

Elements of Team-Based Care in a Patient-Centered Medical Home Are Associated with Lower Burnout Among VA Primary Care Employees

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BACKGROUND: A high proportion of the US primary care workforce reports burnout, which is associated with negative consequences for clinicians and patients. Many protective factors from burnout are characteristics of patient-centered medical home (PCMH) models, though even positive organizational transformation is often stressful. The existing literature on the effects of PCMH on burnout is limited, with most findings based on small-scale demonstration projects with data collected only among physicians, and the results are mixed.

OBJECTIVE: To determine if components of PCMH related to team-based care were associated with lower burnout among primary care team members participating in a national medical home transformation, the VA Patient Aligned Care Team (PACT).

DESIGN: Web-based, cross-sectional survey and administrative data from May 2012.

PARTICIPANTS: A total of 4,539 VA primary care personnel from 588 VA primary care clinics.

MAIN MEASURES: The dependent variable was burnout, and the independent variables were measures of team-based care: team functioning, time spent in huddles, team staffing, delegation of clinical responsibilities, working to top of competency, and collective self-efficacy. We also included administrative measures of workload and patient comorbidity.

KEY RESULTS: Overall, 39 % of respondents reported burnout. Participatory decision making (OR 0.65, 95 % CI 0.57, 0.74) and having a fully staffed PACT (OR 0.79, 95 % CI 0.68, 0.93) were associated with lower burnout, while being assigned to a PACT (OR 1.46, 95 % CI 1.11, 1.93), spending time on work someone with less

training could do (OR 1.29, 95 % CI 1.07, 1.57) and a stressful, fast-moving work environment (OR 4.33, 95 % CI 3.78, 4.96) were associated with higher burnout. Longer tenure and occupation were also correlated with burnout.

CONCLUSIONS: Lower burnout may be achieved by medical home models that are appropriately staffed, emphasize participatory decision making, and increase the proportion of time team members spend working to the top of their competency level.

KEY WORDS: patient-centered medical home; burnout; team-based care; organizational change.

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BACKGROUND

Employee burnout is characterized by emotional exhaustion, depersonalization, and a low sense of personal accomplishment.^{1,2} Burned-out employees are more likely to leave their jobs,^{1,3–7} take sick leave, and suffer from relationship problems and depression.^{8–10} Clinician burnout is associated with worse patient safety^{11–15} and satisfaction.^{16–18} By some estimates, burnout affects nearly half of all US nurses and physicians.^{1,19}

There are many contributors to burnout. Employees who experience long work hours, excessive clinical workloads, a chaotic work environment, or discord among fellow staff are more likely to have burnout.^{5,8,10,20} Conversely, those who report a greater institutional emphasis on quality of care, team cohesiveness and communication are less likely to report burnout.⁵ Adequate staffing levels, equitable distribution of

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clinical work, as well as opportunities for skill development, may be protective.^{2,21} Likewise, a sense of control over work schedule and environment, autonomy, and participation in organizational decision making are associated with lower burnout.²⁰ Many of these factors are characteristics of patient-centered medical home (PCMH) models, which emphasize coordination of care, more efficient distribution of clinical tasks, and a collaborative work environment.

However, there has been limited research on the association of PCMH implementation with burnout or job satisfaction.^{22,23} In the Group Health Cooperative medical home pilot, characterized by smaller panel sizes and greater visit durations, Reid and colleagues reported a 1-year decrease in provider burnout from 30 % to 10 %, while it did not change at control clinics. These differences in burnout persisted through the second year of their PCMH.^{24,25} They attributed this decrease to reduced panel sizes, greater time with patients, and a more supportive work environment.²⁵ Hochman and colleagues likewise found that implementation of PCMH in a single resident physician clinic was associated with improved job satisfaction.²⁶ However, Nutting and colleagues reported change fatigue, including burnout and turnover, among participants in the National Demonstration Project,²⁷ and Lewis and colleagues found greater PCMH characteristics associated with high staff morale, but also higher provider burnout, among 65 safety-net clinics in a 2010 survey.²⁸ Moreover, organizational research has previously found workplace change—particularly frequent change or multiple changes—associated with greater burnout.^{29,30} In addition to offering conflicting findings, the existing literature on PCMH implementation and burnout is limited by small sample sizes, generally restricted to PCMH demonstration sites, and a focus almost exclusively on the physician experience.^{22,23} Overall, it remains unclear what effect broad-based PCMH implementation will have on a primary care workforce, including nurses and other staff, that is already exhibiting high levels of stress.

