

## Burnout Among Physicians, Advanced Practice Clinicians and Staff in Smaller Primary Care Practices.

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# Burnout Among Physicians, Advanced Practice Clinicians and Staff in Smaller Primary Care Practices

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**BACKGROUND:** Burnout among primary care physicians, advanced practice clinicians (nurse practitioners and physician assistants [APCs]), and staff is common and associated with negative consequences for patient care, but the association of burnout with characteristics of primary care practices is unknown.

**OBJECTIVE:** To examine the association between physician-, APC- and staff-reported burnout and specific structural, organizational, and contextual characteristics of smaller primary care practices.

**DESIGN:** Cross-sectional analysis of survey data collected from 9/22/2015–6/19/2017.

**SETTING:** Sample of smaller primary care practices in the USA participating in a national initiative focused on improving the delivery of cardiovascular preventive services.

**PARTICIPANTS:** 10,284 physicians, APCs and staff from 1380 primary care practices.

**MAIN MEASURE:** Burnout was assessed with a validated single-item measure.

**KEY RESULTS:** Burnout was reported by 20.4% of respondents overall. In a multivariable analysis, burnout was slightly more common among physicians and APCs (physician vs. non-clinical staff, adjusted odds ratio [aOR] = 1.26; 95% confidence interval [CI], 1.05–1.49, APC vs. non-clinical staff, aOR = 1.34, 95% CI, 1.10–1.62). Other multivariable correlates of burnout included non-solo practice (2–5 physician/APCs vs. solo practice, aOR = 1.71; 95% CI, 1.35–2.16), health system affiliation (vs. physician/APC-owned practice, aOR = 1.42; 95% CI, 1.16–1.73), and Federally Qualified Health Center status (vs.

physician/APC-owned practice, aOR = 1.36; 95% CI, 1.03–1.78). Neither the proportion of patients on Medicare or Medicaid, nor practice-level patient volume (patient visits per physician/APC per day) were significantly associated with burnout. In analyses stratified by professional category, practice size was not associated with burnout for APCs, and participation in an accountable care organization was associated with burnout for clinical and non-clinical staff.

**CONCLUSIONS:** Burnout is prevalent among physicians, APCs, and staff in smaller primary care practices. Members of solo practices less commonly report burnout, while members of health system-owned practices and Federally Qualified Health Centers more commonly report burnout, suggesting that practice level autonomy may be a critical determinant of burnout.

**KEY WORDS:** burnout; primary health care; organization of care.

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## INTRODUCTION

Burnout, a psychological state characterized by emotional exhaustion, depersonalization, and a perceived lack of effectiveness,<sup>1</sup> is common and, by some accounts, worsening in primary care.<sup>2–6</sup> Although absolute levels of burnout vary depending on the measure used,<sup>7</sup> current evidence suggests burnout may be related to the changing environment of care including increased workload,<sup>8, 9</sup> clerical task performance,<sup>7</sup> use of electronic health records (EHR),<sup>10–12</sup> engagement in practice change initiatives,<sup>13</sup> and the rising complexity of primary care practice.<sup>14</sup> The potential consequences are serious for patients, clinicians, and staff, as burnout is associated with poorer care quality,<sup>8, 15</sup> lower patient satisfaction,<sup>16, 17</sup> decreased patient safety,<sup>18</sup> employee work-hour reductions,<sup>19,</sup>

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**Registration:** Evaluating System Change to Advance Learning and Take Evidence to Scale (ESCALATES) is registered as an observational study at [clinicaltrials.gov](https://clinicaltrials.gov) (NCT02560428).

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<sup>20</sup> and turnover.<sup>21</sup> While many recent studies of burnout in health care have focused on physicians, primary care is increasingly delivered by multidisciplinary teams.<sup>22</sup> Other studies have focused on large health systems<sup>9, 23</sup> and have included relatively few physicians, advanced practice clinicians (nurse practitioners, physician assistants [APCs]), and staff from small, independent primary care practices.<sup>24, 25</sup>

Little is known about how structural, organizational, and contextual characteristics relate to burnout in smaller practices, where over 75% of Americans receive primary care,<sup>26</sup> or whether non-physician team members also suffer from burnout. Therefore, we examined the prevalence of burnout among physicians, APCs and staff, and the relationship between practice-level organizational characteristics and burnout in a large national sample of smaller primary care practices, with the aim of identifying practice characteristics and environments that may provide protection or risk for burnout. Findings from this study may inform policy efforts designed to support clinical teams in smaller primary care practices.

