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Prevalence of Burnout of Radiologists in Private Practice

Jay R. Parikh, MD^a [Professor], Arl Van Moore, MD^b [Chairman, CEO Emeritus], Lisa Mead, RN^c, Roland Bassett, MS^d, Eric Rubin, MD^c

^aDivision of Diagnostic Imaging, The University of Texas MD Anderson Cancer Center, Houston, Texas

^bStrategic Radiology, Palmetto, Florida

^cStrategic Radiology, Palmetto, Florida

^dDepartment of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, Texas

Abstract

Purpose: The aim of this study was to evaluate the prevalence and demographic factors associated with both burnout and fulfillment of private practice radiologists within the largest coalition of independent wholly physician-owned diagnostic radiology practices within the United States.

Methods: The study cohort included practicing radiologists within the largest coalition of wholly radiologist-owned, independently practicing diagnostic radiology groups within the United States. Practicing radiologists within all 31 radiology private practices within the organization were electronically mailed a web link to a confidential institutional review board–approved survey in August and September 2021. The survey included validated questions from the Stanford Professional Fulfillment Index, individual and practice demographics, and self-care. Radiologists were classified as being burned out and professionally fulfilled on the basis of established cutoffs from the Professional Fulfillment Index.

Results: The overall response rate was 20.6% (254 of 1,235). The overall rate of radiologist burnout was 46% (Cronbach's $\alpha = 0.92$), and professional fulfillment was 26.7% (Cronbach's $\alpha = 0.91$). The inverse association between professional fulfillment and burnout was highly significant ($r = -0.66$, $P < .0001$) on the basis of average scores. Radiologists who took call (evenings, overnight, and weekends) were statistically most likely to be burned out. Older radiologists were less likely to experience burnout. Factors statistically significantly associated with professional fulfillment were eating nutritious meals and exercising at least four times per week. No statistically significant association was seen between either burnout or fulfillment with gender, ethnicity, practice geography, or practice size.

Corresponding author and reprints: Jay R. Parikh, MD, Division of Diagnostic Imaging, The University of Texas MD Anderson Cancer Center, 1155 Pressler Street, Unit 1350, CPB 5.3208, Houston, TX 77030; jrparikh@mdanderson.org.

ADDITIONAL RESOURCES

Additional resources can be found online at: <https://doi.org/10.1016/j.jacr.2023.01.007>.

Conclusions: In the largest coalition of independent wholly physician-owned diagnostic radiology practices across the United States, about one-half of radiologists were burned out, and just over one-quarter were professionally fulfilled. Taking call was significantly associated with radiologist burnout. Self-care habits were associated with professional fulfillment.

Keywords

Radiologist; private practice; burnout; professional fulfillment; wellness

INTRODUCTION

The World Health Organization formally recognizes burnout as an occupational syndrome resulting from chronic workplace stress that has been unsuccessfully managed [1]. The three fundamental dimensions of burnout are lack of accomplishment, feelings of energy depletion or exhaustion, and increased mental distance from one's job [2]. Physician burnout has been linked with multiple adverse outcomes affecting the physician, patient safety and quality, and the workplace [3,4]. Compared with the average prevalence of physician burnout, the prevalence of radiologist burnout has been consistently elevated [5-7]. This burnout is ubiquitous among multiple radiology subspecialties [8-12].

According to the most recent published Human Resources Workforce Surveys by the ACR, private practice is still the prevailing practice model for radiologists within the United States [13,14]. Historically, wholly owned independent private practice radiologists have earned the highest financial compensation among radiologists [15]. Independent private practice radiologists, however, do not have guaranteed levels of compensation [16], depend on one another to learn challenging practice skills, and navigate practice politics [17]. Over the past decade, independent radiology private practice groups have been subject to multiple tectonic forces—including payer consolidation, hospital consolidation, physician practice consolidation, changing payment models, and disruptive technologies [18]—that have disrupted the landscape of independent private practice. Specifically, independent private practice radiology groups have been under stress and threat for partial or complete replacement by external forces [17-19].

