	-0.15***	-0.12***	0.02
7. Hospice or end-of-life services.	0.04	0.02	0.02
<b>Supportive care needs</b>			
1. Support from family.	-0.12***	-0.07*	0.01
2. Support from friends.	-0.12***	-0.07*	-0.01
3. Age-appropriate information about their cancer, the treatment, possible side effects and/or late effects.	0.05	0.05	0.04
4. Ability to assume responsibility for their own health care and decision-making.	0.10**	0.03	0.07*
5. Opportunities to meet other young adult cancer patients or survivors with similar diseases and similar ages	-0.02	-0.06	0.10***
6. Counseling and support to help manage distress, depression, anxiety, worries	0.04	0.02	0.05
7. Support groups led by trained mental health professionals such as social workers or psychologists.	-0.02	-0.01	0.02

<sup>a</sup> Rank ordered as determined by calculated rank score. Cells contain Spearman Rank Correlations used to examine associations between variables.

\*  $p < 0.05$

\*\*  $p < 0.01$

\*\*\*  $p < 0.001$

Spearman Rank Correlation Coefficients indicated significant differences in rankings based on respondents' age, age at diagnosis, and years since diagnosis (Table 5). Older respondents in the sample and those diagnosed at older ages attributed significantly higher rankings to the need for counseling and support to help manage distress and worries after the completion of treatment. Respondents who were further out in time from diagnosis also ranked the need for adequate health insurance, as well as the need for opportunities to meet other young adult cancer survivors, significantly higher than did respondents closer in time to diagnosis. Older respondents and those further out in time from treatment ranked the need for availability of health care providers who know about long-term follow-up care for cancer survivors significantly higher than did respondents closer in time to diagnosis. Respondents who were older at the time of diagnosis also ranked the need for off-treatment survivor support groups significantly higher than did those diagnosed at younger ages. Younger respondents and those diagnosed at younger ages attributed significantly higher rankings to needs for information and counseling around fertility, reproductive problems and options for having children. Younger respondents also ranked the need for support from friends and the need for encouragement to

pursue social activities significantly higher than did older respondents.

Mann-Whitney tests of comparisons of mean rank scores by gender revealed that females ranked the need for information and counseling about fertility, reproductive problems and options for having children significantly higher than did males ( $p=0.006$ ). Females also attributed significantly higher rankings to the need for counseling and support to help manage distress or worries ( $p=0.001$ ) and the need for opportunities to meet other cancer survivors after the completion of treatment ( $p < 0.001$ ). Males ranked the need for support from friends significantly higher than did females ( $p=0.002$ ). As for reported differences by respondents' treatment status, respondents in treatment at time of study ranked the need for a defined plan for long-term follow-up care ( $p=0.009$ ) and the need for encouragement to pursue social activities ( $p=0.001$ ) significantly higher than did off-treatment survivors.

## Discussion

From the perspective of young adult cancer patients and off-treatment survivors, the highest priority needs appear to

**Table 5** Health and supportive care needs for *off-treatment survivors* ( $n=1,083$ ), and variation in mean rank scores by current age, age at diagnosis, years since diagnosis

Rank order (%) <sup>a</sup>	Current age	Age at diagnosis	Years since diagnosis
Health care needs			
1. Having adequate health insurance	-0.03	-0.03	0.09**
2. Availability of health care providers who know about long-term follow-up care for cancer survivors	0.07*	0.03	0.07*
3. A defined plan for follow-up health care	-0.04	0.05	-0.05
4. Individualized information about the type of cancer, treatments received, and possible long-term effects.	0.03	0.03	0.04
5. Information and counseling about fertility, reproductive problems, and options for having children	-0.06*	-0.06*	0.04
6. A system for transitioning health care from oncologists to primary care providers	0.00	0.01	0.02
Supportive care needs			
1. Support from family	-0.06	-0.02	0.02
2. Support from friends	-0.06*	-0.01	-0.01
3. Opportunities to meet other young adult cancer patients or survivors with similar diseases and similar ages	-0.02	-0.03	0.08**
4. Encouragement to pursue social activities, such as dating, going out with friends, returning to work, etc.	-0.09**	-0.05	0.01
5. Counseling and support to help manage distress, depression, anxiety or worries	0.10**	0.06*	0.06*
6. Support groups led by trained mental health professionals such as social workers or psychologists.	0.02	0.07*	-0.02

<sup>a</sup> Rank ordered as determined by calculated rank score. Cells contain Spearman Rank Correlations used to examine associations between variables.