## METHODS

### Setting

In 2015, the Agency for Healthcare Research and Quality (AHRQ) launched EvidenceNOW, a nationwide initiative to promote evidence-based cardiovascular preventive care in smaller primary practices. The seven regional EvidenceNOW cooperatives worked with 1716 practices in 12 US states, in which over 5000 physician and APCs care for over 8 million patients. AHRQ additionally funded an independent national evaluation of these seven cooperatives, “Evaluating System Change to Advance Learning and Take Evidence to Scale (ESCALATES),”<sup>27</sup> which aggregated the data used in this study.

### Participants and Procedures

Each EvidenceNOW cooperative aimed to enroll at least 200 smaller primary care practices, defined as practices with up to ten physicians/APCs.<sup>27</sup> Because of recruitment challenges, the funder allowed some cooperatives to recruit a few practices with up to 15 full-time clinicians. Practices were included if they used an EHR and if they had little or no internal quality improvement support.

Surveys were fielded by EvidenceNOW cooperatives prior to practice interventions, 9/22/2015–06/19/2017. Cooperatives administered a *Practice Survey* to a self-identified practice leader (e.g., office manager, lead physician/APC), collecting information on practice structure. Cooperatives also administered a *Practice Member Survey* to all members of each practice. The sample frame of practices was all those participating in EvidenceNOW, while the sample frame of practice members was all practice members in participating practices at the time of survey administration. Cooperatives selected the mode in which the survey was administered

(paper, web-based, phone) to suit their practices’ needs. Incentives were offered by most cooperatives to practices and practice members for survey completion. Incentives varied in size (\$2–\$75) and type (cash, gift card) per cooperative. EvidenceNOW cooperatives were instructed to ensure respondent confidentiality during survey administration.

Practice survey response rate was calculated as the number of participating practices that completed a practice survey. Practice member survey response rate was calculated as the number of surveys returned divided by the number of practice members in each practice at the time of survey administration. For 153 practices (~11%), we had incomplete response rate data; we used a multiple imputation approach to estimate response rate based on the number of surveys returned, and responses reported in the practice survey (see Online Appendix Table 1 for details).

### Survey Measures

At study initiation, EvidenceNOW cooperatives and the ESCALATES team collaboratively developed a core set of survey measures. The Practice Survey collected structural characteristics, such as practice size, ownership, staffing, EHR capabilities, registry use, recent practice disruptions (e.g., employee turnover, EHR implementation), participation in accountable care organizations (ACOs), and participation in other practice-change initiatives (e.g., State Innovation Models initiative, Comprehensive Primary Care Initiative, Transforming Clinical Practice Initiative). Additional questions included proportion of patients with Medicare or Medicaid, and average patient volume (patient visits per physician/APC per day). The practice member survey included questions on the primary outcome of burnout and other individual member characteristics, including professional category [i.e., physician, APC, clinical staff (e.g. registered nurse, medical assistant, behavioral health provider), non-clinical staff (e.g. receptionist, billing staff) and other], length of employment, and hours worked per week. Burnout was measured by a single-item, 5-point measure validated against the emotional exhaustion scale of the Maslach Burnout Inventory (MBI),<sup>28, 29</sup> and which has been used in multiple studies<sup>5, 7–9, 23, 30</sup>—“Overall, based on your definition of burnout, how would you rate your level of burnout?” Responses were scored on a five-category ordinal scale:

- 1 = I enjoy my work. I have no symptoms of burnout.
- 2 = Occasionally, I am under stress, and I do not always have as much energy as I once did, but I do not feel burned out.
- 3 = I am definitely burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion.
- 4 = The symptoms of burnout that I am experiencing will not go away. I think about frustration at work a lot.
- 5 = I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help.

As defined in prior work, a person reporting a score of 3 or higher was considered to be experiencing burnout.<sup>23</sup> A complete list of survey items is found in Table 1.