Previous work has assessed the prevalence of burnout in academic radiologists [20]. To our knowledge, the prevalence of burnout in other radiology practice models has not been investigated. We hypothesized that stressors affecting independent private practice would lead to overall burnout of radiologists in private practice. The primary purpose of this study was to survey private practice radiologists among the largest cohort of wholly physician-owned, independent physician practices within the United States to evaluate the prevalence of burnout and professional fulfillment in independent private practice radiologists. Secondary objectives included assessing the association of radiologist burnout with demographic factors, practice factors, and self-compassion care.

METHODS

This study was deemed exempt from ongoing evaluation by an Institutional Review Board at an academic medical center.

The studied cohort included radiologists practicing in the largest coalition of wholly radiologist-owned, independent private diagnostic radiology practices within the United States. To focus on rank-and-file practicing radiologists, two radiology practice leaders were excluded from each group. The two leaders were selected after consultation with the head of each group; this varied among groups because of differing governance structures, but typically this was the CEO of the board or president of the group. Burnout among leadership has been previously evaluated [21]. The list of private practice radiologists and associated e-mail addresses was confidentially maintained by the coalition. The private radiologists were electronically mailed a web link by senior leadership internally within the private practice coalition to a confidential institutional review board–approved survey on August 18, August 24, and September 28, 2021. The link enabled respondents to complete the anonymous survey without recording their e-mail addresses. The study authors at the academic institution who received the survey responses and performed the analysis did not have access to the list of private practice radiologists or their e-mail addresses. Members of the coalition did not have access to the responses. The survey was closed 30 days after the final reminder.

Using Qualtrics, a confidential survey (Appendix 1) was prepared and structured at an academic center, including demographic questions based on workforce surveys carried out by the ACR Commission on Human Resources [13,14], questions regarding self-care, and validated questions from the Stanford Professional Fulfillment Index to assess burnout and professional fulfillment [22]. The “prevent multiple submissions” feature in Qualtrics was activated to avoid respondents from revisiting the survey after completion. Professional fulfillment was defined from six items in question 16 measured on a Likert-type scale from 0 to 4. The average of these 6 values was computed, and fulfillment was defined as an average score of greater than 3. Burnout was defined from 10 items in questions 17 and 18. Four items in question 17 measured the dimension of work exhaustion, and six items in question 18 measured the dimension of interpersonal disengagement on a Likert-type scale from 0 to 4. The average of the 10 items was computed, and burnout was defined as an average score of greater than 1.33 [22,23].

Univariable logistic regression was conducted to assess the association between burnout and demographic and other questions and between fulfillment and the same covariates. For cases in which the number of patients in a category was 0, Firth’s penalized likelihood method was used to obtain parameter estimates and *P* values in univariable models only. Multivariable logistic analysis was then conducted to specifically understand the independent effects of each of the individual practitioner and practice characteristics. All variables with *P* values < .05 in univariate analysis were selected for consideration in a multivariate model. Spearman rank correlation was used to assess the association between burnout and fulfillment scores. All statistical analyses were performed using R version 3.6.1 (R Foundation for Statistical Computing). All statistical tests used a significance level of 5%. No adjustments for multiple testing were made.

RESULTS

The overall response rate was 20.6 % (254 of 1,235). The overall rate of radiologist reporting burnout was 46.0% (mean score, 1.34 ± 0.84 ; range, 0-4), and professional fulfillment was 26.7% (mean score = 2.47 ± 0.91 ; range, 0-4). The inverse association between professional fulfillment and burnout was highly significant ($r = -0.66$, $P < .0001$) on the basis of average scores. Table 1 summarizes characteristics for the 254 respondents with associated univariate logistic regression models for burnout the number of radiologists in each category and level.

