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Relationship Between Physician Burnout And The Quality And Cost Of Care For Medicare Beneficiaries Is Complex

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Abstract

Despite reports of a physician burnout epidemic, there is little research on the relationship between burnout and objective measures of care outcomes and no research on the relationship between burnout and costs of care. Linking survey data from 1,064 family physicians to Medicare claims, we found no consistent statistically significant relationship between seven categories of self-reported burnout and measures of ambulatory care-sensitive admissions, ambulatory care-sensitive emergency department visits, readmissions, or costs. The coefficients for ambulatory care-sensitive admissions and readmissions for all burnout levels, compared with never being burned out, were consistently negative (fewer ambulatory care-sensitive admissions and readmissions), suggesting that, counterintuitively, physicians who report burnout may nevertheless be able to create better outcomes for their patients. Even if true, this hypothesis should not indicate that physician burnout is beneficial or that efforts to reduce physician burnout are unimportant. Our findings suggest that the relationship between burnout and outcomes is complex and requires further investigation.

Physician burnout has received increasing attention during the past decade.^{1,2} Physicians who report being burned out report making more medical errors,^{3–5} being more likely to

leave their jobs,⁶ being less satisfied with their careers,⁷ and feeling less responsibility to try to control health care costs.⁸ Physician burnout has also been linked to worse patient experience of care.⁹ Nevertheless, there is controversy about the extent to which burnout affects the quality of care.^{10–12} There is very little research on the relationship between burnout and outcomes of care¹³ and no research on the relationship between burnout and annual costs of care per patient. There is also a lack of evidence on the relationships among physician burnout, outcomes, and costs for socially disadvantaged patients, who often have worse outcomes and higher costs than other patients.¹⁴

To address these questions, we linked Medicare claims data to physicians' self-reports of burnout among physicians seeking to continue their certification with the American Board of Family Medicine. We hypothesized that patients of family physicians who reported more frequent burnout or callousness would have higher annual Medicare per beneficiary costs and higher rates of three important outcomes: ambulatory care–sensitive admissions, ambulatory care–sensitive emergency department (ED) admissions, and thirty-day readmissions.

Patients, other physicians, and hospitals may influence these outcomes, but primary care physicians can affect them through the time and effort they give to patient care. Physicians who report being frequently burned out or callous might give less time or effort, resulting in worse outcomes for their patients. For example, when a patient calls for an appointment late in the day, the physician may simply refer the patient to the ED instead of seeing the patient in the office. Similarly, a burned-out or callous physician might not take the time to adequately explain symptoms that should suggest to a patient with congestive heart failure that they should contact the physician in time to avoid a preventable ED visit or hospital admission. Lack of physician effort may be particularly important for “dual-eligible” patients—patients eligible for both Medicaid and Medicare—for whom poverty and other adverse socioeconomic conditions can make it more difficult to obtain good outcomes.¹⁵

Study Data And Methods

STUDY POPULATION

Physicians applying to continue their specialty board certification from the American Board of Family Medicine complete a practice demographic questionnaire, creating a cross-sectional census each year. In 2017, in addition to the core questionnaire, each physician was randomly assigned to complete one of five additional modules, one of which focused on burnout (see online appendix exhibit A1).¹⁶ Prior work demonstrated that each module subsample is representative of the exam cohort.¹⁷ In 2017, 1,505 physicians completed the burnout module.

After excluding 222 physicians who did not have Medicare claims in 2017 in our 20 percent national sample of Medicare beneficiaries, as well as 28 physicians for other reasons, we attributed 32,413 Medicare beneficiaries, including 3,068 dual-eligible beneficiaries, to the physicians, using the two-step attribution method from the Merit-based Incentive Payment System (appendix exhibits A2 and A3).¹⁶ After we excluded an additional 191 physicians

to whom no beneficiaries were attributed, our final sample consisted of 1,064 physicians (appendix exhibit A3).¹⁶

BURNOUT MEASURES

We used two questions that correlate highly with the Maslach Burnout Inventory (appendix exhibit A1):¹⁶ first, “I feel burned out from my work” to measure emotional exhaustion, and second, “I have become more callous toward people” to measure depersonalization.^{18–21} Accordingly, throughout this article we use “burned out” to refer to emotional exhaustion and “callous” to refer to depersonalization.

