

Career Burnout Among Pediatric Oncologists

Michael Roth, MD,^{1*} Kerry Morrone, MD,² Karen Moody, MD,¹ Mimi Kim, ScD,³ Dan Wang, MS,³
Alyson Moadel, PhD,³ and Adam Levy, MD¹

Background. Burnout is a work-related syndrome consisting of emotional exhaustion, depersonalization, and diminished feelings of personal accomplishment. Physicians who care for patients with life-threatening illnesses are at high risk for developing burnout. This survey evaluates the prevalence of burnout among pediatric oncologists, and assesses risk factors associated with the development of burnout. **Procedure.** A questionnaire was sent via email to 1,047 practicing pediatric oncologists. The survey included the 22 question Maslach Burnout Inventory (MBI), as well as questions regarding work-related and lifestyle-related factors associated with developing burnout. **Results.** Four hundred ten pediatric oncologists (40%) responded to the survey. Thirty-eight percent of pediatric oncologists had high levels of burnout on the MBI, while 72% had at least moderate levels of burnout. Women (47% vs. 32%, $P < 0.004$) and physicians practicing for < 10 years (50% vs. 33%,

$P < 0.004$) had significantly higher rates of burnout. Physicians who reported satisfaction with their lives outside of work were less likely to have burnout (odds ratio 0.238, 0.143–0.396, $P < 0.001$). The availability of a forum for debriefing, and services for physicians affected by burnout were both associated with lower rates of burnout (24% vs. 46%, $P < 0.001$ and 23% vs. 46%, $P < 0.001$). Thirty-six percent of respondents reported their institution has a forum for debriefing and 40% of respondents reported their institution has services available for physicians experiencing symptoms of burnout. **Conclusions.** Approximately three quarters of pediatric oncologists experience burnout. Further research is needed on the effectiveness of interventions aimed at preventing and treating work-related burnout. Pediatr Blood Cancer 2011;57:1168–1173. © 2011 Wiley Periodicals, Inc.

Key words: burnout; pediatric oncology; supportive care

INTRODUCTION

Caring for children with cancer is often demanding and stressful. The day-to-day life of a pediatric oncologist includes delivering news to children and families about prognosis, supporting children through the many side effects of treatment, and supporting families through taking care of a child with a life threatening illness [1,2]. In addition, pediatric oncologists face the tragic reality that, despite their best efforts, many of their patients ultimately will not be cured of their disease. The emotional toll these demands take on pediatric oncologists is not well studied.

Burnout is a work-related syndrome that consists of three main components: emotional exhaustion, depersonalization, and diminished feelings of personal accomplishment [3]. Emotional exhaustion refers to a loss of emotional energy and feeling emotionally overextended. Depersonalization consists of the development of negative thoughts and feelings towards patients, often leading to impersonal relationships between the physician and patient. Personal accomplishment refers to the provider's feelings of achievement and accomplishment when working with others. Burnout is especially common among physicians, with studies showing as many as three quarters of physicians experience high levels of emotional exhaustion [3–5]. Burnout has been associated with major depressive disorder, alcohol and drug use, emotional hardening, as well as thoughts of changing professions, and early retirement [2,6–8].

While burnout has been studied in medical oncologists and many other medical specialties, there is limited literature on burnout among pediatric oncologists [4,6,9–14]. Among staff working in pediatric oncology, rates of burnout have been reported as high as 60% [6,15]. In 2008, at the ASPHO annual meeting, pediatric hematologists/oncologists noted burnout was a significant challenge in their lives and careers [16]. To date, no studies have extensively studied burnout among pediatric oncologists. The largest study included only 60 pediatric oncologists and was conducted 2 decades ago [13]. Given the limited number of study participants, it has been difficult to draw conclusions on the prevalence of burnout and its risk factors in pediatric oncologists.

In order to determine the prevalence of work-related burnout among pediatric oncologists and factors associated with increased and decreased risk of burnout, an international survey was performed between May 2010 and June 2010.