In April 2010, the Veteran's Health Administration (VHA) launched the Patient Aligned Care Team (PACT) initiative to implement a PCMH model in VHA primary care nationally.³¹ PACT, described in detail elsewhere,^{31,32} emphasized team-based care to improve clinical continuity, coordination and patient-centeredness. The teams, or PACTs, comprised a primary care provider (PCP) (i.e., a physician, nurse practitioner or a physician assistant), a nurse care manager, a clinical associate (e.g., LPN, medical assistant) and an administrative clerk. The VHA provided resources to support PACT implementation, such as funding to expand the staffing model to 3.0 Full-time equivalent (FTE) support staff for each PCP. There was an emphasis on communication and participatory decision making to develop well-functioning teams. PACTs were encouraged to use brief daily meetings or “huddles” to better coordinate work. There was education about different team roles, notably for the nurse care manager, who promotes wellness and self-care, and conducts proactive outreach to patients, including electronic and telephone contacts. Early findings suggest

substantial progress in implementing the PACT model,^{32,33} with increases in the use of telephone and electronic encounters, and proactive follow-up after hospital admissions, as well as reductions in hospitalizations for ambulatory sensitive conditions.^{32,34} However, one-third of primary care employees report signs of burnout,³³ and there appear to be strong temporal trends in declining job satisfaction and workplace climate among VA PCPs.³⁵ The stress of a large-scale change could be contributing to burnout among employees, or conversely, this team-based care model, which has characteristics associated with lower burnout in other settings,^{2,5,8,10,20,21,36–38} could be protective of burnout.

Our aim was to test the association of specific PACT elements with burnout among primary care employees approximately 2 years into a medical home transformation that is still underway, in order to better understand how broad-based implementation of a team-based PCMH model affects primary care employees.

METHODS

We conducted a cross-sectional, web-based survey in May–June 2012. Survey links were distributed via e-mail through clinical leadership in Primary Care and Nursing. Clinical leaders were asked to distribute the surveys to all staff that worked in primary care. Surveys were anonymous, with only clinic identifiers. The survey was approved by national union representatives.

With the exception of two of the 21 networks, all VA primary care team members (PCPs, nurses care managers, clinical associates and administrative clerks) employed by VA in summer 2012 were eligible to participate. The two networks that did not participate were demonstration sites that fielded similar but more in-depth surveys not reported here.

MAIN MEASURES

The dependent variable was burnout, measured using a single-item, 5-point measure³⁹ used for the Physician Worklife Study (PWS).^{40,41} A score of 3 or higher indicated signs of burnout.⁴¹ In sensitivity analyses, we also analyzed the PWS burnout measure as an ordinal value, and a 3-item version of the Maslach Burnout Inventory (MBI) Emotional Exhaustion scale.⁴² In the study sample, the PWS had a sensitivity of 78 % and specificity of 88 % for detecting burnout as indicated by the MBI, with an area under the curve (AUC) of 0.91.⁴³

We assessed implementation of PACT in terms of team-based care structure, team processes and team effectiveness. Four measures related to team structures: 1) spending at

Table 1. Characteristics of VA Primary Care Employees by Burnout (n=4,819, clinics=626)

