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ORIGINAL REPORT

Oncology Fellows' Career Plans, Expectations, and Well-Being: Do Fellows Know What They Are Getting Into?

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ABSTRACT

Purpose
To evaluate the career plans, professional expectations, and well-being of oncology fellows compared with actual experiences of practicing oncologists.

Methods
US oncology fellows taking the 2013 Medical Oncology In-Training Examination (MedOnc ITE) were invited to participate in an optional postexamination survey. The survey evaluated fellows' career plans and professional expectations and measured burnout, quality of life (QOL), fatigue, and satisfaction with work-life balance (WLB) using standardized instruments. Fellows' professional expectations and well-being were compared with actual experiences of US oncologists assessed simultaneously.

Results
Of the 1,637 oncology fellows in the United States, 1,373 (83.9%) took the 2013 MedOnc ITE. Among these, 1,345 (97.9%) completed the postexamination survey. The frequency of burnout among fellows decreased from 43.3% in year 1 to 31.7% in year 2 and 28.1% in year 3 ($P < .001$). Overall, the rate of burnout among fellows and practicing oncologists was similar (34.1% *v* 33.7%; $P = .86$). With respect to other dimensions of well-being, practicing oncologists had lower fatigue ($P < .001$) and better overall QOL scores ($P < .001$) than fellows but were less satisfied with WLB ($P = .0031$) and specialty choice ($P < .001$). Fellows' expectations regarding future work hours were 5 to 6 hours per week fewer than oncologists' actual reported work hours. Levels of burnout ($P = .02$) and educational debt ($P \leq .004$) were inversely associated with ITE scores. Fellows with greater educational debt were more likely to pursue private practice and less likely to plan an academic career.

Conclusion
Oncology fellows entering practice trade one set of challenges for another. Unrealized expectations regarding work hours may contribute to future professional dissatisfaction, burnout, and challenges with WLB.

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INTRODUCTION

The United States is projected to face a profound shortage of oncologists by 2020.[1-3] Although oncologists report a high degree of career and specialty satisfaction, recent studies suggest a burnout prevalence of approximately 40%.[4,5] A study of US oncologists also suggests satisfaction with work-life balance (WLB) is among the lowest of all medical specialties.[6] This dissatisfaction with WLB has profound effects on oncologists' career plans, including reducing the number of hours they devote to patient care.[6] This possibility has the potential to exacerbate the projected oncologist shortage.[1]

One unexplored factor that may contribute to burnout and dissatisfaction with WLB is a mismatch between the expectations oncologists may have when they enter the field and the reality of their professional experiences. It is unknown how accurately oncology fellows' expectations regarding work hours, call schedule, salary, and patient volume match what they will experience when they enter practice. Although fellows typically have extensive experience in academic practice (AP) models, they often have limited exposure to private practice (PP) and other practice settings. Indeed, studies suggest that fellows who prioritize lifestyle considerations are more likely to pursue non-AP settings,[7] despite data suggesting that oncologists in

PP work more hours per week, see more patients, and have more frequent night call and greater weekend responsibilities.[5,6]

In addition, although trainees often assume that fatigue, problems with WLB, and professional burnout peak during training (eg, during residency and fellowship), how the experiences of oncology fellows in these domains compare with those of practicing oncologists has not been well studied.[8] To explore these aspects, we assessed the career plans and professional expectations of US oncology fellows and measured burnout, quality of life (QOL), fatigue, and satisfaction with WLB using standardized instruments. Fellows' professional expectations and well-being in these dimensions were compared with the actual experiences of practicing oncologists assessed simultaneously.

METHODS

Participants

The Medical Oncology In-Training Examination (MedOnc ITE) was developed by the American Society of Clinical Oncology (ASCO) to measure fellows' medical knowledge, establish and demonstrate consistent educational standards for training programs, allow programs to assess program strengths and weaknesses, compare mean scaled test scores among programs, and provide individual fellows with feedback regarding their strengths and weaknesses in specific content areas.[9] All US medical oncology fellows completing the 2013 MedOnc ITE (February to March 2014) were invited to participate in an optional 36-item postexamination survey. Participation was voluntary, and all data were deidentified before analysis. ASCO commissioned the study, with human participant oversight provided by the Mayo Clinic Institutional Review Board.

