



Twenty-five-Year Follow-up of Short-term Cancer Research Trainees at the University of Alabama at Birmingham: a Brief Report

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Abstract

Long-term follow-up is needed to evaluate the impact of short-term cancer research programs on the career trajectories of medical and graduate students. Participation in these programs may be crucial in fostering the next generation of cancer research scientists. This report presents the career outcomes and research productivity of 77 medical and public health students with 25 years of tracking data following their participation in a summer cancer research training program at the University of Alabama at Birmingham (UAB) in 1990–1998. Of 64 summer trainees with contact information, complete survey responses were received from 55 (86.0%) individuals. Over half reported clinical care of cancer patients and 18.2% stated that they were engaged in cancer research. Literature searches confirmed that 23.4% (18/77) of trainees have published cancer research papers. Future studies should explore the optimal timing of short-term post-baccalaureate academic cancer training experiences to identify participant characteristics and institutional factors that influence career choices and determine research productivity.

Keywords Cancer training · Longitudinal tracking · Summer research programs

Introduction and Background

The purpose of this investigation is to evaluate the career outcomes of students who participated in a summer cancer research training program at the University of Alabama at Birmingham (UAB) from 1990 to 1998. These students were supported by UAB's Cancer Prevention and Control Training Program (CPCTP), first funded by NCI (National Cancer

Institute) grant R25CA047888 in 1988. The main purpose of the CPCTP was to support post-doctoral fellows and doctoral students in medicine, nutrition sciences, and public health, for periods of 1–3 years, as they prepared for cancer research careers. In addition, a small portion of the initial CPCTP budget supported eight or nine students per summer (77 students in all) for 8-week terms to conduct short cancer research projects. About two thirds of the summer trainees were medical students, the remainder being graduate public health students. In 1999, NCI funded the CaRES (Cancer Research Experiences for Students) program grant R25CA076023. The CaRES program was designed exclusively to support short-term summer students no longer covered by the CPCTP beyond 1998. Histories of the CPCTP and CaRES training programs have been detailed previously [1–3].

Materials and Methods

Study Population

An in-depth longitudinal tracking methodology was developed for the CaRES grant as described elsewhere [4]. This methodology was adapted to locate members of the 1990–1998 cohort

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using a computer software and technology unavailable for our 5- and 10-year tracking. Adapting the algorithm by utilizing a variety of information sources as outlined in our publications, we found information on 65/77 (84%) of the cohort. One member of the cohort was deceased, while 64 others (83%) were apparently alive with e-mail addresses, and in some instances, physical addresses (Fig. 1). We could find no contact information for the remaining 12 individuals in the cohort.

Survey Administration and Study Outcomes

Funding of summer cancer research programs requires periodic follow-up of program participants. Our survey of occupation, professional activities, and career accomplishments was exempt from UAB Institutional Review Board approval as it was an alumni tracking effort, not a research study. The invitation to complete the survey was sent via email to 64 members of the cohort. As many as three messages were sent over 3 months, with a final e-mail request made at 4 months. Our message stated that we wished to collect information on demographics, highest degrees and training received, current employment status and position, and cancer-related research, education, and service activities. Each participant had the option of accessing our website where they could complete the survey electronically or requesting that we call them for a telephone interview. In most instances, the survey was self-administered, with responses entered electronically. A total of 55 completed surveys were received and entered into our primary database for analysis. Five other individuals submitted incomplete responses, two individuals repeatedly stated that they would complete and submit their surveys but failed to do so, and two others failed to respond.

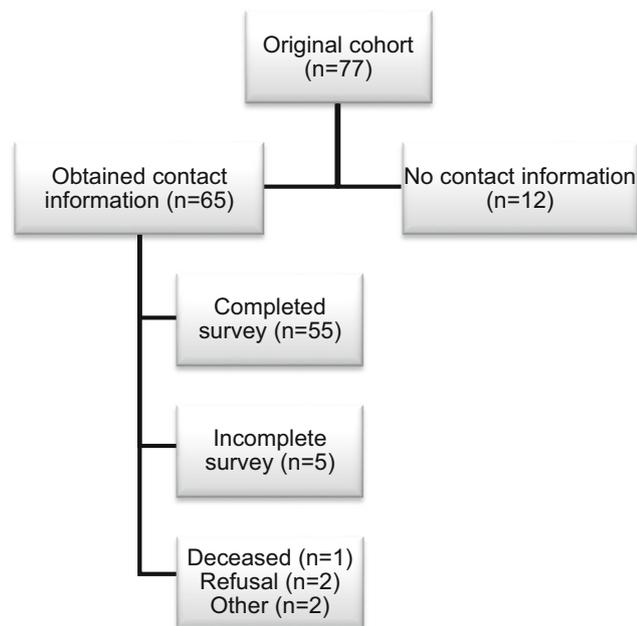


Fig. 1 Consort diagram for follow-up of trainees

The primary outcome of interest to us was whether the individual was engaged in cancer research and if so, their primary research area and number of peer-reviewed cancer publications (to be confirmed by electronic searches utilizing Scopus®) [4–6]. Cancer researchers were asked to specify whether they were engaged in basic laboratory research, clinical research, translational research, or studies of prevention and control, survivorship, palliative care, quality of life, or outcomes. In addition, we asked questions about type of employer (e.g., university, hospital, private medical practice) and other cancer-related professional activities such as working with health departments and membership in professional societies.