	No burnout n (row%) n=2,937	Burnout n (row%) n=1,882	p value [†]
Respondent characteristics	—	—	—
All respondents	2,937 (61 %)	1,882 (39 %)	—
Percentage of time spent in Primary Care	—	—	0.02
Less than 20 %	128 (70 %)	55 (30 %)	—
20–40 %	70 (65 %)	38 (35 %)	—
41–60 %	66 (52 %)	60 (48 %)	—
61–80 %	101 (56 %)	78 (44 %)	—
More than 80 %	2,572 (61 %)	1,651 (39 %)	—
Tenure with VA	—	—	< 0.01
Less than 6 months	113 (90 %)	13 (10 %)	—
Between 6 months and 1 year	176 (81 %)	40 (19 %)	—
Between 1 and 2 years	323 (74 %)	116 (26 %)	—
Between 2 and 5 years	629 (58 %)	453 (42 %)	—
Between 5 and 10 years	565 (57 %)	421 (43 %)	—
Between 10 and 15 years	411 (58 %)	303 (42 %)	—
Between 15 and 20 years	202 (53 %)	176 (47 %)	—
Over 20 years	363 (62 %)	225 (38 %)	—
Don't know/Not applicable	155 (53 %)	135 (47 %)	—
Supervisory level	—	—	0.05
None	1,786 (62 %)	1,077 (38 %)	—
Team leader	826 (59 %)	568 (41 %)	—
First Line Supervisor	94 (57 %)	71 (43 %)	—
Manager	84 (69 %)	37 (31 %)	—
Executive/Senior Executive	15 (71 %)	6 (29 %)	—
Don't know/Not applicable	132 (52 %)	123 (48 %)	—
Occupation	—	—	< 0.01
Primary Care Provider	965 (55 %)	804 (45 %)	—
Nurse Care Manager	682 (60 %)	453 (40 %)	—
Clinical Associate	941 (69 %)	417 (31 %)	—
Administrative Clerk	349 (63 %)	208 (37 %)	—
Clinic workload and capacity	—	—	—
Proportion of PCPs with panels at over-capacity	0.018 (61 %)	0.021 (39 %)	0.17
Adjusted panel size	1,104 (219)	1,111 (217)	0.31
Patient intensity (DCG Average)	0.74 (0.26)	0.75 (0.26)	0.41
Hospital-based clinic	1,507 (60 %)	1,025 (40 %)	0.03
PACT elements of team-based care	—	—	—
Assigned to a PACT	2,579 (60 %)	1,691 (40 %)	0.03
Assigned to multiple PACTs	—	—	0.98
Yes	1,733 (60 %)	1,137 (40 %)	—
No	846 (60 %)	554 (40 %)	—
Don't know/Not applicable	358 (65 %)	191 (35 %)	—
PACT staffed to 3.0 ratio of team members to PCP	—	—	< 0.01
Yes	1,613 (70 %)	701 (30 %)	—
No	972 (49 %)	993 (51 %)	—
Not sure	232 (63 %)	135 (37 %)	—
Don't know/Not applicable	507 (50 %)	251 (25 %)	—
Spends ≥ 0.5 h/day on average in teamlet huddles	1,591 (65 %)	860 (35 %)	< 0.01
Working to top of competency	—	—	—
Amount of time spent on work that someone w/less training could do	—	—	< 0.01
< 25 %	1,340 (70 %)	570 (30 %)	—
25–50 %	779 (52 %)	718 (48 %)	—
50–75 %	263 (48 %)	282 (52 %)	—
> 75 %	123 (41 %)	177 (59 %)	—
Don't know/not applicable	432 (76 %)	135 (24 %)	—
Amount of time spent on work for which one has too little training	—	—	< 0.01
< 25 %	1,792 (60 %)	1,184 (40 %)	—
25–50 %	145 (46 %)	170 (54 %)	—
50–75 %	47 (41 %)	68 (59 %)	—
> 75 %	48 (48 %)	53 (52 %)	—
Don't know/not applicable	905 (69 %)	407 (31 %)	—
Collective self-efficacy to implement PACT (How confident are you that your teamlet/clinic team is capable of implementing PACT?)	—	—	< 0.01
Not at all	93 (28 %)	241 (72 %)	—
A little bit	185 (39 %)	295 (61 %)	—
Somewhat	744 (56 %)	577 (44 %)	—
Very much	1213 (71 %)	505 (29 %)	—
A lot	607 (73 %)	227 (27 %)	—
Don't know/Not applicable	95 (72 %)	37 (28 %)	—
Team functioning (range: 1 to 5, higher is better except for Chaos)	—	—	—
Communication	3.58 (0.56)	3.29 (0.73)	< 0.0001

Table 1. (continued)