METHODS

Subjects

We obtained the email addresses of 1,047 pediatric oncologists currently practicing medicine in the United States, Canada, and 11 other countries around the world. Email addresses were obtained on the internet via hospital, medical school, and clinic websites. Pediatric oncologists were emailed a link to an anonymous online survey with the subject line “Burnout in Pediatric Oncology.” Two additional emails were sent to individuals who had not responded to the original email. All participants were subsequently emailed their individual burnout scores, a brief interpretation of their scores, and a list of support services available for individuals experiencing burnout (Supplemental Appendix I). The study was approved by the Institutional Review Board at the Children's Hospital at Montefiore.

Additional Supporting Information may be found in the online version of this article.

¹Division of Pediatric Hematology/Oncology, Children's Hospital at Montefiore, Bronx, New York; ²Department of Pediatrics, Children's Hospital at Montefiore, Bronx, New York; ³Department of Epidemiology and Population Health, Albert Einstein College of Medicine, Bronx, New York

Conflict of interest: Nothing to declare.

*Correspondence to: Michael Roth, MD, Division of Hematology/Oncology, Department of Pediatrics, Children's Hospital at Montefiore, 111 East 210th Street, Rosenthal Pavilion, 3rd Floor, Bronx, NY 10467. E-mail: mroth@montefiore.org

Received 6 October 2010; Accepted 14 February 2011

Survey Instrument

The Maslach Burnout Inventory (MBI) is a self-administered, reliable (reliability coefficients = 0.90 for emotional exhaustion, 0.79 for depersonalization, and 0.71 for personal accomplishment), well-validated (convergent and discriminant validation), 22 question survey that assesses the three major subscales of work-related burnout. It has been used extensively in healthcare professionals and is the standard instrument for measuring burnout among physicians [3,17,18]. The survey instrument assesses an individual’s level of burnout by asking respondents to answer how frequently certain emotions are experienced during the course of a year (Supplemental Fig. 1). The emotional exhaustion subset consists of nine questions, the depersonalization subset includes five questions, and the personal accomplishment subset includes eight questions. A high level of burnout is defined as a score of 27 or higher in the emotional exhaustion subset, a score of 10 or higher in the depersonalization subset, or a score of 33 or lower in the level of personal accomplishment subset [17,18]. The categories of “high,” “moderate,” and “low” levels of burnout are based on the normative distribution of 1,104 physicians and nurses [17].

In addition to the MBI, the survey consisted of 31 questions assessing demographic data, as well as lifestyle and work-related factors associated with high and low levels of burnout (Supplemental Appendix II). The survey was created based on an extensive literature review describing risk factors for burnout among healthcare providers. The literature review found significant associations between gender, marital status, job experience, hours worked, control over work environment and home life, time dedicated to patient care, and job satisfaction with level of burnout [1,3–7,9–15,19–27]. Based on limited evidence showing the effectiveness of formal debriefing, additional questions were added regarding the presence of a debriefing forum and available services for physicians experiencing burnout [28]. Twenty-six questions had multiple choice responses with three of these questions allowing for additional comments. These questions asked respondents reasons why they would not seek out services or techniques to lower their burnout and asked respondents to comment on whether they would start their career over in pediatric oncology, as well as comment on whether they believed they had symptoms of burnout. Four questions used a 5-point Likert scale with five signifying the most and one signifying the least. One additional question asking respondents what they do to cope with job stress was an open-ended response. Responses were divided into two main categories: physical activities and non-physical activities.

Statistical Analysis

Standard descriptive statistics were computed for all variables. The Fisher’s exact test was used to evaluate bivariate associations between categorical variables. For missing data points on the MBI, mean-substitution was used for items within each subscale, as long as 80% of the items were completed. Multivariable analyses were also conducted by fitting logistic regression models to the data to identify independent predictors of burnout. All variables with $P < 0.2$ in the bivariate analyses were considered for inclusion in the logistic model. The final model was determined using a stepwise approach and included only

those variables which were still significant at the $P < 0.05$ level.

RESULTS

Demographics

Four hundred ten pediatric oncologists participated in the survey for an overall response rate of 40%. Eight survey recipients responded that they are no longer practicing oncology and they were excluded from the study. Fourteen email addresses were returned as invalid. Eighty-six percent of respondents completed the entire survey. Respondent demographic data is shown in Table I.