Demographics (Questions 1-7)

The table presents the number of private practice radiologists in each category and level. The majority are male, white, and of non-Hispanic ethnicity. On average, they have been practicing for at least 11 years, and more than half of the respondents are in the Midwest or South. More than half are in urban/suburban or suburban areas.

Practice Characteristics (Questions 8-12)

Most of the respondents are full-time, working 41 to 60 hours per week. The majority of the practices have between 21 and 75 radiologists, with radiologists expected to take call at least evenings and weekends.

Self-Care (Questions 13-15)

Most radiologists report exercising at least once per week, and they indicate that they eat at least moderately nutritious meals. The majority have had a physical within the past 3 years.

Multivariable regression modeling, summarized in Table 2, includes effects for three factors associated with burnout: call, age, and last annual physical examination. There was a significant association between taking calls and burnout ($P = .022$). The highest level of burnout was in radiologists who took call evenings, overnight and weekends (odds ratio, 2.53 [95% confidence interval, 0.91-7.02] compared with radiologists who did not take call), with a trend toward significance. Radiologists age 65 or younger were more likely to experience burnout than radiologists older than 65 (odds ratio, 5.72; 95% confidence interval, 1.23-26.55; $P = .009$). There was no evidence of an association between the timing of the last physical and burnout in this model after considering the effects of age and taking call.

Multivariable regression modeling, summarized in Table 3, includes the effects of two factors associated with fulfillment: nutrition and exercise. Nutritious meals were significantly associated with fulfillment in this model. Radiologists who ate moderately or minimally nutritious meals were less likely to be fulfilled than radiologists who ate very or extremely nutritious meals (odds ratio, 0.467; 95% confidence interval, 0.254-0.857; $P = .0146$). There was a marginal association between exercise and fulfillment; radiologists who exercised four or more times per week were somewhat more likely to experience fulfillment than those who exercised less ($P = .0560$). No significant association was seen between either burnout or fulfillment with gender, ethnicity, practice geography, or practice size.

DISCUSSION

In this study, the prevalence of burnout among private practice radiologists was 46%. The prevalence of professional fulfillment was 26.7%, with a strong inverse association between professional fulfillment and burnout. Radiologists who took call (evenings, overnight, and weekends) and radiologists younger than 65 years were statistically most likely to be burned out. Self-care habits were associated with professional fulfillment.

The prevalence of burnout of 46% among private practice radiologists was higher than the reported prevalence of burnout of 37.4% among academic radiologists in the United States [20]. This is consistent with a previous study demonstrating a higher prevalence of burnout of musculoskeletal radiologists in private practice compared with academics [12]. In private practice, radiologists have the greatest degree of autonomy to determine their group governance, compensation structures, benefits, and work schedules [16]. According to a report by the ACR Commission on Human Resources [24], lack of autonomy is a risk factor for radiologist burnout. Therefore, one could postulate a lower prevalence of burnout in radiologists in private practice than in academic radiology. Our study suggests other factors contribute to burnout of private practice radiologists.

Radiologists in private practice who took call (evenings, overnight, and weekends) were statistically most likely to be burned out. Specifically, call involving weekends was more likely to be associated with radiologist burnout than other call shifts. Previously identified drivers of physician burnout include excessive workloads, work-home conflicts, and lack of input or control for physicians with respect to issues affecting their work lives [4]. We postulate that weekend call contributes to radiologist burnout through some combination of these three drivers. Private practice radiologists are dependent on the effective management of their practices, adequate imaging volume and high productivity to maintain their salaries [16]. Taking call has previously been shown to be a stressor for subspecialty radiologists [25,26]. Our data suggest that the burden of radiologist call in private practice, which helps sustain salaries, also contributes to radiologist burnout.