	No burnout <i>n</i> (row%) <i>n</i> =2,937	Burnout <i>n</i> (row%) <i>n</i> =1,882	<i>p</i> value [†]
Participatory decision making	3.47 (0.69)	2.87 (0.81)	< 0.0001
Chaos/stress	2.96 (0.82)	3.98 (0.69)	< 0.0001
History of change	3.42 (0.85)	3.51 (0.91)	0.0016
Delegation of clinical duties	—	—	—
Patient care (range: -9.1 to 6.5)	0.24 (4.88)	-0.37 (5.00)	< 0.0001
Assessing patients (range: -8.9 to 6.8)	0.16 (4.23)	-0.24 (4.31)	0.0015
Responding to messages (range: -7.7 to 2.1)	0.07 (2.49)	-0.10 (2.69)	0.0243

[†]*p* values are for Chi-square tests of independence for categorical variables and *t*-tests for comparison of means

least a half-hour per day in team “huddles” to plan the workday; 2) being assigned to a PACT; 3) being assigned to multiple PACTs; and 4) that the respondent’s PACT was staffed to a recommended ratio of 3.0 FTE team members for each FTE provider.

Measures of team processes included team functioning and delegation of clinical responsibilities. We used a 4-scale measure of team functioning adapted from the Survey of Organizational Attributes of Primary Care.⁴⁴ It included scales assessing communication about conflict, participatory decision making, stressful work environment, and a history of successful change in the clinic. We developed a 15-item measure to assess the extent to which the PCP delegated and relied on the team to accomplish clinical activities. Items were scored on a 4-point scale from “not at all” to “a great deal.” To create summary scores for delegation, we standardized items using *z*-scores and performed principal components analysis⁴⁵ to determine the most efficient representation of the items, resulting in three scores: activities related to direct patient care (e.g., “Educating patients about disease-specific self-care activities”); patient assessments (e.g., “Assessing patient lifestyle factors”); and resolving messages (e.g., “Resolving messages from patients”).

Two items assessed whether the respondent felt they spent the majority of their time working to the top of their competency in terms of 1) doing work that someone with less training could do; and 2) doing work for which they do not have sufficient training. We also included a measure of respondents’ confidence or self-efficacy that their team was capable of implementing the PACT model. A copy of the full survey instrument is included online as Appendix A.

We adjusted for respondents’ length of tenure with VA and supervisory level. We did not include demographics such as gender and race, which have not been consistently associated with burnout.⁴⁶ We also included three measures of clinic workload and capacity: 1) overall clinic-adjusted average panel size, which is adjusted for type of provider (physician vs. nurse practitioner and physician assistant) and FTE; 2) the proportion of providers in the clinic who are over-capacity, which is whether providers’ panels exceeded the panel size the VA expects a PCP to manage adjusted for provider FTE; and 3) clinical “intensity” of the patients in the panel, which is the average Diagnostic Cost

Group (DCG) score. DCG score is based on demographics and weighted diagnoses recorded in a 12-month period. Larger DCG indicates greater complexity.⁴⁷ We also adjusted for whether the clinic was community-based or co-located with a VA medical center.

Analyses

We conducted a respondent-level, logistic regression of employee burnout (dichotomized as presence of burnout symptoms or not) as a function of PACT implementation related to team-based care, adjusting for respondent characteristics and clinic-level workload characteristics. Analyses were adjusted for clustering by clinic using robust standard errors. The model was specified a priori based on components of team-based care that are goals of the PACT initiative; we did not engage in stepwise regression. For multivariate analyses, we excluded 250 observations that contained “don’t know/not applicable” response options for one or more of the continuous variables comprising the team functioning or delegation of clinical responsibilities scales. For ordinal variables, we included dummy variables for “don’t know/not applicable” responses. We report odds ratios with robust standard errors. All analyses were completed with STATA/MP 11.2 (Stata Corp LP, College Station, TX) and SAS 9.3 (SAS Institute, Inc., Cary, NC).

KEY RESULTS

We received a total of 4,819 surveys (626 clinics) from respondents in the four occupations comprising PACTs (estimated response rate of approximately 25 %). Overall, the prevalence of burnout was 39 %, with the highest prevalence for PCPs (45.4 %), and the lowest for Clinical Associates (31.7 %).