Study Measures

The survey explored personal and professional characteristics using standardized instruments to measure burnout and career satisfaction. Fellows were also asked about their future career plans (including practice setting) as well as their professional expectations once they completed fellowship (hours worked per week, nights on call per week, salary expectations, number of patients they expected to see per week, and average time spent per patient visit [both for new and returning patients]). The full survey is available on request.

Although the 22-item Maslach Burnout Inventory (MBI) is the gold standard for measuring symptoms of burnout,[10] its length limits feasibility for use in large survey studies exploring multiple content areas, such as the post MedOnc ITE survey. Single-item measures of emotional exhaustion and depersonalization derived from the full MBI have been shown to be accurate proxy measures of burnout.[11-13] These two items strongly correlated with the emotional exhaustion and depersonalization domains of burnout on the full MBI and also demonstrated concordant validity with a host of outcomes related to burnout in a sample of > 10,000 physicians and medical students.[11,12] This method has also been used previously in large-scale national studies of > 15,000 US physicians.[14] In keeping with previous studies[15-17] and convention,[18] physicians with high degrees of depersonalization and/or emotional exhaustion were considered to have at least one manifestation of professional burnout.[10]

Career satisfaction was assessed using two questions from previous physician surveys regarding career and specialty choice[16,19-23] and used in recent studies of US oncologists.[5] Similar to national studies of physicians and the general US population[24] as well as recent studies of US oncologists,[5] satisfaction with WLB was assessed by the following item: "My work schedule leaves me enough time for my personal/family life" (response options: strongly agree, agree, neutral, disagree, or strongly disagree). Individuals who indicated they strongly agreed or agreed were considered to be satisfied with their WLB.

Practicing Oncologist Comparison Group

As previously described,[5,6] we surveyed a sample of 2,998 US oncologists between October 2012 and January 2013. Participating oncologists provided detailed information on personal and professional characteristics, including practice setting, hours worked per week, number of patients seen per week, and average time spent per patient visit (both for new and returning patients).

Statistical Analysis

Standard descriptive statistics were used to characterize responding oncology fellows. Associations between variables were evaluated using the Kruskal-Wallis test (continuous variables) or χ^2 test (categorical variables) as appropriate. All tests were two sided, with type I error rates of 0.05. On the basis of a sample size of 1,345 US oncology fellows, percentage estimates are accurate to within 2.7% with 95% confidence. Multivariable analysis to identify demographic and professional characteristics associated with the dependent outcomes (ITE score and career plans) was performed using logistic regression for dichotomous response variables and mixed linear regression for continuous variables. SAS software (version 9; SAS Institute, Cary, NC) was used for all analyses.

RESULTS

Personal and Professional Characteristics

Of the 1,637 US oncology fellows in the academic year 2012 to 2013, 1,373 (83.9%) took the 2013 MedOnc ITE. Among these, 1,345 fellows (97.9%) completed the postexamination survey and are included in our analysis.

The demographic characteristics of participating fellows are listed in Table 1. Median age was 33 years; 47.2% were women, 73.6% were married, and 49.5% had children. Participants were distributed across the traditional 3 years of oncology fellowship training in a relatively even fashion (ie, first year, 29.1%; second year, 36.7%; third year, 33.4%), with a small fraction (0.8%) pursuing a fourth year. Although median educational debt was approximately $25,000, the distribution was somewhat bimodal, with 498 fellows (42.1%) having no educational debt and 379 (32.0%) having > $125,000 in educational debt.