Our study showed that there was less burnout among radiologists older than 65 years. Multivariable regression demonstrated that the effect of age was independent of call. This is consistent with other studies of radiology burnout in subspecialty cohorts [9,12] and may be related to multiple possible explanations. Prolonged burnout may negatively affect longevity, so that radiologist most severely affected by burnout may leave their jobs or retire earlier in their careers, leaving those with a lower amount of burnout. Alternatively, more senior radiologists may be in positions that allow them to have better control of their schedules, fewer responsibilities for family care, a more stable financial situation, or developed better skills at internally addressing burnout [12].

Radiologists who ate moderately or minimally nutritious meals were less likely to be fulfilled than radiologists who ate very or extremely nutritious meals. There was also a marginal association between exercise and fulfillment; physician self-care habits were therefore associated with lower burnout and improved fulfillment. Our findings are

consistent with a cross-sectional study of five academic medical centers in the United States in which lower self-valuation scores among physicians were associated with burnout [27].

Radiology practice leaders are increasingly becoming accountable within the United States for addressing burnout in their practices [5], with more than three in four practice leaders acknowledging that radiologist burnout is either a significant or a very significant problem [28]. Physician burnout has been shown to be associated with increased physician intention to leave [29]. The AMA currently estimates the costs of replacing a physician to be \$250,000 to \$1 million [30]. There is therefore a business case for practice leaders to address radiologist burnout, especially in the climate of recruitment challenges within the current job market [13,14]. Our study suggests an opportunity for private practice leaders to address burnout in their practices is to review call structure, especially call involving weekends. Possible options include increasing radiologist staffing and outsourcing call.

In cross-sectional studies, causative relations cannot be determined. A temporal link between the outcome and the exposure cannot be determined because both are examined at the same time. Therefore, self-care habits may be a result of or a contributor to higher fulfillment, which is a limitation in interpretation. However, our study suggests that radiologist fulfillment may be improved by efforts from practice leadership to promote a culture emphasizing constructive prioritization of personal self-care by radiologists.

Our study had other limitations. Our study cohort included radiologists practicing in the largest coalition of independent physician-owned independent practices within the United States. There is heterogeneity of radiology private practice models within the United States, with some private practices having an ownership structure involving nonradiologist physician investors, individual investors, and/or corporate investors. Our sample may not be representative of private practices across the United States, and our results may not be generalizable to all private practices. The sample size is not very large relative to the number of variables being considered. These results should be considered more exploratory or hypothesis generating. Our response rate was 20.6%, low but significantly higher than multiple published voluntary web-based surveys of radiologist burnout [10,12]. Like other web-based physician surveys, our study was susceptible to voluntary selection type bias; namely, participants with burnout may have been more likely to participate in the survey and elevate the prevalence rate of burnout. Nonresponse bias may have occurred in the most severely burned out private practice radiologists; because of time constraints and/or higher workload, they may have been disinclined to respond.

In conclusion, we found that the prevalence of burnout in private practice radiologists was 46%. The prevalence of professional fulfillment was 26.7%, with a strong inverse association between professional fulfillment and burnout. Taking call and age less than 65 years was significantly associated with radiologist burnout. Self-care habits were associated with professional fulfillment and lower burnout. Opportunities for private practice radiology leaders to address radiologist burnout and fulfillment include reviewing call structure and promoting self-care habits.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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TAKE-HOME POINTS

- About one-half of private practice radiologists in the largest coalition of independent wholly radiologist-owned diagnostic radiology practices across the United States were burned out.
- Just over a quarter of independent private practice radiologists in the United States were professionally fulfilled. The inverse association between professional fulfillment and burnout was highly significant on the basis of average scores.
- Radiologists who took call (evenings, overnight, and weekends) were statistically most likely to be burned out. Specifically, call involving weekends was more likely to be associated with radiologist burnout than other call shifts. This suggests addressing call structure may reduce radiologist burnout in private practice.
- Eating nutritious meals was statistically significantly associated with professional fulfillment of radiologists. Exercise was marginally associated with radiologist fulfillment. Promoting self-care may therefore improve fulfillment of private practice radiologists.

Table 1.