Virtually all independent variables were significantly correlated with burnout, the exceptions being assignment to multiple PACTs, and the clinic workload and capacity variables: proportion of PCPs with panels over-capacity, adjusted panel size and patient intensity. The strongest associations were seen for working to top of competency

Table 2. Logistic Regression for Burnout as a Function of PACT Elements of Team-Based Care Adjusting for Respondent and Clinic Characteristics (n=4,569; clinics=589)

	Odds Ratio for Burnout	Robust Std. Err.	z	P > z	95 % Conf. Interval	
Respondent characteristics	–	–	–	–	–	–
Percentage of time spent in Primary Care	–	–	–	–	–	–
Less than 20 %	referent	–	–	–	–	–
20–40 %	0.95	0.33	–0.16	0.873	0.48	1.87
41–60 %	1.52	0.53	1.2	0.231	0.77	3.02
61–80 %	1.73	0.57	1.66	0.097	0.91	3.32
More than 80 %	1.35	0.36	1.14	0.253	0.81	2.28
Tenure with VA	–	–	–	–	–	–
Less than 6 months	referent	–	–	–	–	–
Between 6 months and 1 year	1.16	0.51	0.33	0.74	0.49	2.75
Between 1 and 2 years	1.31	0.56	0.63	0.526	0.57	3.01
Between 2 and 5 years	2.36	0.98	2.07	0.039	1.05	5.32
Between 5 and 10 years	2.20	0.89	1.94	0.052	0.99	4.87
Between 10 and 15 years	2.13	0.89	1.81	0.07	0.94	4.83
Between 15 and 20 years	2.68	1.12	2.35	0.019	1.18	6.09
Over 20 years	2.31	1.01	1.92	0.055	0.98	5.42
Don't know/not applicable	1.89	0.98	1.22	0.224	0.68	5.24
Supervisory level	–	–	–	–	–	–
None	referent	–	–	–	–	–
Team leader	1.02	0.09	0.26	0.797	0.85	1.23
First Line Supervisor	1.24	0.26	1.03	0.305	0.82	1.89
Manager	1.21	0.33	0.69	0.491	0.71	2.05
Executive/Senior Executive	1.00	0.76	0.01	0.996	0.23	4.44
Don't know/not applicable	1.19	0.39	0.54	0.591	0.63	2.28
Occupation	–	–	–	–	–	–
Primary Care Provider	referent	–	–	–	–	–
Nurse Care Manager	0.82	0.09	–1.72	0.086	0.66	1.03
Clinical Associate	0.74	0.09	–2.39	0.017	0.58	0.95
Administrative Clerk	1.07	0.18	0.37	0.709	0.76	1.49
Clinic workload and capacity	–	–	–	–	–	–
PCP overcapacity	0.96	0.25	–0.15	0.884	0.58	1.60
Adjusted panel size	0.95	0.04	–1.29	0.198	0.87	1.03
Patient intensity (DCG Average)	0.91	0.09	–0.92	0.359	0.75	1.11
Hospital-based clinic	1.11	0.12	1	0.317	0.90	1.36
PACT elements of team-based care	–	–	–	–	–	–
Assigned to a PACT	1.46	0.21	2.67	0.008	1.11	1.93
Assigned to multiple PACTs	–	–	–	–	–	–
No	referent	–	–	–	–	–
Yes	1.07	0.10	0.68	0.496	0.88	1.29
Not sure	1.000	omitted	–	–	–	–
Staffed to 3.0 ratio of team members to PCP	–	–	–	–	–	–
No	referent	–	–	–	–	–
Yes	0.79	0.06	–2.9	0.004	0.68	0.93
Not sure	1.000	omitted	–	–	–	–
Spends > 0.5 h/day on average in teamlet huddles	0.91	0.07	–1.19	0.235	0.78	1.06
Working to top of competency	–	–	–	–	–	–
Amount of time spent on work that someone w/less training could do	–	–	–	–	–	–
< 25 %	referent	–	–	–	–	–
25–50 %	1.29	0.13	2.61	0.009	1.07	1.57
50–75 %	1.10	0.14	0.76	0.45	0.86	1.40
> 75 %	1.34	0.22	1.77	0.077	0.97	1.86
Don't know/not applicable	0.80	0.12	–1.55	0.122	0.60	1.06
Amount of time spent on work for which one has too little training	–	–	–	–	–	–
< 25 %	referent	–	–	–	–	–
25–50 %	1.18	0.18	1.12	0.261	0.88	1.58
50–75 %	1.07	0.24	0.29	0.775	0.69	1.66
> 75 %	1.03	0.29	0.11	0.909	0.59	1.80
Don't know/not applicable	0.97	0.10	–0.26	0.792	0.81	1.18
Collective self-efficacy to implement PACT (How confident?)	–	–	–	–	–	–
Not at all	referent	–	–	–	–	–
A little bit	0.92	0.19	–0.39	0.696	0.62	1.38
Somewhat	0.71	0.13	–1.88	0.059	0.50	1.01
Very much	0.70	0.14	–1.85	0.064	0.47	1.02
A lot	0.72	0.16	–1.49	0.136	0.47	1.11
Don't know/Not applicable	0.49	0.15	–2.35	0.019	0.27	0.89
Team functioning	–	–	–	–	–	–
Communication	0.92	0.07	–1	0.317	0.79	1.08
Participatory decision making	0.65	0.04	–6.6	< 0.001	0.57	0.74
Chaos/stress	4.33	0.30	21.19	< 0.001	3.78	4.96
History of change	1.05	0.06	0.92	0.359	0.94	1.17
Delegation of clinical duties	–	–	–	–	–	–