## Statistical Analysis

We used summary statistics (counts and proportions) to describe characteristics of the EvidenceNOW practices, the practice-member respondents involved in the study, and the prevalence of burnout by member role and practice characteristics. To determine the member- and practice-level factors associated with burnout, we performed multivariable member-level generalized estimating equation (GEE) logistic regression models of burnout (dichotomized as yes/no) with robust sandwich variance estimators that accounted for clustering of members within a practice (assuming an exchangeable correlation structure) as a function of selected practice organizational and individual characteristics (Table 2). We performed analyses for the entire sample, and stratified by professional category. We used multiple imputation by chained equations to account for missing data in member- and practice-level characteristics.<sup>31</sup> Final estimated odds ratio of burnout and their corresponding 95% confidence intervals across 50 imputed data sets were combined using Rubin's rules.

As a sensitivity analysis, we performed univariable models and multivariable models of burnout as a function of member and practice characteristics, including dummy variables for missing covariate responses, to avoid removing members from the analyses and maintain the overall sample. For all models, we excluded 617 (5.6%) members that did not respond to the burnout item. Analyses were conducted using R version 3.4.0 and statistical significance was set at  $p$  value < 0.05. This study was approved by the Institutional Review Board at Oregon Health & Science University and was registered as an observational study at [clinicaltrials.gov](https://clinicaltrials.gov) (NCT02560428).

## RESULTS

Of 1716 enrolled practices, 1492 returned practice surveys (87% response rate), and 1501 returned at least one practice member survey (88% response rate). Among 1380 practices that submitted a practice survey and had at least one practice member respondent (80% of enrolled practices), 10,901 practice members responded (with 10,284 responses to the burnout item), a mean of 7.9 respondents per practice, with an estimated per-practice response rate of 75.8% (see Online Appendix Table 1 for details).

Practice and practice-member characteristics are presented in Table 1. Almost 15% of respondents were physicians, 9.2% were APCs, 35.6% were clinical staff, 21.7% were non-clinical staff, and 6.4% were office managers. Forty-five percent had worked in their current practice for over 3 years, and 15.3% worked more than 40 hours per week.

Just under one-quarter of practices were solo practices, and nearly half had 2–5 physicians/APCs. Nearly 40% of practices were physician/APC-owned, just over 20% were owned by hospitals or health systems, and 16.4% were Federally Qualified Health Centers (FQHCs). Sixteen percent of practices were located in rural areas, and 32.3% were in a medically underserved area. Nearly 40% reported patient-centered medical home (PCMH) recognition, and 30% reported participating in other demonstration projects. Nearly 40% reported participating in an ACO, and just over half reported receiving incentives or payments based on clinical quality, adoption/use of information technology, or patient satisfaction.

Sixty-two percent of practices reported using registries, and 71.6% of practices acknowledged participating in Meaningful Use<sup>32</sup>; almost 20% reported experiencing multiple practice disruptions in the prior 12 months. Practice characteristics were similar between practices with and without responses to the burnout survey item (Online Appendix Table 2).

## Burnout

Burnout was present in 20.4% of respondents overall, ranging from 25.1% of physicians to 17.2% of office managers (multivariable analysis in Table 2 and Online Appendix Table 4). In multivariable models, the odds of burnout were higher among non-solo practices as compared to solo practices (e.g., 2–5 physician/APCs vs. solo practice, adjusted odds ratio (aOR) = 1.71, 95% CI = 1.35–2.16). People who worked in hospital- or health system-owned practices and FQHCs had higher odds of burnout than people working in physician/APC-owned practices (hospital/health system: aOR = 1.42, 95% CI = 1.16–1.73; FQHC: aOR = 1.36, 95% CI = 1.03–1.78). There was no significant difference in burnout by practice location.

Practice members whose practice reported participating in an ACO had higher odds of burnout (aOR = 1.27, 95% CI = 1.08–1.48). Neither the proportion of patients covered by Medicare or Medicaid, nor practice level patient volume (patient visits per physician/APC per day) was associated with practice member burnout.

Physician and APCs had higher odds of burnout than non-clinical staff (physician vs. non-clinical staff, aOR = 1.26; 95% CI = 1.05–1.49, nurse practitioner or physician assistant vs. non-clinical staff, aOR = 1.34, 95% CI = 1.10–1.62). Individuals who worked more than 3 years in their current practice, and worked more than 40 h per week had higher odds of reporting burnout.

The sensitivity analyses using missing data indicators in univariable and multivariable GEE models to examine the potential bias related to missing practice and practice member characteristics data (Online Appendix Tables 3 and 4) demonstrated similar findings to the multiply-imputed multivariable GEE models.