Prevalence of Burnout Among Pediatric Oncologists

Thirty-eight percent of respondents were experiencing high levels of burnout and 72% of respondents were experiencing at least moderate levels of burnout as scored on the MBI. Physicians reported the highest levels of burnout in the emotional exhaustion

TABLE I. Characteristics of Survey Respondents. N = 410

Gender	
Female	174 (43%)
Male	235 (57%)
Number of years in practice	
<10 years	124 (30%)
≥10 years	285 (70%)
Marital status	
Married	331 (87%)
Single	32 (8%)
Divorced	13 (3%)
Widowed	3 (1%)
Identify self as religious	
Yes	176 (43%)
No	231 (57%)
Identify self as spiritual	
Yes	282 (69%)
No	125 (31%)
No. of newly diagnosed oncology patients institution sees per year	
<100	206 (51%)
≥100	201 (49%)
No. of your pediatric oncology patients passed away last year	
≤5	248 (62%)
>5	151 (38%)
Time dedicated to clinical care	
<80%	255 (62%)
≥80%	154 (38%)
Hours worked per week	
≤60	247 (60%)
>60	163 (40%)
Weekends on call	
≤8	173 (48%)
>8	184 (52%)
Weeks managing inpatient floor	
≤8	147 (42%)
>8	207 (58%)
Identify self as having symptoms of burnout	
Yes	127 (36%)
No	222 (64%)

subscale (28%) compared to the depersonalization (7%), and personal accomplishment subscales (16%) (Table II). On chi-square analysis, the prevalence of overall burnout was not significantly different between pediatric oncologists practicing in the United States, Canada, or outside of North America. Prior to this survey only 3% of respondents had ever taken a formal burnout assessment.

Self-Identification of Burnout

More than one-third of respondents believe they have symptoms of burnout (Table I). Ninety-four percent of respondents who suspected they have symptoms of burnout were found to have at least moderate levels of burnout on the MBI and 73% were found to have high levels of burnout on the MBI. Sixty percent of respondents who stated they did not think they have symptoms of burnout were found to have at least moderate levels of burnout, with 18% qualifying as having high levels of burnout on the MBI.

Demographic Factors Associated With a High Level of Burnout

A number of demographic factors and lifestyle-related factors were associated with having a high level of burnout on bivariate analysis (Table III). Women and less experienced physicians were more likely to have a high level of burnout on the MBI. Pediatric oncologists who reported being satisfied with their life outside of work were much less likely to have a high level of burnout. No significant relationship was seen between marital status, self-identification as religious (belief in certain denominational doctrines) or spiritual (general belief in a higher power), size of institution, and having a high level of burnout. There was a trend demonstrating that respondents who reported partaking in physical activity to cope with job stress were less likely to have burnout; however, this was not statistically significant ($P = 0.15$).

Work-Related Factors Associated With a High Level of Burnout

A number of work-related factors were associated with having a high level of burnout on bivariate analysis (Table III). Respondents with more than 80% of their time dedicated to clinical care, and respondents who spent more than 12 weeks managing the inpatient hospital floors had higher levels of burnout. Physicians who work a greater number of hours per week did not have a

significantly higher rate of burnout. However, physicians who reported less control over the number of hours worked or their work schedule had significantly higher rates of burnout.

Satisfaction With the Profession of Pediatric Oncology

Eighty-seven percent of respondents reported at least moderate satisfaction with their work. Pediatric oncologists who reported being satisfied with their job were less likely to have a high level of burnout (Table III). Overall, 80% of respondents stated they would go into the field of pediatric oncology again. However, of physicians experiencing high levels of burnout, only 64% of physicians would embark upon a career in pediatric oncology if they were to start over.

Independent Risk Factors for the Development of Burnout

Results from the multivariate analysis indicate a number of work-related and lifestyle-related factors remained independently associated with having high levels of burnout (Table IV). In addition to fewer years in practice and less control over work hours, working in an institution which does not have services available for physicians affected by burnout was an independent risk factor associated with having a high level of burnout. Decreased satisfaction with life outside of work was also found to be independently associated with having a higher level of burnout. All other factors found to be significant on bivariate analysis did not achieve significance on the multivariate analysis.