Table 2. (continued)

	Odds Ratio for Burnout	Robust Std. Err.	z	P > z	95 % Conf. Interval	
Patient care	0.99	0.02	-0.91	0.36	0.96	1.02
Assessing patients	1.01	0.02	0.61	0.541	0.98	1.05
Responding to messages	1.00	0.02	0.04	0.968	0.96	1.04
Constant	0.01	0.01	-7.05	0	0.00	0.03

(< 25 % of time spent on work that someone with less training could do or for which one has too little training), being on a PACT staffed to recommended ratio, collective self-efficacy in ability to implement PACT, and delegation of clinical activities (particularly activities related to direct patient care) (Table 1).

In adjusted multivariate analyses (Table 2), five elements of team-based care remained significantly correlated with burnout: participatory decision making (OR 0.65, 95 % CI 0.57, 0.74), being assigned to a PACT (OR 1.46, 95 % CI 1.11, 1.93), having a team staffed to the recommended 3.0 ratio (OR 0.79, 95 % CI 0.68, 0.93), spending 25–50 % of one's time on work that could be done by someone with less training (OR 1.29, 95 % CI 1.07, 1.57), and a chaotic work environment where employees feel overwhelmed by work demands (OR 4.33, 95 % CI 3.78, 4.96).

Both longer tenure and occupation were correlated with burnout in adjusted analyses. Those with 2 or more years of tenure had higher odds of burnout relative to those with less than 6 months (OR range 2.13–2.68). Clinical associates (OR 0.74, 95 % CI 0.58, 0.95) had lower odds of burnout relative to PCPs. None of the measures of clinic-level workload, including the proportion of PCPs whose panels were overcapacity, were significantly correlated with burnout.

Findings were similar when we used the ordinal PWS burnout measure and the Maslach Burnout Inventory Emotional Exhaustion scale. When we conducted analyses with independent variables aggregated to the clinic level, being assigned to a fully-staffed teamlet and working to top of competency were no longer significant across all measures of burnout (dichotomized and ordinal PWS, and MBI), but the results were otherwise similar. These results are included in online Appendix B.

CONCLUSIONS

We found that participatory decision making and having recommended staffing levels for primary care teams were associated with significantly lower burnout after adjusting for a variety of characteristics of respondents and clinics. Being assigned to a PACT; a stressful, fast-moving work environment; and spending time on work that someone with less training could do were associated with higher odds of burnout.