In analyses stratified by professional category (Fig. 1), practice size was not associated with burnout for APCs (e.g., 11+ clinicians vs. solo, aOR = 0.86, 95% CI 0.35–2.07), but

Table 1 Description of Participating EvidenceNOW Practices and Practice Members

Practice characteristics	N = 1380
Practice size, measured by number of physician/APCs, N (%)	
Solo practice	322 (23.3)
2 to 5 physician/APCs	652 (47.2)
6 to 10 physician/APCs	191 (13.8)
11 or more physician/APCs	149 (10.8)
Practice ownership, N (%)	
Physician/APC-owned	528 (38.3)
Hospital/health system	277 (20.1)
Federally Qualified Health Center	227 (16.4)
Other*	291 (21.1)
Years under current ownership, N (%)	
< 5 years	329 (23.8)
5–10 years	244 (17.7)
10–20 years	316 (22.9)
> 20 years	233 (16.9)
Practice type, N (%)	
Single-specialty	843 (61.1)
Multi-specialty	365 (26.4)
Location†, N (%)	
Rural area	223 (16.2)
Large town	183 (13.3)
Suburban	99 (7.2)
Urban core	875 (63.4)
Medically underserved area classification, N (%)	446 (32.3)
Participation in transformation initiatives	
Patient-centered medical home recognition, N (%)	547 (39.6)
Part of an Accountable Care Organization, N (%)	538 (39.0)
Participation in other demonstration projects‡, N (%)	411 (29.8)
Received external incentives in past 12 months, N (%)	697 (50.5)
Health information technology characteristics	
Meaningful use participation, N (%)	
No	212 (15.4)
Yes	988 (71.6)
Use of registries, N (%)	
No	421 (30.5)
Yes	862 (62.5)
Internal factors	
Major disruption(s) in past 12 months§, N (%)	
No major disruptions	533 (38.6)
One major disruption	475 (34.4)
More than one major disruption	272 (19.7)
Other factors	
Patient visits per physician/APC per day, N (%)	
0–15	357 (25.9)
16–25	744 (53.9)
> 25	131 (9.5)
% patients with Medicare or Medicaid, mean (SD)	45.2 (21.2)
Practice member characteristics	N = 10,284
Role in practice, N (%)	
Physician	1535 (14.9)
NP/PA	946 (9.2)
Clinical staff	3659 (35.6)
Non-clinical staff	2235 (21.7)
Office manager	663 (6.4)
Other	974 (9.5)
Years in practice	
0–3 years	5294 (51.5)
> 3 years	4647 (45.2)
Hours worked per week, N (%)	
0–40	8476 (82.4)
> 40	1575 (15.3)

EHR electronic health records, SD standard deviation, NP nurse practitioner, PA physician assistant

Percentages may not add up to 100% due to missing data. Only practice members who had a non-missing response for the burnout survey item are included. Additional characteristics of responders and non-responders are located in the online supplement

\*"Other" category includes multiple ownership, health maintenance organization, academic health center, non-federal government clinic, rural health clinic, Indian Health Service, etc.

†Location categories determined using rural-urban commuting area (RUCA) codes

‡Other demonstrations programs include State Innovation Models initiative, Comprehensive Primary Care Initiative, Transforming Clinical Practice Initiative, Community Health Worker training program, BC/BS PCMH program, and Million Hearts

§Major disruptions include new EHR, new billing system, moved locations, staff turnover, and purchased/affiliated with larger organization

Table 2 Prevalence and Odds of Burnout by Practice and Practice Member Characteristics