Available Services for the Prevention and Treatment of Burnout and Risk of Burnout

Thirty-six percent of respondents reported their institution has a forum for staff to debrief and discuss their emotions when caring for children with life-threatening illnesses. Forty-one percent of respondents reported their institution has services available for staff experiencing symptoms of burnout. Physicians who work in an institution where there is a forum for debriefing and physicians who work in an institution where there are services for staff experiencing symptoms of burnout had significantly lower rates of high burnout (Table III).

TABLE II. Prevalence of Burnout by Location

Location ^a	High level of burnout				Average or high level of burnout			
	Overall (%)	EE (%)	DP (%)	PA (%)	Overall (%)	EE (%)	DP (%)	PA (%)
USA (n = 229)	38	30	7	15	69	57	21	45
Canada (n = 54)	30	24	4	9	72	57	20	43
Outside North America ^b (n = 71)	44	27	10	24	80	51	28	53
All Nations (n = 353)	38	28	7	16	72	56	23	48

EE, emotional exhaustion; DP, depersonalization; PA, low personal accomplishment. ^aNo significant differences ($P < 0.05$) were seen in the overall level of burnout or in the burnout subcategories between the three locations. ^bNations include Australia, Belgium, Denmark, Finland, Iceland, Israel, Netherlands, Norway, Sweden, New Zealand, UK.

TABLE III. Factors Associated With High Levels of Burnout

	High level of burnout, N (%)		P-value
	Yes	No	
Sex			0.004
Female	70 (47)	79 (53)	
Male	65 (32)	138 (68)	
Years in practice			0.004
<10 years	53 (50)	54 (50)	
>10 years	82 (33)	163 (67)	
Time dedicated to clinical care			0.001
<80%	67 (31)	148 (69)	
≥80%	67 (49)	70 (51)	
Control over hours worked (1–5) ^a			0.005
<4	99 (43)	131 (57)	
≥4	33 (28)	86 (72)	
Control over work schedule (1–5) ^a			<0.001
<4	102 (46)	120 (54)	
≥4	29 (24)	93 (76)	
Weeks managing inpatient floors			0.001
≤12	70 (31)	155 (69)	
>12	58 (50)	57 (50)	
Satisfaction with work ^a			<0.001
<4	79 (64)	45 (36)	
≥4	50 (23)	170 (77)	
Satisfaction with life outside work ^a			<0.001
<4	82 (59)	57 (41)	
≥4	47 (23)	156 (77)	
Forum for burnout			<0.001
Yes	30 (24)	96 (76)	
No (or do not know)	102 (46)	120 (54)	
Services available for staff experiencing burnout			<0.001
Yes	35 (25)	107 (75)	
No (or do not know)	96 (46)	111 (54)	
Would go into pediatric oncology again			<0.001
Yes	85 (30)	194 (70)	
No	47 (66)	24 (34)	
Identify self as having symptoms of burnout			<0.001
Yes	93 (73)	34 (27)	
No	39 (18)	183 (82)	

^aRating 1–5, with higher scores signifying higher control/satisfaction

TABLE IV. Multivariate Analysis of Risk Factors Associated With a High Level of Burnout

	Odds ratio	95% CI	P-value
Satisfaction with life outside work (scale 1–5)			<0.001
<4			
≥4	0.238	0.143–0.396	
Year in practice			0.018
<10 years			
>10 years	0.388	0.205–0.732	
Control over work schedule (scale 1–5)			0.008
<4			
≥4	0.474	0.272–0.824	
Available services for staff experiencing burnout			0.015
No			
Yes	0.516	0.303–0.878	
Available forum for debriefing ^a			0.052
No			
Yes	0.582	0.336–1.005	

^aNot statistically significant.

Interest in Learning Burnout Prevention Strategies

Eighty percent of respondents indicated interest in learning about strategies to cope with burnout. In addition, more than three quarters of physicians (78%) stated they would seek out assistance if they were found to have significant levels of burnout. Eighteen percent of respondents who stated they would not seek out assistance reported concerns over job security and the attached stigma if their confidentiality was breached.