\*  $p < 0.05$

\*\*  $p < 0.01$

\*\*\*  $p < 0.001$

be availability of state-of-the-art treatments for cancers diagnosed among adolescent and young adults, and availability of health care providers who are skilled and knowledgeable about treating young adults and providing appropriate follow-up care. These results are relevant given the absence of an age-appropriate infrastructure to support patient data collection and advancement of clinical research that targets this group.[31] Empirically-based guidelines for treating and monitoring older adolescents and young adults with cancer are lacking, as are health care practitioners who are attuned to the unique emotional, developmental and social transitions that occur during this stage of life. Also, respondents' high priority ranking of need for health insurance may reflect their recognition that health insurance is indeed a scarce resource for persons their age, and that possessing adequate insurance is critically important for accessing on-going health care and surveillance post-treatment.

With regard to supportive care needs, the role of family and friends seems paramount for both patients in treatment and off-treatment survivors, although the younger portion of the cohort appears to attribute greater importance to the need for support from family and friends. Furthermore, as survivors move further out in time from their cancer diagnosis they may, in retrospect, better understand or recognize the potential benefits of meeting other young

cancer survivors. These findings are consistent with theories of identity development in which older adolescents and young adults define themselves through social interaction with groups and peers.[40] Thus, for adolescent and young adult cancer survivors it is not inconsequential that they say they make friends when they attend oncology camps and retreats. Making friends actually is a critical developmental task that promotes social competence, psychosocial adjustment and mental health,[40] and appears relevant to young adults during as well as after cancer treatment. Existing studies of young adult patients suggest that peer involvement with others whom they can observe as sharing similar experiences offers opportunities to address areas of concern such as coping with uncertainty, dependency versus autonomy, social exclusion, separation processes, body image, intimacy, sexuality and fertility, and career plans.[13, 36, 42, 43]

The older portion of the cohort attributed a greater level of importance to the availability of professional counseling and trained mental health professionals, suggesting that emotional distress may be more salient, or perhaps less often resolved, for patients in their 30s. Younger adults (late teens, early 20s) may be more concerned about cancer treatment disrupting their lifestyles and social involvement and thus may be more likely to look to their friends or other cancer survivors for support. In contrast, young adults in

their 30s may be more amenable to accessing professional care providers (and perhaps also possess adequate insurance coverage to do so).

There were few instances in which survey responses from patients currently receiving treatment differed significantly from those of off-treatment survivors. For the most part, when respondents in treatment thought ahead to what they thought off-treatment survivors need, their rankings closely matched those of off-treatment survivors. Similarly, off-treatment survivors' recall of their time in treatment and subsequent rankings of what they felt was most important during that time closely matched what respondents currently in treatment considered to be important. The finding that patients in treatment ranked the need for age-appropriate cancer information during treatment significantly higher than did off-treatment survivors not only suggests a greater need but also perhaps infers that the need for age-appropriate information is currently not being met. While the findings could be influenced by retrospective recall, they suggest that young adults have different needs at various points along a continuum of care that initiates at diagnosis and continues through treatment and post-treatment survivorship. The findings justify the need for prospective investigations of the impact of cancer at various phases of survivorship. Finally, the finding that off-treatment survivors ranked the need for psychological counseling during treatment higher than did respondents currently receiving treatment suggests that in hindsight survivors recognize that they may have benefited from psychological counseling or support while in treatment.

Findings reported here reflect the perspective of young adult cancer patients and survivors with select characteristics and may not represent the universe of adolescent and young adult cancer survivors in the US. The study is limited in that only young adults actively pursuing health information on the Internet or registered to receive mailed announcements through patient service and advocacy organizations became informed of the study and elected to complete it. The number of people who may have seen announcements about the survey but elected not to complete it is unknown. Use of a web-based interface may have precluded individuals without Internet access to hear about or access the survey, although a recent Kaiser Family Foundation study found that 90% of teens and young adults (age 15–24) have gone online, 75% of young people have Internet access at home, and 75% have searched the Internet for health information.[34] Yet, generalizability is limited in that the sample was disproportionately female, Caucasian and well-educated, as well as relatively early in their survivorship. Finally, the statistically significant but relatively low correlations among needs and age, age at diagnosis and time since diagnosis suggest that other demographic or health status

variables may have simultaneous or greater influence on health and service needs. Future investigations should better examine the potential effects of health status, type of cancer and type of treatment, as well as race/ethnicity, class and socioeconomic status, as these factors also may be associated with young adult survivor needs and outcomes.

Among the recommendations set forth by the NCI's Progress Review Group on Adolescent and Young Adult Oncology is a directive to "ensure excellence in service delivery across the cancer control continuum (i.e., prevention, screening, diagnosis, treatment, survivorship, and end-of-life)" (p. 15).[31] Responses from this large and geographically-dispersed sample can provide direction to practitioners and program planners intent on delivering services to what previously has been an underserved population of adolescents and young adults diagnosed with various forms of cancer. While the results are not particularly unexpected, this study represents a useful first start in obtaining empirical data from this under-represented young adult cohort.

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