ITE Scores

Median score of participants on the MedOnc ITE was 524. MedOnc ITE scores increased with year in training, with mean scores of 431, 539, and 595 for first-, second-, and third-year fellows, respectively ($P < .001$). Demographic characteristics associated with MedOnc ITE score included age ($P = .016$), relationship status ($P < .001$), sex ($P < .001$), and having children ($P = .001$; Appendix Table A1, online only). An inverse relationship between educational debt was observed for fellows with no debt, $1 to $125,000 in educational debt, and > $125,000 in educational debt, with median ITE scores of 546, 532, and 499, respectively ($P < .001$).

Burnout and Well-Being Among Fellows Relative to Practicing Oncologists

The frequency of emotional exhaustion, depersonalization, and burnout among oncology fellows by year in training is listed in Table 2. The prevalence of emotional exhaustion (dimension of burnout) decreased incrementally during the course of fellowship, from 42.7% in year 1 to 29.4% and 25.4% in years 2 and 3, respectively ($P < .001$). Overall burnout also decreased from 43.3% in year 1 to 31.7% in year 2 and 28.1% in year 3 ($P < .001$). These improvements in burnout occurred in parallel with improvements in fatigue ($P < .001$), satisfaction with WLB ($P < .001$), and overall QOL ($P < .001$). Although satisfaction with career choice (ie, being a physician) improved from year 1 to 3, satisfaction with specialty choice (oncology) remained stable.

The frequency of emotional exhaustion, depersonalization, and burnout among oncology fellows relative to a national sample of

Table 1. Personal Characteristics and Career Plans of Oncology Fellows

Characteristic	US Oncology Fellows (n = 1,345) No.	%
Age, years		
Missing	208	
Median	33.0	
< 30	67	5.9
30-34	727	63.9
35-40	278	24.5
> 40	65	5.7
Sex		
Missing	152	
Male	630	52.8
Female	563	47.2
Children		
Missing	162	
Yes	586	49.5
No	597	50.5
Age of youngest child, years		
Missing*	744	
< 5	503	83.7
5-12	78	13.0
13-18	17	2.8
19-22	2	0.3
> 22	1	0.2
Relationship status		
Missing	151	
Single	252	21.1
Married	879	73.6
Partnered	60	5.0
Widow/widower	3	0.3
Ever gone through divorce		
Missing	156	
Yes	43	3.6
No	1,136	95.5
Currently going through one	10	0.8
Year of training		
Missing	22	
First	385	29.1
Second	486	36.7
Third	442	33.4
Fourth	10	0.8
Current student loan debt		
Missing	162	
No debt	498	42.1
< $25,000	79	6.7
$25,000-$49,999	69	5.8
$50,000-$74,999	52	4.4
$75,000-$99,999	46	3.9
$100,000-$125,000	60	5.1
> $125,000	379	32.0
Career plans		
Academic practice		
Clinical/translational research	362	28.8
Clinician educator	231	18.4
Basic science (eg, laboratory-based research)	93	7.4
Nonacademic clinical practice	440	35.0
Health care administration†	3	0.2
Nonuniversity research (eg, industry)	3	0.2
State/federal agency (eg, veterans, military)	118	9.4
Undecided	8	0.6
Other		

*Includes 597 fellows without children.
†Without clinical practice.

practicing US oncologists studied at approximately the same time point is listed in Table 3. No statistically significant differences were observed between fellows and practicing oncologists with respect to the proportion having high emotional exhaustion (fellows, 32.1% *v* oncologists, 29.3%; $P = .15$), high depersonalization (16.1% *v* 13.4%; $P = .07$), or high overall burnout (34.1% *v* 33.7%; $P = .86$). When compared specifically with third-year fellows, practicing oncologists had higher rates of burnout (33.7% *v* 28.1%; $P = .0411$). With respect to other dimensions of well-being and career satisfaction, fellows had higher fatigue ($P < .001$) and lower overall QOL scores ($P < .001$) than practicing oncologists but were more satisfied with WLB (40.9% *v* 34.8%; $P = .0031$) and specialty choice (89.4% *v* 80.5%; $P < .001$).