In our primary analysis we placed each physician into one of seven categories of frequency of burnout and of callousness, from never burned out (or never callous) to burned out (or callous) every day. We also conducted a secondary analysis that used a dichotomous measure of burnout and of callousness (that is, feeling burned out or callous once a week or more often).

OUTCOMES

Using the Medicare claims files, we measured three quality outcomes as well as total annual per beneficiary costs. The outcomes included hospital admissions and emergency department (ED) visits that are potentially preventable, at least to some extent, with high-quality outpatient care. We used the risk-adjusted measures developed by the Agency for Healthcare Research and Quality to identify ambulatory care–sensitive admissions;²² ambulatory care–sensitive ED admissions;²³ and thirty-day all-cause hospital readmissions, using the Centers for Medicare and Medicaid Services (CMS) algorithm for an unplanned readmission.²⁴

We calculated total annual per beneficiary costs of all claims for services provided under Medicare Parts A and B. We defined costs as the sum of allowed amounts for these claims (allowed amounts are the amount paid by Medicare plus Medicare’s calculation of the beneficiary’s share of costs, if any). We geographically adjusted these costs using the CMS Geographic Variation Public Use File, using an index defined as the ratio of actual Medicare fee-for-service spending to standardized Medicare fee-for-service spending in the county where the service was provided.²⁵

STATISTICAL ANALYSIS

We estimated logistic regressions at the patient level for analyses of the relationships between physician burnout and quality measures (ambulatory care–sensitive admission rate, ambulatory care–sensitive ED admission rate, and thirty-day readmission rate) and estimated generalized linear models at the beneficiary level for analyses of costs. All regressions controlled for patient characteristics (age, sex, Hierarchical Condition Categories [HCC] score); physician characteristics (age, sex); and practice characteristics, including size, ownership of main practice site, and percentage of vulnerable patients (uninsured, Medicaid, homeless, low income, non-English speaking, or member of a racial or ethnic minority group or otherwise traditionally underserved group) as reported by the physician. Standard errors were clustered at the physician level. For each dependent variable (quality or cost

measure), we additionally conducted analyses that included only dual-eligible patients. In a sensitivity analysis, we also controlled for practices' hospital referral region indicators.

Data preparation was conducted using SAS, version 9.4; analyses used Stata, version 14. The study was approved by the Institutional Review Board at Weill Cornell Medical College.

LIMITATIONS

This study had several limitations. First, it was a cross-sectional, observational study, and so could not demonstrate causal relationships.

Second, persistent burnout over time may have effects on outcomes that could only be determined through a longitudinal study, which would be valuable but expensive to conduct on a large, nationally representative sample.^{20,26}

Third, there are more extensive instruments for measuring self-reported physician burnout; however, it is not clear which instrument is best,^{18,27} and these instruments are lengthy to complete and expensive to deploy. The burnout and callousness measures that we used correlate well with more extensive measures and have been used in other studies.^{19–21,28–32}

Fourth, much of what physicians do is not accounted for by current quality measures; our measures, although important and widely used, covered only a limited fraction of the quality of care provided by physicians. Nevertheless, this is the first study of burnout to use three important, objective outcome measures rather than physician self-reports about quality, and the first to include the relationship of burnout to the cost of care.