This paper makes two important contributions to the limited literature on the association of PCMH implementa-

tion with burnout in primary care.^{24,25,27,28,48} First, this is the first study we know of to assess the association of PCMH implementation with burnout in a broad population of clinics all engaged in implementing a PCMH model, rather than demonstration sites, or sites surveyed on the extent to which they already resemble PCMH models. We also include all members of the team, not just physicians. Consequently, our findings provide a more accurate picture about how a large-scale effort to implement a PCMH model is likely to affect all primary care personnel. Second, while past studies of PCMH initiatives have tested or described changes in burnout, no studies have tested which PCMH elements are associated with burnout among clinics implementing a PCMH model. We are able to identify specific elements of the model that are significant, independent correlates of burnout, which may help other systems embarking on PCMH initiatives.

Respondents who reported being on a team staffed to the recommend 3.0 ratio had significantly lower odds of burnout, even after adjusting for clinic-level workload and the proportion of PCPs whose panels were overcapacity. Our findings suggest that working on a fully staffed team is important for mitigating burnout, and add to a growing body of literature regarding the important impact of medical teams on employee stress, satisfaction and burnout.⁴⁹ Conversely, having a stressful, fast-moving work environment was associated with more than four times the odds of burnout, even after taking into account being on a team staffed to the recommended ratio and clinic-level measures of workload. Being assigned to a PACT was also associated with higher burnout. This is consistent with previous literature regarding the deleterious effect of a large-scale, organizational change,^{30,31} but could also be unobserved confounding, as the small proportion of respondents who had not been assigned to a PACT 2 years into the initiative may have been different in other respects as well.

We also found longer tenure was positively associated with burnout. The association with tenure may be a common feature of work life: the longer one spends in a job, the more one is worn out by it. But it may also be a function of the PACT initiative: employees with the longest tenure may experience the stress of major transformation most acutely, because their habits are well established and their expectations most likely to be challenged by the initiative. A question for future research will be to test the interaction of respondent tenure with extent of implementa-

tation of the new model, to determine if change-related stress disproportionately affects longer-tenured employees.

LIMITATIONS

The most important limitation is that our findings are based on cross-sectional observations; thus, we cannot draw causal inferences between measures of team-based care related to PACT and employee burnout. It is possible that sites with high rates of burnout are at a disadvantage implementing PACT, or that there is unobserved confounding (e.g., that clinics with adequate staffing and strong cultures of improvement have lower burnout and are better able to implement PACT). As additional data become available, we will examine trends over time to better address the association of changes in PACT implementation with changes in burnout.

There are also two other potential limitations that bear discussion, though we argue that both cases are of limited concern for the purposes of the analyses reported here (i.e., testing the association of specific PACT components with burnout).

First, because both the dependent and independent variables were measured with the same survey instrument, common method bias can inflate associations between variables. However, this is primarily a concern when a single or small number of independent variables are tested, and not for large numbers of independent variables in multivariate regression, where shared variance is not reflected in coefficients or odds ratios.^{50,51} Furthermore, we obtained nearly identical findings in clinic-level analyses, in which we would expect common method variance to be normally distributed, and as a result, attenuated.

Second, there is a threat of selection bias due to our survey methodology. Because we were obligated to distribute the survey via clinical leadership, and because surveys had to be anonymous, we do not have a defined sampling frame, and it is impossible to know for certain who participated in the survey. The individuals who did participate may differ in important ways from those who did not. However, our sample has very similar demographics with a primary care sample from a general employee survey, the VA All Employee Survey, fielded the month prior to ours, which achieved a 62 % response rate (tables of respective demographics and burnout rates by occupation in online Appendix C); our sample had a higher proportion of supervisors, fewer African Americans, and burnout was 6.6 % higher (38.5 % vs. 31.9 % among the four occupations comprising PACTs). Our sample was also representative of primary care clinics, with 69 % of VA primary care sites nationally being represented in our findings. This gives us added confidence that our findings are generalizable.

In terms of measures, the tenure item included response options that overlap, which may have caused confusion to respondents and introduced measurement error, and the staffing ratio question uses the term “recommended staffing ratio,” which may have introduced social desirability bias.

In summary, our findings suggest that lower burnout may be achieved by a medical home model that includes appropriately staffed teams, emphasizes participatory decision making among team members, and increases the proportion of time team members spend on work well-suited to their training.

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