Career Plans and Expectations

With respect to their anticipated career plans, 686 fellows (51.0%) intended to pursue a career in AP, 440 (35.0%) in PP, and 118 (9.4%) in veterans or military practice. Among the 686 fellows who intended a career in AP, 362 (52.8%) aimed to focus on clinical translational research, 231 (33.7%) on medical education, and 93 (13.6%) on laboratory-based research. Career plans by sex, year in fellowship, and level of educational debt are shown in Figure 1. Intent to pursue AP decreased through the course of training, whereas intent to pursue PP increased (Fig 1B). Fellows with greater educational debt were less likely to select a career in AP and more likely to pursue PP.

We next evaluated fellows' expectations regarding the typical work hours, call schedule, patient volume, and average amount of time allocated for each patient once they completed fellowship. Given the differences in these characteristics by practice setting,[5] these aspects were evaluated separately based on whether fellows planned to work in PP or AP. The expectations of oncology fellows planning a career in PP relative to the actual experience of practicing oncologists in PP are listed in Table 4. Fellows underestimated the number of hours spent per week on administrative tasks at work, hours spent on work tasks at home each week, and overnight call expectations. They also overestimated the amount of time they would be able to spend on reading to keep abreast of changes in the field. Overall, expectations regarding total hours worked per week for fellows planning a career in PP were 6 hours fewer per week than the actual reported work hours of oncologists in PP (fellows' expectations, 56.9 hours per week; actual work hours, 62.9 hours per week; $P = .025$). Fellows' expectations regarding the volume of patients seen per week were also substantially lower than that reported by PP oncologists (fellows' expectations, 65.9 patients per week; actual reported, 74.2 patients per week; $P < .001$). Median salary expectations for fellows planning a career in PP were between $300,000 to $349,999.

Table 2. Distress of US Fellows by Year of Training

Distress	First Year (n = 385) No.	%	Second Year (n = 486) No.	%	Third Year (n = 442) No.	%	*P*
Burnout indices*							
High emotional exhaustion†	144	42.7	130	29.4	101	25.4	< .001
High depersonalization‡	62	18.5	71	16.1	54	13.6	.2061
Burnout§	146	43.3	140	31.7	112	28.1	< .001
QOL							
Overall QOL‖							< .001
Mean		6.5		6.9		7.1	
SD		2.0		1.9		1.7	
Score < 6	101	30.2	103	23.4	61	15.3	< .001
Level of fatigue‖							< .001
Mean		5.1		5.5		5.9	
SD		2.1		2.2		2.2	
Score < 6	194	58.1	218	49.4	161	40.6	< .001
Satisfied with WLB	115	34.6	186	42.2	175	44.1	.0256
Career satisfaction							
Would become physician again (career choice)	263	80.2	379	86.1	339	86.5	.0340
Would become oncologist again (specialty choice)	297	90.5	389	88.8	350	89.1	.7176

Abbreviations: MBI, Maslach Burnout Inventory; QOL, quality of life; ROC, receiver operating curve; SD, standard deviation; WLB, work-life balance.
*As assessed using single-item measures for emotional exhaustion and depersonalization adapted from full MBI. Area under ROC curve for emotional exhaustion and depersonalization single items relative to that of their respective full MBI domain score in previous studies were 0.94 and 0.93, and positive predictive values of single-item thresholds for high levels of emotional exhaustion and depersonalization were 88.2% and 89.6%, respectively.[11,12]
†Individuals indicating symptoms of emotional exhaustion weekly or more often have median emotional exhaustion scores on full MBI of > 30 and have > 75% probability of having high emotional exhaustion score as defined by MBI (≥ 27).
‡Individuals indicating symptoms of depersonalization weekly or more often have median depersonalization scores on full MBI of > 13 and have > 85% probability of having high depersonalization score as defined by MBI (≥ 10).
§High score (≥ weekly) on emotional exhaustion and/or depersonalization scale.
‖On 0- to 10-point Likert scale; higher scores favorable.