DISCUSSION

This survey is the first large-scale study to formally assess burnout among pediatric oncologists. To our knowledge, it is also the only international study on physician burnout to provide individualized burnout results to all participants. We found that almost three quarters of all pediatric oncologists experience burnout, which is consistent with other studies assessing burnout among other physicians [3,7–9,13–15,22,23,29–31]. However, our study found many more pediatric oncologists experience some level of burnout than was previously believed, as Whippen et al. reported the burnout rate among pediatric oncologists to be only 39% [13]. In that study, the authors used physician self-report of burnout to determine the prevalence of burnout, whereas we relied on the well-validated MBI to determine the prevalence of burnout.

Most pediatric oncologists who thought they had symptoms of burnout were found to have high levels of burnout on the MBI. On the other hand, more than half of the pediatric oncologists who did not think they had symptoms of burnout were also found to

have moderate or high levels of burnout on the MBI. It appears that many physicians may become self-aware of their symptoms of burnout only after they are experiencing a high level of distress. While there are only a few studies that longitudinally track burnout among healthcare providers, it is likely that burnout is a progressive phenomena, resulting from cumulative stress and taxing environmental factors [20,21].

Less than half a percent of pediatric oncologists had ever taken a formal burnout inventory. Prior to this survey, many pediatric oncologists were unaware they were experiencing any symptoms of burnout. Institutions could consider offering their physicians periodic, self-administered and self-scored burnout inventories. Such a program could potentially detect symptoms of burnout at an earlier stage, while still maintaining confidentiality. Individuals would then have an opportunity to seek help managing their burnout.

Despite the high prevalence of burnout among pediatric oncologists, only 40% of physicians surveyed reported that their institution has services available for physicians who are struggling with burnout. Implementing services for physicians with symptoms of burnout is an important step toward trying to improve the wellness of physicians; however, it is not the only barrier to providing supportive care for pediatric oncologists. Consistent with prior studies, a number of pediatric oncologists stated that despite their institution having supportive services available for physicians experiencing burnout they would not reach out for help secondary to concerns of confidentiality and job security [32,33]. Innovative programs are needed to support physicians experiencing burnout in a safe, non-threatening, confidential manner.

This survey found a number of work-related and lifestyle-related factors associated with increased risks of burnout. Physicians who felt in control over their work hours and schedule had significantly lower rates of burnout consistent with prior studies [14,19,34]. Interestingly, physicians who worked more hours, but felt in control of how much they worked had a lower rate of burnout than their colleagues who worked fewer hours, but had less control of their hours. Of note, women were more likely to have high levels of burnout than men, a finding consistently reported in the literature [35–37]. Some may assume this is associated with role overload, with many female physicians feeling they carry the majority of responsibility for childcare and household tasks. However, in this study, women who had children had a lower rate of burnout compared to women without children. With more women entering the field of medicine, research is needed to better elucidate why female physicians are more likely to experience burnout.

There appears to be a large overlap between physicians' personal lives and their level of burnout as physicians who were satisfied with their home lives were much less likely to have high levels of burnout [19,38,39]. However, the interaction between work-related burnout and life satisfaction is not clearly defined [39]. While it is likely that work-related burnout contributes to decreased satisfaction with one's personal life, the reverse is probably also true, as individuals who are less satisfied with their lives are more likely to develop burnout. Studies suggest physicians who dedicate more time to their personal lives by partaking in hobbies, exercise, and personal interests have lower rates of burnout than their colleagues [40–42].

As expected, physicians with high levels of burnout were much less likely to be satisfied with their jobs and more likely

to state they would not go into the field of pediatric oncology if they were to start their career over [20,21]. These results are consistent with prior studies identifying burnout as an independent risk factor for physicians' desire to leave their profession [43]. Grunfeld's study of medical oncologists practicing in Canada, showed as many as 40% of oncologists considered leaving the field or taking early retirement, with strong associations seen with having a high level of job stress and high levels of emotional exhaustion [8,31]. Increased burnout may lead to increased attrition among pediatric oncologists and there is currently a shortage of pediatric subspecialists practicing in the United States. Between the years 2003 and 2006 there was virtually no increase in the number of practicing board certified pediatric oncologists [44].