Results

The primary outcome data for this cohort are shown in Table 1. Respondents had completed their short-term CPCTP cancer research experiences 20–28 years (median, 25 years) previously. Over half of the individuals tracked are physicians engaged in private medical practice. Clinical care and counseling of cancer patients represented a large proportion of employment activities (54.6 and 36.4%, respectively). Of the 55 individuals completing the survey, ten (18.2%) reported that they did cancer research, primarily clinical research (50.0%), and laboratory research (40.0%). Of those not currently engaged in cancer research, four (7.0%) indicated an intention to do cancer research in the future. All survey participants recommended short-term summer cancer research programs to current medical or public health students.

An electronic search for peer-reviewed publications by any of the 77 members of the cohort revealed that 23.4% (18/77) were authors of peer-reviewed cancer-related publications. Half of the 18 trainees authored fewer than six papers, while five individuals (27.8%) coauthored over 20 publications.

Discussion

A recent report suggested that institutions have a commitment to disclose follow-up information about trainees encompassing employment and career choices [7]. The authors emphasize that outcomes of training programs at the local level are needed due to the variability in program content and experiences across institutions. Our methods may be useful to researchers evaluating programs like ours. Although our results may not be generalizable to all short-term cancer research training programs, retrospective studies of career accomplishments are needed to inform future trainees as they consider post-graduate training options.

Our longitudinal tracking revealed that ten of 55 trainees (18.2%) who completed the survey are currently engaged in

Table 1 Cancer research, education, and service activities of short-term cancer research trainees after median follow-up of 25 years

	<i>N</i> (%)
Type of employer (of <i>n</i> = 64 alive, having contact information)	
Private medical practice	31 (48.4)
Academic institution	18 (28.1)
Business/consulting/other	5 (7.8)
Federal/State government	4 (6.3)
Industry	4 (6.3)
None	2 (3.1)
Cancer activities (of <i>n</i> = 55 completing survey) *	
Clinical care of cancer patients	30 (54.6)
Counseling cancer patients	20 (36.4)
Oversees cancer screening/control program	16 (29.1)
Other cancer-related activities	8 (14.6)
Works with a health department	4 (7.3)
Do your current activities involve cancer research? (of <i>n</i> = 55 completing survey)	
No	45 (81.8)
Yes	10 (18.2)
If yes, what areas are your primary focus? (of <i>n</i> = 10 who stated they do cancer research) *	
Clinical research	5 (50.0)
Basic or laboratory research	4 (40.0)
Cancer prevention and control	3 (30.0)
Translational research (basic to clinical)	2 (20.0)
Cancer survivorship research	2 (20.0)
Cancer quality of life research	2 (20.0)
Cancer outcomes research	2 (20.0)
Other cancer research	2 (20.0)
Palliative care research	1 (10.0)
Cancer-related publications (of <i>n</i> = 77 in cohort, found on Scopus search)	
No	59 (76.6)
Yes	18 (23.4)
Number of publications (of <i>n</i> = 18 who published)	
1–5	9 (50.0)
6–20	4 (22.2)
> 20	5 (27.8)

*More than one category response allowed

cancer research, and that over half take care of cancer patients. Considering the entire cohort of 77 trainees, ten of 77 (13.0%) are engaged in cancer research. The electronic literature search found that 23.4% (18 of the cohort of 77) published at least one cancer research paper.

Nine of the 64 live subjects we located did not complete their surveys (Fig. 1). These nine individuals may have clinical research or cancer care responsibilities but had no cancer publications identified from the literature search. The 12 individuals for whom we had no contact information presumably made no cancer research contributions, although a change in

surname could have made these individuals impossible to track or link to publications. Overall, we assume that 22 individuals (28.6% of the cohort of 77) have no cancer research accomplishments. However, it is noteworthy that 71.4% did report some involvement in the cancer care continuum of bench to bedside.

Our previous publication [5] summarized the results of longitudinally tracking 481 CaRES trainees who served from 1999 to 2012. Follow-up was 98% complete. The most recent trainees (43%) were still in training. Of the remaining 57%, 15% reported cancer research activity, 58% provided clinical care of cancer patients, and 20% had published cancer research. These results are quite similar to the results presented here. However, the figures for the CaRES trainees could change if there have been recent trends in career choices of medical students (i.e., research versus practice) over this 14-year period.

Our previous papers summarized the evaluation results of other summer cancer research training programs [5, 6]. Most evaluation data focus on perception of the cancer research field, intention to pursue further education such as a doctoral degree, and satisfaction with program logistics and administration [8]. Results from one long-term R25E summer cancer program utilized Facebook for follow-up of trainees and participant networking [9]. This study reported 19.7% had a cancer career goal, 9.9% were in cancer-committed careers, and 6.5% were involved in cancer research [9]. A specialized program designed for MPH and Ph.D. students in cancer epidemiology assessed long-term outcomes such as post-doctoral positions or employment in special populations [10]. The authors found that predictive factors of long-term success were student resourcefulness and compatibility with mentors. The authors noted that the results were based on a relatively small sample size and qualitative measures [10]. Last, a structured 10-week cancer prevention summer program has collected follow-up data since 2013 and tracks the percentage of participants involved in research. Of the half that have completed formal training, only about half of them are engaged in some sort of research, while one in five works in health care [11].

In conclusion, 18% of 55 trainees in our study are currently engaged in cancer research, and 55% deliver clinical care to cancer patients. The internal and external factors that impact retention in cancer research careers have not been well studied. Future studies should seek to identify trainee characteristics and institutional factors that impact long-term career choices and shape accomplishments in cancer research, education, clinical practice, and community health.

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Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of our institution and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. For this type of study, formal consent is not required.

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