Independent variables	% Burnout	Adjusted OR	95% CI	P value
Practice characteristics				
Practice size				
Solo practice	12.2	Ref	Ref	Ref
2 to 5 physician/APCs	20.7	1.71	1.35–2.16	< 0.001
6 to 10 physician/APCs	20.4	1.61	1.22–2.10	0.001
11 or more physician/APCs	24.5	2.01	1.52–2.65	< 0.001
Practice ownership				
Physician/APC-owned	18.3	Ref	Ref	Ref
Hospital/health system	22.9	1.42	1.16–1.73	0.001
Federally Qualified Health Center	21.6	1.36	1.03–1.78	0.027
Other*	20.3	1.30	1.05–1.60	0.013
Years under current ownership				
< 5 years	19.2	Ref	Ref	Ref
5–10 years	19.5	1.00	0.81–1.23	0.984
10–20 years	21.4	1.11	0.91–1.35	0.274
> 20 years	22.9	1.13	0.90–1.42	0.283
Practice type				
Single-specialty	20.1	Ref	Ref	Ref
Multi-specialty	21.9	0.93	0.79–1.09	0.398
Location <sup>†</sup>				
Rural Area	18.6	0.83	0.62–1.09	0.189
Large Town	17.9	0.82	0.60–1.10	0.185
Suburban	23.0	Ref	Ref	Ref
Urban	21.1	0.91	0.70–1.17	0.458
Medically underserved area classification				
No	20.5	Ref	Ref	Ref
Yes	19.8	0.98	0.79–1.19	0.813
Participation in transformation initiatives				
Patient-centered medical home recognition				
No	19.4	Ref	Ref	Ref
Yes	21.2	0.97	0.83–1.12	0.688
Part of an accountable care organization				
No	18.6	Ref	Ref	Ref
Yes	22.9	1.31	1.13–1.51	< 0.001
Participation in other demonstration projects <sup>‡</sup>				
No	19.7	Ref	Ref	Ref
Yes	21.8	1.12	0.96–1.30	0.138
Received external incentives in past 12 months				
No	18.4	Ref	Ref	Ref
Yes	19.7	1.02	0.85–1.20	0.843
Health information technology characteristics				
Meaningful use participation				
No	16.3	Ref	Ref	Ref
Yes	21	1.19	0.97–1.45	0.092
Use of registries				
No	18.8	Ref	Ref	Ref
Yes	21.2	0.97	0.82–1.13	0.698
Internal factors				
Major disruptions(s) in past 12 months <sup>§</sup>				
No major disruptions	19.5	Ref	Ref	Ref
One major disruption	20.3	1.04	0.89–1.22	0.595
More than one major disruption	22.5	1.17	0.97–1.38	0.085
Other factors				
Patient visits per physician/APC per day				
0–15	19.3	Ref	Ref	Ref
16–25	21.4	1.06	0.90–1.24	0.457
> 25	17.4	0.89	0.67–1.17	0.418
% patients with Medicare or Medicaid	21.8 <sup>¶</sup>	0.99	0.96–1.03	0.675
Practice member characteristics				
Role in practice				
Physician	25.1	1.26	1.05–1.49	0.010
NP/PA	22.6	1.34	1.10–1.62	0.003
Clinical staff	20.6	1.17	1.01–1.34	0.028
Non-clinical staff	18.0	Ref	Ref	Ref
Office manager	17.2	0.78	0.61–0.99	0.048
Other	16.5	0.82	0.66–1.01	0.058
Years in practice				
0–3 years	17.3	Ref	Ref	Ref
> 3 years	23.9	1.48	1.32–1.64	< 0.001

(continued on next page)

Table 2. (continued)

Independent variables	% Burnout	Adjusted OR	95% CI	P value
Hours worked per week				
0–40	18.6	Ref	Ref	Ref
> 40	30.1	1.88	1.64–2.15	< 0.001

OR odds ratio, CI confidence interval, EHR electronic health records, NP nurse practitioner, PA physician assistant

The prevalence of burnout by characteristics are unadjusted. Adjusted odds ratios of burnout and 95% confidence intervals were obtained from a multivariable multiple-imputation-based generalized estimating equation logistic model with robust sandwich variance estimators that accounted for clustering of members within a practice (assuming an exchangeable correlation structure). Details about the multiple imputation procedure are presented in online supplementary material. Italicized text denotes statistical significance (*p* value < 0.05)

<sup>1</sup>“Other” category includes multiple ownership, health maintenance organization, academic health center, non-federal government clinic, rural health clinic, Indian Health Service, etc.