Fifth, our study sample included only family physicians and did not include physicians who chose not to attempt recertification or physicians who recently finished training. These physicians might have higher burnout rates. However, the study used a national, representative sample of family physicians applying for continuing board certification; had a 100 percent response rate; and had a sample nearly three times larger than the sample in most studies of the relationship between burnout and quality, for which a systematic review states that the mean sample size was 376.³

Finally, some physicians may have been concerned (mistakenly) about a possible negative impact of reporting burnout on a recertification survey and thus may have reported a lower level of burnout than they experienced.

Study Results

PHYSICIAN AND PATIENT CHARACTERISTICS

One hundred percent of physicians responded to the questionnaire. Among these 1,064 physicians, the frequency of reported burnout ranged from every day (7.7 percent) to never (8.8 percent); other burnout frequencies included a few times a week (23.5 percent), once a week (10.2 percent), a few times a month (24.6 percent), and a few times a year or less (13.5 percent) (exhibit 1). Callousness was reported less frequently: every day (2.4 percent), never (38.7 percent), a few times a week (9.3 percent), once a week (5.6 percent), a few times a month (10.5 percent), and a few times a year or less (21.6 percent) (appendix exhibit A4).¹⁶

The percentage of dual-eligible patients was 12.7 percent for physicians who reported everyday burnout and 10.6 percent for never-burned-out physicians, compared with a mean of 9.5 percent across all burnout frequencies (exhibit 1). The respective HCC scores were 1.31, 1.29, and 1.24. The percentage of dual-eligible patients was 12.6 percent for physicians who reported everyday callousness and 10.8 percent for never-callous physicians compared with a mean of 9.5 percent across all burnout frequencies. The respective HCC scores were 1.53, 1.26, and 1.24.

OUTCOMES

Appendix exhibits A5 and A6 display unadjusted results suggesting that there is no clear “dose-response” relationship between burnout or callousness and our outcomes—that is, outcomes do not become progressively worse, from frequency category to frequency category, as the frequency of burnout or callousness increases.¹⁶ However, appendix exhibit A6 suggests that feeling callous daily is associated with worse outcomes, especially for ambulatory care–sensitive admissions and for spending.¹⁶

In adjusted analyses, rates of ambulatory care–sensitive admissions and readmissions were consistently lower (as indicated by negative coefficients) for each frequency of burnout compared with patients of physicians who reported never being burned out (exhibit 2). However, few of these coefficients were statistically significant, and in contrast to ambulatory care–sensitive admission rates, the coefficients for ambulatory care–sensitive ED admissions were generally higher, indicating higher rates. The rates were similar in analyses limited to dual-eligible patients. There was no consistent pattern for annual per beneficiary cost of care.

Results were similar for callousness, except for physicians who reported daily callousness, for whom the coefficients on ambulatory care–sensitive admissions, ambulatory care–sensitive ED admissions, and readmissions were all positive—indicating higher rates—and for whom annual per beneficiary costs were \$2,720 higher than for patients of never-callous physicians (exhibit 3). Results were similar in analyses limited to dual-eligible patients. Once again, few coefficients were statistically significant.

Regression results for all covariates are in appendix exhibits A7 and A8.¹⁶

In the secondary analyses that used a dichotomous measure of burnout, comparing outcomes for physicians who reported burnout at least once a week with those for physicians who reported burnout less often or never, the results were consistent with the results in our primary analysis. Burned-out physicians had lower—although generally not statistically significantly lower—rates of ambulatory care–sensitive admissions and readmissions (appendix exhibit A9).¹⁶ Results for callous physicians were also consistent with those of our primary analysis (appendix exhibit A10).¹⁶

Results of the sensitivity analyses that add hospital referral regions as a control were consistent with those of our primary analyses (appendix exhibits A11 and A12).¹⁶

Discussion

Using a large national sample drawn from family physicians applying to continue their specialty board certification, with a 100 percent response rate, we conducted the first analysis of the relationship between physician burnout and three important outcomes (ambulatory care–sensitive admissions, ambulatory care–sensitive ED admissions, and hospital readmissions) and the first analysis of the relationship between burnout and annual per beneficiary costs. We hypothesized that as the frequency of burnout and callousness increased, outcomes for patients would worsen, and that this relationship would be even stronger for dual-eligible patients.