The consequences of suffering from work-related burnout are still being explored. Burnout among physicians has been associated with depression, drug and alcohol use, as well as other psychiatric co-morbid conditions [7,8,45]. Ramirez et al. [4,7] reported the prevalence of psychiatric disorders in cancer physicians practicing in the UK was >25%, with a strong correlation with high levels of stress. Given the potential consequences to their health, it is important that physicians consider dedicating their time not only to taking care of their patients, but also to taking care of themselves [38]. In addition, burnout hinders physicians' ability to give their patients quality care [22,46,47]. A recent study by Shanafelt et al. [48] showed a strong relationship between surgeons' level of burnout and admission of making major medical errors. Given reports of increased emotional hardening and depersonalization it is also likely that burnout negatively impacts the doctor-patient relationship, a relationship that is vital when supporting patients with life-threatening illnesses and their families [47].

This study found that fewer physicians who work in an institution which has a forum for debriefing had high levels of burnout, suggesting these forums may play a role in preventing the development of burnout. Despite this fact, only a minority of pediatric oncology programs have a forum for debriefing for their physicians and support staff. Debriefing rounds where staff discuss the emotional issues involved in caring for patients with serious illnesses have been shown to decrease providers' perceived level of stress, as well as improve providers' ability to cope with the stressors involved in caring for patients with life-threatening illnesses [28]. Given that most pediatric oncologists who had high levels of burnout were experiencing emotional exhaustion, it is understandable why institutions with support programs and debriefing rounds were associated with lowered rates of burnout. While the survey found an association between lower levels of burnout and working at an institution with a debriefing forum and/or available support services, it is unclear whether the respondents with lower levels of burnout actually utilized these services. It is possible that institutions with debriefing forums and support services have other characteristics and qualities that are associated with lower burnout rates. It will be important to further elucidate the direct impact these forums and support services have on the prevention of burnout.

Additional studies have shown that interventions such as teaching healthcare workers coping skills, relaxation techniques, and encouraging narrative writing, can also be effective in decreasing levels of reported stress and burnout [49–52]. However, the majority of these studies are small, and larger,

randomized studies are needed to assess the impact of stress reduction interventions and their effects on decreasing burnout among healthcare providers. In addition, a number of medical schools and residency programs have recently developed programs aimed at promoting trainee wellness and self-care [53–55]. Many of these programs are in their infancy, and while they have shown at least short-term decreases in student and resident stress level, it is unclear whether these courses will lead to sustained improvements in physician wellness.

This study has a number of limitations. The study is limited by responder bias, as it is possible that pediatric oncologists who were experiencing symptoms of burnout were more likely to participate in the survey, and have their level of burnout assessed in a confidential manner. However, two-thirds of the respondents did not think they had symptoms of burnout. The response rate of 40% was lower than expected. It is possible that respondents were concerned about maintaining their anonymity when participating in an online survey, as compared to similar surveys with higher response rates, which were sent in by mail. In addition, the survey was only sent to pediatric oncologists whose email addresses were available on the internet, or supplied by their institution. The survey population may not be completely representative of all pediatric oncologists as it is likely the survey was sent to a greater proportion of physicians working in academic institutions.

Burnout is experienced by many practicing pediatric oncologists, and the vast majority are interested in learning strategies to prevent and cope with symptoms of burnout. Additional prospective studies are needed to assess the effectiveness of interventions aimed at decreasing burnout and promoting wellness among pediatric oncologists.