<sup>2</sup>Location categories determined using rural-urban commuting area (RUCA) codes

<sup>3</sup>Other demonstration programs include State Innovation Models initiative, Comprehensive Primary Care Initiative, Transforming Clinical Practice Initiative, Community Health Worker training program, BC/BS PCMH program, and Million Hearts

<sup>4</sup>Major disruptions include new EHR, new billing system, moved locations, staff turnover, and purchased/affiliated with larger organization

<sup>5</sup>Prevalence of burnout from the middle 10% of the sample was estimated. This corresponded to estimating the prevalence of burnout among practices fitting in the 45th to 55th percentile of the Medicaid/Medicare payer distribution. The regression was performed with percentage of patients with Medicare/Medicaid as a continuous variable

the effect size on burnout among physicians was larger than in the overall practice member model (e.g., 11+ clinicians vs. solo, aOR = 3.60, 95% CI 2.03–6.34 in stratified analysis vs. aOR = 2.01, 95% CI 1.52–2.65 in overall practice member model). Practice ownership was not associated with burnout among non-clinical staff, and practice participation in an ACO was associated with burnout, but only for clinical and non-clinical staff. Full stratified model results are presented in Online Appendix Table 5.

### DISCUSSION

This national study of burnout in over 10,000 members of over 1300 smaller primary care practices has several notable

findings. First, while physicians and APCs had slightly higher levels of burnout, burnout was prevalent among all employee types. Second, members of solo practices reported less burnout compared to larger practices. Third, people working in physician- or APC-owned practices reported less burnout compared to those working in health system-owned practices and FQHCs. Finally, patient volume at the practice level was not associated with burnout.

Much recent attention to burnout in health care has been focused on physicians; in this work, we demonstrate that nurse practitioners and physician assistants in primary care experience burnout at similar levels. Additionally, burnout was more common among clinical staff than non-clinical staff. However, burnout was prevalent among all roles in the practice, suggesting it may be a characteristic of specific practices, or primary care in general. Practice characteristics were associated with burnout, suggesting that organization-level factors may be important drivers of burnout. Indeed, recent systematic reviews show that initiatives targeting organizations, not only individual employees, are critical to reduce burnout.<sup>33, 34</sup>

Primary care is physically, emotionally, and cognitively demanding work.<sup>35</sup> Consistent with prior studies, we found that working more hours per week, as reported by practice members, is associated with more burnout. Our findings complement research on primary care burnout conducted in larger practice settings. Helfrich, et al. demonstrated that in the United States Department of Veterans Affairs, primary care workload, as measured by panel overcapacity, was strongly associated with burnout.<sup>9</sup> Yet, recent evidence, including findings from this study, suggest that number of hours worked by itself may not be directly related to burnout.<sup>36</sup> Factors such as perceived control over work, autonomy, relatedness, competence, and values congruence may be important factors influencing burnout in large and small practices.<sup>37</sup>

Social determination theory (SDT) suggests that three innate psychological needs drive human well-being: autonomy, relatedness, and competence, and—when fulfilled—people express vitality, curiosity, and self-motivation. When these

PRACTICE SIZE	Overall		NP or PA	Clinical Staff	Nonclinical Staff
	MD				
Solo (ref)					
2–5 clinicians	1.71*	2.16*	1.01	1.98*	1.56
6–10 clinicians	1.61*	1.86*	1.18	1.51	1.99*
>10 clinicians	2.01*	3.59*	0.86	1.82*	2.71*
<b>PRACTICE OWNERSHIP</b>					
Clinician Owned (ref)					
Hospital/HS	1.42*	1.67*	1.71	1.43*	1.06
FQHC	1.36*	2.06*	2.47*	1.37	1.02
Other	1.29*	1.22	1.51	1.29	1.09
<b>PART OF ACO</b>					
No (ref)					
Yes	1.31*	0.98	1.39	1.41*	1.53*
<b>YEARS IN PRACTICE</b>					
0–3 years (ref)					
3+ years	1.48*	1.46*	1.36	1.77*	1.44*
<b>HOURS WORKED / WK</b>					
40 or less (ref)					
>40	1.88*	1.94*	1.81*	1.93*	2.08*