Univariate logistic regression models for burnout

Parameter	Level	n	n With Burnout	Odds Ratio	95% Confidence Interval	P Value
Age*	36-45 y	77	40	—	—	1.0000
	46-55 y	59	26	0.732	0.3726-1.440	
	56-65 y	76	39	0.975	0.5194-1.831	
	>65 y	20	3	0.185	0.0541-0.634	
Race	<36 y	16	6	0.573	0.1958-1.678	
	Asian	36	20	—	—	.4549
Length practicing*	Black	3	2	1.600	0.1328-19.28	
	Other	9	3	0.400	0.0863-1.85	
	White	200	89	0.641	0.3141-1.31	
	5 y	34	14	—	—	1.0000
Region*	6-10 y	33	17	1.50	0.579-3.88	
	11-20 y	73	35	1.30	0.578-2.94	
	21 y	106	47	1.13	0.521-2.45	
	Mid-Atlantic	2	0	—	—	1.0000
Urban/suburban/rural*	Midwest	81	38	4.43	0.206-95.1	
	New England	6	3	5.00	0.170-146.7	
	South	106	51	4.64	0.218-99.0	
	Southwest	26	10	3.18	0.139-73.0	
Radiologists in group	West	27	12	4.03	0.177-91.9	
	Urban	57	28	—	—	1.0000
	Urban/suburban	73	31	0.767	0.384-1.53	
	Suburban	73	36	1.007	0.507-2.00	
Urban/suburban/rural*	Suburban/rural	33	12	0.602	0.253-1.43	
	Rural	10	5	1.035	0.285-3.76	
	5-10	6	2	—	—	0.5790
Urban/suburban/rural*	11-20	47	20	1.48	0.247-8.9	
	21-50	91	44	1.87	0.327-10.7	

Parameter	Level	n	n With Burnout	Odds Ratio	95% Confidence Interval	P Value
Individual responsibilities*	51-75	73	37	2.06	0.354-11.9	
	>75	31	11	1.10	0.173-7.0	
	General and interventional radiology call	25	12	—	—	1.0000
	General and subspecialty radiology call	49	25	1.124	0.4355-2.90	
	General radiology call	103	51	1.059	0.4483-2.50	
	Interventional radiology call	14	9	1.865	0.5075-6.86	
	No call	30	7	0.345	0.1118-1.06	
	Other	6	1	0.295	0.0414-2.10	
	Subspecialty radiology call	21	9	0.821	0.2620-2.57	
	Evenings (shift completed before midnight)	7	2	—	—	.0152
Take call	Evenings and overnight (shift completed after midnight)	15	5	1.250	0.176-8.87	
	Evenings and overnight and weekends	73	42	3.387	0.616-18.62	
	Evenings and weekends	100	48	2.308	0.427-12.46	
	None	24	6	0.833	0.127-5.47	
	Other	8	1	0.357	0.025-5.11	
	Weekends only (after 5 PM Friday)	15	9	3.750	0.540-26.05	
	Full-time	219	104	—	—	.1824
	Part-time	29	10	0.582	0.259-1.31	
	0-20	8	4	—	—	1.0000
	41-60	189	88	0.872	0.229-3.32	
Hours worked per week*	61-80	31	10	0.488	0.109-2.19	
	0	47	28	—	—	1.0000
	1 time/wk	38	16	0.502	0.213-1.183	
	2 or 3 times/wk	81	31	0.427	0.206-0.884	
	4 or 5 times/wk	49	23	0.607	0.273-1.351	
	>5 times/wk	32	16	0.684	0.280-1.671	
	0-3 times/wk	166	75	—	—	0.6607
	4 or more times/wk	81	39	1.13	0.662-1.92	
	Extremely nutritious	9	3	—	—	1.0000
	Very nutritious	63	27	1.40	0.348-5.62	
Exercise per week categories	0	47	28	—	—	1.0000
	1 time/wk	38	16	0.502	0.213-1.183	
	2 or 3 times/wk	81	31	0.427	0.206-0.884	
	4 or 5 times/wk	49	23	0.607	0.273-1.351	
	>5 times/wk	32	16	0.684	0.280-1.671	
	0-3 times/wk	166	75	—	—	0.6607
	4 or more times/wk	81	39	1.13	0.662-1.92	
	Extremely nutritious	9	3	—	—	1.0000
	Very nutritious	63	27	1.40	0.348-5.62	
	Nutritious meals*	0	47	28	—	—
1 time/wk		38	16	0.502	0.213-1.183	
2 or 3 times/wk		81	31	0.427	0.206-0.884	
4 or 5 times/wk		49	23	0.607	0.273-1.351	
>5 times/wk		32	16	0.684	0.280-1.671	
0-3 times/wk		166	75	—	—	0.6607
4 or more times/wk		81	39	1.13	0.662-1.92	
Extremely nutritious		9	3	—	—	1.0000
Very nutritious		63	27	1.40	0.348-5.62	