The expectations of oncology fellows planning a career in AP relative to the actual experience of oncologists in AP are listed in Table 4. Fellows underestimated the number of hours spent per week on administrative tasks at work and hours spent per week on work tasks at home. Fellows overestimated the amount of time they would be able to spend on reading to keep abreast of changes in the field. Overall, expectations regarding total hours worked per week for fellows planning a career in AP were 5 hours fewer per week than the actual reported work hours of oncologists in AP (fellows' expectations, 53.5 hours per week; actual work hours, 58.6 hours per week; $P = .004$). Expectations regarding the volume of patients seen per week for fellows going into AP were similar to those actually reported by oncologists in AP (fellows' expectations, 39.1 patients per week; actual reported, 37.4 patients per week; $P = .6$). Median salary expectations for fellows planning a career in AP were between $200,000 to $249,999.

Multivariable Analysis

Finally, we performed multivariable analysis to identify personal and professional characteristics associated with MedOnc ITE score and career plans (Table 5). Factors associated with higher MedOnc ITE scores included increasing year in training, male sex, and having children. Burnout, older age, and greater educational debt were associated with lower MedOnc ITE scores on multivariable analysis.

With respect to career plans, models were developed to identify characteristics associated with intent to pursue a career in either PP or AP (two most common career plans). Fellows with children and with greater educational debt were more likely to report planning a career in PP, whereas those in the first 2 years of training were less likely to be planning a career in PP. Fellows without children and with lower educational debt were more likely to report planning a career in AP (Table 5).

DISCUSSION

Although some of the challenges specific to the practice of medical oncology are recognized, the cause of dissatisfaction with WLB among US oncologists is not well understood. Unrealized expectations for oncologists entering practice may represent a potential contributing factor. In this study, we compared the well-being and career expectations of US oncology fellows with the actual experiences of practicing US oncologists. The results suggest that fellows underestimate future work hours and overestimate the amount of time they will have to keep abreast of developments in the field. Those going into PP also underestimate their future patient care volume. Although fatigue and overall QOL seem to get better after the completion of fellowship, burnout does not improve, and other challenges, such as issues with WLB and career satisfaction, may increase.

Collectively, these findings suggest oncology fellows entering practice will work more hours than they anticipate and trade one set of challenges for another. It is well recognized that physicians work more hours than most US workers[13] and that oncologists work more hours than physicians in most other specialties.[25] The mismatch between expectations and reality may also be an important source of dissatisfaction among practicing oncologists given the fact that work hours and the amount of time spent providing direct patient care seem to be key drivers of both burnout[5] and dissatisfaction[6] with WLB among oncologists.

Table 3. Burnout, QOL, and Career Satisfaction

Distress	US Fellows (n = 1,345) No.	%	US Oncologists (n = 1,117) No.	%	*P*
Burnout indices*					
High emotional exhaustion†	385	32.1	317	29.3	.1459
High depersonalization‡	193	16.1	144	13.4	.0651
Burnout§	409	34.1	367	33.7	.8591
QOL					
Overall QOL‖					< .001
Mean	6.8		7.3		
SD	1.9		1.8		
Score < 6	268	22.4	161	14.6	< .001
Level of fatigue‖					.0062
Mean	5.5		5.8		
SD	2.2		2.4		
Score < 6	583	48.8	506	46.0	.1691
Satisfied with WLB	487	40.9	374	34.8	.0031
Career satisfaction					
Would become physician again (career choice)	1,002	84.8	908	82.5	.1503
Would become oncologist again (specialty choice)	1,056	89.4	877	80.5	< .001

Abbreviations: MBI, Maslach Burnout Inventory; QOL, quality of life; SD, standard deviation; WLB, work-life balance.
*As assessed using single-item measures for emotional exhaustion and depersonalization adapted from full MBI.
†Individuals indicating symptoms of emotional exhaustion weekly or more often.
‡Individuals indicating symptoms of depersonalization weekly or more often.
§High score (≥ weekly) on emotional exhaustion and/or depersonalization scale.
‖On 0- to 10-point Likert scale; higher scores favorable.