Fig. 1 Adjusted odds of burnout by practice and practice member characteristics overall and stratified by member role in practice. HS, health system; FQHC, Federally Qualified Health Center; ACO, accountable care organization; WK, week; MD, doctor of medicine; NP, nurse practitioner; PA, physician assistant. Only the significant practice and practice member characteristics in the overall sample are displayed. For all characteristics, please refer to supplementary materials. Statistical significance is denoted by the asterisk (*p* < 0.05)



needs are unmet, people become apathetic, alienated, and diminished.<sup>38</sup> Our findings align with SDT and an emerging literature, suggesting that practice features related to autonomy, relatedness, and competence (e.g., solo practice, clinician ownership) are protective for burnout.<sup>39–42</sup> People working in solo and clinician-owned practices may have more autonomy and decision-making power than those working in system-owned practices,<sup>43</sup> and may also have a higher sense of relatedness, with fewer employees, closer working relationships, and a shared sense responsibility for the practice's success. In contrast, external measurement and reward systems, as are frequently used in health systems and FQHCs, may erode clinician and staff perceptions of competence and autonomy,<sup>44</sup> and undermine intrinsic motivation, leading to burnout.<sup>45</sup>

Burnout also may be attributable to the type and difficulty of work. For example, we observed that burnout was associated with working in FQHC practices, where practice staff manage large, complex and vulnerable patient panels, and may lack critical resources. This finding aligns with observations of larger FQHCs, where Friedberg, et al. found that burnout was increasing over time, while perceived control of work was decreasing.<sup>6</sup> We also observed that other workload-related practice characteristics, such as the approximate proportion of patients on Medicare or Medicaid, practice location in a medically underserved area, and patient volume, were not associated with burnout. This suggests that the additional workload associated with these variables may not directly impact burnout, but these variables might interact with other unmeasured factors through indirect pathways.

Analyses stratified by professional category revealed important differences in the association of practice size and ownership with burnout. Practice size was not associated with burnout for APCs, while being associated with burnout for all other professional categories. It may be that in larger practice settings APCs may practice more independently and have greater autonomy, protecting them from burnout. Additionally, practice ownership had no relationship with burnout among non-clinical staff. This null finding may indicate various trends within practices. Non-clinical staff members may already lack autonomy, and the practice ownership does not impact their work life. Alternatively, outside ownership may provide staff with greater benefits and new opportunities for career advancement, while simultaneously reducing practice relatedness, leading to mixed impact on burnout.

Policy efforts to improve primary care often impose requirements on practices, such as the use of quality measures, or the adoption of specific practice structures or capabilities, such as EHRs. In our study, PCMH recognition and participation in other transformation initiatives were not associated with burnout, while participation in an ACO was (among clinical and non-clinical staff only). ACOs may encourage practices to make changes in practice patterns and require reporting on specific quality

measures, and much of this work may fall on staff members, leading to burnout.

Our findings should be interpreted in light of several limitations. First, as a cross-sectional study, we cannot be certain about causation. Second, we use a single-item measure of self-defined burnout, whereas other survey measures of burnout, such as the Maslach Burnout Inventory (MBI), separately measure three dimensions of burnout: emotional exhaustion, depersonalization, and feelings of ineffectiveness. However, the single-item measure we used correlates with the emotional exhaustion subscale of the MBI,<sup>28, 29</sup> has been used in multiple large studies<sup>8, 9, 23, 46</sup> and has been adopted by the American Medical Association for burnout prevention efforts. Third, we relied on respondent self-reporting to determine practice characteristics, and in some practices respondents may not have had the necessary information to accurately complete the survey. However, we encouraged respondents to seek information from multiple sources to get the most accurate data. Fourth, as cooperatives did not collect data on response rate by professional category, we were unable to use non-response weights by professional category in our modeling approach. Finally, our sample consists of smaller primary care practices willing to engage in an external quality improvement project, and these practices may have differing levels of burnout than other practices. Nonetheless, our estimates of burnout prevalence are similar to other recent studies using similar measures.<sup>5, 7</sup>

## CONCLUSION

Burnout is common among physicians, APCs and staff in smaller primary care practices. Burnout was less common among solo and physician- or APC-owned practices and was more common among health system practices and FQHCs. While solo and independently owned practices provide a large proportion of primary care,<sup>26</sup> as policy and economic forces continue to promote consolidation and external ownership<sup>47, 48</sup> increased burnout among practice members may be a consequence. Future efforts to promote improvement of primary care should consider strategies that minimize burnout risk. These may include programs and policies that support and strengthen solo and smaller practices and encourage distribution of leadership and decision-making at the practice level in system-owned practices—promoting agency, enhancing intrinsic motivation, and creating work environments that ensure team members feel valued, engaged, and perform personalized work. Importantly, programs and policies need to take into account the work environment and degree of autonomy afforded all practice members, not just physicians.

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**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

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