Contrary to our hypotheses, we did not find a consistent relationship between burnout or callousness and outcomes for patients in general or for dual-eligible patients. Surprisingly, we found that physicians who reported at least some frequency, or even a high frequency, of burnout had generally lower rates of undesirable outcomes. Few of these results were statistically significant, so this finding might be spurious. Alternatively, it may be that physicians who report at least some burnout are highly conscientious and give extra effort to providing good care to their patients. This effort, and their concern about their patients, may be stressful and produce a feeling of burnout, particularly when physicians experience time pressure or other obstacles to providing care. Possibly some physicians who report burnout are sufficiently resilient that although they sometimes feel burned out, they are not overwhelmed and nevertheless are able to make the effort to get good results for their patients.¹² Joseph Rabatin and colleagues, summarizing a similar line of thinking, suggested that “burnout was not associated with poorer quality care or errors. We conclude, as have others, that quality of care is preserved but at great personal cost to providers.”³³

The results for self-reported callousness differed somewhat from the results for burnout. Both unadjusted and adjusted analyses suggest that the patients of the 2.4 percent of physicians who reported daily callousness had worse outcomes. It is possible that burnout of physicians to some extent is associated with concern for patients, and therefore better outcomes, where-as physicians who report daily callousness lack this concern or are different in other ways from other physicians.

Our results are not consistent with those of studies that focused on the relationship of burnout (self-reported) to quality (also self-reported), most of which focused on self-reported medical errors.^{3,4} In general, this research has shown that physicians who report more burnout also report making more errors. However, there is concern about the accuracy of self-reporting of errors and about whether feeling burned out makes physicians more inclined to report perceived errors or whether perceived errors make physicians feel more burned out.^{3,12}

The measures we studied are objective rather than self-reported. The few studies that have used more objective measures of quality (for example, by using chart review to identify diagnostic or prescribing errors) have mainly found a small or no association between burnout and quality.^{34–37} Our results are consistent with the result of these studies.

Our findings should not be taken to suggest that it is good for physicians to feel burned out. Physician burnout may be harmful to physicians and patients even if it is not associated, at a given point in time, with lower quality or higher costs of care.^{1,5,8,38} First, patients of burned-out physicians may have worse experience of care.⁹ Second, it may be that occasional periods of moderately frequent burnout are not harmful to patients but that if they persist over time, lower quality or higher costs may result. Third, feelings of burnout are distressing to physicians. Fourth, physician turnover appears to be higher among burned-out physicians.^{5,6,39} This disrupts continuity of care, may be upsetting for patients, and generates large replacement costs for practices. Contributors to physician burnout, whether they come from policies in the external environment from government or health insurers (for example, regulatory or payment policies) or from a physician's organization's policies and culture, should be removed whenever possible.^{40,41} It may also be helpful to provide physicians with training in resiliency skills that help reduce the feeling of burnout,^{42–45} although these are not a substitute for changing external or organizational factors that contribute to burnout.^{42,46,47}

Nevertheless, our burnout results are counter-intuitive. Further research is needed into differences among physicians by the frequency of burnout and callousness they report, into differences in outcomes for these physicians, and into the longitudinal effects of physician burnout on physicians and on outcomes for patients.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

An earlier version of this study, which did not include the callousness results and was based on a different primary analysis, was presented at the North American Primary Care Research Group Meeting (virtual), November 23, 2020. Lawrence Casalino, Jing Li, Manyao Zhang, and Eloise O'Donnell report receiving grant support from the Physicians Foundation Center for the Study of Physician Practice and Leadership at Weill Cornell Medical College and from the American Board of Family Medicine Foundation.