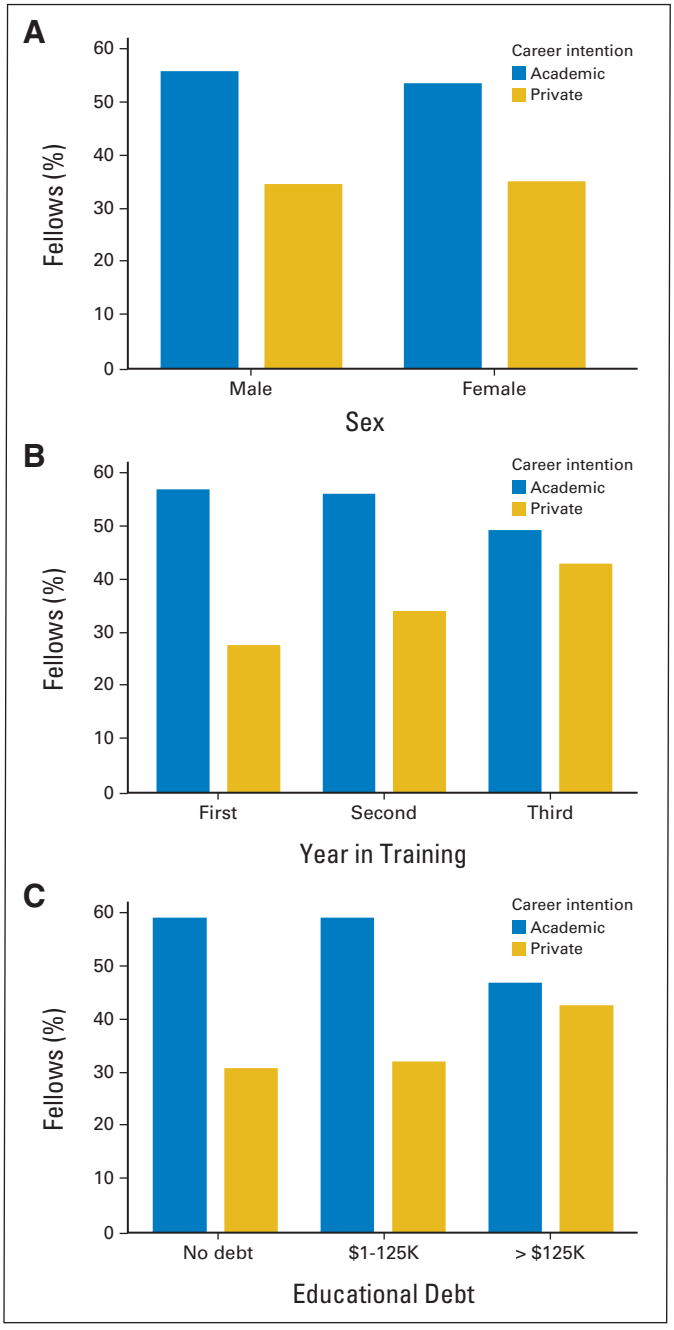

Fig 1. Career plans by (A) sex, (B) year in training, and (C) amount of educational debt.

Our results also provide important insights about well-being during the course of fellowship and factors that may influence career plans. Burnout seems to peak in the first year of fellowship and decrease incrementally in the second and third years in parallel with improvements in fatigue, QOL, and WLB. Although a majority of fellows in the first and second years of training plan to pursue an academic career, this commitment decreases in the later years of training. Financial responsibilities related to educational debt and parenting responsibilities seem to have a major influence on fellows' career plans. Fellows with children and those with greater educational debt were more likely to plan a career in PP. Consistent with this notion, median salary expectations of fellows planning a career in PP were approximately $100,000 higher than salaries expected by those planning to pursue AP. This finding is consistent with previous studies of gastroenterology fellows, suggesting those choosing nonacademic careers do so in part because they believe it better meets their financial needs.[26] Given the pivotal role academic oncologists play in conducting scientific studies necessary to improve patient outcomes long term, these observations have important implications for efforts (loan repayment programs and so on) to maintain an adequate supply of academic oncologists. Other recent studies have suggested that fellows receiving greater mentorship and who gain experience presenting and publishing research are more likely to choose an AP model.[7] Our findings also provide new insights into individual factors that may affect medical knowledge scores on the MedOnc ITE. Specifically, both burnout and increasing educational debt were associated with lower test scores, a finding similar to previous observations in internal medicine residents.[14]