REFERENCES

- Mukherjee S, Beresford B, Glaser A, et al. Burnout, psychiatric morbidity, and work-related sources of stress in paediatric oncology staff: A review of the literature. *Psycho-Oncology* 2009;18: 1019–1028.
- Spinetta J, Jankovic M, Ben Arush M, et al. Guidelines for the recognition, prevention, and remediation of burnout in health care professionals participating in the care of children with cancer: Report of the stop working committee on psychosocial issues in pediatric oncology. *Med Pediatr Oncol* 2000;35: 122–125.
- Chopra S, Sotile W, Sotile M. Physician burnout. *JAMA* 2004;291:633.
- Ramirez A, Graham J, Richards M, et al. Mental health of hospital consultants: The effects of stress and satisfaction at work. *Lancet* 1996;347:724.
- Trufelli D, Bensi C, Garcia J, et al. Burnout in cancer professionals: A systematic review and meta-analysis. *Eur J Cancer Care* 2008;17:524–531.
- Zimmermann C, Dougherty E, Pierce B, et al. Factors associated with work stress and professional satisfaction in oncology staff. *Am J Hosp Palliat Med* 2009;26:105–111.
- Ramirez A, Graham J, Richards M, et al. Burnout and psychiatric disorder among cancer clinicians. *Br J Cancer* 1995;71:1263.
- Doan-Wiggins L, Zun L, Cooper M, et al. Practice satisfaction, occupational stress, and attrition of emergency physicians. *Acad Emerg Med* 1995;2:556–563.
- Armstrong J, Holland J. Survey of medical oncology fellows' burnout, communication skills, and perceived competencies. *J Clin Oncol* 2004;22:8132.
- Asai M, Morita T, Akechi T, et al. Burnout and psychiatric morbidity among physicians engaged in end-of-life care for cancer patients: A cross-sectional nationwide survey in Japan. *Psycho-Oncology* 2007;16:421–428.
- Vachon M. Staff stress in hospice/palliative care: A review. *Palliat Med* 1995;9:91.
- Whippen D, Zuckerman E, Andersen J, et al. Burnout in the practice of oncology: Results of a follow-up survey. Presented at 2004 ASCO Conference.
- Whippen D, Canellos GP. Burnout syndrome in the practice of oncology: Results of a random survey of 1000 oncologists. *J Clin Oncol* 1991;9:1916–1921.
- Campbell D. Burnout among American surgeons. *Surgery* 2001;130:696–705.
- Liakopoulou M, Panaretaki I, Papadakis V, et al. Burnout, staff support, and coping in pediatric oncology. *Support Care Cancer* 2008;16:143–150.
- Frugé E, Margolin J, Horton T, et al. Defining and managing career challenges for mid career and senior stage pediatric hematologist/oncologists. *Pediatr Blood Cancer* 2010;55:1180–1184.
- Maslach C, Jackson S, Leiter M. Maslach burnout inventory manual. Palo Alto, California: Consulting Psychologists Press; 1996.
- Maslach C, Leiter M. Early predictors of job burnout and engagement. *J Appl Psychol* 2008;93:498–512.
- Keeton K, Fenner D, Johnson T, et al. Predictors of physician career satisfaction, work-life balance, and burnout. *Obstet Gynecol* 2007;109:949.
- Mirvis D, Graney M, Kilpatrick A. Trends in burnout and related measures of organizational stress among leaders of department of veterans affairs medical centers. *J Health Manag* 1999;44:353.
- Mirvis D, Graney M, Kilpatrick A. Burnout among leaders of department of veterans affairs medical centers: Contributing factors as determined by a longitudinal study. *J Health Hum Serv Adm* 1999; 21:390.
- Shanafelt T, Bradley K, Wipf J, et al. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med* 2002;136:358.
- Spickard A, Jr., Gabbe S, Christensen J. Mid-career burnout in generalist and specialist physicians. *JAMA* 2002;288:1447.
- Arnetz B. Psychosocial challenges facing physicians of today. *Soc Sci Med* 2001;52:203–213.
- Gabbe S, Melville J, Mandel L, et al. Burnout in chairs of obstetrics and gynecology: Diagnosis, treatment, and prevention. *Am J Obstet Gynecol* 2002;186:601–612.
- Murray A, Montgomery J, Chang H, et al. Doctor discontent: A comparison of physician satisfaction in different delivery system settings, 1986 and 1997. *J Gen Intern Med* 2001;16:451.
- Williams E, Konrad T, Scheckler W, et al. Understanding physicians' intentions to withdraw from practice: The role of job satisfaction, job stress, mental and physical health. *Health Care Manage Rev* 2001;26:7–719.