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EXHIBIT 1

Physician, practice, and Medicare patient characteristics in the US, by physician burnout status, study of physician burnout, 2017

Variables	All	Every day	Few times per week	Once a week	Few times a month	Once a month or less	Few times a year or less	Never
PHYSICIAN AND PRACTICE CHARACTERISTICS								
No. of physicians	1,064	82	250	109	262	123	144	94
Percent of physicians	100.0	7.7	23.5	10.2	24.6	11.6	13.5	8.8
Age (years), %								
Up to 39	10.2	14.6	9.6	12.8	11.1	15.4	6.9	0.0
40–49	36.2	25.6	36.0	43.1	39.7	32.5	36.8	31.9
50–59	33.9	40.2	40.0	30.3	29.0	32.5	36.1	28.7
60 or older	19.7	19.5	14.4	13.8	20.2	19.5	20.1	39.4
Female, %	42.2	53.7	44.8	45.9	46.2	39.0	33.3	27.7
Practice size, %								
Solo	14.9	20.7	10.8	11.9	12.6	14.6	18.8	25.5
2–5 physicians	37.6	30.5	39.6	38.5	37.8	34.2	40.3	37.2
6–20 physicians	29.9	29.3	31.2	33.9	29.0	35.8	25.0	24.5
More than 20 physicians	17.6	19.5	18.4	15.6	20.6	15.5	16.0	12.8
Ownership, %								
Academic medical center	7.6	7.3	6.8	3.7	9.9	8.9	8.3	5.3
Hospital/health system	40.5	50.0	42.4	43.1	42.0	39.0	32.6	34.0
Government	4.1	1.2	4.0	5.5	4.2	5.7	4.9	2.1
Physicians	43.8	40.2	41.6	42.2	40.8	43.9	48.6	55.3
HMO	3.9	1.2	5.2	5.5	3.1	2.4	5.6	3.2
Vulnerable patients, ^a %								
0–9%	42.0	30.5	42.0	46.8	45.4	34.2	41.0	48.9
10–49%	43.2	51.2	48.0	38.5	40.5	49.6	41.7	30.9
50% or more	14.8	18.3	10.0	14.7	14.1	16.3	17.4	20.2
Callous once a week or more, %	17.3	51.2	36.4	22.9	4.2	6.5	4.1	1.1
PATIENT CHARACTERISTICS								
No. of patients	32,413	2,779	7,724	3,543	7,355	3,637	4,419	2,956
Age, mean years	76.7	76.5	76.7	76.6	76.6	76.6	76.7	77.2

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Variables	All	Every day	Few times per week	Once a week	Few times a month	Once a month or less	Few times a year or less	Never
Female, %	58.4	63.1	58.3	58.3	60.4	57.3	56.5	54.4
Dual-eligible, %	9.5	12.7	7.6	7.8	9.9	9.1	11.0	10.6
HCC score, mean ^b	1.24	1.31	1.19	1.22	1.23	1.22	1.29	1.29

SOURCE Authors' analyses of Medicare claims data from January 1 to December 31, 2017, linked to American Board of Family Medicine survey of all recertifying physicians in 2017. **NOTES** Each column shows means and proportions (out of the column total, except row 1) of variables for physicians who reported a given burnout level in the 2017 American Board of Family Medicine survey, and for their patients. HMO is health maintenance organization.

^a Vulnerable patients include traditionally underserved groups such as uninsured, Medicaid, homeless, low income, non-English speaking, or member of a racial or ethnic minority group, as reported by the physician.

^b A Hierarchical Condition Categories (HCC) score below 1.00 is generally considered healthy.