What can oncology fellowship programs do to reduce distress among oncology fellows and better prepare them for their careers? Several studies have suggested that peer support groups may be a useful strategy to help reduce distress during fellowship.[27,28] Other studies suggest that providing oncology fellows training in end-of-life topics and improving the quality of teaching during fellowship may reduce burnout during fellowship.[29-31] ASCO has released new curricular guidelines that may help programs improve skill development

Table 4. Expectations of Oncology Fellows Relative to Reported Work Characteristics of Oncologists

Future Career Plan	Expectations of Fellows No.	Expectations of Fellows %	Actual Reported Oncologists No.	Actual Reported Oncologists %	P
PP	440		482		
Call schedule					
Nights on call per week	1.7	1.4	2.5	2.1	< .001
Work hours					
Hours seeing patients at work per week	39.8	19.0	43.4	11.9	.3349
Hours on administrative tasks at work per week	7.5	5.5	8.9	6.9	.0169
Hours at home on work tasks per week†	5.0	4.7	7.2	7.2	.0001
Hours at home per week spent keeping abreast of developments in field‡	6.3	5.1	4.3	3.3	< .001
Total work hours per week§	56.9	25.7	62.9	16.2	.0247
Patient care expectations					
No. of outpatients in clinic per week	65.9	27.3	74.2	31.0	< .001
Minutes allocated per new outpatient	39.8	19.0	43.4	11.9	.3349
Minutes allocated to returning outpatient	7.5	5.5	8.9	6.9	.0169
AP	686		377‖		
Call schedule					
Nights on call per week	1.1	1.2	1.5	2.1	.0731
Work hours					
Hours seeing patients at work per week	29.8	18.8	29.2	14.1	.7396
Hours on administrative tasks at work per week	9.5	7.2	14.6	11.0	< .001
Hours at home on work tasks per week†	8.1	6.6	10.8	8.5	< .001
Hours at home per week spent keeping abreast of developments in field‡	7.0	5.4	4.6	3.8	< .001
Total work hours per week§	53.5	26.9	58.6	17.7	.0036
Patient care expectations					
No. of outpatients in clinic per week	39.1	23.6	37.4	21.0	.6044
Minutes allocated per new outpatient	49.7	14.3	53.9	17.0	< .001
Minutes allocated to returning outpatient	21.6	6.3	20.7	6.8	.1509

Abbreviations: AP, academic practice; PP, private practice.
*Actual reported by oncologists in PP.
†Completing paperwork, preparing talks, writing grants/manuscripts, and so on.
‡Reading journals, maintenance of certification tasks, and so on.
§Sum of above four categories.
‖Actual reported by oncologists in AP.

Table 5. Multivariable Analysis

Predictor	Parameter Estimate	95% CI	OR	95% CI	P
ITE score*					
Second-year fellow (*v* first year)	110	94 to 126			< .001
Third-year fellow (*v* first year)	165	149 to 181			< .001
Burned out (*v* not burned out)	−15	−29 to −2			.0256
> $125,000 debt (*v* no debt)	−53	−68 to −38			< .001
Debt $1-$124,999 (*v* no debt)	−23	−39 to −7			.0050
Age (for each year older)	−7	−8.3 to −4.7			< .001
Male sex (*v* female)	39	26 to 51			< .001
Children (*v* no children)	18	5 to 31			.0076
Career plan: PP*†					
Children (*v* no children)			1.74	1.33 to 2.28	< .001
> $125,000 debt (*v* no debt)			1.65	1.22 to 2.24	.0011
Third-year fellow (*v* first year)			1.98	1.41 to 2.79	< .001
Career plan: AP*†					
Children (*v* no children)			0.62	0.48 to 0.80	< .001
> $125,000 debt (*v* no debt)			0.60	0.45 to 0.79	< .001