Parameter	Level	n	n With Burnout	Odds Ratio	95% Confidence Interval	P Value
Nutritious meals categories	Moderately nutritious	144	64	1.49	0.390-5.68	
	Minimally nutritious	25	14	2.34	0.516-10.63	
	Extremely/very nutritious	72	30	—	—	.5208
Last annual physical	Moderately/minimally nutritious	169	78	1.2	0.687-2.1	
	Within the past year	108	46	—	—	.0219
	1-3 y	76	35	1.151	0.637-2.08	
	3-5 y	29	20	2.995	1.249-7.18	
	>5 y	18	4	0.385	0.119-1.25	
	Never	17	9	1.516	0.544-4.23	

Table 1 summarizes results from univariate logistic regression models for the probability of radiologist burnout. The table presents the odds ratio, corresponding 95% confidence interval, and P value for each of the parameters of interest.

* Indicates that model fit with Firth penalized likelihood method due to lack of events in one or more categories.

Table 2.

Multivariate logistic regression models for burnout

Parameter	Level	Odds Ratio	95% Confidence Interval	Overall P Value
Age	<66 y			.0091
	66 y	0.175	0.038-0.811	
Take call	None			.0215
	Yes, but no weekends	1.039	0.274-3.939	
	Yes, including weekends	2.527	0.910-7.019	
	Other	0.398	0.038-4.145	
Last physical	<1 y			.8809
	1 to >5 y	1.067	0.614-1.855	
	Never	1.306	0.452-3.771	

Table 2 summarizes results from multivariate logistic regression model 1 for the probability that a radiologist experiences burnout (see text for definition). This model categorizes "take call" into four categories and presents the odds ratio, 95% confidence interval, and P value for each of the parameters of interest. Age and taking calls were significantly associated with burnout. Younger radiologists were more likely to experience burnout. Radiologists who took calls were more likely to be burned out than those who did not.

Table 3.

Multivariate logistic regression model for fulfillment

Parameter	Level	Odds Ratio	95% Confidence Interval	Overall P Value
Nutritious meals	Extremely/very nutritious			
	Moderately/minimally nutritious	0.467	0.254-0.857	.0146
Exercise	0-3 times/wk			
	4 times/wk	1.802	0.989-3.285	.0560

Table 3 summarizes results from a multivariate logistic regression model for the probability that a radiologist experiences fulfillment (see text for definition). This model categorizes exercise and nutritious meals into two categories and presents the odds ratio, 95% confidence interval, and *P* value for both of the parameters of interest. Nutritious meals were significantly associated with fulfillment in this model. Radiologists who ate moderately or minimally nutritious meals were less likely to be fulfilled than radiologists who ate very or extremely nutritious meals were fulfilled. There was a marginal association between exercise and fulfillment; radiologists who exercised four or more times per week were somewhat more likely to experience fulfillment than those who exercised less.