EXHIBIT 2

Association between seven levels of physician burnout and Medicare patient outcomes in the US, study of physician burnout, 2017

Physician burnout frequency	ACSA	ACSED	Readmission	Cost
ALL PATIENTS				
A few times a year	-0.18	1.02**	-0.00	1,006.51
Once a month	-0.81	0.33	-3.75*	-78.85
A few times a month	-0.54	0.22	-2.89*	-530.18
Once a week	-1.30**	0.48	-3.53*	76.75
A few times a week	-0.94*	0.16	-4.00**	-120.72
Every day	-0.46	0.42	-0.51	229.45
Mean of dependent variable	3.66%	3.98%	13.71%	\$10,897.38
No. of attributed patients	32,413	32,413	5,040	32,413
DUAL-ELIGIBLE PATIENTS				
A few times a year	-0.89	2.59	-4.83	1,027.82
Once a month	-3.40	1.02	-12.02*	-3,065.66
A few times a month	-0.42	1.36	-10.41**	-1,792.11
Once a week	-3.42	3.74*	-11.46*	-1,837.77
A few times a week	-1.69	0.23	-12.36**	-3,047.74
Every day	0.22	0.37	0.90	138.98
Mean of dependent variable	7.53%	8.05%	18.1%	\$16,242.94
No. of attributed patients	3,068	3,068	713	3,068

SOURCE Authors' analyses of Medicare claims data from January 1 to December 31, 2017, linked to the American Board of Family Medicine survey of all recertifying physicians in 2017. **NOTES** Dual-eligible patients are those eligible for both Medicare and Medicaid. Coefficients shown are marginal effects—that is, adjusted differences in rates of quality measures (or cost) relative to the omitted category of burnout (never; not shown), estimated from regressions adjusting for physician, practice, and patient characteristics identical to those in exhibit 1. Rates were the annual number of patients with ambulatory care-sensitive admissions (ACSAs), ambulatory care-sensitive emergency department admissions (ACSEDs), and readmissions per 100 patients. Logistic regressions were estimated for quality outcomes, and a generalized linear model was estimated for the cost outcome.

* $p < 0.10$

** $p < 0.05$

EXHIBIT 3

Association between seven levels of physician callousness and Medicare patient outcomes in the US, study of physician burnout, 2017

Physician callousness frequency	ACSA	ACSED	Readmission	Cost
ALL PATIENTS				
A few times a year	-0.58*	0.33	-1.30	91.31
Once a month	-0.34	0.23	-1.81	-434.57
A few times a month	-0.48	0.48	-0.13	-339.02
Once a week	-0.48	0.73	3.27	-28.39
A few times a week	-0.59	0.15	1.89	-413.51
Every day	0.46	0.59	2.33	2,720.41
Mean of dependent variable	3.66%	3.98%	13.71%	\$10,897.38
No. of attributed patients	32,413	32,413	5,040	32,413
DUAL-ELIGIBLE PATIENTS				
A few times a year	-2.41*	1.22	-3.01	381.72
Once a month	0.44	-0.44	-3.68	-1,372.40
A few times a month	-2.16	2.03	2.96	937.05
Once a week	-1.53	1.64	3.56	-1,483.99
A few times a week	0.93	0.28	-1.88	-1,868.41
Every day	1.03	-1.33	9.41**	3,781.20
Mean of dependent variable	7.53%	8.05%	18.1%	\$16,242.94
No. of attributed patients	3,068	3,068	713	3,068

SOURCE: Authors' analyses of Medicare claims data from January 1 to December 31, 2017, linked to American Board of Family Medicine survey of all recertifying physicians in 2017. **NOTES**

Dual-eligible patients are those eligible for both Medicare and Medicaid. Coefficients shown are marginal effects—that is, adjusted differences in rates of quality measures (or cost) relative to the omitted category of callousness (never; not shown), estimated from regressions adjusting for physician, practice and patient characteristics identical to those in exhibit 1. Rates were the annual number of patients with ambulatory care-sensitive admissions (ACSAs), ambulatory care-sensitive emergency department admissions (ACSEdS), and readmissions per 100 patients. Logistic regressions were estimated for quality outcomes, and a generalized linear model was estimated for the cost outcome.

* $p < 0.10$

** $p < 0.05$