NOTE. Three multivariable analyses were conducted to identify personal and professional factors associated with ITE score, planning career in private practice, and planning career in academic practice.
Abbreviations: AP, academic practice; ITE, In-Training Examination; OR, odds ratio; PP, private practice.
*Characteristics in model: debt, age, sex, children, fellowship year, burnout, fatigue score; includes first- to third-year fellows.
†Additional characteristics in career plan models: ITE score.

in these areas.[32] Strategies to expose fellows to the care of oncology patients in PP settings may also provide them better insight into the work load, pace, and patient care volumes they may experience once in practice. Fellowship programs have traditionally been frontloaded with respect to clinical duties. Creative approaches to more evenly distribute these responsibilities over the course of training may help reduce burnout during the first year of fellowship but could result in increased burnout in the second and third years. Strategies to reduce burnout and improve career satisfaction that can be applied by fellows individually have also been proposed.[8]

Our study is subject to a number of limitations. The differences observed between first-, second-, and third-year fellows are based on cross-sectional rather than longitudinal analysis. Given the cross-sectional nature of the study, we are also unable to determine causality or the potential direction of effect for the associations observed. Fellows' intended career plans may change over time, and thus, our analysis of factors that correlate with career plans should be interpreted with caution. Although the participation rate in our sample of practicing oncologists (approximately 50%) is consistent with[33] or even higher[13,19,34] than physician surveys in general, response bias remains possible. Because international medical graduates often have less educational debt, and educational debt may also influence moonlighting activities,[14] it is possible the relationship between debt and burnout in our study is related to interactions between educational debt, moonlighting, and whether an individual is a US or international medical school graduate. We did not collect information on moonlighting activities or whether fellows graduated from a US or international medical school; therefore, we are unable to explore these aspects.

Our study has several potential strengths. The study sample included > 80% of all US oncology fellows across all years of training, and our participation rate of approximately 98% is remarkable. Our study design allowed us to directly evaluate the

associations of various personal and professional characteristics with medical knowledge as assessed by the MedOnc ITE. Burnout, fatigue, QOL, and satisfaction with WLB were assessed using standardized tools. Finally, the ability to compare the well-being and expectations of US oncology fellows with the experiences of practicing US oncologists evaluated contemporaneously using the same metrics provides unique insights.

In conclusion, US oncology fellows seem to underestimate the workload they will experience once they enter practice. Oncology fellows entering practice trade one set of challenges for another. Unrealized expectations regarding work hours may contribute to professional dissatisfaction, burnout, and challenges with WLB.

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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Appendix

Table A1. Individual Characteristics and ITE Score

Characteristic	Mean ITE Score (n = 1,345)	*P*
Age, years		.0159
< 30	485	
30-34	536	
35-40	519	
> 40	517	
Sex		< .001
Male	546	
Female	505	
Children		< .001
Yes	541	
No	513	
Relationship status		< .001
Single	498	
Married	535	
Partnered	519	
Widow/widower	579	
Year of training		< .001
First	431	
Second	539	
Third	595	
Current student loan debt		< .001
No debt	546	
$1-$125,000	532	
> $125,000	499	
Career plans		.0083
AP		
Clinical/translational research	537	
Clinician educator	522	
Basic science (eg, laboratory-based research)	520	
Nonacademic clinical practice	534	
Medical/health care administration*	472	
Nonuniversity research (eg, industry)	543	
Undecided	480	
Other	515	

Abbreviations: AP, academic practice; ITE, In-Training Examination.