- Low B, Manning C. The Schwartz Center Rounds: Evaluation of an interdisciplinary approach to enhancing patient-centered communication, teamwork, and provider support. *Acad Med* 2010;85:1073.
- Arigoni F, Bovier P, Mermillod B, et al. Prevalence of burnout among Swiss cancer clinicians, paediatricians and general practitioners: Who are most at risk? *Support Care Cancer* 2009;17:75–81.
- Bressi C, Manenti S, Porcellana M, et al. Haemato-oncology and burnout: An Italian survey. *Br J Cancer* 2008;98:1046.
- Grunfeld E, Whelan T, Zitzelsberger L, et al. Cancer care workers in Ontario: Prevalence of burnout, job stress and job satisfaction. *Can Med Assoc J* 2000;163:166.
- Bruce S, Conaglen H, Conaglen J. Burnout in physicians: A case for peer-support. *Intern Med J* 2005; 35:272–278.
- Guille C, Speller H, Laff R, et al. Utilization and barriers to mental health services among depressed medical interns: A prospective multisite study. *J Inf* 2010;2:210–214.
- Freeborn D. Satisfaction, commitment, and psychological well-being among hmo physicians. *West J Med* 2001;174:13.
- Caniano D, Sonnino R, Paolo A. Keys to career satisfaction: Insights from a survey of women pediatric surgeons. *J Pediatr Surg* 2004;39:984–990.
- Linzer M, McMurray J, Visser M, et al. Sex differences in physician burnout in the United States and the Netherlands. *JAMA* 2002;287:191–193.
- McMurray J, Linzer M, Konrad T, et al. The work lives of women physicians: Results from the physician work life study. *J Gen Intern Med* 2000;15:372.
- Kearney M, Weininger R, Vachon M, et al. Self-care of physicians caring for patients at the end of life: "Being connected. A key to my survival." *JAMA* 2009;301:1155.
- Demerouti E, Bakker A, Nachreiner F, et al. A model of burnout and life satisfaction amongst nurses. *J Adv Nurs* 2000;32:454–464.
- Shanafelt T, Novotny P, Johnson M, et al. The well-being and personal wellness promotion strategies of medical oncologists in the north central cancer treatment group. *Oncology* 2005;68:23–32.
- Quill T, Williamson P. Healthy approaches to physician stress. *Arch Intern Med* 1990;150:1857.
- Weiner E, Swain G, Wolf B, et al. A qualitative study of physicians' own wellness-promotion practices. *West J Med* 2001;174:19.
- Shanafelt T, West C, Sloan J, et al. Career fit and burnout among academic faculty. *Arch Intern Med* 2009;169:990.
- Mayer M, Skinner A. Influence of changes in supply on the distribution of pediatric subspecialty care. *Arch Pediatr Adolesc Med* 2009;163:1087.
- Ramirez A, Graham J, Richards M, et al. Mental health of hospital consultants: The effects of stress and satisfaction at work. *The Lancet* 1996;347:724–728.
- West C, Huschka M, Novotny P, et al. Association of perceived medical errors with resident distress and empathy: A prospective longitudinal study. *JAMA* 2006;296:1071.
- Halbesleben J, Rathert C. Linking physician burnout and patient outcomes: Exploring the dyadic relationship between physicians and patients. *Health Care Manage Rev* 2008;33:29.
- Shanafelt T, Balch C, Bechamps G, et al. Burnout and medical errors among American surgeons. *Ann Surg* 2010;251:995.
- Delvaux N, Razavi D, Marchal S, et al. Effects of a 105 hours psychological training program on attitudes, communication skills and occupational stress in oncology: A randomised study. *Br J Cancer* 2004;90:106–114.
- Razavi D, Delvaux N, Marchal S, et al. The effects of a 24-h psychological training program on attitudes, communication skills and occupational stress in oncology: A randomised study. *Eur J Cancer* 1993;29:1858–1863.
- Rowe M. Teaching health-care providers coping: Results of a two-year study. *J Behav Med* 1999;22:511–527.
- Sands S, Stanley P, Charon R. Pediatric narrative oncology: Interprofessional training to promote empathy, build teams, and prevent burnout. *J Support Oncol* 2007;6:307–312.
- Broquet K, Rockey P. Teaching residents and program directors about physician impairment. *Acad Psychiatry* 2004;28:221.
- Finkelstein C, Brownstein A, Scott C, et al. Anxiety and stress reduction in medical education: An intervention. *Med Educ* 2007;41:258–264.
- Shapiro S, Shapiro D, Schwartz G. Stress management in medical education: A review of the literature. *Acad Med* 2000;75:748.